JAN. - JUNE, 1889.]
HOUSE OF

The American Architect and Building News.
and Bishop's Chair,
Trinity Church, Lenox, Mass. W. C.
Brocklesby, Architect, 681
Sketcn for a Country Church, Chapel
and Parsonage, Montclair, N.
J.
R. H. Robertson, ArchiPulpit. Choir Stalls

:

Lenox,
Frederick
Frelinghuysen,
Mass. Kotch & Tilden, Architects,
699 (Gel.)
J. D.
Johnston, Architect, 705 (Gel.)

K. S. Isbam, Manchester, Vt.
Stiekiiey, Architect, 704

George M. Jones, Greensbnrgh, Pa.
J. A. DempwolfjArchitect, 704
M. Ogden Jones, Wood's Holl, Mass.
Wheelwright & Haven, Architects,

M

J. l)e F. Junkin,

tect, 693

W.

F.

Sacrament, Providence, R. I.
Heins & La Farge, Architects,
694
St. Peter's

Episcopal Church, Albany,
N. Y. R. M. Upjohn, Architect,

700 (Gel.)

West Philadelphia,

Pa. Albert W. Dilks, Archt., 698
Mrs. Jeremiah Milbank, Greenwich.
Conn. Lamb & Rich, Architects,
098 (Ge/.)

Mrs. Isabelle Nash, Bridgeport, Conn.
C. T. Beardsley, Jr., Archt., 681
H. L.
C. J. Page, Boston, Mass.
Warren-, Architect, 6%
Dr. W. B. Parker, Boston, Mass.
Hartwell & Richardson, Architects,
690 (Gel.)
C. Proctor, Cincinnati, O.
Neill Wilson, Architect, 697
R. C. Pruyn, Albany, N. Y. R.
Gibson, Architect, 685 (Oel.)

Grange Sard, Albany, N. Y.

EDUCATIONAL.
Bryn Mawr School-house, Baltimore,
Md. H. K. Marfhall, Architect, 692
Competitive Design for a School-house,
Yonkers, N. Y. Farnsworth, Hamilton & Mersereau, Architects, 692
Science Hall. Randolph Macon College,
W. M. Poindexter,
Ashland, Va.
Architect, 702
State Military Academy, Albany, N. Y.,

H.

W.

H. H.

& Elliot,

Architects, 689

FOREIGN.

Monument.
Figures for the,
Auguste Kodin, Sculptor, 696 (Gel.)
Cathedral, Mentz. Germany, 683 (Gel.)
"
Verona, Italy, 700

Calais

CHUBCH OF
"
"

Venice, Italy, 702
Laon, France, 694
Crewe Hall, Cheshire, England, 704 *
Fountain, Jativa, Spain, 691

Kirkham,

Hosley,

Springfield, Mass.

Guy

St. Mark,
St. Martin,

High Altar, Church

of Guadalupe,
Mexico, 682
Hotel de Ville, Compiegne, France, 683
"
"
"
Lyons, France, 683
"
"
"
Rheims, France, 683
" des
Brasseurs, Brussels, Belgium,

Kirkham,

tiago, Chili, S. A., 681

ECCLESIASTICAL
All Saints' Church, Pasadena, Cal.

E.

A. Coxhead, Ar"

"

chitect, 692
Pontiac, It. I.

How-

ard Hoppin, Ar-

Interior of St. Mark's, Venice, Italy,
after an Etching by Otto Bacher, 690
Juliet's Tomb, Verona, Italy, 700
Model of Gattamelata's Horse, Padua,
Italy, 702
Monument to Duke of Brunswick,

Geneva,

chitect, 6X1

Switzerland,

704

Baptist Church, Maiden, .Mass. Shepley, Kutan & Coolldge, Archts., 701

"

"

Brua Memorial Chapel, Pennsylvania
J. A.
College, Gettysburg, Pa.

"

" Niccoio
Orsini,

Dempwolf Architect, 680
Cathedral, Mentz, Germany, 683 (Gel.)
,

"

Verona, Italy, 700

Christ Church, Williamsbnrg, Va., 703
(Gel.)

Church at Ann Arbor, Mich. W. G.
Malcomson, Architect, fi87
CHDBCH OF:
702 (Gel.)
San
" Antonio, Padua, Italy,

Miehele, Pavia, Italy, 083
Miguel, Jerez de la Frontera,

Spain, 692
Xeno, Verona, Italy, 700
Martin, Laon, France, 694
SS. Giovanni e Paolo and School of
St. Mark, Venice, Italy, 702

OMPETITIVE DHSIUN FOR:

Malaspina, Verona, Italy,
697

Moretou Hall, Cheshire, England,

704

685
Scaligers.

Tombs

of the, 696

St Zeuo, Verona, Italy, 700

STATPF. OF

:

Duke Antoine of Lorraine, Nationa
Museum, Nancy, France, 694
Colleoni, Venice, Italy, 702

Gattameiata, Padua, Italy, 702 (Gel.)
Louis XII, Chateau de Blois, France
694
Street Views in Quebec, Can. Sketchet
by Robert Brown, Jr., 684
Tecbnische Hochschule, Berlin, Ger
many, 697
Upper Canada College, Toronto, Can
George F. Durand, Architect, 682
Verona, Italy. Views in, 6%, 700
I

IM

.

High Altar, Church

Architects, 689
of

Guadalupe,

Mexico, 682
Interior of St. Mark's, Venice, Italy.
After an Etching by Otto Bacher, 690

King Memorial Decoration, St. Paul's
Church, Augusta, Ga. Designed by
F. S. Lainb, 700

Mission Chapel for Emmanuel Church,
Boston, Mass. Kotch & Tilden, Architects, 695

Church, Santa Barbara, Cal.
J. G. Howard, Archt., 090
Proposed Twelfth Baptist Church, Boston, Mass. Eugene C. Fisher, Architect, 691

683

Scaligers.

HOUSE OF

ENTRANCE TO

Dud-

I.

Newton, Architect, 687

Frederic Frelinghuysen, Lenox, Mass.
Rotch & Tilden, Architects, 699
Mrs. Jeremiah Milbank, Greenwich,
Conn. ljunb & Rich, Archta., 698
Dr. W. B. Parker, Boston, Mass.
Hartwell & Richardson. Archts., 690
R. C. Pruyu. Albany, N. Y. K. W.
Gibson, Architect, 685
Grange Sard, Albany, N. Y. H. H.
Richardson, Architect, 701
Houses of Mrs. J. J. French and Mrs.
C. E. Stratton, Boston, Mass. Allen

Colleoni, Venice, Italy, 702

Gattameiata, Padua, Italy. 702 (Gel.)
Louis XII, Chateau de Blois, France,
694

Statues of St. John the Baptist, 688

PUBLIC.
Competitive Design for City-hall,
Lowell, Mass. Wait & Cutter, Architects, 703

& Kenway, Architects, 681
It. Employes' Reading-room,
New York, N. Y. R. H. Robertson,

N. Y. C. R.

Architect, 695
ailroad Station, Battle Creek, Mich.
Rogers & MacFarlane, Architects, 692
t. pbter's Episcopal Church, Albany,
N. Y. K. M. Upjohn, Architect, 700
,ate Military Academy, Albany, N.
Y., 6X0
tatue of Gattameiata, Padua, Italy,
702
pper part of Extension to Adams

W. Whitney

House, Boston, Mass.

Albany, N. Y.
ardson, Architect, 688

H.

[I.

Kiel

B. W. Gibson, Archt., 6H7
House of C. L. Tiffany, New York. >
Y. McKim, Mead & White, Arch

N. Y.

tects, 682

Y. M. C. A. Building, Albany, N. Y
Fuller & Wheeler, Architects, 091
Figures for the Calais Monumen
Itodin, Sculptor, 696

Issued only in

tli

Impf rial Edition,

685

Probate

Office,

Wait &

East Cambridge, Mass.

Cutter, Architects, 687

Proposed Municipal Buildings, Washington, D. C.

Willis Polk, Architect,

HOTELS.

KAILROAD.

H.
amily Hotel, Minneapolis, Minn.
W. Jones, Architect, 705
Va.
Geo.
T.
Pearuray Inn, Luray,

N. Y. C. R. R. Employes'
Readlug-rocm,
"
New York, N. Y. R. H. Robertson,

son, Architect. 690
roposed Hotel, Kingsville, Out., Can.
Mason & Rice, Architects. 691

Railroad Station, Battle Creek, Mich.
Rogers & MacFarlane, Architects, 692

The Talleyrand," Bar Harbor, Me.

De Grasse

Fox, Architect, 686
pper part of Extension to Adams
House, Boston, Mass. W. Whitney
Lewis, Architect, 704 (Gel.)

Architect, 695 (Gel.)

(Gel.)

Station on the Baltimore & Ohio R. R.
A. H. Bieler, Architect, 6X3

STABLE.
W. F. Proctor,
New York, N. Y.

Proctor, Architect, 681
and Billiard-room, Pelham, N.
Y.
Walgrove & Israels, Ar-

Jilliard-room, Boston Athletic Association Building, Boston, Mass. J. H.
Sturgis, Architect, 693 (Gel.)

chitects, 6X9

lymnasium, Boston Athletic Associa-

tion Building, Boston, Mass. J. H.
Sturgis, Architect, 693 (Oel.)
iterior of St. Mark's, Venice, Italy.
After an Etching by Otto liacher, 690

Lorhada,
W. Rosa

Stable for

INTERIORS.

TOWERS AND

SPIRES.

"entilating Tower, Presbyterian HosJ. C. Cady &
pital, New York, N. Y.
Co., Architects, 6X9

MERCANTILE.

iOTHIC SPIRES AND TOWERS.

rcher Building. Kochester, N. Y. C.
S. Ellis, Architect, 688
tlantic Building, Washington, D. C.
James (i. Hill, Architect, 694 (Gel.)
Auchmnty Building, Boston, Mass.
Wiuslow & Wetherell, Archts., fi99
branch Bank of America, Philadelphia.
Pa. Charles W. Bolton, Archt., 703
Shepley, Rutan & Coolidge, Architects, 686
" Bell
"
Telephone Co, St.

1'ublished only in the Imperial Edition.]
_11 Saints', Oakham, 695
Jathedral, Canterbury, t>X2

Mo. Shepley,
Rutau &Coolidge, ArchiI.ouis,

tects, 682

"

"

Maj. F. H. Phipps & Mrs.
It. R. Wallace. St. Louis,
Mo. A. F. Kosenheim,
Architect, 689
World
ompetitive Design lor the
Building, New York, N. Y. R. H.
Robertson, Architect, 685
Mohawk Block, Buffalo, N. Y. E. A.
Kent, Architect, 692

698

Fuller

&

Delano, Architect!, 697
Building at Berkeley, R. I., for the
Berkeley Co. Stone, Carpenter &
Wilson, Architects, 701
Design for a Plaster Ceiling by C. J,
Brooke, 686
Details of Slow-burning Construction
Florence Flats, Minneapolis, Minn,

James C. Plant, Architect, 680
Donatello's St. John the Baptist, 6X8
Fountain, Jativa, Spain, 691
Hotel des Brasseurs, Brussels, Belgium
Sculptures by Auguste Rodin, 682, 688

6%, 703

Sketches at Williamsburg, Va., by
B. Bibb, 703
"
in California

by J. Q.

A

How

ard. 690

Slow-burning Construction.
by Robert Brown,

Drawing.

Sketch*

Jr., 684

MONUMENTAL.
Bust of

Mme.

Morla.

Auguste Itodin

Sculptor, 703

Busts by Auguste Rodin, 689, 703
Figures for the Calais Monument
Auguste Rodin, Sculptor, 696 (Gel.)
Model of Gattamelata's Horse, Padua
Italy, 702

Monument

to

Duke

of

Geneva,
704

fiXG

Augustine, Fledon, 695

680

"
"
Newark, 682
Nicholas, Newcastle-on-Tyne-, 699
686
harrold,
Peter,
SS. Mary and Nicholas, Spalding, 695
" Peter and
Paul, Easton Maudit, 6x6

THE

AtiE

OF FRANCIS

I.

Published c til if in the Imperial Edition.]
Jhamber of Marie de' Medici, Blois, 695
Chapel of St. Hubert, Amboise, 682
Court-yard, Chateau de Blois, 699

Chenonceaux, 704
juard-room, Chambord, 691
at Fontainebleau. 699
in
Church
Pulpit
Tomb of Cardinal d'Amboise, 68fi
Uiniug-hall,

Field,

Chambord, 6al

lo the page of text,
not to the plates.]
Belfry, 18, 43

These figures refer

Boston Athletic Association Building.
Details, 160. 161, 162
Plougastel, Brittany, 41
Capitals, 44, 45, 54, 69, 75, 140, 103, 164,
165, 166, 226, 255, 273, 285
Cathedral. Quimper, Brittany, 40

Calvary.

Centennial Arch. Washington Square,
New York, N. Y., 238
Choir of St. Peter's, Leipsic, 8
Church,
Folgoet, Brittany, 203
u
Snrgeres, France, 41
of Convent at Palrua, 172
Elephant de la Bastille, in
Elmwood, Cambridge, Mass., 77

Doorway

683 (Gel.)
Juliet's Tomb, Verona, Italy, 700
689,

Andrew, Billingborough,

James, I.outh, 691
llminster, 695
Mary,
"
Malvern, 695
"
Swineshead, 695
"
Magdalene, Chewton-Mendlx,

INITIAL CUTS.

Architectural Shades and Shadows, 687


St.

Tourney

MISCELLANEOUS.

of, 684

Commercial Bank Building, Albany

Hotel de Ville, Compiegne, France, 683
"
"
"
Lyons, France, 683
"
"
"
Rheims, France, 683
Memorial Library, Acton, Mass. Hartwell & Richardson, Architects, 705
Memorial 1 ibrary, Lexington, Ky.
Willis Polk, Architect, 689
Miners' Hospital, Hazleton, Pa. Benj.
Linfoot, Architect, 703
Old Hotel de Ville, Lyons, France, 683
Place of Arms, Santiago, Chili, S. A.,

6X7

Street Views in Quebec, Can.

:

City-hall,

Auguste

:

Mrs. Eldridge, Newport, R.
ley

STATUE OF
Duke Antoine of Lorraine, National
Museum, Nancy, France, 694

:

*

Old Hotel de Ville, Lyons. France, 683
Place of Arms, Santiago, Chili, S. A

to Malaspina, Verona, Italy?
697
" Niccoio
Orsini, Venice,
Italy, 697
Tombs of the, 6%

6<J3

Hotel des Brasseurs, Brussels, Belgium,

Venice,

Italy, 697

Calvary Baptist Church, Devenport,
lo. Wm. Cowe, Architect, 681
(.' '. \
Christ Church, New York, N. Y. R.
H. Robertson, Architect, 695
Algonquin Club-house, Boston, Mass
Church, Clergy-house and Schools for
McKim, Mead White, Archts., 684
Trinity Corporation, New York, N. Arion Clubhouse, New York, N. Y
Y. H. M. Congdon, Architect, 705
De Lemos & Cordes, Architects, 686
Church, Clergy-house and Schools for Atlantic Building, Washington, D. C
James G. Hill, Architect, 694
Trinity Corporation, New York, N.
Y. K. M. Hunt, Architect, 700
Billiard-room, Boston Athletic Associa
tion Building, Boston, Mass, J. H
Church, Clergy-house and Schools for
Trinity Corporation, New York, N.
Sturgis Architect, 893
Y. F. C. Withers, Architect, 702
Cathedral, Mentz, Germauy, 683
Church, Clergy-house and Schools for Christ Church, Williamsburg, Va., 703
Trinity Corporation, New York, N. Church of Sau Antonio, Padua, Italy
Y. W. Halsey Wood, Archt., 698
702
(iraue Church Cathedral and Guild- Doorway to House of John Peabody
Hall, Topeka, Kansas. H. M. CongPeabody & Steam
Boston, Mass.
don, Architect, 69C

Sturgis, Architect,

683 (Gel.)

House of Enrique Concha y Toro, San-

Architect, 688

"

Italy, 702 (Gel.)
Miehele, Pavia, Italy, 683
Miguel, Jerez de la Frontera,
Spain, 692

SS. Giovanni e Paolo and School of

Architect, 688

D.

:

San Antonio. Padua,

Vll

Gymnasium, Boston Athletic Associa- Monument
tion Building, Boston, Masj. J. H.

Lewis, Architect, 704

Arena, Verona, Italy, 6%
Bramshill, Hampshire, England, 704
Hall, Cheshire, England, 704*

Hays, 702
Proposed House f or K. F. Crocker,
Fitchburg, Mass.

" C.

Berlin, Ger-

many, 697
Upper Canada College, Toronto, Can.
George F. Durand, Architect, 682

Knox Brereton

T. F. Schneider, Archt., 6x1
V. F. Whitmore, Rochester, N. Y.
Otto Block, Architect, 699
B. F. Willis, York, Pa. B. F. Willis,
Architect, 688
Houses of Mrs. J. J. French and Mrs.
C. E. Stratton, Boston, Mass. Allen
& Kenway. Architects, 681 (Gel.)
Moreton Hall, Cheshire. England. 704
Old House at Grey's Ferry, PhiladelSketched by Frank A.
phia, Pa.

"

Richardson, Archi-

tects, 688

D. C.

"

&

Hartwell

James E. Waugh, Charlton Heights,

Guy

Normal Art School, Boston, Mass.

Technische Hochschule,

Curlett, Eisen & Cuthbertson, Architects, 686
J. F. Sinnott, Rosemont, Pa. Hazlehurst & Huckel, Architects, 704
B. E. Taylor, Newton, Mass. Hand
& Taylor, Architects, 696

Alexander Ure, Toronto, Can.

680 (Gel.)

"

W.

Richardson, Architect, 701 (Gel.)
M. S. Severance, Los Angeles, Cal.

Church of the Blessed

of the

Index.

Brunswick
Switzerland

Equestrian Designs,

171, 190,

269

EQUESTRIAN STATUES:
Annibale Bentivoglio, 208
Duke of Brunswick, 299
Clovis. King, 41
Colleoni, 269, 270, 272
Pietro Farnese, 209
Francis 1, 297
Gattameiata. 270
Gradlon. King, 40

Lesdiguieres. Marshal, 89
Koberto Malatesta, 209
Otho I, 298
Leonardo <1a Prato, 210
Rene II. Duke, 172
Pierre de Rohan, 173
Rudolph of Hapsburg, 41
St. George, 171
St. Martin, 41, 42

191,

207,


The American Architect and Building News.

Vol. XXV. Copyright, 1889, byTicknor & Company, Boston, Mass.

JANUARY 5, 1889.

Entered at the Post-Office at Boston as second-class matter.

Summary:

Carry on Mason-work in Cold Weather.-Theatre Fires at Oswego, N. Y., and Chicago, Ill.—The Supervising Architect and the New York Tribune's Charges.—Some Details of the alleged Improperites committed by Mr. Porect.—The Moral to be deduced from this Accusation.—Massachusetts State-House Competition.

Illustrations:

State Military Academy, Albany, N. Y. Horse of Mr. M. Ogden Jones. Woods Hall, Mass.—Dining-room Window. Poland Springs Hotel.—Dining-room Fireplace, Poland Springs Hotel.—Buxu Memorial Chapel, Pennsylvania College, Gettysburg, Pa.—Details of Slow-burning Construction.

Professional and Social Notes.

Societies:

The Architectural Course at Columbus College.—Slow-burning Construction.—A Correction.

Trade Surveys.

NOTES AND NEWS.

THE question of carrying on mason-work in freezing weather has excited a good deal of attention among architects, since the publication of an official report to the British Government by a representative in Copenhagen, from which it appeared that brick walls are laid in that city in winter with perfect success, the only precaution taken being to use freshly-slaked lime in the mortar, so that it may be warm when put on. It is hardly necessary to say that many, if not most, architects doubt seriously the propriety of using under any circumstances mortar mortar with lime half-laked, and doubt still more whether the inevitable freezing would be any more advantageous to this sort of mortar than to the ordinary kind. Quite recently Interesting contributions to the discussion have been made by architects and engineers in Norway. One of these, Herr Tury, a Government Engineer, had several experimental walls built in 1879, part with materials prepared in the ordinary manner, and part with mortar made with freshly-slaked lime. The work was done in winter, the thermometer varying from six to twelve-and-one-half degrees below zero. We must note, by the way, that the Deutsche Bauzeitung, in which the above account is given, does not say whether the thermometer used is Fahrenheit or Réaumur or Centigrade, but although there seems to be a fashion in Germany just now of using Réaumur's scale, we may perhaps assume that these are Fahrenheit temperatures. The walls were left for five years exposed to the weather, and were then taken down. Although the best materials had been used, both in the hot and cold mortar, and the bricks had been laid with great care, the walls proved worthless. There was no cohesion between the bricks, and the mortar in all cases was more powder. On the other hand, Herr Due, an architect of Christiania, who had built experimental walls, both with lime and cement, in very severe frosts, found in the following summer that the frozen walls were quite equal in quality to those laid with similar materials in warm weather. A third expert, Herr Werving, of Stockholm, reports that in 1881, five experimental piers were built in the city material-yard, with brick in lime mortar. The bricks were thoroughly dried, and the lime was not only freshly slaked, but the sand was piled on iron plates, heated nearly to redness, and in this condition was mixed with the lime. The first pier was built when the thermometer showed four below zero, the second at ten below, the third at fourteen below, the fourth at thirty below, and the fifth at eighteen below. Each pier, when completed, was covered with a small roof, to keep the rain off the top. At present these piers are in tolerably good condition, but the joints of those built at a temperature of ten degrees or more below zero were disintegrated to a considerable extent. A fourth and fifth at thirty below, in the winter of 1886-7 a technical society in Stockholm had several experimental piers and walls built in cold weather, but the result was so unfavorable that it was decided that the experiment had not been carried out with sufficient care, and the piers are to be rebuilt. The Deutsche Bauzeitung hopes, as will all architects and engineers, that careful and extensive tests may be made, to decide conclusively under what circumstances masonry in lime mortar can be carried on in severely cold weather, and we earnestly commend the subject to the attention of students at our schools of scientific architecture. So far, the only points upon which the experimenters seem to agree, are that the bricks must be dry, and that the work must be done with great care. These, however, cover only a small portion of the question. In fact, "great care" is not to be expected of bricklayers at work in a piercing February wind, and what architects and builders want to know is how walls can be safely built, with either lime or cement, with ordinary care during the cold season. To our mind, the idea of warming the mortar by using freshly-slaked lime, or by pouring hot water on a brick pavement on a cold day, and mortar freezes much more readily than clear water. Of course, the mortar under some circumstances, may not be injured by freezing, but this immunity from injury should not be attributed to the fact of using mortar which had been left to freeze, rather than to the freezing it from freezing. If we might make a suggestion, it would be that some one should experiment in a field hitherto almost untried, by warming the bricks, instead of the mortar. We had, years ago, occasion to lay brickwork in cement in winter, and the bricks were kept hot by piling them over one of the low, flat furnaces used for heating puddles for making coal-tar concrete. They retained the warmth for a long time, probably long enough for the cement in the inner portions of the wall, at least, to set before freezing, and the work seems to have been perfectly sound; but whether this was a better plan than heating the mortar alone, or how the bricks can be best warmed, or whether the cement under such circumstances would be better with salt or lime in it, are points which trial alone can decide.

W e generally prefer to wait for more definite information before tackling the "charges," which are solemnly hurled at Democratic office-holders by Republican newspapers, and vice versa, and the New York Tribune, we regret to say, is not the journal to which we refer with the most im-
plcit confidence for information on topics bearing upon policies; but one of its recent "developments," or "mare's nests," or whatever else our readers may choose to call it, has so much importance to public and the profession, whether the truth be in it or not, that we will try to extract a moral from it, without attempting to investigate its probability. According to the Washington correspondent of the Tribune, who has just turned his austere Republican eye upon the office of the Democratic Secretary of State, an atmosphere of moral storm has been, or rather, is likely to be found there, which must excite the gravest concern in all lovers of virtue. Among other things, it appears that Colonel Freret, the present supervising architect, has so monstrous a love for Democratic draughtsmen that, after the recent order of the President, placing his office under Civil Service rules, he "summoned his henchmen" and connected with them an extraordinary scheme for resisting the operation of the order. As soon as draughtsmen were needed for the office, although, under the new rules, it was necessary to select the candidates by competitive examination, the conspirators, whom, for some explained reason, the Civil Service Commissioners appear to have entrusted the preparation of the examination papers, drew up a set of questions "that would turn any would-be applicant gray." Advertisements for candidates were inserted in the newspapers, accompanied by a statement of requirements which was "enough to knock the best architectural draughtsman in the country dizzy." With the purpose of preventing candidates from presenting themselves or passing the examination, so that, in default of material from this source, Colonel Freret would be permitted to employ himself, they have got at the style of composition bequeathed by the late Mr. Groceley to his successors, worked well or not we are unable to ascertain, but it appears that, if any one of himself or his friends are accepted in the examinations, and only a small amount of imagination is required to infer all the rest from this circumstance.

SOON afterwards, however, another fell plot was conceived in the bosom of the supervising architect, whose "insatiable desire for self-glorification and enrichment" is soon, it appears, to be fed by means which have been revealed to the Tribune correspondent, although kept secret from the other persons. The principal point of this scheme, and, it need hardly be said, the one which causes the keenest anguish to good Republicans, is to consist in an effort to have contracts entered into for all public buildings for which an appropriation has been made, and the fourth of which, when the payment and administration goes out of office. As the execution of this heinous purpose requires the cooperation of the principal assistants in the office, they have been seduced by "plums" in the shape of missions to buy sites for the new buildings, and will, we suppose, come back prepared for any integrity, although, as it is usual to obtain sites for pleasant, and at the same time cumbrous, buildings beforehand to their erection, and as these gentlemen have been for years entrusted with that duty, we do not at once perceive how Satan should be able to utilize the present opportunity any better than the previous ones. However, we suppose that Colonel Freret, who evidently maintains intimate relations with the powers of evil, will look out for that, and on their return the conspirators will find the plot ready. Omitting the least important of the horrid details which the Tribune correspondent gives, the scheme contemplates nothing less than the employment of the office-drawers for fractions of hours in making drawings for contracting the new buildings. As there seems to be some objection to doing this directly, the plan is said to be for the supervising architect to employ outside architects to furnish drawings for given buildings, which, by the way, is, we think, often done, with the understanding that they, in their turn, will engage the office-draughtsmen to do for them, as private individuals, out of hours the work which official routine does not allow them to do for the public utility. By this indirect means the persons familiar with the proposed buildings will be enabled to push the drawings far more rapidly than would be the case in the ordinary course, and at the same time, inasmuch as the supervision of the office, and the establishment of a precedent dangerous and impracticable," besides "utter confusion and the worthless work that must ensue in consequence of its being done in less than one-fifth the time required for good work," followed by the award, "on these drawings bristling with mistakes," of contracts which "cannot be annulled without great cost to the Government," while, "if the buildings are begun, the work will have to be torn down as worthless." This "startling conspiracy," which, to the ordinary mind, looks exactly like an attempt of a faithful and energetic architect to free himself from the intolerable fetters of official deliberation and routine and try, for once, to get public work done with the speed and spirit of the private enterprise, is called by the Tribune correspondent a "premeditated and determined attempt to violate the law," devised by Colonel Freret to "enrich himself." Abundant proof is asserted to be in the possession of the same correspondent, "to send several of his friends as the supervising architect's office to State Prison," and "at least one of them" has been represented as "liable to indictment and punishment by fine and imprisonment, or both," while Congress is called upon to interfere at once, and, in fact, the Senate, as the guardian of Republican interests, has already ordered an investigation into charges which, so far as we can see, are based simply on speculations as to what Colonel Freret's motives could have been in making his examination papers so hard, and sending certain of his clerks to certain places, and on predictions as to what he is likely to do hereafter.

THE moral which decent architects, as well as decent people generally, will draw from all this is, that under present conditions, appointment to a post of professional responsibility under the Government is only a means to degradation to be avoided at all hazards. So long as Tribune and World correspondents and their like are allowed, under the excuse of political zeal, to lay hold of the simplest sets of an official, garnish them with false constructions and interpolations invented on the spot, and exhibit the victim, day after day, as a fit subject for the criminal courts, just so long will the public be served mainly by persons with no reputation to lose. We have always believed the supervising architect's office to have been originally a device for exercising an extensive political influence under cover of doing work which, as has been amply demonstrated, would be much better and more cheaply done by employing local architects. The excellent character of the heads of the office has done much to deprive it of its usefulness as a political machine, and the scandals which disgraced it during the early days of its existence would be impossible under the well-trained professional men who have of late years conducted it, but, with its disposition and opportunity to exert political influence, its only reason for existence disappears. The uniform testimony of those who should know best, the incumbents of the office, is that it is a slow and cumbrous device for producing poor work at an enormous expense, and that it expects the Government to do what is right in the matter of allowing the architect no discretion in dealing with them, while the endless defamation poured upon those who hold what the Tribune correspondent calls its "fat berths" by those who would like to get into them themselves brings Government employment into contempt among self-respecting members of the profession.

THERE is a homely adage about the bird that fouls its own nest which has a close application to this matter of competitions conducted under improper conditions, and, if architects as a body, who, if we understand an article in this paper, are now spending their leisure hours in making drawings for contracting for the new buildings, should cross between the vampire and the turkey buzzard, are not interested in the cleanliness of their own nest, they have themselves to blame if the public continue toprofit off for their subsistence. The protest against the manner of conducting the competition for the enlargement of the Massachusetts State-House is put in such a form as to have application to any similar invitation, and the greater the number of contestants—from all parts of the country—the more respectful consideration it will receive, the more valuable precedent will it establish, and the greater step forward toward the desired better condition of things will have been taken. We will remind the younger men who may be disposed to regard such affairs as their "chance," that when they are a few years older they will look upon the matter from a different standpoint, and will then regret that they did not make an effort to help abolish the evil.
BUILDERS' HARDWARE. — XVI.

SHUTTER FASTS AND LOCKS.

THE appliances for securing outside blinds, though in some cases combined directly or indirectly with the blind hinges, are more often distinct fixtures, acting independently of the blind attachments. The usage in regard to shutter fasts and locks varies in different portions of the country. In the West there seems to be a willingness to accept considerable complication in the devices, whereas the standard Eastern goods are mostly very simple; though, of course, this distinction is not a rigid one, by any means. The West, however, is rapidly developing new ideas and fresh combinations, in hardware no less than in nearly every other department of mechanical industry, and special patent forms seem to be more naturally expected there than elsewhere. This does not imply that the Eastern cities are united in the usage of particular forms, for places as near to each other as New York, Providence and Boston employ different forms, as will be seen later on.

Figure 235 will serve to illustrate one of the most common forms of shutter or blind fast, consisting of a tempered steel rod, or wire, one end of which is cut with a thread and screws into the under side of the blind, while the other end is held by a staple. The rod is bent so that the loop is kept away from the blind, and the elasticity of the metal enables it to spring into the malleable-iron catch on the sill, or on the outside of the wall. The well-known "Stedl" blind fastener is practically the same as this, except that the rod is bent in a complete twist to gain the elasticity, and a common screw takes the place of the threaded end. The same form is made, with slight variations, by several of the leading manufacturers.

Figure 236 shows the only form of wire blind-fast which allows one to close the blind without leaning out of the window, or in any way lifting the shutter to release it from the back catch. It consists of a steel wire, bent as shown by the figure, but carried as far back towards the hinge as the hanging-style of the blind will permit. To release the blind, the fastener is simply pulled inward. Any form of back catch may be used. For the sill-catch a wide staple is used, which is set on an angle to the blind, so as to force the spring back and permit it to catch behind the staple. This fastener has but very recently been put on the market.

The blind-fast shown by Figure 238 works entirely by gravity. It consists of a bent lever, working in a mortise cut through the bottom rail of the blind, pivoted so that one arm protrudes above the top of the rail, while the other catches over an ordinary hook on the sill or against the wall. Lugs on the end of the horizontal lever arm catch on a thin plate screwed to the under side of the rail and prevent the fast from dropping too low or being lifted too high. This fast is made of coppered malleable-iron, and seems like a very satisfactory article.

Figure 237 is an older style of blind-fast, on essentially the same principle as Figure 236; using, however, a flat bar instead of the spring wire. This form requires a little more work in adjustment. It is designated peculiarly as the "Boston" pattern blind-fast. The so-called "New York" pattern is illustrated by Figure 239. The action of this fast will be better appreciated when it is remembered that in New York, the blinds are usually hung flush with the outer casing, and the sill is rebated so that the bottom of the blind strikes against the upper rebate. The latch is hinged on the inner plate, the weight of the long arm keeping the inner hook thrown up. The sill-staple is driven perpendicularly, while the back catch is screwed horizontally into the wall. The Stanley Works also has what is designated as the "Providence" style of blind-fast. This is exactly the same as the "New York" pattern, except that the inner hook catches over instead of under the sill-staple, and is shaped like the back catch of Figure 235, inverted.

Figure 240 shows a form of blind-fast which is screwed bodily through the blind, catching on sill and wall staples in the same manner as the preceding styles. A flat spring inside of the case keeps the inner hook constantly pressed up and against the sill-staple. A variation of this same pattern is made which acts by gravity, the catch working in an oblique slot in such a manner that the weight of the outer catch forces the inner catch always against the sill-staple.

Figures 241 and 242 illustrate two forms of fasts which are screwed to the under side of the blind. The former acts entirely by gravity. The lobes, A A, are connected through the case, and are counterbalanced so as to always drop to the

A. G. Newman.

Stanley Works.

Stanley Works.

Stanley Works.

Stanley Works.

Stanley Works.
position shown. When the blind is closed, the lobe strikes against the sill-pin and is forced up as shown by the dotted lines, dropping so as to catch inside of the pin. Figure 242 has a concealed spring, to force the action of the lever.

The foregoing styles of blind-fasts are intended to be used on wooden buildings, but with some modifications in the sizes might also serve for brick buildings. In New York, it is customary to use some form of turn-buckle. Figure 243, which is driven into the joints of the brickwork, the cross-piece being free to turn, but hanging naturally in a vertical position by reason of the greater weight of the longer arm. Turn-buckles of a slightly different shape are sometimes used, also, for wooden buildings.

All of the foregoing are, in a certain sense, automatic: that is to say, the blind, if flung open or shut will stay in position, requiring no special adjustment. Figure 244 is a form of drop-pin fast, much used in some cases, consisting simply of a plate secured to the blind by a screw-eye, perforated with a hole to fit over the pin driven into the sill. For holding the blind open, a back catch is made as shown by the figure, which locks with a plain, flat spring, screwed to the under side of the blind. The figure also shows the form of back catch used for brick buildings.

Figures 245 and 246 show two very simple forms of blind-catch serving only to keep the blind closed, and generally used with some form of turn-buckle to hold the blind open. Figure 245 works with the aid of a small spring, as works entirely by gravity. There are several varieties of each of these forms in the market. The catch shown by Figure 247 acts in the same manner as Figure 245, but has, in addition, a locking-lever, operated by a key, which secures the catch so that the blind cannot be opened.

There are a number of forms of blind-hinges, which have been previously described in the chapter on hinges, that in a measure serve as blind-fasteners, keeping the blind either open or shut. They are all perfectly simple in their operations, and it is difficult to discriminate between them. The common fault with them all is in the difficulty of opening and closing the blind. With most of the forms of patent self-locking blind-hinge, the blind must be raised from its seat in order to be swung around. With the blind-fasts previously described in this chapter, it is necessary to lean far out of the window to release the catch from underneath. Figure 248 shows a device intended to overcome the difficulties of both styles. It consists simply of a lever attached to the blind, and hooking into a plate screwed onto the jamb of the window. It is only necessary to lift the end of the lever in order to swing the blind shut. The advantages are that in closing, no lifting of the blind is necessary; there is no danger of throwing it off the hinges, and no chance of pinching the fingers or bumping the head.

There are several other devices intended to hold the blind, either shut or open. Figure 249 illustrates the “Tenon” blind-fastener, which consists of a bent, flat bar, attached to the outside of the blind and catching in slots cut in a plate which is secured to the sill, so that the blind can be held either open or shut, or in either of two intermediate positions. The bar is lifted by means of a lever on the inside of the blind. This fixture does away with the ordinary bottom hinge, substituting therefor a pivot working in the locking sill-plate. A blind-fastener of this description is especially suitable for bay-windows, or any place where the blinds cannot open clear back. Being placed on the outside of the blind exposes it to the weather to an undesirable degree, though it is made of Bower-Barford iron to prevent it from rusting.

Figure 250 is a very simple form of bar blind-adjuster, the bar being attached to the blind, and held in position by the action of the thumb-screw on the jamb; Figure 251 shows a variation of the same principle, consisting of a bar which fits into the sockets at several points on the sill, enabling the blind to be held in several different positions. The action of the adjuster will readily be understood by the figure. Zimmerman’s Blind-fast is on practically the same principle as this.

The difficulty with the two foregoing patterns is, that they do not hold the blind perfectly rigid, and the rods are likely to get in the way, especially as the rods and sockets take up considerable space on the sill. There is but little practical advantage in having a fixture which permits of the blind being open at various degrees, for,
as a rule, most people prefer to have their blinds either entirely open or entirely shut.

The desire to open and operate blinds without opening the window has led to the invention of several devices which are worked by rods passing entirely through the frame of the house and attached to the blind. It is not altogether easy to understand why such devices are used so little, but it must be admitted, that all of those now in the market are more or less clumsy. Still, the idea is an excellent one, and if there were greater demand for such appliances, undoubtedly better ones would be put before the public. The shutter-worker of this description that is the most natural in its adjustment is illustrated by Figure 252. This consists simply of a rod, at the

end of which is a thread working against a cog-wheel forming a part of the bottom hinge of the blind. On account of the slowness of pitch of the thread, it is very difficult to move the blind from the outside, but the leverage is sufficiently strong to enable one to easily open the blind from within by turning the crank.

A very similar appliance to this is the Brown shutter-worker, Figure 253, in which the thread on the spindle works into teeth on the bottom of a plate forming a part of the lower shutter hinge.

The Automatic Shutter-worker, Figure 254, combines the good points of several other devices, and is somewhat more complicated than either of the preceding. Two cog-wheels gear into each other. The shaft of one wheel is carried through the wall and can be operated by a crank or handle inside the house. The shaft of the other wheel turns a crank, or bent lever, the end of which works in a slide attached to the face of the blind. The cog-wheels are encaised in an iron box, which is shown partly removed in the figure, in order to illustrate the workings. Aside from the number of parts, which is no very great objection, this shutter-worker has a great deal to recommend it. It is strong and compact, and can act on the shutter with such force that, it is asserted, a child can work the blind with it in a high wind. It has the advantage of permitting the blind to be removed without disturbing the fixtures.

The simplest setting shutter-workers, is illustrated by Figure 255. This is very ingenious in its idea, consisting of a straight rod set on an angle, with a bent lever on the end working in a curved slot or catch secured to the outer face of the blind. This shutter-worker will lock the blind as securely as any door can be locked, the handle of the rod being dropped down onto the pin as shown by the lock.

The company which manufactures the Brockton shutter-worker has bought up the patents of the Prescott shutter-worker, which was somewhat on the same principle. There are a few other shapes in the market, but practically a very few, which embody ideas essentially different from those described.

AWNING-HINGES.

Awning-hinges might more properly be considered with common blind-hinges, but they are included in this connection, as they are in a measure blind-adjusters, permitting the blind to be opened part way. The writer has been able to find only two forms in the market. The simplest is shown by Figure 256. This consists of a double-acting hinge for the upper portion of the blind, a lower hinge being screwed to the jamb and fastened to the blind only by a turn-bolt.

The other form of awning-fixtures is more commonly used about Boston, Figure 257. The upper hinge is so made as to work in either direction, while the lower hinge consists of a cup fitting over a pin screwed to the jamb. A small catch, A, keeps the blind from pushing out when the hinges are to be used in the ordinary manner, but is readily lifted when the blinds are to be pushed out from the bottom. The fixtures are sold with side-bars to hold the bottom of the blind away from the building, and with a centre cross-bar which permits the blinds to be opened part way in the ordinary manner, and secured. The description and the figure might seem to imply
a somewhat complicated arrangement, though the fixtures work very simply, and seldom fail to give satisfaction.

Figure 238 shows a form of slat-adjuster intended to be operated by a key from the inside of the house without opening the window. The slats are connected with an eccentric which is turned by the key, so that the slats can be either raised or lowered as desired.

**HARDWARE FOR INSIDE SHUTTERS.**

There is little to be said as regards fasts or locks for inside shutters. The shutters themselves are usually provided with knobs of some description, with porcelain or metal heads secured in position by a screw. The shutters are also provided with some form of latch or bar, of which Figure 240 is a very simple type. Figure 260 shows a more elaborate form, for inside work. There are, of course, many variations of these forms. A few of the hardware manufacturers have been making self-locking shutter-bars, in which the cross-bar is secured by some form of auxiliary lever or cam. Figure 261 illustrates one variety. There is, however, but little demand for such appliances.

For sliding shutters a bar like that shown by Figure 260 may be employed. There are also several varieties of mortise hooks, Figure 262, which work with a spring, and are rather preferable for most cases.

The retail prices of the foregoing blind and shutter fixtures are as follows:

**TABLE OF SHUTTER-FIXTURES—PRICES PER WINDOW, WITH TWO SINGLE-FOLD BLINDS.**

<table>
<thead>
<tr>
<th>Fig.</th>
<th>Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>235</td>
<td>Stanley's wire blind-fast</td>
<td>$ 6.75</td>
</tr>
<tr>
<td>236</td>
<td>Folsom's shutter-fastener</td>
<td>8.65</td>
</tr>
<tr>
<td>237</td>
<td>Boston pattern blind-fast</td>
<td>6.65</td>
</tr>
<tr>
<td>238</td>
<td>New York pattern blind-fast</td>
<td>6.05</td>
</tr>
<tr>
<td>239</td>
<td>Standard screw blind-fast</td>
<td>6.65</td>
</tr>
<tr>
<td>240</td>
<td>Security blind-fast</td>
<td>6.85</td>
</tr>
<tr>
<td>241</td>
<td>Lock blind-fast</td>
<td>6.85</td>
</tr>
<tr>
<td></td>
<td>(Turn-buckles or drop-buttons for brick)</td>
<td>7.15</td>
</tr>
<tr>
<td>242</td>
<td>(Turn-buckles or drop-buttons for wood)</td>
<td>7.05</td>
</tr>
<tr>
<td>243</td>
<td>Drop-and-pin fast</td>
<td>6.85</td>
</tr>
<tr>
<td>244</td>
<td>Seymour's blind-catch</td>
<td>6.85</td>
</tr>
<tr>
<td>245</td>
<td>Shepard blind-fast</td>
<td>6.85</td>
</tr>
<tr>
<td>246</td>
<td>Seymour's blind-catch and lock</td>
<td>6.85</td>
</tr>
<tr>
<td>247</td>
<td>Rochester blind-hinge</td>
<td>8.15</td>
</tr>
<tr>
<td>248</td>
<td>Tenon blind-fast</td>
<td>8.75</td>
</tr>
<tr>
<td>249</td>
<td>Excelsor blind-adjuster, galvanized</td>
<td>9.55</td>
</tr>
<tr>
<td>250</td>
<td>Washburn's blind-adjuster, galvanized, 10-inch bar</td>
<td>10.56</td>
</tr>
<tr>
<td>251</td>
<td>Malory's shutter-worker, with hinges and handle</td>
<td>12.85</td>
</tr>
<tr>
<td>252</td>
<td>Brown's shutter-worker, japanned</td>
<td>8.55</td>
</tr>
<tr>
<td>253</td>
<td>Automatic shutter-worker, with hinges and handle</td>
<td>8.55</td>
</tr>
<tr>
<td>254</td>
<td>Brockton shutter-worker</td>
<td>8.55</td>
</tr>
<tr>
<td>255</td>
<td>Tucker awning blind hinge</td>
<td>8.75</td>
</tr>
<tr>
<td>256</td>
<td>Automatic blind awning fasteners</td>
<td>7.55</td>
</tr>
<tr>
<td>257</td>
<td>Bryant's blind-slat-adjuster</td>
<td>8.25</td>
</tr>
<tr>
<td>258</td>
<td>Shutter-bar—bronze-iron, 2-inch, per dozen</td>
<td>8.65</td>
</tr>
<tr>
<td>259</td>
<td>Shutter-bar, bronze, 2-inch, per dozen</td>
<td>1.20</td>
</tr>
<tr>
<td>260</td>
<td>Morris's self-locking shutter-bar, bronze, 2-inch, per dozen</td>
<td>0.90</td>
</tr>
<tr>
<td>261</td>
<td>Morris's self-locking shutter-bar, bronze, 2-inch, per dozen</td>
<td>3.00</td>
</tr>
<tr>
<td>262</td>
<td>Sliding shutter-hook, bronze, each</td>
<td>7.50</td>
</tr>
</tbody>
</table>

*For wooden houses.*

**TRANSM AND SKY-LIGHT FITTINGS.**

Transoms are hung by common butts at the top or bottom, or are pivoted in the centre horizontally. The ordinary hinges used for transoms are such as might be used for any purpose. These have been previously discussed. Sash centres or pivots are commonly mortised into the frame and into the sash. Figure 265 is the ordinary form. Figure 264 is another variety in which both pivots are exactly alike. This is secured in place by first fastening the round part of the pivot at entire end of the sash, and securing one socket-piece to the sash-frame. The other socket is then fitted to the opposite pivot, and the sash placed in position and turned at right angles, thus uncovering the second socket, so that it can be screwed to the jamb. This form is claimed to be tighter and consequently more secure against draughts than the ordinary style.

Instead of either of the foregoing, it is sometimes desirable to use pivots which do not turn on the line of the centre of the sash. Figure 263 illustrates a form which can be used in such a case, both pivot and socket being planted on the faces of the sash and the frame. Figure 266 and Figure 267 are other varieties sometimes met with. The different uses for which these various forms are applicable will readily be appreciated; the first being for a case in which the jambs and the sash are flush; the second, one in which the transom sets out from the jamb; and the third, one in which the jamb is too deep, or the
House at Wood's Holl:
For
Mr. M. Ogden Jones
Wheeler & Haven, Arch'ts.
Boston, Mass.
transom set too far in to permit of the hinges being applied to the face of the jamb.

Transoms are usually provided with some form of spring catch to hold them closed. Figure 268 is a direct catch, the latch being secured to the transom. This is for use when the jamb and the sash are flush. Figure 269 is a transom-catch worked on a little different principle from the foregoing. The same form is also used for cupboards. This, as well as the first, is fastened onto the face of the transom. Figure 270 shows a transom-catch intended to be mortised into the edge of the transom, either at the top or the bottom.

In the best work it is customary to provide some appliance for lifting the transom and holding it in position. With the ordinary catches previously described, a chain is attached at one side of the transom, permitting it to be opened down from the top a certain distance only; but it is much more convenient to have some appliance that will permit the transom to be opened in either direction, and will hold it securely. The most popular, and one of the best known is the Wollensak transom-lifter, Figure 271. This consists of a straight rod with a hinged arm attached to it, the arm being secured to the edge of the transom, while the rod works up and down in a series of rings, being held at any given height by turning a button at the bottom binding on the rod. These are made for transoms either pivoted at the centre and swinging down, or pivoted and swinging up, or hinged at either top or bottom. Figure 272 shows another form, made by the American Manufacturing Company. The rod in this case is replaced by a flat bar, the attachment otherwise being essentially the same as in the previous example. The bar is notched at the bottom on the inner edge, and a catch on the lower guide-ring locks the bar at any height. Figure 273 is another form manufactured by Russell & Erwin. In this case the bar is held in position by turning the button at the bottom. This transom is provided with a supplementary set of guides at the top, so that in raising up the bar there will be no opportunity for the weight of the transom to deflect it sidewise. Figure 274 shows a form of transom-lifter manufactured by F. & F. Corbin, consisting of a straight rod, with a long, flexible steel attachment at the top. The rod is secured at any height by a turn-button in the same manner as in the first example, while the flexibility of the upper portion of the rod permits the transom to turn at any angle. There is yet another form, Figure 275. This consists of a single rod attached directly to the transom, and secured on the jamb only by a single turn-button, near the bottom. This turn-button is placed at an angle in such a manner as to allow considerable side-play on the rod, and so permit of the deflection necessary for opening the transom.

**TABLE OF TRANSOM-Fittings.**

<table>
<thead>
<tr>
<th>Fig.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>263</td>
<td>Sash-centres, japanned, per dozen pairs.</td>
<td>$ .42</td>
</tr>
<tr>
<td>264</td>
<td>Sash-centres, brass, per pair.</td>
<td>.25</td>
</tr>
<tr>
<td>265</td>
<td>Sash-pivots, 1-inch brass or bronze, per set.</td>
<td>2.00</td>
</tr>
<tr>
<td>266</td>
<td>Sash-pivots, bronzed-iron, per set.</td>
<td>1.00</td>
</tr>
<tr>
<td>267</td>
<td>Surface sash-centres, F. &amp; F. Corbin, brass, per set.</td>
<td>4.00</td>
</tr>
<tr>
<td>268</td>
<td>Surface sash-centres, Wollensak, bronze No. 4, per set.</td>
<td>1.00</td>
</tr>
<tr>
<td>269</td>
<td>Surface sash-centres, Wollensak, bronzed-iron, per set.</td>
<td>.17</td>
</tr>
<tr>
<td>270</td>
<td>Sash-centres, Hopkins &amp; Dickinson, bronze, per set.</td>
<td>.55</td>
</tr>
<tr>
<td>271</td>
<td>Transom-catch, per dozen.</td>
<td>15.00</td>
</tr>
<tr>
<td>272</td>
<td>Transom and cupboard catch, bronze, per dozen.</td>
<td>7.50</td>
</tr>
<tr>
<td>273</td>
<td>Transom and cupboard catch, bronzed-iron, per dozen.</td>
<td>.50</td>
</tr>
<tr>
<td>274</td>
<td>Transom-catch, bronze, per dozen.</td>
<td>5.00</td>
</tr>
<tr>
<td>275</td>
<td>Wollensak’s transom-lifter, bronz.</td>
<td>1.20</td>
</tr>
<tr>
<td>276</td>
<td>Wollensak’s transom-lifter, nickel-plated.</td>
<td>2.50</td>
</tr>
<tr>
<td>277</td>
<td>American transom-lifter, coppered.</td>
<td>1.10</td>
</tr>
<tr>
<td>278</td>
<td>American transom-lifter, nickel-plated.</td>
<td>3.15</td>
</tr>
<tr>
<td>279</td>
<td>Stenier’s transom-lifter, bronz.</td>
<td>.55</td>
</tr>
<tr>
<td>280</td>
<td>Stenier’s transom-lifter, bronze.</td>
<td>2.50</td>
</tr>
<tr>
<td>281</td>
<td>Overell’s transom-lifter, bronz.</td>
<td>.50</td>
</tr>
<tr>
<td>282</td>
<td>Overell’s transom-lifter, bronze.</td>
<td>.55</td>
</tr>
<tr>
<td>283</td>
<td>Exceeleer transom-lifter, bronzed.</td>
<td>2.00</td>
</tr>
<tr>
<td>284</td>
<td>Exceeleer transom-lifter, bronzed.</td>
<td>1.50</td>
</tr>
</tbody>
</table>

Prices for transom-lifters are for a medium 4-foot rod and for a single fixture.
Closely allied to the transom-lifters are those which are used for skylights. Figure 276 shows a form manufactured by Wollenbaek. This consists of a double bar attached to a socket working on a slotted bar. The socket has attached to it a spring-clip which slips into the slots on the bar. The rope passes through the socket up over a pulley, and down through an eye in the end of the spring-clip. By pulling the bar out away from the socket, the spring-clip is released and the socket, and with it the skylight may be lifted or lowered, the spring-clip shutting back when the horizontal strain on the rope is relaxed. This is made in two sizes, with a length of eighteen inches each. Figure 277 shows another form of sky-light-lifter in which a ratchet on the side of the upper framework fits into slots on the edge of the lifting-rod, the ratchet being worked by a separate cord. The ratchet is fitted with a spring to keep it in position.

The preceding table gives the retail prices of the goods described in this chapter,

[To be continued.]

ARCHITECTURAL CAMPING IN ARIZONA. — I.

The Commonwealth of Massachusetts has, by its Commissioners, advertised for designs for the State-House extension, said designs to be furnished in open competition. The conditions of the competition, as announced, have evidently been framed without due regard to the best custom in the conduct of such matters, the sole end and aim of which should be to secure to the State the best service by making sure that the best men shall take part; that they shall be encouraged to do their best; that the best they offer shall be selected; and that the author of the successful design shall be employed as architect, provided the building is built and be in competence.

The conditions announced are faulty —

First. In that they are not drawn up in accordance with the best custom, and no assurance is given that an expert adviser will be employed to aid the Commission in their choice.

Second. That no assurance is given that the successful competitor will be employed, but, on the contrary, it is distinctly stated that all proposed competitors are to relinquish all ownership in their plans to the State, without any further claim to compensation or employment.

Third. Even if the first prize in the competition were as it should be, the execution of the building, the actual prizes offered would still be entirely insufficient compensation to the authors of the drawings placed second and third.

For the above reasons, we, the undersigned architects, citizens of the State of Massachusetts [and elsewhere], protest against this form of

The writer has elsewhere given an account of the work of the Hemenway Southwestern Archaeological Expedition in Arizona, under the direction of Mr. Frank Hamilton Cushing: its purposes, its composition, and the results reached in the first fifteen months of its operations. Some details about the country, pictures of life in camp, and the methods of exploration pursued — rambling though they be — will probably help the many who are interested in the important prehistoric story of our continent to gain a clearer conception of the character of the race. First, then, a glance at the country: The scene of operations has chiefly been in the neighborhood of the flourishing young towns of Phoenix and Tempe, in the valley of the Rio Salado, now usually called the Salt River by the American inhabitants. I prefer, however, to keep to the more euphonious Spanish name. To the northward and eastward the mountains rise grandly in compact ranges, the main peaks having about the same relative height, as seen from the plain, as Mount Washington when viewed from the Saco Valley at Conway, in New Hampshire. Out of this mountain-wall the Salado breaks from a wild cleft, whose neighborhood was the scene of some fierce and momentous struggles between the gallant troopers of General Crook and the wild Apache fifteen years ago. At the time when that splendid soldier gave the country its first relief from its incursions a peace which would probably have remained unbroken to this day had it not been for the wicked

mismangement of the Indian Department, under the control of corrupt
rings. Not far from its exit into the plain the Salado is joined by the Rio
Verde near a huge rocky knob, that looks like a mountain. At the guar-
dilla, called San Miguel, post, Fort McDowell, is near its
base. A few miles below Phoenix the Salado joins the Gila, the former
being really the main stream above their confluence, although the
great river is not fast than they. It is shaded by a heavy
million the californian of the whole along the
Grand Colorado. From the southeastward around to the north-
west the rounls are in detached groups, with the land sloping
away evenly and gradually from their feet. In parts of the semi-
terebrated red rocks an envelope of gray and white rocks
that deposit of the Rose mountains thin and
the Rocky Mountain. The sands of Southern
California, and the altitude in the neighborhood of a thousand feet.
The winters are delightful in temperature; a tierce summer heat is
hardly to be found in North America: dry and overcast.
ness of about 2,000 feet is, or an
so oppressive as a temperature of 90 degrees in the humid air of the
Eastern States. The vegetation is the monstrous growth of the
desert, on the sandy rocks, or dry hills. But the ground is brown
under irrigation a new and luxuriant growth appears; fertile fields
of grain and pasture, vineyards, orchards of peaches and apricots,
and already, in spots, date-palms, fan-palms, orange-trees, deodars,
and fruit trees in general. They are all alike, though some sparse yellow leaves still cling to the alkali,
and cottonwoods, here and there.

The town has enjoyed a "boom" from the building of the rail-
way. There are in many new buildings; the railway
has made the great timber-supply of California and Oregon available,
and, frame-building a novelty here, its attainability has
caused a vast increase in the number of the dwellings built by
the stockholders. Wooded buildings are, however, totally unsuited to this
hot and dry climate, and the folly of substituting them for the thick-
wall and comfortable adobe structures, so despised as "mud-
houses" by the average settler, must soon be made manifest ex-
perience. It is possible to make an adobe building architecturally
attractive, though, as commonly constructed by the American or the
southern American, it is bad for the best things as it is for the worst.
New houses can possibly be made, with their bare walls contrasting with the bony
whiteness of painted door and window-frames, and the incon-
venient sliding shades set even with the wall-surface, thus giving no
shade at all. The floors are well covered with native rugs. This is
a vulgar impertinence of expression. The conservative traits of
ordinary humanity are shown in hardly anything more than in their
methods of construction, and the presumably wide-awake and pro-
gressive people are as backward as they are. It is a
all the tenacity of the most primitive races though he has no other
ground than that his fathers did so before him, and, therefore, it
must be good, reasons nothing. More about it until experience in a
changed environment slowly teaches him more convenient ways.
The unintelligent savage builds like his fathers because his fathers
were taught to build like the gods, and, therefore, those ways are sacred,
and must be followed. The Mexican, who makes the most of the
American population that is filling up this region is shown by its adoption
of details of construction totally unsuited to the climate, who reason,
"surely these are about as ugly a manner of building as the
country," and, therefore, must necessarily be superior to the ways
in which Mexicans do things. So they go on strolling and sweltering
all through the long, hot summer days in their boxy little houses,
survivals of the habits brought from regions where timber is plenty
and the climate kind.

Considering these things, I have thought I should like to set
down the manner in which the American might be able to live comfortably
with pleasant surroundings by adapting the
ordinary materials to modern means and taste. For instance:
a one-story, wide-spreading house of thick adobe walls, with large,
high windows. This will be light and airy, and will receive the
full benefit of the air-space; above the flat roof, supported on posts
or thick adobe piers, with a space of eight to ten feet between, a
second story, kept cool by the waxen walls of the
Spanish and Spanish American, sloping gently, and with wide eaves.
This would answer the purpose of a double-roof, the shaded air-space
keeping the rooms below cool, and would also give a second story,
open to the air. In the summer this open story would be used for
sleeping purposes, divided by screens in the Japanese fashion to

January 5, 1889. The American Architect and Building News. out by wire-setting surrounding the whole. People in this region find it impossible to sleep in their houses in the summer now; they
take to the open air with their mattresses, either on the roofs or on the ground outside. Even this method will have its advantages when the advantages of open air combined with shelter, for drenching
rain come up in the night-time not infrequently. Care would be
taken, in such a house, to leave no interstices for the concealment of
varmikes, scorpions, and other vermin. The exterior, that is, the
agreable exterior would be given by coating the walls with cement,
colored with some pleasant-tinted paint or wash so common in Western
and other states, and it would look comfortable and cozy,
introduced in the shape of a large central hall, running up to
the second roof, with a handsome staircase to a gallery
communicating with the open space on either side. Instead of the hand-made adobe, to
unnecessary and cheaper adobe, the floor would be of
the blocks in an ordinary brick-madine, like common bricks, thus
saving the very considerable expense of burning them, while
the present would in a great degree at that time to its
parsimony, assuring a lasting quality far greater than that of the adobe. We have
seen an unburnt, machine-made brick that has been kept for
years without crumbling, as hard as when first turned out. I wonder
counts of the story, of the tale, by the score has been probably never occurred to makers.

Several rocky hills rise abruptly around the town, the
main portion of which lies at the base of one of them. Here, as elsewhere
throughout the West, the French term "ba" is applied to such

1 The term "cotto" is now almost universally used, being a
probable in an ordinary phrase, like common bricks, thus
saving the very considerable expense of burning them, while
the present would in a great degree at that time to its
parsimony, assuring a lasting quality far greater than that of the adobe. We have
seen an unburnt, machine-made brick that has been kept for
years without crumbling, as hard as when first turned out. I wonder
counts of the story, of the tale, by the score has been probably never occurred to makers.

Several rocky hills rise abruptly around the town, the
main portion of which lies at the base of one of them. Here, as elsewhere
throughout the West, the French term "ba" is applied to such

1 The term "cotto" is now almost universally used, being a
probable in an ordinary phrase, like common bricks, thus
saving the very considerable expense of burning them, while
the present would in a great degree at that time to its
parsimony, assuring a lasting quality far greater than that of the adobe. We have
seen an unburnt, machine-made brick that has been kept for
years without crumbling, as hard as when first turned out. I wonder
counts of the story, of the tale, by the score has been probably never occurred to makers.

Several rocky hills rise abruptly around the town, the
main portion of which lies at the base of one of them. Here, as elsewhere
throughout the West, the French term "ba" is applied to such

1 The term "cotto" is now almost universally used, being a
probable in an ordinary phrase, like common bricks, thus
saving the very considerable expense of burning them, while
the present would in a great degree at that time to its
parsimony, assuring a lasting quality far greater than that of the adobe. We have
seen an unburnt, machine-made brick that has been kept for
years without crumbling, as hard as when first turned out. I wonder
counts of the story, of the tale, by the score has been probably never occurred to makers.

Several rocky hills rise abruptly around the town, the
main portion of which lies at the base of one of them. Here, as elsewhere
throughout the West, the French term "ba" is applied to such

1 The term "cotto" is now almost universally used, being a
probable in an ordinary phrase, like common bricks, thus
saving the very considerable expense of burning them, while
the present would in a great degree at that time to its
parsimony, assuring a lasting quality far greater than that of the adobe. We have
seen an unburnt, machine-made brick that has been kept for
years without crumbling, as hard as when first turned out. I wonder
counts of the story, of the tale, by the score has been probably never occurred to makers.
intent upon making the most of their time, should not from the start have their days something like those of an ancient hen in a yard and exertion to which the planning of their tours subjects them.

Our road takes us first to the eastward. Facing us are the Super-

mition Mountains, their name another misinterpretation for Spanish. A round, majestic designation, sug-

gestive of sacrificial caves and weird rites held by the Indians, as they undoubtedly were. It is, however, a matter for congratulations that the latter part of the mountain is not of the same composition as the lower, but also, like the Spanish, has a mystic significance. The Super-

mition have a broad, cliff-like frontage, rising abruptly from the plain, with high if not uniformly sloping deterirs at their feet. Their tops are generally though broken, and on their faces are plainly traced the strata-lines that indicate their geological history. Their forms are suggestive of some grand primitive architecture; castle-like towers, and thatched pyramids of ancient ages, the intervening desert.

A few miles of the old road leads to the foot of the near-by mountain, and among others of the party, a Mr. Cushing, is out still at the excavations, but in a few minutes he comes galloping into camp on his beautiful horse, "Douglas," and is shining with perspiration. He is a vigorous, hardy, and picturesque man, and Mr. Cushing is still at it the excavations, but in a few minutes he comes galloping into camp on his beautiful horse, "Douglas," and is shining with perspiration. He is a vigorous, hardy, and picturesque man, and

in his behalf, our esteem.

It is dark when the violent clattering of a cow-bell summons us to the kitchen tent to supper. All our little community, with the excep-
tion of the laborers, who wait for our "second call," are gathered around the board, and the presence of the ladies imparts an ameliorat-
ing influence rare in camp-life. There are the two anthropological members of the staff, Dr. Herman F. C. ten Kate and Dr. Jacob L. Brunt, in the old tent that has been used for nearly twenty years, and in Dr. Wortman I am delighted to find a man whose quiet, unassuming ways do not obscure the recognition of the markable scientific attainments of which I have heard from mutual friends. Dr. Wortman is a comparative anatomist for the Army Medical Museum, at Washington, and has been temporarily detailed to look after the preservation of the valuable ancient skeletons excavated here. Doctor Washington Matthews, also surgeon in the Army, and at present Curator of the Museum, himself a distinguished ethnologist, was ordered to this place by the Secretary of War, last summer, owing to the critical condition of Mr. Cushing's health. Dr. Matthews, who is an old friend of Mr. Cushing's, having been surgeon at Fort Wingate when Mr. Cushing was making his important investigations at Zuñi near by, was so im-
plicated with that specific work that it was necessary for him to come here, that his representations induced Dr. J. S. Billings, the Director of the Museum, to enter into an arrangement whereby the Museum should secure duplicate series of the skeletons in consideration of the necessity the preservation of the original series. The interesting detail of Mr. Wortman for this purpose, a young man already known as the foremost comparative anatomist in the country, and one of the ablest of osteologists and paleontologists.

SYLVESTER BAXTER.
The ARCHITECTURAL COURSE AT COLUMBIA COLLEGE.

BOSTON, MASS., December 29, 1888.

Dear Sirs,—In your reply to Mr. Kimball in the American Architect of December 29, 1888, you convey the impression in regard to the comparative “progressiveness” etc., of the trustees or managers of the Architectural School at Columbia. It is not open to question which of the two institutions, the Massachusetts Institute of Technology, the principal rival of the Columbia College School, is concerned. During my seven years' experience in the Institute of Technology, whatever may have been the faults of the Department, I am certainly not due to any lack of intelligent interest, and desire to promote the welfare of the Department, on the part of the officers of the Corporation. In the efforts of the Corporation to accomplish the utmost possible good with the limited funds at their command, the Architectural Department was never forgotten or neglected, and it is hardly fair to compare their prudent and far-seeing management of the whole school of which the Department formed a part, with the enthusiastic zeal of the wealthy private gentleman at whose expense the Columbia Architectural School was founded and maintained, and who could be called upon with confidence for almost unlimited contributions for the good of any practicable scheme.

Very truly yours,

T. M. CLARK.

[Although our statement was positive, and not comparative, it is possible we may have been unlucky enough to be understood in the latter sense by others than Mr. Clark.—Eds. American Architect.]

SLOW-BURNING CONSTRUCTION.

MINNEAPOLIS, MINN., December 11, 1888.

Dear Sirs,—I am prompted to send you sketches of a cheap construction which I have used, by the letter you published from Mr. Atkinson in one of your October issues. No. 1 is from an apartment house in Minneapolis, the liberty to which had been used, so to speak, in some respects I consider it a success. The outside walls have common brick outside, bonded through the wall every six courses; the backing is of hollow bricks, 4 x 8 x 12, of which I should not care to build piers, but which I have tested with actual weights, and consider them strong enough for ordinary four-story brick walls. This wall receives the plaster without lath or furring, and is dry. The extra expense of this wall is met by the saving in furring and laths.

The partitions are all made of 2 x 4's studs, run into "shelathing-lath" on two sides, as shown by No. 3, with a groove in each side. These studs—which were toenailed into the wall are filled with mineral wool or glass. The walls are plastered on both sides with ordinary lath. This is 1 x 6. The plaster has been put on without lath. The partitions run with the joists, the joists are trebled below, making a two-carrier scheme.

These partitions have been made at 12' 0" high, without cross-bracing, and, after plastering, they prove stiff enough for general use. I have several sets of similar, 2 x 4's on the ends, so it is very easy to thoroughly secure the buildings against the danger of "springing." The plaster is applied, as shown, on both sides of all the studs, with mortar of 1 x 20, set 1 x 10 on.

There are no tongues or splices, it is very necessary to thoroughly secure the plaster to the laths, for I think it is as necessary as the "pent." The partitions have been plastered for 100 feet, and the whole cost to date is $5.00 per 100 feet of wall.

I was very anxious to secure a cheaper method of construction than the usual one, and I think I have succeeded in doing so. The partitions have been used from the 1st of November to the 1st of December, and the work has been done at an average cost of $5.00 per 100 feet.

A CORRECTION.

NEW YORK, N. Y., December 26, 1888.

To the Editors of the American Architect:

Dear Sirs,—In your column of death notices of architects published December 19, 1888, you have printed an article by Arthur Crooks on the architecture of St. Thomas's Church in the Fifth Avenue, New York. This is incorrect. Mr. Crooks was in the employ of R. & R. M. Uijohn as draughtsman at the time St. Thomas's Church was built. The design and selection of all the simple materials was done out to an eighth-inch scale for Dr. Morgan five years before Mr. Crooks came to this country, and the design and scheme of the building was made by my father. He was the architect of the church and according to our books Mr. Crooks entered our employment three days after he had been hired from England, the last of July in 1863, he then said he was not quite twenty-one years old, he remained in our employ for upwards of two years continuously. In Mr. Crooks we always found an able and willing assistant. In England, he had been architect to a Mr. Sutton an architect of Nottingham, England. By publishing the above you will be correcting an error undoubtedly unintentionally made.

Yours respectfully,

R. M. Uijohn.
The Inventor of the Wheelbarrow. — There are probably very few people outside the specialized circles of mechanics who are aware of the inventor of the wheelbarrow. The sculptor, painter, architect, engineer — in fact many skilled genius and universal scholar, Leonardo da Vinci of Italy, himself the most versatile of all the master creative artists of the renaissance, was the inventor of the wheelbarrow. His fertile brain conceived the idea about the time Columbus discovered America, which was perhaps the first instance of thinking on a line hitherto touched with the highest order of the divine art of painting bringing himself down to the diametrically opposite study of a simple mechanical invention, but such is the case, says history.—Chicago Herald.

INCREASE IN BROOKLYN'S BRIDGE RECEIPTS. — The annual report of the Trustees of the New York and Brooklyn Bridge shows that the receipts from tolls in 1887 totaled $1,268,000, as compared with $1,007,655 in 1886, an increase of $250,345. The tolls were divided as follows: Promenade, $136,969.38; carriages, $27,331.30; railroad, $855,790.31. The tolls exceed those of the previous year by $170,344. The promenade, $1,482.35; carriages, $34,909.95 for the railroad, and $67,237.35 in the total.
The number of railroad passengers was 39,302,283, compared with 27,980,335 the preceding year; 1 foot passengers, 2,783,535; against 2,944,513 in 1887, this shows a total of 31,116,816 passengers, and a total increase of 2,512,066 over 1887. The largest monthly number of foot passengers was in April 202,778 — and of railroad passengers in October 2,500,697 — in which month also the total traffic was largest — 82,720,341, according to the report, an increase of $250,345.
The figures for the year have been $831,405.22, leaving the balance on hand December 1, 1888, $230,710.95. Among the extraordinary expenditures were bridge riprap, $339,049; repairs to walkways, $110,000; repairs to the estate, $202,007.25 for Washington Street extension, $383,700 for six Pullman cars, $119,000 for a carriage, $99,000 for two (plus post suits), and $17,000 for repairs and extensions. The pay-rolls amounted to $123,014.75, besides $29,192.29 in salaries, $52,679.53 in tolls, and $19,273.78 for printing, and telephone wire and the single Commercial cable.—New York Evening Post.

A GIANTIC ELECTRIC LIGHTING SYSTEM. — The newest form of interest in electrical development is the condensers printed in the electrical journals for the current week of the articles in the English column of the New York Times. It is the London Electric Supply Corporation. The Electrical Engineer says: Projects for central station electric lighting on a large scale in England are following one another with great rapidity both in the smaller towns and in provincial towns as well. This present activity is doubtless due in large measure to the improved situation of the capitalists who undertake such enterprises, consequent upon the modification by Parliament of the onerous restrictions of earlier legislation touching their privileges and still more perhaps to the widespread and successful introduction of the double lighting system throughout the country. Chief among the new schemes which have marked the reaction following the removal of restrictions of the Electric Lighting Act is the formation of the London Electric Supply Corporation for the purpose of erecting a system as to dwarf the most extensive appliances in use to day into comparative insignificance, and its conception is so bold as to excite both the admiration and the active interest of American capitalists in such matters. If successful it will be a great advance upon present arrangements — and insurance companies, for example, will employ a larger expenditure of electric light, in proportion to the power, with one of the circuit base and designedly grounded at innumerable points. The strongest arc-lighting current in use in Providence has a potential of about 1,400 volts and this increase of tension will demand an absolute insulation, the possibility of which is still an open question. The Superintendent Station has about four acres of ground at the river-side, almost the whole of which will be eventually covered with the steam and electric plant, capable of lighting half of London. The "small" dynamos will have a capacity of 25,000 lights each, and will be the largest electric generators yet constructed, and the "large" dynamos, forty-five feet high all over and weighing 150 tons each, driven by 10,000 horse-power engines, will be capable of supplying 250,000 lights each. The total power will be 15,000 horse-power magnificently located by the exciting current so that it will be impossible to get a shock from the dynamo itself. The conductors will present a radical departure from anything practised at the present day. No precedents being available for the transmission of such voltages, Mr. Ferranti has had to work out the problem on his own case. Throughout the whole system one end of the primary is connected to earth and the difference of potential between it and the line will be carried over in the form of a current of electricity enclosed within this grounded copper conductor, separated from it by the most perfect insulating compound obtainable. By this means it is carried directly to the consumer, requiring no more precaution unnecessary in running the conducting wire than in placing an ordinary gaspipe. In the transmission of high electrical pressures, Sir William Thompson has shown that the interior of a solid copper rod is practically useless and the weight of the inside copper is simply wasted. They have therefore, for this purpose, hollow conductors cylinders of pure copper 3-inch in thickness. The high pressure main will be laid along the embankments and lines of the various railroads on the route of the proposed system, so that the distributing points a transformer of 125 horse-power and weighing a ton will expand the current down to 2,400 volts, which is the pressure now used in the Grosvenor Gallery and will be capable of supplying 2,500 lamps on 10 c. p. From these stations the current will be distributed by over 50,000 conductors for the benefit of the trade. The total expenditure on this system was about 3,000 miles loss. Pigiron output, exclusive of Bessemer, was only fully up to 1887. The capital of manufacturing companies in the Southern States was 29,687,000, more than 31,000,000 in 1887. The number of rails of Bessemer and a third understaking, the St. James Electrical Light Co., has announced the intention to construct a station for 20,000 lamps.

TRADE SURVEY. — The features of the week are heavy traffic on nearly all trunk lines, and an active distribution of products of all kinds. The year's business, according to the railroad clerks, has been slightly exceeding the expectation of a few months ago. The actual construction was about 3,000 miles loss. Pigiron output, exclusive of Bessemer, was only fully up to 1887. The capital of manufacturing companies in the Southern States was 29,687,000, more than 31,000,000 in 1887. The number of rails of Bessemer and a third understaking, the St. James Electrical Light Co., has announced the intention to construct a station for 20,000 lamps.

True features of the week are heavy traffic on nearly all trunk lines, and an active distribution of products of all kinds. The year's business, according to the railroad clerks, has been slightly exceeding the expectation of a few months ago. The actual construction was about 3,000 miles loss. Pigiron output, exclusive of Bessemer, was only fully up to 1887. The capital of manufacturing companies in the Southern States was 29,687,000, more than 31,000,000 in 1887. The number of rails of Bessemer and a third understaking, the St. James Electrical Light Co., has announced the intention to construct a station for 20,000 lamps.
With this material woodwork can be thoroughly protected from fire at a cost of less than one cent per square foot.

It can be had in all colors at 30 cents per gallon.

Send for Anti-Pyre circulars and samples.

---

SAMUEL CABOT
70 KILBY ST
BOSTON, MASS

ALSO SOLE MAN'FR. CREOSOTE SHINGLE STAINS.
TOMBS AND MONUMENTS.

Arabian Tomb after L'Architecture.

Unfinished Monument to Mary Washington, near Fredericksburg, Va.

Breton Cross.

Columns at Ravenna, Italy.

Cemetery Entrance, St. Theogennec, France. From Le Moniteur des Architectes.

Confederate Monument, Lexington, Ky.
electricity, carried out on a new series of experiments upon a horse weighing twelve hundred and thirty pounds, and two calves weighing about as much as an average man. With all death followed in a few seconds the application of an alternating-current of seven or eight hundred volts intensity.

APARENTLY, the public apprehension must have been so aroused by these experiments as to make itself felt in the business of lighting by alternating-currents, and the Westinghouse Electric Company, which is said to control in the country all systems of alternating-currents, thought fit to hire a large number of newspapers to publish a letter, to which every honorable man must be sorry to see the name of Mr. George Westinghouse, Jr., subscribed. The letter begins with a reiteration of the insinuation, which has been refuted over and over again, that Mr. Brown is "conducting his experiments in the interest and pay of the Edison Electric Company," followed by an assertion that "it is generally understood" that as the Edison Company's business may be vitally injured if the alternating-current apparatus continues to be successfully introduced and operated, "the Edison representatives, from criminal interests, have committed the crime of endeavoring to prevent the extension of the system." As the idea that "the Edison representatives" have anything to do with the "expedients" in question rests entirely on the false assumption that Mr. Brown is one of those "representatives," it does not need to be disproved; but those whom Mr. Brown himself has accused of criminal interests, even of very few in this country will be tempted to point out to Mr. Westinghouse that with the Edison Company the "business point-of-view" has hitherto been generally identical with the point-of-view of honesty and decency, and that, if he considers the systems that his company controls superior to the Edison system, he will get more public sympathy by describing their advantages without any accomplishment of bragging and slanderous imputations. Proceeding to discuss the facts in the case, Mr. Westinghouse says that the animals killed by the alternating-currents were "Mr. Brown's experiments," and "in no case has any placed " so as to receive the shock in a way that would be impossible under ordinary circumstances, and offers to produce "a large number of persons " who have received a shock of one thousand volts from alternating-currents without injury," explaining further that alternating-currents are less dangerous than continuous currents, because the latter decompose the tissues, while the former only affect the nerves.

MR. WESTINGHOUSE'S contemplative and abusive advertisement has now, very naturally, stirred up Mr. Brown to a reply which one might wish he could wish, inasmuch as it goes out of its way to impute to Mr. Westinghouse motives which would be much better left for the readers of the correspondence to infer for themselves. In regard to the facts of the matter, Mr. Brown says that however it may have been with Mr. Westinghouse's friends, who have "withstood" pressures "exceeding one Light Company," followed by an assertion that "it is generally understood" that as the Edison Company's business may be vitally injured if the alternating-current apparatus continues to be successfully introduced and operated, "the Edison representatives, from criminal interests, have committed the crime of endeavoring to prevent the extension of the system." As the idea that "the Edison representatives" have anything to do with the "expedients" in question rests entirely on the false assumption that Mr. Brown is one of those "representatives," it does not need to be disproved; but those whom Mr. Brown himself has accused of criminal interests, even of very few in this country will be tempted to point out to Mr. Westinghouse that with the Edison Company the "business point-of-view" has hitherto been generally identical with the point-of-view of honesty and decency, and that, if he considers the systems that his company controls superior to the Edison system, he will get more public sympathy by describing their advantages without any accomplishment of bragging and slanderous imputations. Proceeding to discuss the facts in the case, Mr. Westinghouse says that the animals killed by the alternating-currents were "Mr. Brown's experiments," and "in no case has any placed " so as to receive the shock in a way that would be impossible under ordinary circumstances, and offers to produce "a large number of persons " who have received a shock of one thousand volts from alternating-currents without injury," explaining further that alternating-currents are less dangerous than continuous currents, because the latter decompose the tissues, while the former only affect the nerves.

A CURIous controversy is going on in the newspapers between the Westinghouse Electric Company, representing a large amount of vested interest, on the one hand, and Mr. Harold P. Brown, who claims that he represents the public interest, on the other. It will be remembered that Mr. Brown, some time ago, wrote a letter to the New York Evening Post, over his own signature, calling attention to the dangerous character of the alternating electric currents used in the Thomaston-Houston system, the Jablackoff system, and several others. In reply to this letter, various anonymous insinuations were circulated, to the effect that Mr. Brown was in the pay of the Edison Electric Company, which uses only continuous currents, and implying that he was attempting to deceive the public, for the benefit of that company, by attributing imaginary dangers to rival systems of electric-lighting. Mr. Brown then, to fortify his opinion by the strongest evidence, applied to Mr. Edison for the use of his great electrical laboratory at Menlo Park, for the purpose of trying whether alternating-currents of the strength used in lighting would be fatal to animals. Dogs of different sizes were first operated upon, and, while one weighing fifty pounds received six successive shocks, the last shock lasting two and one half seconds, with a continuous current of intensity varying from one thousand to fourteen hundred and twenty volts, without experiencing any injury, a fifty-six pound dog was killed in five seconds by an alternating-current of one hundred and sixty volts, a little more than one ninth the intensity of the harmless continuous current. As soon as these results were published a new attack was made upon Mr. Brown and Mr. Brown. The Society for the Prevention of Cruelty to Animals was called upon to put a stop to the experiments, while the experiments themselves were declared to be of no value as showing the relative effect of alternating and continuous currents on human beings, because the dogs treated were smaller than men. Mr. Brown then, with the cooperation of the Commission appointed by the State Government of New York to determine the best method of executing criminals by
pressure, and proposes that the one who first cries enough shall be considered to have acknowledged himself in error. This is certainly a fair offer, and, if Mr. Westinghouse does not like to leave his business for such trifles, we strongly advise him to read one of his thousandvolt salamanders as his champion.

As the controversy now stands, his friends maintain that the current used in his system is "absolutely harmless," and, consequently, we suppose, that the persons who have been killed on touching the wires carrying it must, by a singular coincidence, have died of consumption, or old age, or some other natural ailment just at that instant. Mr. Brown maintains that an alternating-current of one-sixth the intensity used by the Westinghouse people has killed a large dog in five seconds in his experiments, and that this current is of a magnitude not to be limited by law to three hundred volts; and unless the Westinghouse companies can show a man receiving a shock of greater force than this without injury, we are much inclined to think that the public will agree with him.

A CURIOS story about an American town comes to us by the way of Paris. According to this, there is in the province of Brooklyn a lot of land which has no owner, but any person who takes it out is not very spacious, being only twenty inches wide, by, apparently, two hundred feet or so in length, but it is regularly taxed to "Owner Unknown," and as regularly put up at auction for the non-payment of taxes by this mysterious individual, but finds no purchaser, the building laws of New York being unfavourable to the conversion of a lot of this description into dwellings.

The explanation given for the origin of this orphan estate is that the block was laid out many years ago with the standards of length then in use, but was not divided into lots. Long afterwards, when the land had become valuable, the sale of the tract in lots began, the measurements of the lots being taken from the street-lines, which had been fixed at the original survey. The length of the legal standard for New York had, however, changed since the survey was made, and, when all the lots had been sold by measurements conforming to the new standard, the strip remained in question, which was included in nobody's deed, and could not be conveyed to any one without an apparent violation of the laws of arithmetic.

ALTHOUGH this explanation may satisfy the Parisians, we are too proud of the astuteness and ingenuity of our countrymen to let it pass without question. We have seen a lot not much more than twenty inches wide in an American city utilized for a very profitable little fruit store, by the simple process of roofing it in, and furnishing it with a movable front, which served as door, counter and window, while there was plenty of room for reserve of goods in the space behind; and it is incredible that the Brooklyn people should be so blind to commercial opportunities as to let this one escape.

Nor can we quite believe in the story of the origin of the surplus lot. So far as we know, there has been no change in the governmental standards of length, either in Brooklyn, or in New York, for the last fifty years at least, and the excess of territory is usually amicably divided among those who have claims upon it.

M. HERBERT D. APPLETON, the earnest and thoughtful President of the London Architectural Association, has written to the American Architectural Association on the "Affiliation of Student Architectural Societies," which is full of valuable suggestions, as well for us as for those to whom it was particularly addressed. By the new charter of the Royal Institute of British Architects the London Architectural Association is now linked with the Council of the Institute, and Mr. Appleton thinks, with reason, that this arrangement could be made much more useful to the younger members of the profession throughout Great Britain by the establishment of somewhat intimate relations between the London Association and those which already exist, or which may be formed, in the provincial towns. It is a curious fact that the adoption of the compulsory examination for admission to the Institute has greatly fostered the development of student societies, which find plenty of reasons for existence in the advantages which their classes offer for preparing their members for the Institute examination, and the ready communication between the Institute and the students, afforded by the presence in the halls of the Institute of representatives of the federation of student societies, would be most useful in preventing misunderstandings, in improving from year to year the system of examinations, with the concurrence of all the parties interested, and in promoting professional advancement and unselfish interchange of ideas. Moreover, and of this we are convinced, Mr. Appleton thinks that a regular communication between the student societies will be of much value in many ways. It would not take long, for instance, for a body comprising several hundred young men to form a lending-library of all the best architectural works, by which all students, whether living in the city or in the country, can be brought into direct correspondence with their fellows; or, again, the list of books owned by each society could be obtained and exchanged with the others, so that they are almost entirely unavailable for young men employed in offices, while the selection is usually so poor that students who have not been warned what to avoid are likely to waste a large part of the time which they can manage to devote to them. Under such circumstances, a proper students' lending-library would be invaluable, and it is hoped that until this could be formed, much good might be done by appointing members in the various towns to examine the local libraries, and urge the purchase of books from a list to be prepared for the purpose by a library committee or some similar authority.

BESIDES all this, Mr. Appleton proposes that the local societies should mutually help each other in facilitating the study of buildings, both ancient and modern. He cites the example of the Architectural Council's appointment of "consuls" in all the principal English towns to recruit tourist members of the club to places of interest, and give information about roads and inns, has immensely facilitated the use of wheels for pleasure travelling, and proposes that the affiliated societies of students of architecture should in the same way appoint members in as many places as possible, as local advisers to students on sketching-tours. This, to our mind, is one of the most valuable suggestions ever made for the benefit of young architects, and the plan might well be carried out on an international scale. Every architect who has made a sketching-tour in an unfamilar district knows the difficulty of finding what he wishes most to see. The guide-books give him a little information about the principal buildings, and tell him how to find the cathedrals, which are usually visible for five miles around, but they are silent in regard to thousands of lovely "bits" more available for sketching, and quite as instructive in the more relaxed structures. In fact, the great cathedrals are so familiar by photographs and drawings that they tempt the sketcher less than buildings which he never heard of before, and to which his sense of proprietorship as a discoverer gives an interest and charm which fix their beauty of design, or construction, in his mind, and lend them an individuality.

We can well recollect the pleasure which we stumbled upon the little Carmelite church and convent in Paris on the south side of the Seine, near the Hôtel Cluny, or the church of Saint-Pierre at Chartres, or an old tower of brick and terra-cotta in a back-yard at Milan, and how novel and delightful they seemed after the familiar grandeur of the cathedrals, and do not doubt that many of our readers have had the same experience, and have, like us, lamented the fortune which, while it brought us to a few treasures, led us in ignorance past others which might have been the first to attract our attention, if the region could have directed us. In the study of modern architecture, which Mr. Appleton strongly recommends to young men, the study of architectural consuls would be of the greatest benefit. We often have occasion to furnish professional tourists, both young and old, with lists of the most interesting buildings in the American towns with which we happen to be acquainted, and, judging from our own experience, the amount of time that could be saved by having such lists prepared by a competent resident in each place would be enormous.
ARCHAEOLOGICAL CAMPING IN ARIZONA. 1—II.

WITH sundown the air has suddenly become sharp and keen, much like that of late October. The difference is due to the midwinter night of this region considerably from the midwinter day. The stars peer brilliant through an airless sky, and an impressive silence broods over the country, hardly disturbed by the muffled tread of these Mexicans quietly chatting in their tent, the cook setting things to rights in it for the night, and the brisk fires are needed for comfort, even late into the spring.

Mr. Cushing's tent, occupying the centre of the camp, has a cozy, home-like appearance, with the touches of decoration and arrangement that betrays the feminine influence present in this large wall-tent, divided by a curtain into two rooms. A canvas covers the ground and makes a neat floor, cases of shelves contain a considerable reference-library for use in working out the material, and the shelves were brought in by day and day, and there is a convenient portable desk; shelves, desk, etc., all made so as to be packed into a small car and easily transported when camp is moved. Bright colored Zuni blankets cover the two beds, and there are two porcupine blankets on the wall and shelves some handsome examples of the decorated basketry of the Pima Indians, mostly with bold, rich design woven in black and white, and with the additional decoration painted in red and green. There are also a few specimens of the ancient pottery excavated near by. A sewing-machine lends an air of domesticity to the place, and several candles illuminate it.

One of the smaller treasures of the collection and guards them with jealous care, bringing them out and delights my eyes with some exquisite arrowheads, carefully clipped and graceful in form, made of quartz and agate, or porcupine teeth, evidently chosen with regard to its beauty; ornaments of turquoise and beads of shell; bracelets and finger-rings carved from sea-shells, and last and most beautiful, a wonderful frog found wrapped in a skeleton of the jasper and jade found excavated from the ruins of the great temple of Los Muertos. It is an exquisite piece of work, showing not only a genuine aesthetic sense possessed by the ancient people, but an artistic conception and taste that has been given to honor to our own race and civilization if produced today. In making it similar to that of a quahog, or "little-neck clam," was taken and on its convex side the clypeus of a frog was produced in lines of mosaic-like fragments, and the body was made from the gumn of the greenwood, or lindenilla. The line down the centre of the back was made in red bits of shell, resembling coral in color. The whole was worn down smooth by rubbing. The effect is extremely realistic — an exception to the conventionalism that characterizes most of the art of this, common with other North American primitive cultures. Prof. Edward S. Morse, who visited Camp Hemenway last year, kindly took this opportunity to show him with safe-keeping, and stopping over in New York he showed it to the people at Tiffany's, who expressed great delight and marvelled at such a thing could have been produced by an ancient people in this country.

The rest of Camp Hemenway consisted of a tent occupied by Mr. Hodge with his desk and records, a tent adjacent occupied by Mr. G. A. Gifford, the surveyor, containing some fine and most beautifully small tents in which Miss Magill was domiciled, commonly known as the "dog-tent" from its diminutive size and fancied resemblance to a kennel, a tent for the horses, a tent for Dr. K. A. Bright, the artist, and a large tent for the collections, with a shelter of canvas, called by its Spanish name of ramada, originally meaning "brush-shelter," adjacent as an annex; a tent for the Mexican laborers, a tent for the photograph material and cameras, a tent for the traveler, a tent for a family, a little "dark tent" for photography operations, and a shelter for the harness. The mules, with two horses, are tethered around a large cibou under one of the few mesquites in the vicinity, and the camp itself is so situated as to need no shelter in this climate, and beyond an occasional kick or bite at an encroaching neighbor they live together in unity.

To the antiquarian of Ramon Castro, the noble-faced young Mexican who acts as foreman of the laborers; faithful, industrious, and an innate gentleman. Later in the day, in the neighborhood of a mile distant, rising in a low, broad mass of brown earth above the plain, and something like twenty-five feet above the general level. It is the ruin of the great central temple of the ancient town of Mr. Cushing excavates. It has been excavated sufficiently to show its construction. It was originally probably six or seven stories high, and divided into various rooms on each floor. Only the remains of two stories are now to be seen; the third is probably closer to the ground. The material is well packed earth, and in the course of excavation Mr. Cushing made a highly important discovery concerning the constructive methods of these people. It is shown that the walls is a double row of holes running down perpendicular, and each row a few inches within the outer and inner face of the wall, respectively. These holes were found filled with the powder of decayed wood, and some large fragments of the wood itself were discovered. Further investigation showed that these walls were constructed by first driving a double row of stakes into the ground, and then lightening in such a wall as the earth is drawn from the holes. The earth was placed as the wall is raised, until the wall was carried to its full height. Thus a solid structure was formed with walls enclosed within a walled surface. This surface contains a sort of hollow along the edge of the wall, and is, in effect, the form of structure heard the records of the story of how this walled walk was, first rendered more substantial and weather-proof by a coating of mud, suggested a more massive form of construction with a basketry basis. Fully all mud or earthen walled construction may have been from basins to baskets.

In this connection, a subsequent discovery deserves mention. Readers of the American Architect may remember an article that appeared in their pages, and which was written by Mr. Cushing discovered that in the ancient Pueblos the doors to the houses were made of stone slabs, through an analysis of the etymology of the modern Zuni word for door, which signifies "a wooden structure," hence, that the ancient Pueblos did not make of stone which the use of doorways with slates of clay, find their origin in basketry types. For, just as the coating of baskets with clay suggested the making of pottery, so this form of structure bears the records of the story of a walled walk, first rendered more substantial and weather-proof by a coating of mud, suggested a more massive form of construction with a basketry basis. Fully all mud or earthen walled construction may have been from basins to baskets.
the available land in this region has all been taken up, and there has been a great development all around, with thousands of acres brought into tillage.

Therefore, the landscape has undergone a rapid transformation. When the camp was established here, the section upon which the main group of buildings is situated was a thickly forested area of very old mesquite trees. Only the great mound betrayed the existence of an ancient city on the spot. The other ruins were hardly discernible. The whole place had been cleared of underbrush, which they said; that is, brought under irrigation. Only a few trees are left standing just about the camp, and the owner of the section, who took it up under the Desertland Act, did not consider it worth while to disturb the rest of the group here and there, the appearance of the landscape would have been much improved, and shade afforded for cattle in their alfalfa pastures during the summer heat. With its thirsty amply gratified, as it is on irrigated land, the mesquite become quite a different tree from the scraggly, dwarfed growth of the desert-plains, with misshapen, unsound, contorted limbs. Given plenty of water, it becomes invigorated with new vigor, and it lifts its head proudly high into the air, animated with health that becomes manifest in symmetrical shape.

Objects of considerable size soon lose themselves in the vastness of the landscape as that spread before us; the white tents of the camp become mere specks on the plain, and the little shanties of the settlers on neighboring lands become so diminutive as to afford a small amusing distance that otherwise would prove very deceptive in this clear air.

The land chosen by Mr. Cushing for his excavations has been chiefly left undisturbed, as yet, and the sections of its surface slightly rising from the level indicate the ruins, and large areas laid bare testify to the industry of the laborers whom we see, here and there, casting out the earth with their shovels. We can see the great upper impressions they are making, and laborers have gained something of the enthusiasm of Mr. Cushing, and are eager for results. When something is found they gain new encouragement of their labors and accounting it with great satisfaction. They are more impressionable and receptive than men of a corresponding grade in our own race, and seem to have a greater natural intelligence. Their training has made them careful, analytic, in their observations, those who handle antiquities, as objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.

Ramón, in particular, has been an admiral commander of one of Mr. Cushing's field crews of archeological archaologists, with an almost intuitive capacity for discerning the presence of ruins and relics. He can trace the course of walls unequally by indications imperceptible to any one else except Mr. Cushing, and marks out with his shovel the lines for the men to follow in their excavations. He will likewise tell just where the skeletons are to be found in the house-ruins, and one day, at Las Acequias, the evidences of their presence of pottery of skeletons, or other objects are encountered, they proceed cautiously, and do their best to remove intact what is found.
NOW that the Annual Exhibition of the New England Architectural League has become an established factor in professional life, the first duty of all St. Mark's critics is to try to compare each year's collection of drawings with those of the preceding year, so as to note the tendency of a branch of American art which is unquestionably gathering momentum. It is an undertaking a brilliant flight at no distant day, and to do what little he can to point out the circumstances which appear likely to be found in the way of true progress.

In the main, the present exhibition cannot be called an advance upon the last one. The general character, both of the design and draughtsmanship, is better, and there is a notable absence of the monstrosities which in former years have marred the walls, but, at the same time, there are very few of the conspicuously beautiful examples, either of drawing or architecture, which do most to in- struct and attract. It is given us in the course of a few years to witness the development of a branch of American art which is also pretty. We are accustomed to think of Mr. Ruskin as a visionary egotist, and, very properly, to warn our pupils against reading the "Stones of Venice," or the "Elements of Drawing," which every draughtsman should own, and more than that, should utilize by thoroughly mastering every exercise in it. In this way, more rapidly than by any other method we know of, can one acquire the sense of shadow which is so hard to obtain, and which Mr. Ruskin's exercises develop so surely, and his drawing is a signal illustration of its value.

Number 7 is a pen-and-ink drawing done with liquid sepia, a medium which seems this year to be greatly in favor, and, with its near relative, the mixture of India ink and burnt sienna, revived the grave for the first time in these years. We have almost driven out the indelible brown ink which was once so popular, but, we believe, is not used in a single pen-and-ink drawing in the exhibition. The sketch in question shows very well the difference between the two, which is, that the sepia, without the harshness and coldness of India ink; and although the design and the drawing are both rather thin, the effect is pretty. Next to this is a sketch with the versatile sepia and liquid sepia. "Bits of Italian Detail," of which we wish we could speak as well. Mr. Tilton is by no means a bad draughtsman, and his subjects are drawn from photographs, so that they might have been, and ought to have been faithful representations of some of the most delicate and beautiful sculptured detail in existence; but he appears to have thought that no one would notice trifling alterations of outline, or oversights in regard to the proportion of parts, so that the whole is not quite as it might be; and the result is that his drawings are little better than caricatures, boldly rendered, but presenting nothing of the fine feeling which is the most valuable part of Italian work. Much better than this are his drawings of the Giraud-Toloria Palace, and a lot of colonial doorways, Nos. 122 and 123, which are careful and good. Numbers 11 and 12 are in color, the first being a rough, but rather effective sketch by Mr. Taft, of a house which would be likely to be considerably less effective than the sketch, and the second a well-executed drawing of what looks like a parochial school, but turns out to be a Washington institution. Other color drawings are not numerous, but Mr. Babb, the pen-and-ink draughtsman, in a competition sketch, made for Mr. R. H. Robertson, for the new World building, an effort which cannot be called particularly successful in any respect. Another pen-and-ink drawing in the exhibition is by Mr. Ray, which represent the door of Bourges Cathedral, but, like too many others, sacrifices conscientious attention to detail to a dash and effectiveness of coloring which is more or less the fault of the full color, and is not unfrequent. The effect is very good, and fidelitiy to the lovely original. There are plenty of drawings on the walls which are quite as effective, as dashed and as sketchy as this, but which give such facts as they are intended to express with perfect faithfulness, the best among these, next to those by Mr. Kirby and Mr. Bacon, of which we shall have more to say hereafter, being perhaps Mr. Schlaedermundt's sketch in Venise, No. 88, and Mr. Schlaedermundt's colored drawings, No. 140, the most careful of which are extremely good.

In No. 17 we arrive at the first example of a tribe of works which is represented in great force in this exhibition,—unfortunately for the draughtsmen, who in this case, which consists of something more than colored blots on paper. This is not the worst of the lot, the most glaringly superficial and meaninglessness of them all, such as Nos. 18, 50, 154. The last exhibits a noted example of outline of a building, on which have been subsequently dropped some little blobs of indigo, which we suppose, are intended to do duty for windows, although we cannot tell what architect intended to indicate chimneys. Of architecture in these works there is little or none. A rectangular wooden box surmounted by a clumsy roof, and furnished with shapely doorways and windows at random, this is not the worst, though even one of them may be yellow and the other red, nor does it help it to clound the middle with green. On the contrary, such views of chromatic haze would spoil the effect of the best piece of archi- tecture ever designed, and on an ugly barn they simply increase the ugliness.
A GENERAL PROTEST AGAINST IMPROPER COND
ITIONS OF COMPETITION.

The Commonwealth of Massachusetts has, by its Commissioner,
advertised for designs for the State-House extension, said designs to be furnished in open competition. The conditions of the competition, as announced, have evidently been framed with
out due regard to the best custom in the conduct of such matters, the sole end and aim of which should be to secure to the State the
best service by making sure that "the best men shall take part; that they shall be encouraged to do their best; that the best they offer
shall be selected; and that the author of the successful design shall be employed as architect, provided the building is built and he is
competent.

The conditions announced are faulty:

First. In that they are not drawn up in accordance with the best
custom, and no assurance is given that an expert adviser shall be
employed to aid the Commissioners in their choice.

Second. That no assurance is given that the successful competi-
tor will be employed, but, on the contrary, it is distinctly stated that
all preannounced competitors are to relinquish all ownership in their
plans to the State, without any further claim to compensation or em-
ployment.

Third. Even if the first prize in the competition were as it should be,
the execution of the building, the actual prizes offered would
still be entirely insufficient compensation to the authors of the draw-
ings placed second and third.

For the above reasons, we, the undersigned architects, citizens of
the State of Massachusetts [and elsewhere], protest against this form of competition, which, in our opinion, is not for the best interests of
the State or our profession, and we therefore decline to enter it.

PROVIDENCE, R. I.

E. M. Cummings

J. F. Schmieder

A. T. Beardsley

Jr., architect, Bridgeport, Conn.

HEATING AND VENTILATING THE NEW COURT-
HOUSE AT BOSTON.

There is no one type of apparatus, no complete system of heating or
ventilating, as just there is no one construction suited to all the
varieties of building. Each building has its characteristic peculiarities and
special requirements. So the modifications in the heating and ventilating
apparatus. In most cases, even of public buildings where ventilation is of
paramount importance, the selection of the apparatus is likely to depend up
on its possessing some one feature per-
haps of great excellence in itself, but
not necessary in any sense to the attainment of the result supposed to
be peculiar to it, and not having a single one of the elements essential to producing the effects most appropriate and desired.

These may have been taken altogether, because overshadowed by the undue prominence accorded to some
detail of really secondary importance. It appears in this case as if the Commissioners, believing a certain type to be generally ex-
cellent, having been shown some actual examples, impressive from their
very magnitude (for that reason perhaps) had forthwith adopted it for
the court-house.

Beyond the case drawn in the preparation of the plans, for whose
competence the engineer deserves the highest praise, we think
magnitude and the lavish use of iron in almost unlimited quantities, cost,
worth and galvanized, constitute the only merits of the design
if indeed it be a merit to cram the valuable space of a costly building
with useless material, of which the whole excess is in fact, nothing but junk.

We propose to investigate the subject of heating and ventilating this building somewhat exhaustively, and, having determined the elements which should indicate the design, to see what extent they have had influence in the plans of the court-house. It is first essential to examine the conditions depending upon the con-
struction and arrangement of the building, and, considering the use
where it is to be applied, to fix the requirements in accordance
with established principles and within the capacity of modern
engineering.

These data being ascertained, the next step is to design an appa-
rat that can, with least first cost but greatest economy, most
nearly attain the results aimed at, doing this with economy in fuel
and maintenance, and ease and simplicity of management.

The degree of excellence which the apparatus will possess de-
pends upon the thoroughness with which the conditions and the
requirements have been studied in all their aspects, the resources of
the designer and his skill in securing indispensable results with-
out the introduction of obstacles and unnecessary restrictions.

The apparatus can be capable of such a variety of effects as
to set at nought the caprices of wind and weather, but the effects will not
be effective if the means of producing them are too numerous, multi-
plity of details not readily accessible and scattered over a wide
area. The arrangement should favor a reduction in the number and a gathering together of parts and making the details conspicuous,
tending to concentration of management. A great number of parts,
Residence of Enrique Concha y Toro,
Santiago, Chili S.A.
Competitive Design — Alternative
Calvary Baptist Church, Davenport, Ia.

Plan.

Side Elevation.

Front Elevation.

Longitudinal Section.

Helotype Printing Co., Boston.
ALL SAINT'S CHURCH,
PONTIAC, R.I.

showing RECTORY
as proposed.

Howard Hoppin, Arch't
Providence, R.I.

Sketch Plan of Gymnasium
and Sunday School.

American Architect and Building News, Jan 12, 1889, No. 651.
either similar or different, involving endless repetition of adjustment, invites confusion. The control of all those elements from whose flexibility proceeds the adaptability of the apparatus to changing conditions, is continuously required. The operation of each part and the whole together must be responsive to it.

It must be taken into account that there will be machinery to be run by steam-power; half-a-dozen elevators and power-cars will be needed be made, and the delivery of steam-generating power is required. Now, it is an important fact that the heating effect of the exhaust steam of engines, though less intense than that of the live steam under pressure, is theoretically not exactly so, but substantially and practically no difference can be detected without the greatest nicety in the measurements. The significance of this is that a large share of the economy may be avoided by utilizing this wasted steam for heating.

There are two modes of transferring heat from a central source: in the one, the water in the mains is heated, in effect, by the surfaces of the radiators; in the other, the heat is transferred by a current of air, which also may have the purpose of ventilation.

As between the two methods the latter is justly believed to be the more desirable, because with the heat there is supplied a continuous flow of fresh air.

In those cases, however, where a rapid change of air is of no consequence, this form of heating is needlessly wasteful. Let it be understood that if the temperature is to be kept at a fixed point, say 70°, the entering fresh air must displace an equal quantity at that temperature, whose heat is thus carried away by the outlet flues and lost.

The average winter temperature is near 32°; now if the air is taken from the space at the same temperature and kept at the point high enough to maintain the building at 70° (which is therefore the temperature of the air thrown away), then the loss by this system is measured by the quantity of air raised from 32° to 70° and condensing the steam by the heat of this air. If the system is changed once in fifteen minutes as would be the case with this unmodified system, the loss would amount in the case of the Court-House building, 31 pounds of coal per hour more than would be required to maintain the temperature of the building, and in cold and windy weather this loss would be disproportionately increased, owing to accelerated velocity in the flues, and consequent egress of air.

The system, in mild weather when unlimited ventilation can be afforded, is almost stagnant; on the other hand, when severe cold is accompanied by necessary ventilation, the heat of the apparatus is far exceeded by the needful heat of the building for both heat and fresh air. The use of the building will be such that a change of air need only be maintained during eight hours of each working-day; therefore during two-thirds of the time at least, change of air is not necessary.

It is plain then, that economical considerations demand that the heat should not be supplied upon the supply of fresh air; that the building should be kept warm, and that the air should be supplied in proportion to the demand for ventilation, sometimes more, sometimes less, and only heated to 70°. Being freed from the necessity of condensing heat (appropriately warmed for introduction into inhabited apartments) the air-supply can be brought under exact control and the ventilation can be adapted to actual needs, be increased, diminished or stopped altogether without in any way affecting the heating or being itself affected.

Thus the heating can be suited to the exigencies of the weather and the ventilation to the wants of the occupants, without interference. But if the two are inseparably connected, the joint apparatus will be worked chiefly with regard to the heating, which is indispensable, and the ventilation, as being of less importance, will be inevitably sacrificed and finally lost sight of altogether.

Next, as to the modes of heating: We have to decide between hot water and steam. It is important to cover a considerable range of temperature, and to obviate all likelihood of action by a steam-air mixture, the water is the more important. Water-circulation affords a complete range of temperature, so that every variety of weather can be perfectly met. On the other hand, it is slow to change its temperature, which, when turned on and shut off, acts within narrow limits. The radiating-surfaces, being calculated for the coldest weather, are excessive for all other times. As a rule, steam-air mixtures are too hot in one season, and not always warm enough in extremely cold weather; there is no provision for extremes, yet it is the extremes of weather which it is the very prudence and intention of a complete system to meet and nullify. No system of steam-air mixture has been carried so far into general use, and, in spite of the greater slowness of action, we must accept the hot-water system on account of its wide range of temperature, and the greater heat of another property of steam which we may make use of, which will enable us to save the waste steam of engines, and to secure a great economy of space and apparatus in the transfer of heat from the heating centre to the local heaters. We have found that we should use hot-water radiators, but it is not therefore necessary that the water should be heated at some remote point, and then be slowly transferred to the distant radiators through ponderous pipes. The radiators can be heated locally by brass coils sup-

plied with steam, and placed within and acting upon the water system at the base of the rising mains. Nothing can exceed the rapidity with which steam can transmit heat at great horizontal distances through pipes of but moderate dimensions, and with but slight loss of pressure. The action of a hot-water radiator, and of steam-driving engines, this, the transfer of heat in great quantities economically, is its most valuable property, and we must not neglect it. This, its most perfect mode of action, is maintained by but a single system; that is, the so-called steam-boilers, useful alike for power and heating, thus saving one set of fires.

Given uptown by letting the settling of the heating, the question of fresh air, its quantity, distribution, and control.

The purest air contains 3 parts of carbonic acid per 10,000; in cities, the air contains 4 per 10,000; all agree that the air is still much coarser when it contains 10 or more parts in 10,000. The concentration of carbonic acid in the breath is about 5 per 100, besides other impurities of which it is the measure, or 100 times as much as in air usually breathed. A quantity of air consumed by one man in an hour is less than 18 cubic feet, and a cubic foot of air contains 26 cubic feet of carbonic acid; whence, to keep this from increasing above 6 per 10,000, it is necessary to supply not less than 3,000 cubic feet per person per hour. This must be the limit for small rooms, for the jail and the library. For crowded court-rooms, a greater degree of ventilation will have to be accepted, if not by the judge and jury, certainly by the spectators, for causes largely owing to themselves. But the air need not be so bad as to be noticeable, except to one coming in from the fresh air out-of-doors.

The supply of air should be proportionate to the number of occupants. Air, like water, should be made for increasing or diminishing this supply by simple means, and without affecting the heating.

Temperature, a very moderate one, the only lower to the temperature is by shutting the registers, and thereby arresting the ventilation, or by opening the windows and pouring cold air down the backs of the occupants; or, where a system of mixing air is adopted, by increasing the draft. In the latter case, the heat may be flushed with deluges of air pouring in from a hundred open doors, exposed to a furious gale; Monday it may be calm, and the ventilation inactive when the house is crowded. If there be dampers for the control of the air, when the heat is over, reduce the dampers so as to expose them all when the wind is southeast. At the next change of wind he will probably close them altogether, and take fresh air from the cellars, as is done in most of the old houses. There is no system of ventilation, can be no system and no regulation under such conditions.

The flow and quantity of air can be regulated and controlled by air-propelling machinery only, and should not be left dependent upon the accident of wind, or the manipulation of hundreds of dampers by several hundreds of people scattered all over an immense building, and acting without knowledge or agreement with each other. It is clear that there is a great amount of motive and positive means to regulate and control both the temperature and volume.

Besides the temperature and volume, the moistness of the air must be considered. Air contains the vapor of water at all temperatures, of course, in capacities varying in inverse ratio to the temperature. The example, at 32° one cubic foot of air can hold two grains of water, while at 70° it can hold eight grains, though, being expanded by twenty-five times, it holds only two parts of water, or 160 grains. But in a normal atmosphere, its mean, its mean in this climate being 71 per cent of saturation, in England 81 per cent, while it varies between the unusual limit of 30 per cent, or extremely dry, and 100 per cent, or saturation, when it either rains or snows.

If we take air from out-of-doors at 32° and at 70° per cent of saturation, called its relative humidity, and heat it to 70° without adding anything we can have but 4.14 grms. starting with, the warm air will have about one-sixth of its capacity for water supplied, or 17° of humidity. This is not because the heating process has dried it, as is commonly supposed, but because, by rise of temperature, the power to absorb water is increased, as it is with salts, by virtue of some disarray to many people; whether it is hurtful or not is an unsettled question. But it would appear that Nature would be a safe guide, and, if we moisten somewhat the air which we heat, we should only do what Nature does on a large scale. Here, again, we are restrained by practical difficulties. If the moisture is abundant, that is, if the relative humidity is high, the dissolved moisture in the air will on ordinary surfaces, just as we see it in summer on pitchers of iced water. If the temperature of the inner surface of a pane of glass is 43°, and the temperature of the air outside is 65°, and the temperature difference is 22°, we shall get glass if the air is at 40 per cent relative humidity. There is no objection to this except in the case of exposed iron skylights, where condensation and dripping might be troublesome. Experience shows how easy it is to maintain a relative humidity of 30 per cent in the coldest climate, except in the most severe cold weather, without incon- venience practically, and with great comfort to many people.

In the grand march of the science of ventilation, the question of moisture probably has an important part in the effects of the climate in this country, and more attention will hereafter be paid

1 Angus Smith. 2 Dr. Parker.
to it. Where there is no ventilation, of course there need be no moisture provided, and it is only as ventilation becomes more prevalent that there is need for the()._revision

Its bearing on the climate is already being investigated, while its influence on the weather has long been established; but, as to climate, it is only as ventilation becomes more prevalent that there can be talk of the dryness of the atmosphere. This dryness, which prevails also in spring in some localities on the coast of New England, is to this day peculiarly evident to us from its drying effect; but repeated observation has established the facts as above explained.

Evaporation produces cold, because each little atom of vapor carries with it a quantity of heat, and a dry air chills by its rapid absorption of invisible perspiration. To avoid chill, dry air must be rather warm; it should have a temperature so high as to remove much heat from the body before what is carried off by the evaporation. A dry air at 60° is not too hot for many persons. If the cold produced by evaporation can be avoided, it is plain a lower temperature would suffice, and it is probable that a moist atmosphere at 60° would have the same effect on our sense of heat as a dry air at 50° or more, and is desirable for many reasons. The blood is not able to furnish an unlimited supply of water for perspiration, and probably the injurious effects of a dry atmosphere will be found to consist in such a rapid evaporation from the skin, while the body is at rest and the circulation slow, as to diminish the proportion of water in the blood of smaller vessels faster than it can be replaced by the heart. This is plausibly shown, but, after all, exposure to dryness may cause no permanent harm, though to many it is a source of momentary discomfort.

The usual way of supplying moisture is by rapid boiling from a pan or a kettle. Objections to this, because the water contains organic matter and dissolved gases, some of which are decomposed and set free by boiling, and impart a smell to the air, in which while the water is driven off, the vapor, and which, by slow accumulation, makes the water very foul. Both of these objections are avoided by evaporating the water at a relatively low temperature, and by allowing it to flow through a heated stream, of a temperature not intended to be hot enough, to show any signs of its being evaporated. This part of the heating apparatus ought to be placed where it can be freely inspected and seen to be in working order.

Having now considered the ruling elements with sufficient fulness to be able to outline a plan, and summarize the results, we find that the three requisites, which we have specified, that the heat-distributing system be worked by steam; adaptation or regulating the quantity of air distributed under a wide range of temperature determines that the local radiators should be warmed by hot water, which, as shown, ought to be arranged in detached circuits serving their heat from a steam apparatus centrally placed; that systematic and regulated ventilation cannot be had without a mechanical propulsion of the air which should be done by a fan or blower, and that, to be fit for discharge, the heat of comfort, the relative humidity of the heated air should be kept up, and, since this is evidently impracticable if the fresh air be admitted at many points, we have another reason for concentrating the entire current of such a warm-current system in the management, prompt adjustment and regularity of working being assured. We now know exactly what is requisite, and the proper means to be employed to secure that requisition, are those means within the reach of the architect and the Commissioners, and if so, they availed themselves of them.

There are numerous examples in our own country as well as in Europe where these principles have been applied with complete success; where the apparatus was designed by engineers who not only appreciated all that is demanded by good ventilation and understood clearly what they were aiming at, but also that each of the above requisites can be so utilized to their resources as to hit the mark with certainty. It is true that many of these examples are impaired by want of money, for none of them had the friendship of Government officials and a Government officers to do the work. Before examining the proposed plans to find an answer to these questions, it would be instructive to determine for ourselves the quantities and the power of a heating apparatus suitable for this court-house.

The contents in cubic feet are 2,693,000 divided as follows: in rooms 1,102,000; by hallways 28,500; by windows, etc., 1,003,900. The area covered by the walls is in square feet 812,300; and of glass in windows and skylights, 25,800. Our figures are approximate.

The average loss of heat at internal temperatures of 70° and exterior 37° (which is the same as our winter climate), will be, according to (Féchet and Box, per hour),

| by walls, 100,000 sq. ft. at 8° | 8,300,000 | by lamps, 25,800 sq. ft. at 70° | 500,000 |
| by leakage of 200 sq. ft. at 70° | 120,000 | Total loss of heat per hour in heat units, 1,866,000 |

Allowing that one pound of coal by its combustion yields only 8,000 units of useful effect, and dividing by this number the above total, we find the coal per hour measured in fuel to be 233 pounds of coal. This is the average loss. At 6° below zero, the loss would be double this, or 466 pounds if the cold should be continuous. But in this latitude, the cold seldom reaches so low a point and never reaches that which could be tolerated by us, so that if we provide for such a degree of cold, with an apparatus capable of meeting this extreme loss of heat we shall have ample provided for other occasions of cold.

We have not considered the cubic space for the reason that it has no fixed relation to the loss of heat. If we change the air in the corridors twice per hour we have in the rooms, 6 times, 1,469,000 x 6 = 8,890,000 in the library, once in 40 minutes, 132,000 x 1.5 = 198,000 Total hourly change of air, cubic feet, 11,196,000 Or 186,000 cubic feet per minute.

The hourly consumption to heat this air from 32° to 70° will be 11,196,000 x 0.07 x 0.24 x 38 = 893,000 pounds, and the quantity at 6° below zero would be double this, or 1,786 pounds.

The average heating effect then calls for the combustion of 233 + 893 = 1,126 (the ventilation being carried on only one-third of the time, eight hours in twenty-four) or about 530 pounds of coal per hour.

The maximum effect, which indicates the power of the apparatus, calls for 466 + 1,786, or curiously enough, about 2474 pounds per hour if 6° below zero. This is a most extravagant proposition; it is improbable that all the rooms will require full ventilation at the same time, and since at 6° below zero, the quantity of ventilation may be reduced somewhat, as in fact it always is, even sometimes to the point of shutting tight all the flue-air inlet and outlet, and making a cold draught on the outside, to extravagance, so that we cannot be accused of suggesting less than the real requirements of the case.

Above we gave a few figures showing the quantity of air required per person for good ventilation to be 3,000 cubic feet per hour. In our argument here, we allowed for 11,196,000 cubic feet per hour, consequently we have provision for adequately supplying fresh air for (11,196,000 x 6) nearly 4,000 persons when the thermometer is outside at 6° below zero. This is more than generous.

We have taken the boiler power to fully convert into useful heating effect the above extreme and improbable use of air. Our boiler capacity is 124,400 square feet, reckoning a maximum combustion of 16 pounds of per hour per square foot of grate-surface, and an evaporative efficiency of only 1.5 pounds of water per pound of coal, or 6 boilers of 48 horse-power each.

As we intend to utilize the exhaust steam of machinery for heating, we need make no provision for power, simply lending the steam to the engines before using it for heating, and thus getting the elevating and lighting-work done for nothing.

To transmit this heat by radiation from surfaces at a moderate temperature agrees in principle with the old method of heating by fire. While one is the most direct and in the end the cheapest of all, and the most elaborate and expensive is the least efficient, it is easier to set the heat to stay there, instead of being wasted. For this reason we have taken a plan for heating, which is called a plate-heating apparatus, and we have also thought the cost the courts need be interrupted.

To have sufficient power even above the improbable maximum demands, we should increase the boilers by one-third; as the radiating-surfaces may be subject to disadvantages of location, arrangement or construction (such as being massed too much together) we should increase them liberally, and also provide a surplus of 530 fire that the building should have become chilled, the apparatus will recover the lost ground rapidly. Let us double the heating-surfces: We now have 6 x 1.5 = 9 boilers of 48 horse-power, and 12,400 X 0.07 = 880,000 square feet of grate-surface, or about 32,000 square feet. We also need three blowing-fans, with their pipes, to force the movement of fresh air, and therefore add to the already three fans to insure positive movement in the ventilating-chutes if they are tortuous and very unequal in length and frictional resistence.

The exhaust-fans should be run by electro-motors. It is cost nothing for the steam to run out of a small fan to expel heat from the boiler-room in the summer, to prevent it and the odor of hot-ot from machinery from passing into other parts of the building.

These, then, are our estimates of the boiler and heating power required by the Court-house, and arrangements similar to those we have described for securing the ventilation we think not only desirable but indispensable to a good result.

We have only sketched an outline, but, in general, our apparatus, besides being capable of the effects which we stated to be necessary at the outset, and which we think will command unquestioning
The American Architect and Building News. 21

Asent, would possess this important quality, the entire control of temperature by the occupants of the rooms or persons in charge of them, without reference to the ventilation; there need be no opening or shutting of windows to adjust the heat, and thereby remove all uncertainty in the supply and removal of air. If it should be too hot or too cold, the remedy is in operating the local radiators; but the ventilation should and could go on absolutely without reference to them.

Another advantage is, that when we have before us the essentials in our enumeration of the effects to be obtained, this air would be delivered in all parts of the building at a constant temperature, say 76°F. or 77°F., and the condition of the valve sets would allow the heat up to that point, but could by no means make it greater. Thus the engineer's duty would be extremely clear and easy for him to perform; and if the whole apparatus were properly concentrated, he could have no excuse for an unsatisfactory result or to consider.

We are forced to admit that in many cases neither has the managing engineer any clearly defined duty beyond keeping the building supplied with a sufficient quantity of air, which is all the more reason why the system is so important.

We believe that our conclusions cannot be shaken by any evidence obtained from the actual use of any type of apparatus; on the contrary, wherever it has been tried, it has to our knowledge given a most perfect and easy control over the heat, and an experience of the highest value for the future.

Let us see to what extent the proposed apparatus is conformable to them. The Commissioners' engineers specify (12 hot-water and 2 steam =) 14 boilers of 45 horse-power each; about 30,382 square feet of direct and 57,210 square feet of indirect radiators, or a total of 87,622 square feet of heating-surface, besides a large amount in ventilators. In short, there are a delightful number of valves upon it. There is no provision for moisture; no utilization of exhaust steam for heating. There are no less than 195 cold-air inlets exposed to all the elements; but it is better to have an apparatus which, in the event of valves under varying conditions, by an indefinite number of occupants of the rooms, of whom there is no guaranty that one will be an expert in ventilation. There are 74 cold-air dampers, 32 switch-dampers and 64 mix-dampers, all to be operated at every change of wind and temperature by the efficient corps of supernumerary engineers under the supervision of a skilled chief, probably a graduate of University of New York. The entire apparatus, under the provisions of the Treasury Department, who will issue hourly bulletins, with maps, indicating the probable climate for the ensuing hour in various parts of the structure, for the guidance of his subordinates and consolation of the inmates. Far from centralizing the control, the care of all these confused and differing subdivisions is scattered all over the building in dark, inaccessible flues, ducts and tunnels obstructed by enormous pipes, and all this mass of material, the larger part of which must, on account of its unsuitable arrangement, remain forever inert and worthless, is to be buried up in masonry, in whose construction 600,000 bricks are actually specified to be consumed, besides the inconceivable galling of the material.

A large part of the apparatus is exposed to certain damage from freezing in case of neglect to manipulate the valves and dampers properly; and it is so built-in within walls and metal casings as to make repairs resulting from such accidents very costly and annoying.

The main pipes are to be covered with felt of cow's hair, which, after the summer, will be thrown away in the same manner, and some of this is in the fresh-air ducts, where it will contaminate the air.

As to the excessive boiler-power and the enormous surplus of heating-surface, it won't do to try to substantiate the correctness of the estimate of reference to Government buildings. In these it can be shown that the power of the apparatus is so far beyond the requirements that large quantities of material have been from time to time discarded. The more is a clear and visible evidence of some of this is in the fresh-air ducts, where it will contaminate the air.

In the Government buildings in New York and Boston where this system is used, these dampers are all permanently fastened up; some of the outer gratings have been closed by solid plates of cast-iron, which indicates the fact that the apparatus of similar design has recently been placed, the wind blows straight through the building, in at one side and out at the other, carrying away all the apparatus for the ventilation; and, unfortunately, not available for heating neighboring buildings.

The same unsystematic arrangements for supply air have been inflicted upon most of the Boston public schools, largely under the administration of the Corporation of the City of Boston.

In many cases the requirement of a working committee, in the city of New, and in many reports made by sanitarians and health-inspectors upon the condition of these buildings, we select the most recent, of which the following is a true extract:

"From the reports of the inspectors, I fail to find the standard reached in the best-ventilated buildings of the city of Boston; and in a large number of the older buildings (especially those occupied by the primary department of the school) the deficiency is startling, the condition of air being such that no test is required to prove its unfitness for respiration, and danger to the teacher and pupil occupying the building. In many buildings we find no provision even for the provision of air, that the air from the furnaces may be led to the various boxes leading to furnaces, where, as a rule, they are entirely inadequate, and not infrequently are partially or entirely closed. In the class of buildings heated by steam, by what we call the indirect or water jacket system, which is the foundation of the apparatus, we find, scarcely any exception, comes far short of the standard adopted, and the supply for the different rooms is irregular, and materialy affected and rendered unimportant.

Valves and conditions are such that the air might as well be driven cold across the apparatus as heated; the deficiency in the general and almost universal deficiency is in the size of the fresh and foul air flues, which are found so small as to require a very high pressure in order to accomplish the work. To illustrate, it is rarely that we find more than two supply-pipes where these are not over fourteen inches in diameter. To get the amount of air required for fifty-six pupils through these pipes would call for the number of apparatus sufficient to supply a school of one hundred pupils."

JANUARY 12, 1889.] The American Architect and Building News. 21

To return to the Court-house plans, we assert that they contain no internal evidence of careful study of the conditions, or of design to effect a single result beyond the certain overheating of the building. In fact, we can with difficulty refrain from the thought that the only design is to effect a sale to the County of a vast amount of material, leading to accident all the essentials of comfort and health, to obtain which the Commissioners have designed apparatus which mainly the edifice is to be constructed. Certainly, without them, the perfection of the apparatus will be a compensation.

Perhaps, as the county has gone so far as Baltimore and Washington, to May 1886, a 12p per year, to the State, it has at least proved its worthlessness. It so happens that there is an example of the greatest historical value, which has established for all time theعلاج مجانية للكل، which we may by the High Court, which we have the Commissioners have adopted and the designed and regulated system which has alone yielded positive results. We refer to the Hospital Lariboisiere (du Nord), in France. About 1843, the commission having charge of the construction of the hospital adopted without competition plans for heating and ventilation prepared by an influ- ential house in the trade. Fortunately, the Council of Administra- tion, Public Health, ordered the State, which specified this arrangement, and required the commission to obtain a report of the engineers upon the proposed plans, together with other propositions from parties of high reputation as engineers. The examining experts reported unanimously in favor of one of the new plans, but the com- mission, under pressure from high quarter friendly to the former proposer, decided to give one-half of the hospital to them, and one-half of the hospital to the apparatus which was later used. Two reports of M. Grassi, physician resident at the hospital. In this report, the results of accidental ventilation compared with regulated ventilation are fully set forth in tabulated statements compiled from observations made on healthy and regularly ascertained. The results, after extended use, the views of the Board of Engineers who had reported unanimously in favor of the mechanical system of ventilation of the Lariboisiere Hospital in 1843, and we have been informed of the apparatus, wherein the local hot-water heaters were joined in short circuits heated by steam. This brilliant idea had already been suc- cessfully applied at the great Marylebone Hospital.

The latest example of this kind of work which we have seen is that at the Hôtel Dieu (City Hospital), Paris. In this immense in- stitution the entire heating and cooking are done by steam from two boilers of about 45 horse-power (we speak from memory), the local hot water heaters being run by steam coils. The two main pipes are of copper beautifully fitted, all angles being turned by arcs of circles of long radius. They appeared to us not over three and one-half or eight inches in diameter. We have these studies in the New York Court House are proposed to be thirty inches in diameter. We confess that the heating effect of an apparatus in Paris should be considerably better than here, and even chamber, (except those which are ventilated by windows kept permanently wide open, as in England also) which is adequately ventilated. We believe this to be due to the extreme economy of the French people, who open their windows, and the choice of the French, American, and Dr. Parkes in England, and Professor Pettenkofer in Germany, the quantity of air needed for good ventilation was not appreciated. The usual apparatus for ventilation is condemned, the local hot-water ventilating devices have been condemned, and are constructed to as to the main ventilation devices, the air are not sufficient. This is due to the real requirements not having been known and stated in the first place, as we, from our knowledge, in appendices in our American, and Dr. Parkes in England, and Professor Pettenkofer in Germany, the quantity of air needed for good ventilation was not appreciated. The usual apparatus for ventilation is condemned, the local hot-water ventilating devices have been condemned, and are constructed to as to the main ventilation devices, the air are not sufficient. This is due to the real requirements not having been known and stated in the first place, as we, from our knowledge, in appendices in our American, and

This brilliant idea had already been suc- cessfully applied at the great Marylebone Hospital.
that it is the most valuable one. In our opinion, this is a decided defect in a heating apparatus, and the very only objection to hot-water heating.

Péchot, the greatest investigator, and, at the same time, highest prophet among our heating developers and pioneers, has worked with such simplicity, with mechanical ventilation, to all things, owing to its rapidity of action, and when a great range of pressure is permissible, to its corresponding range of action, that the apparatus is perfectly refined. It is remarkable to show that there are objections to using high pressure in steam-heating, and, consequently, its action is confined within narrow limits. No way of imparting to hot water the quick action of steam, or the same effect of the very Raynald, has yet been found. It seems, therefore, to be neglected until the worthy companion of Botta took up the spade.

M. Dieulafoy was particularly well fitted for his task. Extensive travels in Persia some years before had made him thoroughly familiar with land and people; prolonged studies of Persian art, of which his five volumes on "L’Art Antique de la Perse" are the fruit, had secured for him a high rank among archaeologists, while his practical profession as an architect and his long experience as "Ingenieur en chef des Ponts et Chaussées" in Paris gave him additional advantages, which were no small factors in his success.

Arrived on the spot, M. Dieulafoy encountered the same opposition from the natives which all explorers in the Orient have had to face, and this despite the firmness with which he was provided. The fetishism of a people, possessed of no power in this world, have been turned into the hands of the same firm which the Court-House Commissioners have employed, many costly patterns and special fittings were required. It is claimed that many of these special patterns are called for in the plans of the Courthouse, and that the firm which prepared the plans have thereby handicapped all competitors against them for the work by a preference amounting to many thousands of pounds, not in their favor. To have some color, for the reason that some very desirable fittings purposely designed for water-heating, and increasing the efficiency of the circuit, have not been handled by this firm, are not specified, named, or shown in the plans. It has begun to be known that the Commissioners are not likely to get many bids. They must expect that there will be hot, and perfect competition between the companies, for the evident enormous cost of the proposed scheme may be forced up to the point of exhausting the financial strength of the County, which, if the work is not finished, as the plans stand, the weight unloaded upon it under this cover of an alleged apparatus for heating and ventilating the new Court-house.

We have a parting word to add: We hope the many thousands of dollars (as much as $300,000) spent in this building into a storehouse for this apparatus, and the space sacrificed, will not prove to have been wholly thrown away. We think the Commissioners’ experts, and all engineers can afford to give up the $4,000 they are to receive for services in specifying their own materials, and pay $100,000 for the monopoly and privilege thus secured them. We think that they ought to do both. Both are, in reason to be doubly grateful to them, and be better able, with this legacy in reserve, to keep in repair the monument with which, at her expense, they propose to perpetuate their memory.

ENGINEER.

M. DIEULAFOY’S DISCOVERIES AT SUSA.

The new attraction at the Musée du Louvre in Paris is the Susa Gallery. Directly above the Salle Assyrienne a handsome and spacious pavilion has been fitted up for the purpose of holding the marvellous specimens of Achemenidian architecture which M. Ch. de Layard and M. Dieulafoy have dug up from the mounds that cover the site of the ancient capital of the Persian Empire. After two years spent in arranging the collection—a task that, for reasons which will become apparent in the course of this article, involved unusual difficulties—the gallery is now thrown open to the public.

It was in December, 1884, that M. Dieulafoy, accompanied by his assistant, M. Dugas, and two assistants, Messrs. Babin and Houssay, left Paris, instructed by the French Government with an archaeological mission. The extensive mounds which were the immediate goal of the expedition had attracted the attention of the scholars of several countries. In 1831 Sir William Loftus visited the village, which still retains the ancient name of Sinis, or Susa, to the north of Diast, in the southwestern corner of modern Persia, and made a careful examination of the mounds at that place. He found unmistakable proofs of the existence of ruins beneath these vast accumulations of dust and rubbish; and hoped to induce the authorities of the British Museum to undertake excavations on a proper scale. But the archaeological interest was at that moment centred upon the mounds, similar in the strata of the bed of the Caspian Sea, near the head of the Gulf of the Caspian. In a short time the expedition of Mr. Layard to Birs Nimroud, and the discovery of the magnificent ruins of Amanishakheth, under the name of "Nineveh," and the "City of the Sun," upon the heels of Botta, created a valuable sensation by the discovery of old Nineveh, with the palaces of several Assyroian kings. A second French expedition was about to be sent into the field, and the Antiquities of Susa were about to be neglected, if the explorers were not to be neglected until the worthy companion of Botta took up the spade. M. Dieulafoy was particularly well fitted for his task.

Excavations in Persia some years before had made him thoroughly familiar with land and people; prolonged studies of Persian art, of which his five volumes on "L’Art Antique de la Perse" are the fruit, had secured him a high rank among archaeologists, while his practical profession as an architect and his long experience as "Ingenieur en chef des Ponts et Chaussées" in Paris gave him additional advantages, which were no small factors in his success.

Arrived on the spot, M. Dieulafoy encountered the same opposition from the natives which all explorers in the Orient have had to face, and this despite the firmness with which he was provided. The fetishism of a people, possessed of no power in this world, have been turned into the hands of the same firm which the Court-House Commissioners have employed, many costly patterns and special fittings were required. It is claimed that many of these special patterns are called for in the plans of the Courthouse, and that the firm which prepared the plans have thereby handicapped all competitors against them for the work by a preference amounting to many thousands of pounds, not in their favor. To have some color, for the reason that some very desirable fittings purposely designed for water-heating, and increasing the efficiency of the circuit, have not been handled by this firm, are not specified, named, or shown in the plans.

It has begun to be known that the Commissioners are not likely to get many bids. They must expect that there will be hot, and perfect competition between the companies, for the evident enormous cost of the proposed scheme may be forced up to the point of exhausting the financial strength of the County, which, if the work is not finished, as the plans stand, the weight unloaded upon it under this cover of an alleged apparatus for heating and ventilating the new Court-house.

We have a parting word to add: We hope the many thousands of dollars (as much as $300,000) spent in this building into a storehouse for this apparatus, and the space sacrificed, will not prove to have been wholly thrown away. We think the Commissioners’ experts, and all engineers can afford to give up the $4,000 they are to receive for services in specifying their own materials, and pay $100,000 for the monopoly and privilege thus secured them. We think that they ought to do both. Both are, in
apartments of which such a palace was composed, and he now de-
velops them with an accuracy and pertinence which has con-
tected the grand reception or "throne" room to have been situated,
and which promised a particularly rich return. His expectations
were not disappointed. The trenches being widened, they came into
the chamber that was believed to be the innermost. It was 100 feet
in diameter, and the walls were nearly 20 feet high. It is surmised
that the destruction of the palace was due to a war, and that the
states of preservation still bore witness to its former glory. Each
tile, as it was taken out, was carefully numbered, and upon placing
them as they were found a representation of a series of lions, whose
fierce look, as they stand to-day in the Louvre, is still well calculated
to inspire terror. These glazed tiles constituted the decoration of the palace walls, corresponding to the art and aerial ordinary material employed by the Assyrian kings in their palaces.

It may be imagined into what ecstasy of joy this discovery threw the French authorities, the members of the expedition to think
them. From other sources, it was known that Artaxerxes had
erected his dwelling on the ruins of an older building, which had
been the work of his predecessor Xerxes, which had been destroyed
by Darius. Upon the discovery of the throne-room of Artaxerxes, as
this "throne-room" of the palace was called, M. Dieulafoy actually
came upon abundant traces of this older building. Indeed, the glazed tiles found here form perhaps the most brilliant
pieces in the "Susa" collection. Upon entering the gallery in the
Louvre the first thing that will strike the eye of the visitor are the
everous friezes to the right and left of the entrance, showing a pro-
cession of the women. It is a remarkable fact that the oldest pieces
of the palace, and what is most remarkable about them is that now, after
a lapse of 2,000 years, they have been restored to view, the coloring
on the tiles is almost as fresh and as gayly as though the glazed have
been found beneath the mounds both of Upper and Lower Mesopo-
tamia which date probably from a period anterior to the conquest
of Xerxes, and there is a passage in the apadana, which traces of coloring found on the slabs of the Assyrian palaces that the
scenes sculptured on them were painted in many colors, but the art
of glazing could never have been carried to that perfection in Baby-
lonian times. Apparently glazing and painting were in use in Assyria
so well known, so essential a place. It is quite impossible to conceive an
Assyrian palace without the bulls in various shapes and forms and
countless reliefs of their favourite animal. The men are for the
brilliant decoration which plays so prominently a rôle in Arabic
architecture, and here in the palaces of Artaxerxes and Darius he found not only this but also the prototype for much of the art
of the Orient. The animal decoration of the walls is the less remarkable in his history of the guards of archers known as "the immortals,"
who were in constant attendance upon the Persian king, and Dieul-
afay has brought to our knowledge the arrangement of these men
and the representation of this body-guard. Another interesting question
raised by the discovery is an anthropological one. Upon placing
the scattered tiles in position it was noticed that there was a differ-
ence in the coloring of the hands and faces. While some presented
the complexion common in the Orient, others were of a decidedly
black hue, pointing apparently to an African origin. Have we here
trails of a black race that once flourished in this region, and to the
easternmost parts of the Persian Empire, were it not for the decided
point, or did the Persian kings import these men from the other side
of the Red Sea? Professor Homay, one of the members of the
Dieulafoy expedition, is at present engaged in studying this im-
portant problem.

- It will now be clear why the work of arranging the collection
which Dieulafoy brought along involved such an expenditure of time and
labour. The pieces, when brought to light, were scattered among
the ruins of the palace in every part, and in such a manner that the
position of each was accurately determined. Naturally, upon
placing them together, both in the cases of the archers of Darius and
of the lions from the apadana of Artaxerxes, there were gaps every
where. In order to furnish the visitor with a vivid picture of the
actual appearance of the friezes in the palaces of the Achemenidians,
M. Dieulafoy went to the great trouble of restoring the missing
portions in following most faithfully, as a matter of course, the
original designs. He has been severely criticized in some quarters
for this attempt, but, as I believe, unjustly. The student of art
will not have failed to observe that artistic restoration is a prac-
tically indic ted on a drawing placed at the side of the friezes,
and the layman will certainly carry with him a far clearer and withal
faithful impression of old Persian art than could possibly have been
the case with merely a confused and imperfect lot of glazed tiles
before him. What deserves more justly to be criticized is the
arrangement of the tiles in the friezes of the archers on which
consensus characters are inscribed—in the same brilliancy of
colour and with the same fidelity. The sides of the fragments
indicate they give no sense whatever, and all that can be recognized
is the name of Darius. Besides, it is more than likely that the inscrip-
tion was badly done, for the details are so vague that any oth-
er Assyrian scribe, and not between the pictures, as Dieulafoy
seems to believe. The vestments of the archers call for special notice.
The short tunic fall in graceful folds over the shoulders, and the var-
tious patterns of the garments adds materially to the effect
produced.

Let us return to the field of excavations for a moment. With
the approach of the hot season the Dieulafoy party deserted their
camp, but early the following winter they were on the ground again.

Things went more smoothly now, though there was still an oppos-
ition of views, and those who were in the field maintained that the
excavations were progressing more slowly than they had expec-
ted at the beginning. But the end of the season the funds at the
disposal of Dieulafoy were exhausted, and he was obliged to close
his labs. His success during the second season was not less
promising. He had been more fortunate in the discovery of a vast
atre in the eastern wall of the palace, which was a sort of retreat
while engaged in digging a large piece of the wall that now occupies
a post of honor in the Susa Gallery, and a most gorgeous piece of
workmanship it is. The design, consisting of a series of rosettes, is
defined by the execution of the workmen. Only a few fragments
have been thus far recovered, but the walls that were once covered
by the magnificent work are really a new cause for admiration, as
the whole palace fitted up in the fashion of which the frieze and the staircase may be taken as a model for the rest of the edifices
of its grandeur. Dieulafoy also brought along portions of those enormous
solid stone which ran in the form of a colonnade around a wing
of Artaxerxes's palace. The longest of these is over 17 feet high, but
the King, which forms the third quarter of the colonnade, may
be 30 feet with a circumference of about three feet. The style
of the colonnade is distinctly Ionic, but it is spoiled by a grotesque
feature of a double bull worked in bronze which surmounts it. The combina-
tion, inartistic though it be, is exceedingly instructive as illustrating
the attempt made by the Achemenidians to combine two wholly
different species of art and architecture; the idea of the columns
and the Ionic order, of the sarcophagi and the Ionic order, of the Greek
workmen brought over into Persia for the purpose, a sup-
position which appears to be born out by passages in the works of
some ancient authors, while the bulbs are borrowed from the Baby-
lonian and Assyro-Aryan style, and so it is with inexorable firmness.

The originality of the Persians in their art was confined to their
methods rather than to their materials. They were not concerned
with the construction of their edifices but also in their inner disposition of the various quarters they followed foreign models, in the first instance
Assyrian models.

Thanks to the attainments of M. Dieulafoy as architect and civil
engineer, he has been able to ascertain the relative position of the
various quarters of which the palace of Artaxerxes was composed,
and he has made the following discovery, which he has not
exercised, but which he has only executed in the sense of what is
in reality a small portion of the edifice. From the plan on
which he has drawn up it appears that the palace consisted of three
parts, or at least two and a half, a wing of the harem, the other
part and the apartments of the King. Included under the latter were
the rooms set aside for the royal attendants as well as for the immediate
family of the King. A wall ran around the whole edifice, and a
mark which could be separated from the main block by columns, which
in the interest of M. Dieulafoy's discovery is the remarkable
figure to which he himself has called attention. The figures of
the palace of Alacarem in the Book of Esther and the very building
itself has not yet been unmasked. This King is very distinctly mentioned by the biblical author under their proper designa-
tions as "lithan," which corresponds to the Persian apadana, the
"house for the women," which is the harem, and "the house of the
King," which represents the third quarter. The walls and the portion
of these three quarters of the picture which we would necessarily form had we the Book of Esther alone to guide us. Adjacent the harem or apadana was the harem, and immediately
to the south of the latter were the royal apartments, the three
forming together an inverted letter L. The Book of Esther, it will
be remembered, opens with a magnificent description of the festival
which King Ahasuerus gave in the harem, and is worthy of note
that in the delineation of the splendor of the palace the colors of
the draperies singled out for special mention are the very ones
which are found in the discovery in the facsimile of the Persian
staircase. Again the scene where Queen Esther approaches his
 Majesty becomes all the more vivid now that we know that the
King's throne was stationed at the back of a hall in the centre of his
apartments facing a corridor which led into the harem. He was so
placed, accordingly, that he could see any one approaching from
quite a distance, and could, by raising his sceptre, indicate that he
had given the visitor the signal to approach. On the second entrance to the King's rooms by a fortified gate to the left,
and it is by this gate that the King's minister, Haman, is represented
in the book as coming to the King. The terms used to denote these
things are in the Persian original, and are the more important
upon us that the biblical writer who, it will be recalled, places his
narrative in the city of Susa, must have had before him the very
building which Dieulafoy has restored, and the scene which
emerges from the book to suppose that it was written at Susa during the reign of Artaxerxes.

I have only spoken above of the large objects in the collection,
but there are hundreds of smaller articles that might be mentioned.
M. Dieulafoy shipped in all 70 boxes from the scene of his labors to

THE AMERICAN ARCHITECT SCHOLARSHIP.

To the Editors of the American Architect:

Dear Sirs,—The architect in whose office I worked for three years in Chicago is an American Architect who was born in 1867. Would the fact that he resided in the latter year prevent my competing for the Travelling-scholarship next June?

[No. 1.]

The Duchesse de Galliera.—As the late Duchesse de Galliera expended more money than any lady of our time upon building and construction, her death should not be allowed to pass unnoticed in this journal. The name of the Duchesse does not, moreover, appear the first time in The Architect, as the fine series of illustrations of the "Cities of Italy," which we published in 1852 were from paintings by Paul Delaroche in the possession of the Duchesse de Varannes. The Duchesse was born in Genoa, and that city owes much to her liberality. The Duchesse expended 7,000,000 francs on the harbor, the collection belonging to the Duc, with its cafe, its promenade, its gardens, and its amusement. The Duchesse then expended another 1,000,000 francs on the erection of the Musee Galliera, cost 5,000,000 francs, and still a larger sum would have been expended but for an error in drafting a deed by which the Musée became the property of the State. These expenses were used to enrich the State. Two blocks of workmen's houses cost 2,000,000 francs; 11,000,000 francs were spent on the erection and endowment of the Opéra, an establishment of much importance, and carrying with it an endowment of an orphanage at Fliey, and an asylum at Meudon. The Duc was known as a great railway contractor and speculator, and is said to have left a fortune to his widow that was valued at nine million sterling. The greater part of that vast sum has been expended for benevolent purposes, and building authorities have reason to regret the loss of an enthusiastic patron. —The Architect.

Heating Buildings by Exhaust Steam.—At a recent meeting of the New England Railway Club, John A. Coleman said: "I have had a long experience in heating buildings by steam. When the matter of using steam was first brought up in New York, the most prominent objections were expressed as follows: we took a number of mills, using then a sixteen-foot tubular boiler, and averaged a ton of coal a day. We heated the mill by using large pipes, having the circulation as straight as possible, open and free, with about two pounds back pressure on the engine, using direct steam except in the morning in starting up and on Sundays. I had similar experience in heating the building of the Providence Tool Company during the war. The building was seventy feet wide by more than two hundred long, the rooms with fifteen-foot stabs, and large windows in an exposed front, and the boiler was a two-ton pipe, cut into two, each of which we placed in the centre of the building, side by side, and one between the heating of the building, and a two-inch socket-bilge for the condensed water, avoiding the circulation of less than 24,000,000 francs upon the erection and endowment of an orphanage at Fliey, and an asylum at Meudon. The Duc was known as a great railway contractor and speculator, and is said to have left a fortune to his widow that was valued at nine million sterling. The greater part of that vast sum has been expended for benevolent purposes, and building authorities have reason to regret the loss of an enthusiastic patron. —The Architect.

Heating Buildings by Exhaust Steam.—At a recent meeting of the New England Railway Club, John A. Coleman said: "I have had a long experience in heating buildings by steam. When the matter of using steam was first brought up in New York, the most prominent objections were expressed as follows: we took a number of mills, using then a sixteen-foot tubular boiler, and averaged a ton of coal a day. We heated the mill by using large pipes, having the circulation as straight as possible, open and free, with about two pounds back pressure on the engine, using direct steam except in the morning in starting up and on Sundays. I had similar experience in heating the building of the Providence Tool Company during the war. The building was seventy feet wide by more than two hundred long, the rooms with fifteen-foot stabs, and large windows in an exposed front, and the boiler was a two-ton pipe, cut into two, each of which we placed in the centre of the building, side by side, and one between the heating of the building, and a two-inch socket-bilge for the condensed water, avoiding the circulation of less than 24,000,000 francs upon the erection and endowment of an orphanage at Fliey, and an asylum at Meudon. The Duc was known as a great railway contractor and speculator, and is said to have left a fortune to his widow that was valued at nine million sterling. The greater part of that vast sum has been expended for benevolent purposes, and building authorities have reason to regret the loss of an enthusiastic patron. —The Architect.

Chicago Tribune says: "The flowing well near Tripoli, Bremer County, is attracting considerable attention, as it appears to be another Belle Plaine gusher on a slightly smaller scale. It is located on the farm of Mr. Smith, about three miles east of town, and is said to have been dug from the Wapapi River. The well was drilled down through the rock and sand about 150 feet. When the well was 120 feet deep the water filled the well to within eight feet of the surface. After drilling two hours longer the water began to flow at the rate of 24,000,000 gallons per day, and four months after the well was started, and at the eighth day of the month, December 30, Mr. Cooks was awakened by a roaring noise, and, on going to the well, he found the water spouting at the rate of 12,000 gallons per minute. The well is 24 feet in diameter, the top is 30 feet of sand and clay. After throwing out about three wagon loads of this debris the water became clearer, but its force increased until it rose to the top of the casing at a height of 40 feet above the ground. Four joints of stovepipe were then put on the casing, and the water flowed in a torrent from the top of this immense column of water, and the work was then discontinued until further experiments could be made. The water may be lost, but it is 24,000 gallons per minute. It is of great interest to the residents, and was found in a six-inch gas-pipe, and in that way it is expected that the flow of water can be controlled.

The exterior of this house is stained with
CABOT'S CREOSOTE STAIN
for Shingles, Fences, Clapboards Etc.

These Stains are very durable and give a much more artistic effect than paint; while they are cheaper, and very easy to apply.

Our Stains contain no water and are the only exterior Stains that do not contain kerosene.

Prices are $0.50, $0.75, and 75 cents per gallon according to color.
Send for samples on wood and circulars.

SAMUEL CABOT
70 KILBY ST., BOSTON, MASS.
EAGLES AND LIONS.
WHATEVER may be the result in the matter of the Massachusetts State-House competition, two things of service to the profession have been accomplished, one which concerns public ethics, and the other which will have a certain weight as a semi-legal precedent. To be sure, both the utterances to which we refer are merely legislative and not judicial; and so full a trial of what is desirable. Still, it is no small matter for so important a body as the Massachusetts Senate Committee on Finance to report that a resolution looking to the remodelling of the terms of competition for the State-House alteration "ought to pass." Nor is it without its value that Mr. McDonough, of Boston, should declare, without exciting controversy, that any plan laying before the Governor on January 20, in accordance with the terms of the original advertisement of competition, "would have legal claim against the State." We hope, if any designs are submitted and the authorities find themselves disposed to uphold the promised awards, that the architects who may have furnished designs in strict compliance with the terms of competition will carry their case at once without the courts. The entire profession could afford to contribute funds for prosecuting such a cause and Massachusetts, if the case went against her, would willingly sacrifice the money for the sake of aiding to establish so desirable a precedent. We trust the action of the House in recommitting the resolution for further consideration will not prevent its being finally enacted.

The main protest of the Massachusetts architects against the unsatisfactory terms of competition offered by the committee of the Legislature for designs for the State-House enlargement, and still more, perhaps, the cordial support which, as our columns show, has been accorded to their position by the best architects in all parts of this country and Canada, has had the effect of causing the unanimous adoption in committee of a resolution, given in full in another column, which increases the appropriation for premiums from thirty-seven hundred dollars to eight thousand, extends the time for submitting designs to the end of March, appropriates five hundred dollars for expert advice in making the decision, and directs that the architect whose plan is adopted shall be employed to superintend its execution. So easily has been won the first encounter in what many thought would be a desperate contest, that the hope is born, so easily will those persons generally win who have courage and self-respect enough to stand out for what they know to be fair treatment. As we have often said, the public bears no malice toward architects. It wants their services, and is willing to pay a reasonable price for them, and to treat those who can furnish them with all due consideration, but of what architects would call proper consideration it has not the smallest idea. Hitherto, the decent architects have been generally too modest or too proud to say what sort of treatment they wanted, and have left the field of official competitions to the sort of persons who consider a favor to be kicked, and the public has supposed that all architects were of the same habit and that he is who can furnishing the State-House and house-school "jobs." Now that this illusion has been dispelled, and the architects of reputation have declared their position in regard to open competitions, the public, far from resenting the movement, will, with nature that can be pleased at having found out such architects really want, and at being enabled at last to frame invitations which will be acceptable to them. Of course it will, as it always does in matters outside of its every-day experience, only emerge from one blunder to plunge into another, and the axioms of fair competition will nearly as well be being really understood by anybody but architects; but the latter will, at least in Massachusetts, have learned the lesson that they can generally get decent treatment by asking for it, and that, if they do not claim it for themselves, nobody else is likely to volunteer to be their champion.

Wdoubt if many of our readers have taken any part in the Grant Monument competition, the terms of which were very poorly calculated to attract architects and designers of the better class; but it is of some interest to know that about a hundred drawings and models have been sent in, and that the Executive Committee of the Monument Association has appointed as its jury of experts to look over the designs and report on their merits to the Committee. Messrs. Post, Ware (W. R.), Le Brun, Ware (J. E.), Renwick, architects and Professor Wolf. After that is done, it is possible that all the designs may be exhibited to the public, for an admission-fee, the proceeds to be added to the monument fund. Whether such an exhibition would do much to increase and may be doubted, the public in general taking about as much interest in architectural drawings and designs as in Egyptian hieroglyphics, but it would have a certain attraction for the profession, and we hope the idea may be carried out.

BELGIUM is a place where architectural competitions are very much in vogue, being favored by the profession, as well as by the public, and the secret of the mutual satisfaction of both parties to these may perhaps be inferred by comparing the following programme, abridged from the notice published in L'Émulation, with the terms usually proposed to architects in this country. The invitation is issued by the city of Verriers, which proposes to build a small theatre this summer, to cost about nine thousand dollars, and calls for bids under a twofold competition. For the first competition, each participant is to furnish sketch plans and sections at one-two-hundredth the full size, or very nearly one-sixteenth of an inch to the foot, and elevations at double this scale, all rendered in tint, together with a memorandum of materials to be used. Each set of sketches is to be signed with a cipher, and must contain two envelopes, both endorsed with the cipher, one containing the real name of the author, and the other, marked "Vote," the name of the architect whom he wishes to have on the jury. These plans are to be handed in by March 1, and will then be compared by the committee, which is to be chosen by lot, and the number of competitors to be admitted to the second trial is not given, but six hundred dollars will be equally divided among those chosen by the jury, whatever the number may be. The date for closing the second competition is to be fixed hereafter. Each competitor is to send plans, sections, and elevations at a cost of one hundred and fifty francs, or one and one-half eighth of an inch to the foot, rendered in tint, together with an estimate of cost of the rough work, and estimates, prepared by specialists, of the cost of heating, electric-lighting, and stage-fittings. The jury will be the same as in the preliminary competition, and the cost of the first flight of stairs can so easily be calculated as can be executed for the specified sum, is to be appointed architect of the building, and is to be paid five per cent on the total cost, in return for which he is to furnish all the drawings and details required, the city providing the necessary superintendence, through its Department of Public Works, at its own
Mr. Francis Hooper recently read before the Royal Institute of British Architects an excellent paper on French building laws, the provisions of which become every day more of interest to the inhabitants of our growing cities. The general municipal regulations in regard to building in Paris are known to most of our readers, but a good deal is to be learned from the different customs prevailing in the provincial towns. Outside of Paris, for example, when it appears that the widening of a street or the removal of an obstruction will soon become desirable, a survey is made, the value of the land affected is ascertained, and a claim is made to the walls or foundations of the portion standing on the land acquired by the public authority, which would tend to prolong their existence. By this sensible arrangement the town or city acquires the land necessary for its future improvements without being long enough and of sufficiently large area to do damage to tenants, or other expenses, and at a time when the cost of the land itself is probably much less than it would be later, when the improvements are actually in progress, while the expropriated owner is comforted by enjoying for some years not only the unimpaired possession of his house, but compound interest on the value of his land, and the changes desired are effected as surely as by the methods in use here, and at a fraction of the cost, although the process is a slower one.

A new device for reproducing drawings is described in the British Architect, which seems likely to find extensive application in architects’ offices. It is called the autotype and is a line engraving of the original, and is suitable for reproduction, and cheaper than the autotype process. The paper is washed and then placed in a printing press, and the impression is then transferred to the original and printed again. This process is said to be more rapid that the autotype, and at a lower cost. The process is also said to be more suitable for reproduction, and cheaper than the autotype process.

A new device for blue-printing large drawings has been lately used, which many architects who have only small frames may find useful. A cylinder, of any material, covered with felt, is used instead of a frame. The cylinder should be made of sufficient diameter to allow the drawing to be wrapped around it without overlapping. The sensitive paper is first drawn around the cylinder, and the tracing placed over it and smoothed by the print, or the rolls with a smooth cylinder are placed in some sort of framework which will allow it to be re-rolled, either by hand or by a weight. The printing is done quite as rapidly as under glass, and the impressions are sharper, as the tracing-cloth can be drawn around the cylinder so tightly that the action of the rolls removes the wrinkles which are liable to occur in the ordinary frame. We should think that the paper-barrel manufacturers might furnish cylinders three or four feet long, and sixteen inches or more in diameter, which would serve an excellent purpose, and might be mounted, for printing, in brackets and fixed to the window, with a cylinder machine in the third or a manufacturer of the city; the fifth an architect nominated by the city; the sixth an architect designated by the Société Centrale des Architectes; and the seventh the architect receiving the greatest number of ballots from the competitors.

The Builder describes a new bath-house just built in Frankfort-on-the-Main, which seems to solve the problem of cheap public bathing more successfully than anything of the kind yet attempted. The building, which is placed in the centre of a small square in the workingman’s quarter of the town, is octagonal in plan. Each side of the octagon measures forty feet, and the building has a diameter of thirty-four feet. The walls are twelve feet high at the eaves, rise with a pitch sufficient to carry off water, to a central portion, also octagonal, which rises to a height of twenty feet. The central octagon, which is about twelve feet in diameter, contains the furnace in the basement. The drying-room for linen in the first storey is vacated, and the number of rooms is increased in the centre of all. Around the middle octagon are ranged fourteen trapezoidal cells, and outside of these is a passageway. The segment nearest the entrance is reserved for a towel store-room and administration. There are two entrances, one for men and the other for women, and between them is a ticket-office, which communicates with the store-room behind it. Four of the cells are allotted to women, and ten to men, by intercepting at the corresponding point the exterior passageway, but the proportion can be varied as required. A water-closet is provided in each division. Each cell is entered from the passageway, and is divided by a waterproof curtain into two parts. The outer part, next the passageway, forms a dressing-room, with chair, mirror, books, and linoleum carpet. The inner portion contains a basin, with hot and cold water and a douche, the temperature of which can be regulated at pleasure, the waste-water passing off under the wooden gratings on which the bather stands. The charge for a bath, including a clean towel and soap, is two cents, and the place is already visited by two or three hundred bathers a day. The building cost less than five thousand dollars, and stands on public ground. The cost of the keepers of the bath is twenty-five cents a day, the gross income, at two cents each, will be twelve hundred and fifty dollars a year. The Builder thinks that fuel, water, light, washing, attendance, and wear and tear would not be more than seven hundred and fifty dollars a year, which leaves a profit of ten per cent on the capital invested. With a doubling of the expenses would be greater, but at three or four, or perhaps five cents for a bath, the profit of such an undertaking ought to be considerable, and the benefit to the public health would be incalculable.

A new appliance for increasing the speed of steamships was recently described at the Société des Ingenieurs Civils, which promises to be of use to every one who has watched the operation of the propeller in a screw-steamer must have regretted the waste of energy involved in the splashing and churning of the water about the screw by its revolutions, and the displacements which can be seen to extend to a considerable distance from the vessel. Grützner, a German engineer, venturing a large part of this waste of power is to have the propeller work in a hollow, truncated cone attached to the stern of the ship, having its larger end open and directed toward the bows, and its smaller end continued for a short distance by an open cylinder, and inclined at a sharp angle to the vessel. One would think there would be a terrible drag upon the motion of the vessel, but its effect in concentrating the energy of the screw is so great that more than a thousand trials, made with thirty different screws, have demonstrated that the force of propulsion is, on an average, doubled, and in many cases is increased in a far greater proportion.
ANATAGE RODIN, SCULPTOR — I.

It has been well said that the Parisian is an epitome of modern life. To its wailing doors come each year the suffering, the struggles, the solom and the laborers who are the artists of all nations. In it, cente their hopes, their fears, their joy and their desperation. It is the world full of life, the world of the art; a living panorama, a Mecca, a confes- for the most important events. Human above all, time alone confirms or reverses its dictum. 

Among the many hundreds of statues and sculpture of censurable description that sought admission to theSalon of 1877, was an unobstructed nude figure, in plaster, accom-panied with the usual paper upon which were written, in a small hand, these explanatory words: "Auguste Rodin is an artist of Paris, pupil of Messrs. Barre and Carlier-Bellleu, Rue Bretonvilliers, number 3. — L’Age d’Airain"; platster.

The exhibition of the "Age d’Airain" was so unusual, and its general effect so life-like, that some members of the jury of admission suspected that it was not a veritable piece of modelling, but a "moulage sur nature" — a reproduction, by pressing, from a mould on the living model — but they did not con- sider the admission. This suspicion meant that the figure was a fraud and its author an imposter. The statue caused considerable and varied comment among the jury, one of them remarking: "If it is not a cast from a living man it is a strong one at any rate." It was finally accepted, under protest, and put in a side space near the entrance reserved for objects of questionable origin and merit.

The "Age of Bronze," as it has been called, was one of the most sensitive, and loyal to the most exacting requirements of his art to a degree as rare as it is high; who had studied and labored like a slave in the most complete obscurity, and suffered the acutest privations, was not the least studious of the sculptors. This was a dishonest man and his work a counterfeit was humiliating to the last degree. Nor was this all, he had been an obligatory servant of others all his life, and he had drunk to the depths the bitter and despiseful experiences that fine souls endure in their struggle against poverty outside the pale of human sympathy, and subject to the abuse of ignorant and brutal employers.

As the first complete result of all this, Rodin had, at the age of thirty-seven years, brought up to the Salon his simple work that he might see how it compared with that of good sculptors; and, more than all, to answer to himself as to whether fate had forever destined him to a workman he could now not possibly reveal to himself, that he was an artist.

But the inexplicable goddess who had thus far so persistently followed him in dark clouds, now appeared in a new and unexpected guise; she placed the most magnificent statues that he had ever turned out, and his work. He went to the Salon as one to be slurred. His statue was pointed at with scorn. What to do he did not know.

If there is one fact more than any other that makes Paris the heart of the art-world, it is that a real work of art a real artist never lost. Some one, sooner or later, finds them out and helps to put them into their deserved place. The living, radiating life of this fact is, that there are hundreds of artists, writers and men, and women in private and public life, whose keen and receptive sensibilities are quick to discover and ready to welcome the appearance of everything that has in it the life, nerve and worship of art. They go to the Salon, not alone interested in the general welfare of the art of France, but to find out and acquaint themselves with the slightest and earliest indications of the coming of new men, and the appear-ance of advancing nodes of progress. With a newness of these devotees, Alidne Gauche, himself a sculptor of superior ability, to first see and fully appreciate the high qualities of the "The Age of Brass," after its arrival at the Salon. He immediately hastened to find some of his friends and lead them to the statue. They saw it with surprise, examined it with increasing interest and admiration, and left it fully convinced that it was one of those master-pieces of French sculpture. Nor was this enough, they obstacles, but it was attacked by the lovers of art, and they talked about it and sung its praises as only enthusiastic French artists can.

At the same time, M. Edmond Turquet, an ardent lover of art and of independent judgment, and who was also a member of the State Committee of Fine Arts and one of buying-committee of the Salon, in making his first visit to the section of sculpture, was astonished at the positions for more than twenty years his standing was an event which had never been heard. Soon after, when the buying-committees were making their first visit to the Salon, M. Turquet brought them before it, and invited them to its attention to its remarkable merits. To his astonish-ment they informed him that it was noed that about that the figure was a reproduction from a mould, and not an honest piece of modelling. To which he observed, "If this report be true, the figure has no value, for if it is not, I ought to be bought by the State, as it possesses exceptional quality." He saw that there was a very difficult matter to decide whether a statue was a veritable piece of modelling, or a cast from a mould. M. Turquet then said: "I am sure there is a chief-d'oeuvre among the mysteries of this, call him and ask him to open it. It must, certainly, be easy to find out the truth about this figure than you can count its money." Notwithstanding M. Turquet's urgent interest in the working of general principle of the sculptor's studio, at the close of the exhibition, and as far as the authorities of the State were concerned, under the ban of counterfeit, the "Age of Brass" went through the world, especially among the younger artists, and much curiosity was awakened in regard to the sculptor. No one knew him. To the inquiries, Who is Rodin? Where did he come from? The only exercise of the school which gave him pleasure was writing

The first inquiry has remained to this day unanswered, and the second one is not yet disposed of. It has been asserted that M. Rodin is a Belgian. A good-for-nothing, and will be soon disposed of.

At a very early age he was sent to a little boarding-school at Beaulieu, of which his uncle was the principal, and where he pursued only the studies of a genuine pupil. The thought of his art never occurred to him, and he spent the most of his time in drawing fanciful designs, telling stories and reciting imaginary descriptions to his comrades.

As the resources of the boy's parents were not sufficient to pay the expenses of his schooling any longer, he was obliged to come home when he was fourteen years of age. The tendency of his nature toward art had begun, many years before, to show itself in various ways more or less common to all children of artistic temperament.

Auguste, his first attempt at making anything was curiously deformite. When he was five years old, his mother was one day frying some cakes, the dough of which was first rolled thin, like pie-crust, and then cut up into various fantastic forms, before it was dropped into the boiling fat. These fanciful forms were attracted by the children, who insisted upon having them made. Auguste, his first attempt at making anything was curiously deformite. When he was five years old, his mother was one day frying some cakes, the dough of which was first rolled thin, like pie-crust, and then cut up into various fantastic forms, before it was dropped into the boiling fat. These fanciful forms were attracted by the children, who insisted upon having them made. Auguste, when he was six years old, he saw a group of eighteenth century statues in the school — good antique models and excellent copies of the ancient masters. In beginning to draw from plaster-cast ornaments, the boy drew only the more prominent portions, and, thinking that there ought to be more details, he filled up the surfaces in as much as he could, by copying from the original, and filling them out. He never saw the statues, why he did not see things as other boys did. From this time on he was obliged to wear glasses. He remained in this school for three years, drawing and modelling in the morning and evening, and at the Louvre in the afternoon. At fifteen-and-a-half years he gained his first recompense, a bronze medal, for drawing from
The fine work he was doing for the school was a constant and growing incentive to do his best, and he determined to follow art. His mother, with true paternal anxiety, and sharing the prevailing intelligence of the time, cautioned him against entering upon a career for which he was not naturally fitted. "If you wish to be an artist," said she, "you must not only have time to pay your teachers through a long course of study, but to help you also and keep a room and support your son, rather than to ruin him in his work." To which the anachronistic answer was: "I don’t want any professors. I can work it through alone." Such an expression of independence and of apparition of a new course of study coming from one who had such a character as Rodin has proved himself to be, would give anything but a favorable impression of the art-nature of him who uttered it, or of his probable future success.

Nothing that he could have said would have been more opposed to what is universally accepted as the proper state of mind for an art-student to be in, as well in regard to himself as to the regard due to artistic teachers. It was an astounding and revolutionary position to take, but the true one for Rodin. In that expression he summed up himself, without knowing it, as able to exemplify in the years to come one of the profoundest facts of individual art progress — the genius which was held to begin not with the obtrusive obstacle and discouragement, to correct his own efforts, to make constant progress, and finally to walk above the client, firm, and without a sentiment or danger, and in debt to no human professional influence.

The question of bread had now to be considered, and Rodin settled it by finding employment among the makers of plaster ornaments and statues. If we refer to the condition of an artist of Rodin’s age, it also cut off to a large degree his hours of study. And now his independence and perseverance took a more immediate practical shape, for he would give two hours of his time — from early in the morning, and study until he went to his employer at eight o’clock; at noon he swallowed his dinner quick to gain half an hour, and when the day was done he again began studies that extended far into the next morning. He could be guided, and in the interval of his continued work, and study he persistently followed for the next twenty-four years.

He set out to go to the Ecole des Beaux-Arts, and he entered upon his first competition for a prize in drawing and modeling at the age of seventeen. Neither the first nor the two succeeding competitions in modeling were successful, though in drawing he was accepted, but did not enter the class. As each competition embraced a period of six months, it was a year and a half before he knew that the privileges of the school, in the department he desired to enter, was available to him, a deep humiliation. Like every young artist, he inclined in the prevailing belief that such men as Ingres, Pernaud, and Pradier were gods in art, to be loyally worshipped by every student. The course of study was a long series of lessons, in which the pupil was told that he was weak and that he should strive to become as strong. It was not until many years afterwards, when his work showed the freedom, boldness, and life of great individuality, untrammeled and untaught by the smallest ill-natured school or master, that the truth of the felicitations extended to him by Dalou, another eminent sculptor who had been through the school, that he was fortunate in escaping the kind of study taught in the school. "For," said Dalou, "it would have killed you."

But the time spent in the competitions was by no means lost. Before he had left La Petite Ecole he could draw from the living model as well as he ever could draw from a sculptor’s conception, and he was able to develop his own way of seeing and working, and the competitions enabled him to compare what he could do with the work of the students who had succeeded in being accepted. He also saw, for the first time, the manner in which Rodin’s father received and made use of the letters of other pupils, and that they watched him and his work with much curiosity and attention. Why his work was not as good as that of others, he was not encouraged to know. Instead he was told to go away and try again, if he could explain the difference between theirs and his own. He now remembers that his "things were well constructed, perhaps a little dry, but the bones were there."

Rodin found that the difference between himself and other young artists was leading him into an unknown and dreary path, where he was destined to travel alone for the next twenty years. He returned to the symptoms of his businees relationship.

He also managed at this time to go to the evening drawing-school at the Gobelins manufactory of tapestry, and with especial satisfaction, because the model posed three hours at one time, whereas at the Ecole he had received the desire to work only a short while. As he was admitted to the Barye’s class at the Jardin des Plantes, and although he saw and got very little there apparently, he felt later on the result of what he had indiscernibly acquired. Of Barye, Rodin says: "He talked very little, and I saw nothing in him at that time."

But the three years at La Petite Ecole was the germinating period of my life, where my own nature planted itself on firm ground without let or hindrance; where the seeds of my subsequent development were sown, and I received the water and air of my growth.

The work that Rodin was obliged to do for his employers was of the most menial description. He mixed plaster, cut off the moulds from plates, and polished the surface of the plaques by means of the dry or wet dust of a scullion in such establishments, and made occasionally a simple ornament, for all of which he received the luxurious salary of forty cents a day. He hated his work and his employers, and they returned him his sentiments by hating him and finding fault with everything that he did.

He continued to serve men of this kind for six years, passing through degrees of anxiety, discouragement, and every form of discouragement, with the sure memory of such bitter experiences with them that to this day he will not speak some of their names. In his spare hours, however, he was himself, and enjoyed the pleasure of doing as he pleased. His little bedroom-and-room was more of a home to him, and in that room he modelled and drew from life to his heart’s content. As soon as he could he got a hole somewhere else—a shed, cellar or stable, no matter where, and used the space as much as he could to model and to work, and there he modelled and drew from life to his heart’s content. As soon as he could he got a hole somewhere else—a shed, cellar or stable, no matter where, and used the space as much as he could to model and to work, and there he modelled and drew from life to his heart’s content.

He invariably attempted some figure larger than life as the principal object of his thought, but had always numberless sketches in various degrees of execution as a sort of momentary enjoyment. Being somewhat negligent, and without means either to care for or preserve these sketches and finished models in plaster, they dried up, fell to pieces, and went into the clay-tub, to continually appear again in other forms, and to follow the same round of resurrection destruction.

While Rodin occupied, in the Rue de la Reine Blanche, a stable as a studio, he began to make, and finished in about eighteen months, a nude—a statue which was the beginning of his life’s work. But as there is no record from the sculptor’s own life of what was his idea when he commenced, the writer had, and ask why the sculptor should choose such a model, his answer is given in this place: "He had a fine head; belonged to a rare race; the form of his body was perfect; it was to be made as a piece of sculpture, solely, and without reference to character of model, as such."

I called it 'The Broken Nose,' because of the nose of the model was broken. And of its value to him, as a point attained and observed, and as the beginning of his future, but a subject of future work. It is the first good piece of modelling I ever did. From that time I sought to look all around my work, to draw it well in every respect. I may say that I have learned everything I have done. I tried it on my first figure, 'The Baccante,' but did not succeed; I again tried it on 'The Age of Brass,' also without success, though it is a good figure. In fact, I have never succeeded in making a figure as good as 'The Broken Nose.'"

"The Baccante" was Rodin’s first great figure, made about the same time as "The Age of Brass," and was completed in about three years. As he be renowned it, he says, that "in style of modelling it was like 'The Broken Nose,' and better than 'The Age of Brass.' Very firmly modelled—possibly a little cold." He thought it was a good start, and that the society at that time was not disposed. So solidly was the clay put together, so severely and endlessly it was modelled, that when it had dried and shrunk up a little, there was much matter that was bruised off. It was peculiar. In making this figure the sculptor was more than everpowerfully influenced by the increasing domination of his feeling for pure sculpture—the question of lines, masses and effects; of drawing its model in the severest sense of the term. The subject, as such, occupied no place in his mind. It was, with it, then, and ever afterwards, the never-ending and all-inposing problem of planes. The sculptor speaks of "The Baccante" with a feeling of deep regret because he was not able to preserve it, and with sadness when he remembers the long hours of patient and suffering labor that the figure cost him.

His closest friends was a priest, named Aymar, the founder of a society called The Sainted Sacrament, and who had summed up the experiences of his life and observation, in the expression—"The sculptor speaks of "The Baccante" with a feeling of deep regret because he was not able to preserve it, and with sadness when he remembers the long hours of patient and suffering labor that the figure cost him.

His closest friends was a priest, named Aymar, the founder of a society called The Sainted Sacrament, and who had summed up the experiences of his life and observation, in the expression—"The sculptor speaks of "The Baccante" with a feeling of deep regret because he was not able to preserve it, and with sadness when he remembers the long hours of patient and suffering labor that the figure cost him.
vigor. The result was that Aymar would not take the bust nor pay the sculptor for the time he had expended on it, nor the money he had paid out for the duplicates. The modelling of this bust taught the priest that Rodin was a master, and at least, to Aymar, he was of much more value than his fellow-workmen as an adroit draughtsman. In the shop, as well as at home he was always drawing, and as frosted-windows were his peculiar delight, he regaled his confreres in cold days with images of his inanimate visions of astonishment and extended his reputation with them, as a being they could not understand. But Bies, even with "The Broken Nose" before his eyes, could not see anything of this workman, but a wireless engraver of false ornaments that he could not use.

Rodin was also making jewelry for a noted Paris manufacturer, Fanieres, in the form of ear-rings and buckles, of the smallest possible dimensions. He superintended the making of, and he was reproducing all the skill and exactness that he was able to put upon them; but they did not please Fanieres. To better his condition Rodin made several ineffectual attempts. In 1863, there was held in a Paris club called the "high-sounding title of "The National Exhibition of Fine Arts," which was directed by M. Martinet, and included in its list of members, Ingres, Delacroix, Baudry, Carpeaux and nearly all the principal artists of the city. Hearing that Martinet was very friendly to young artists and much disposed to give them a word of encouragement, or to do them an act of kindness, Rodin went to him to see if he could be made a member of the club. The director put the young artist, in the manner of examination, and came to the conclusion that he was eligible. From time to time the club gave private exhibitions of the works of its members, preceded by a banquet, and Rodin, on one of these occasions, as the sign of his desire, decided to sit down with the mighty men into whose presence he now entered, his bust of "Aymar." To his great comfort it was much admired, and he felt, for the first time in his life, that he was regarded as something more than a willing slave upon earth. If he could only have courage to bring "The Broken Nose" to the next dinner.

But before that patienty awaited for event was to take place the club was dissolved. "During his short membership he had seen face to face the great lights of French art, and been introduced to Dumas sire and Théophile Gautier. Being a great admirer of Carpeaux, he went to see him at one of the evenings of this eminent sculptor, and asked him if he would give him work and take him into his studio. Rodin's great joy Carpeaux responded in the most cordial manner: "Certainly! Come when you please." It may be imagined that he did not wait long before presenting himself at the latter's studio, but, to his sad astonishment, Carpeaux received him coldly, almost brutally, and he left without any disposition to return at a more promising moment.

One of Rodin's comrades was a native of Marseilles, and after completing his studies in Paris he returned to his native city and undertook the execution of a large amount of stonework, on public buildings, in order to support himself. Not desiring to immediately return to Paris, he obtained work at his old trade, ornament-making. Neither did this last long, two or three weeks of an individual Parisian was employed in a journey to some distant part of Italy, and earn his bread under circumstances which he anticipated would be more agreeable, he set to work with the liveliest enthusiasm; but it was a delusion of short duration. He soon realized that he was not capable of following the taste of the country, and Rodin packed his bundle and turned his footsteps towards home. But he had no sooner arrived than he was asked to go to Strasbourg, by a manufacturer of church sculpture, or, what is known in the vocabulary of sculptors as a marchand de bois durs, a class of men not held in good repute among artists for any reason, but for whom many young sculptors are obliged to work to get their living. This one had, however, a slight reputation of superstition, which, for some reason, had followed a Gothic style of sculpture, of which, in its purity; the latter is an enthusiastic lover. He remained in this city three months, and one day, while enjoying the festivities of a great fair, Rodin was drawn towards the women and girls who were filling the streets with their beauty and pretty costumes, he saw a little head which pleased him so much that he went to his room and modelled in an hour or two. "La Peau de Morte," the last masterpiece of Rodin, was now upon the market, and in all that time Rodin had received nothing but reproaches from his employers, and not a word of encouragement from those who had seen his busts, sketches and figures. The truth is, he had altogether too strong a nature and too much artistic intelligence to have any satisfactory relations with the class of men he was obliged to serve.

He would not svvere a hair to please any one in his work. Instinctively he felt that Nature was the best guide and master, and he followed her with unchanging faithfulness and at whatever cost. It is also true that he has a marked distaste for any sort to recommend him to ornament-makers or commercial sculptors. The kind of modelling he did was too robust for the petty requirements of such employers.

One day, while in the Rue de la Reine Blanche, a photographer, named Aubry, who possessed a good deal of appreciation of art, especially as it concerned his own profession. He knew Rodin, felt kindly disposed towards him, and had the unique impression, among all of the sculptor's acquaintances, that the latter might possibly get something to do for a higher class of employer than those he had been working for. He, therefore, asked Rodin to go with him to see Carrier-Belleuse, the most extensive commercial sculptor in Paris. The result of the visit was, that Belleuse came to Rodin's studio, examined his work, particularly "The Broken Nose," and told him that he would give him employment. "I was very happy," said Rodin, "To go to Belleuse, because it took me away from an ornament-maker to one that made figures. I began to work for him in 1863, and remained until the breaking out of the Franco-German War; although, at first, I only worked in the afternoon, continuing with Fanieres in the mornings."
solemn; that is, he has not copied it so exactly that the imitation is in any way obtrusive. We are not, indeed, struck by the originality in the addition of wings to the caryatides, and in leaving out the frisee from the entablature, making it consist of a dentilled cornice. But it is purely a matter of taste. We can only say that either of these innovations appears to us an improvement, and are not convinced by the name of Mr. St. Gaudens, imperfectly, if not of that of Mr. Brown in the same position. The architectural merit of the design, however, we cannot deny.

When we in Grecian vein, as in his sketches for country houses, we have found much more agreeable, as is usually the case with people who mistake architecture for art.

The bird's-eye view seems to be acquiring an undeserved popularity among architects. In No. 34 we find an etching of Milan Cathedral, by Mr. Otto H. Bacher, which will be very creditable, if the point-of-view is not quite as fine as it might have been. Above the windows of the houses on the opposite side of the Piazza. It is true that the photographs of the cathedral are often taken from this position, but the vertical lines caused by looking upward a cheap camera, but the result is that the building looks in the picture like a small model, set down in a hole. Very probably Mr. Bacher copied his etching from such a photograph, but it would have been much better, before making so much labor on it, to have translated the perspective, so that the building should appear as high above the eye as it really does to a person standing on the ground in front of it, instead of destroying the dignity of the picture by showing the object as it would appear to a giant fifty feet high. In another, but less successful etching of the Church of the Holy Sepulchre, at Jerusalem, Mr. Bacher prevents the faithful reproduction of his subject, which we hope a careful study of Piranesi, Bourgeois, Prout, Haig and the other first-rate engravers of architectural subjects will induce him to renounce.

There may, perhaps, be a certain advantage in considering the sketches of old work, as distinguished from the modern designs, by themselves, for in no separate branch of the latter are there more important, perhaps, do we find works of such merit. At the very head we must certainly place Mr. H. F. Bacon's "Sketches in Greece and Asia Minor," No. 101. These are by a strong hand. It is more than as the only previously exhibited, and seem to us the finest pen-and-ink architectural sketches ever made. In saying this we remember perfectly the merit of Mr. R. Burnham's sketches, but it is quite possible that his work would have failed in rendering Davison's subjects, but fortune will not that Mr. Bacon's quick precision of eye and hand should be exercised on the brilliantly lighted but barren landscape of the East, rather than on soft English views, and the result is greatly to the advantage of the American sketcher. Next to Mr. Bacon, leaving out of consideration Mr. Pennell's work, which has a different object, and should probably be considered as part of the etchings of Mr. Kitson, which are rather works of imagination than records of fact, we should put a group of three sketches, all of them uneven, but all very good when at their best—Mr. Arthur Ratclie, Mr. A. W. Brunton, Mr. Bacher, will all find their way to a niche.

Mr. Ratclie's color drawing of the Church of San Pablo, at Seville, is quite a model of an architect's water-color sketch. Close after these gentlemen, and better than the one previously exhibited, is an impression of the whole while some years, which we will not mention, make splendid caricatures of buildings, which shrive from the walls for us to admire them, some of the conscientious students, like Mr. T. H. Randall, whose Ifnno, No. 57, of Italian sketches in color, is so earnest and true that we can without a little crudeness in our gratitude to the artist for allowing us to think of his subject instead of himself.

Returning from Spain and Venice, a little while to the nineteenth century of American architecture, we have few exceptions to the rule of creditable, but not remarkable designs and drawings, which should be noticed. The most curious in the room is perhaps one by Mr. Sydney V. Stratton, No. 77, a sketch by Natchez, executed in pastel. Now, pastel has its uses, but we feel ourselves compelled to say that the rendering of hasty architectural sketches is not so apetite of the present, and even so agreeable a design as Mr. Stratton's falls to charm when set on a coarse escarpment of green with two rectangular patches of vermilion in the foreground. This is not the only illustration in the room of the fact that pastel is an illusory medium, in a day when a photograph of those who are not sure of using it well had better let it alone. As particularly good examples to enforce this moral, we might mention Nos. 86 and 87. The former is a water-color drawing of Mr. Arthur Little's room in Boston, by Mr. G. P. Fernald. It is, with a faultless, of the detail that would do credit to Old Dog Tray, and it need hardly be said that the finish of the furniture and in its room is impossible. Rocket's letter is all imagination, but the very completeness of the rendering takes away from its charm, and one cannot help criticising the contrast of color between the sofa and the chair, and doubt whether it would have suffered less if the oak wallcoat ought not to have been balanced by stronger decoration in the ceiling, and so on; and the net result of the inspection is one of mild discontent. No. 188, on the other hand, which is a mere outline sketch, in black-and-white, "An Old Colonial Hall," by Mr. Frank E. Wallis, attracts us at once.

The design is beautiful, both in arrangement and detail, though perhaps no more so than Mr. Little's work, but the firm simplicity of the drawing, showing with precision what it wishes to insist upon, and the clearness of the work, which we are so far from doubting is due to the artist rather than to the material, as we cannot rely on accessories, certainly leaves most persons with the impression that it represents much the more successful design of the two. The late Mr. Richardson, who was a keen observer of the conditions of success or failure in competitions, was always prejudiced against colored drawings. Until his success in the Trinity Church contest, which he won with drawings very slightly tinted, he was pronounced never to use them, an aversion which to us it is incredible. When he sent colored drawings, and never lost one to which he sent a perspective in pen-and-ink. According to his view, it was a mistake to render a drawing so fully as to leave nothing for the imagination of the spectator to supply. Even with coloring so good as to be in no danger of offending any one, he believed that the average eye, even though composed in part of experts, was disposed to fear that a mild deception was kept from them, and that the building in execution would not look so handsome as the picture; while a pen-and-ink drawing impressed most persons as an inadequate medium for representing the beauties of the design, and jurors, in contemplating it, would, as he found, say to each other, "If a mere sketch looks so well, what must the actual building be?"

It would, however, be unfortunate to carry this principle too far. While Mr. Richardson's maxims would apply with full force to drawings like an extraordinary one rendered in color by Mr. Lautrup for Messrs. Burnham & Root, representing a bank building, in which we find the windows represented as placed in lead-work on a scale so colossal that the disappointed depositors, who are shown gathering in groups about the doorway, could easily crawl through the space made by the removal of a single quarry, it is certain that in Mr. Peabody's lovely little color scheme, which he laid before a church at West, Mass, and three studies for a church at Pittsfield, the design gains much from the rendering. Perhaps as sketches the church proceeds and will excel the study for the house—Mr. White's, is so full of the sweetest charm of peace and home that we are very much inclined to rank it, slight as it is, as the best specimen of architectural expression in the exhibition, and one of the best ever shown in New York.

With these, as shining examples of that rare and precious quality, architectural expression, should be mentioned Mr. H. P. Kirby's drawings, of which a dozen or so are collected on a stand near the door. Our readers know our opinion of Mr. Kirby's compositions, so we need say no more than that in some of those here shown he is at his very best. A few are sketches from old French towns, in which he has hardly roved in the true sense of the word, but you see the impression of light and shade, while the others are mostly compositions of his own, more picturesque even than French nature, and delicious in their indications of detail. Why it is that we do not see some of Mr. Kirby's conceptions carried out, we cannot imagine. There seems to be nothing about his "Court-House Tower," or his "Country Tavern," which is not perfectly adapted to modern requirements, and either of them has architectural novelty and beauty enough to endanger a whole American town with those qualities, yet they appear to remain unfruitful. We cannot say quite as much for his sketches for a Moorish "Casino" as for the French, which we have already brought forward, and we can, in the latter, as well as in compositions too simple to be of any style, and depending purely on picturesqueness, his sketches, at least, are unrivalled. To have lost them, even as sketches, to the architectural world would be a most misfortune, and we doubt whether it before it is too late, some one will see to it that a complete collection is made of the works of this American Prout.
THE HIGH ALTER, CHURCH OF GUADALUPE, MEXICO.
Saint Mary Magdalene, Newark.

Nottinghamshire.
The Cathedral, Canterbury.
Kent.
"PÈRE AYMER"  "THE BROKEN MOSE"  "THE AGE OF BRASS"
UPPER CANADA COLLEGE
TORONTO - ONTARIO

GEORGE F. DURAND - ARCHIT - LONDON, ONTARIO

Heliotype Printing Co., Boston.
A GENERAL PROTEST AGAINST IMPROPER CONDITIONS OF COMPETITION.

[An extract from part of the letter is not legible.]

The fact that the Committee on Finance, to whom the following resolution was referred by the Massachusetts Senate, reported on Monday last that it "ought to pass" may be taken by the profession as a distinct encouragement and induce all architects to uphold each other’s hands in all similar cases.

The resolution prepared by Mr. Tittredge of Boston, from the Council House, which was probably now be before this issue reaches our readers in, as follows:

Resolved, That there be allowed and paid out of the Treasury of the Commonwealth a sum not exceeding $8,000, to be expended under the direction of the Governor and Council, to enable them to make a report to the General Court in the month of March, 1889, a general plan for the use, occupancy and improvement of any land acquired or taken for State purposes, including the present State House grounds, and for the alteration or enlargement of any existing buildings or the erection of any new buildings thereon. It being hereby provided that the architect or architects employed by the legislative body by its authority shall be employed to superintend the construction of the building designed in such plan, on terms to be agreed upon by the Governor and Council; and it being further provided that $500 of the above sum may be expended under the direction of the Governor and Council to enable them to apply for and have the benefits of the arts which may be needed.

Resolved, That chapter 92, Resolves of 1888, is hereby repealed, provided that any bill or acts under the said resolve may be paid out of the amounts herein stated.

BOSTON, MASS., December 16, 1888.

THE Commonwealth of Massachusetts has, by its commissioners, advertised for designs to the State-House extension, said designs to be furnished in open competition. The conditions of the competition, as announced, have been evidently framed without due regard to the best conduct in the custom of such matters, the sole end and aim of which should be to secure to the State the best service by making sure that “the best men shall take that job; that the State shall be exonerated and do their best; that the best they offer shall be selected; and that the author of the successful design shall be employed as architect, provided the building is built and he is competent.

The conditions announced are faulty—

First. In that they are not drawn up in accordance with the best custom, and no assurance is given that an expert adviser will be employed to aid the Commission in their choice.

Second. That no assurance is given that the successful competitor will be employed, but, on the contrary, it is distinctly stated that all preselected competitors are to relinquish all ownership in their plans to the State, without any further claim to compensation or employment.

Third. Even if the first prize in the competition were as it should be, the existence of the building, the actual prizes offered would still be entirely insufficient compensation to the authors of the drawings placed second and third.

For the above reasons, we, the undersigned architects, citizens of the State of Massachusetts and elsewhere, protest against this form of competition, which, in our opinion, is not for the best interests of the State or of our profession, and we therefore decline to enter it:

BOSTON, MASS.

Cabrall, Freer & Much.

Wheelwright & Havens.

John A. Fox.

H. G. Young.

W. H. New.

L. C. R. N. & Har.

Andrews & Lewis.

Drummond & Rees.

T. M. Clark.

Boston, Mass.

W. B. C. & Cabot.

Lawrence, Mass.

J. C. M.

B. P. Richards.

C. A. T. & W. S.

C. T. & T. E. T.

C. H. F. & C.

F. C. F. & C.

A. L.

C. T. & T.

W. H. S.

W. P. R.

J. W. M.

H. M. S.

W. E.

F. G. W.

BOSTON, MASS.

Sponsors & Cabot.

Shepley, Rutan & Cool.

C. M. K.

C. F. & H.

J. M.

C. A.

W. H. M.

J. P.

BOSTON, MASS.

J. W. L.

J. W.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. W.

J. P.

W. H.

J. P.

BOSTON, MASS.

J. W. L.

J. W.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. W.

J. P.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. L.

J. W.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. W.

J. P.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. L.

J. W.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. W.

J. P.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. L.

J. W.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. W.

J. P.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. L.

J. W.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. W.

J. P.

W. H.

J. E.

J. P.

BOSTON, MASS.

J. W. L.

J. W.

W. H.

J. E.

J. P.
ARCHITECTURE AND BUILDING NEWS. [Vol. XXY. — No. 682.

AN architectural camping proves to be a very busy place, although it seems a very region of dolce far niente, under the serene sky, on the wide and silent sunlit plains basking in the sunlight.

The landscape is a piquant, picturesque, and deliciously repose. No insect of insects is heard in the bright and quiet air. The ground is brown and bare; even the withered herbs have nearly all crumbled into dust and been scattered in the wind, leaving the brown plain bare and baked. The warm sun of the days cannot yet call forth the plants from the sleep induced by the cold of the night-time; only the brave blades of the grain have the strength to thrust themselves through the earth, day after day, farther and farther into the air, until March sees them undulating like sea-waves over the broad fields, their bloom showing foam-like and creamy green, while mid-April finds them golden and ready for the harvest. The singing of the birds, the humming of the bees, and the scurrying of the rabbits, the timid little cotton-tails and the great jack-rabbit with its enormous ears, and the industrious long-legs, show in the few sounds, that at intervals strike the eye or greet the ear, the scattering of the honeycomb that keeps housemen warily on the lookout when dashing across country; that humorous fellow, the coyote, skulking among the brush or scampering indifferently along a deep, scenecast away, his barks seeming at times neither musical nor unmelodious, for he sings one thing at night anything but musical with his yelpings; and the birds that hover round, some with exquisite musical notes, and the numerous flocks of quail with their piping notes; the quail are clearly very much alive, they are seeming to carry in their bills, evidently aware that their meat is as dry and tasteless as sawdust, for they run across the roads as indifferently as barnyard fowl and rarely take wing.

While Nature and her children are taking their ease, Camp Hemenway is well occupied. The laborers have early gone afield to carry out the instructions that Mr. Cushing has dictated to his secretary, the others putting on the two doctors are out with them inspecting the skeletons of the Ancients; Mr. Hodge is at his desk in his neatly-kept tent writing out his notes or busy with the accounts; Don Carlos is looking after practical affairs, turning out some needed carpentry at the bench under one of the mesquite trees, or is on the way to Phoenix for supplies, or is at work on his surveys, while Mr. Cushing is out keeping the run of the work on the excavations, photographing the finds in situ, elated over some interesting discoveries made in peeping at the skeletons of the Ancients; it is the way to Phoenix for supplies, or is at work on his surveys, while Mr. Cushing is out keeping the run of the work on the excavations, photographing the finds in situ, elated over some interesting discoveries made in peeping at the skeletons of the Ancients; it is.

The ladies also are by no means idle, even a camp providing abundant domestic cares for Mrs. Cushing, while Mrs. Max Gill spends the day at her easel over the beautiful water-color drawings which she is making of all the important articles in the collections, with conscientious accuracy, and to scale. Of the pottery, for instance, she has been employing for the past few weeks, she has been occupied by the following of his health, and often accomplished only by dominating over keen; pain by the mastery of a strong will.

The ladies also are by no means idle, even a camp providing abundant domestic cares for Mrs. Cushing, while Mrs. Max Gill spends the day at her easel over the beautiful water-color drawings which she is making of all the important articles in the collections, with conscientious accuracy, and to scale. Of the pottery, for instance, she has been employing for the past few weeks, she has been occupied by the following of his health, and often accomplished only by dominating over keen; pain by the mastery of a strong will.

Another busy man in the camp is the cook, who has a difficult task in suiting the appetites of so many, some of whom have been made dyspeptic by the exigencies of desert fare. Cooks in camp appear to maintain the reputation of the craft for inconstancy and for versery of temper, and the incumbrance of the office often changes.

Various nationalities have been tried: Chinamen, Mexicans, Americans, Irishmen, Germans, Frenchmen. The Chinamen bring the economy that they are accustomed to exercise in their own affairs in the matter of their fare; it seems impossible to make them do anything but eat.
excludes out of his limited English vocabulary. But Jack has not yet got enough, and proceeds to take another roll, while Rafael smiles indulgently. Rafael's English is limited to his remarks to the American teamsters, and he may not be as well disposed toward it as he used to be. The language of the Spanish is the language of heaven, Italian of love, French of social intercourse, while English was designed to be spoken to animals!"

The buckboard aroused the Greek part of the Cushing's and was ardently attached to Douglas; occasionally the latter will set them a bad example when returning from water, and, feeling the need of exercise, go galloping in splendid style off to our neighbor's barley-field, only to find that the Greeks have been out and started a fight. Of course, they feel themselves privileged to follow, and there is a grand scampering and flourishing of heels, until, after great efforts on the part of Rafael to guide his horse, they finally come to a stop. Then, if the Greeks have seen the Greeks, they will feel the Greeks, and the Greeks will feel the Greeks. The Greeks are the Greeks, and the Greeks will feel the Greeks.

The skeletons exhumed at Los Muros are so badly decayed that it proves next to impossible to preserve them, and so Mr. Cushing decides to establish a side-camp at Las Acequias, where the more gravelly soil affords better conditions for sound bones. True, not in the sketches had yet been found there, for there had been no excavations on that site, and the two doctors, who are to have charge of the remains, express some doubt as to the result. "You shall find skeletons," and so says Mr. Cushing, and the result proves the justification of his prediction.

The new camp is pitched in a pretty little hollow, amid a clump of mesquite and mesquite bushes. Three tents are pitched in the hollow, and one for the Doctors, a larger one for the Mexican laborers, the main force being transferred to the new field here, and the Silbey has been brought for the storage of the collections. One of the Mexicans has assumed the duties of cook, and the kitchen is established between the first two tents in the open air, the apparatus consisting of a "tarantula," or great iron frame supported on legs, and plated with an array of cut-glass plates, and in them all the cooking pans, etc., and a crib is built for the animals needed for service here. The name conferred on this ancient city, Las Acequias, comes from the great irrigating-canales that spread out, fan-like, among the ruins, and there are other parts of the ruins that show how close the camps of the cities of the group. Their course may still be plainly traced here, and one of them runs close by the camp, connecting with the reservoir of the Templo Canal. It must still be necessary to excavate them in those times, with nothing but crude stone implements and baskets for transportation of the earth. The present Templo Canal follows the course of one of these old ditches very nearly for some hundred yards in length and where another passed through a hard bed of natural cement. The Mormons of the neighboring settlement in constructing their canal adopted the old route, thus saving an expenditure of between $10,000 and $20,000.

In a short time the plain is dotted with the yellow heaps of earth thrown up by the excavations, and rich archaeological treasures are found in the shape of skeletons, pottery, stone Implements, and other articles. The value of the land is soon found, and the workmen toil unresistingly at work over the skeletons, over whose anatomical characters their enthusiasm is aroused to a high pitch. They are into the details, the parts, and every bone, is the regard of the personal discomfort, not only their clothes being covered with the dust, but their faces begrimed and their hair and beards thoroughly powdered, making them look like some strange burrowing animals. The bones are carefully washed, the eyes are cut out, the brains are removed, and the complete collections of ancient skeletons ever brought together, and the consequent discovery of certain anatomical characteristics that promise to be of high importance in the determination of racial distinctions.

Las Acequias, like the other ancient cities, consists of groups of large houses, corresponding to our city blocks of dwellings, each of which was a very large building, the numbers of which are recorded in the course of the excavations, and the numbers are recorded on the plats of the ruins subsequently made. The skeletons and other specimens found are labelled with the numbers of the ruins and rooms where they are found, and the circumstances attending them are also recorded, so that each object is accompanied by a concise statement of its history, which, in connection with the preliminary and daily reports made by Mr. Cushing, will prove invaluable in the study of the collection, giving it a scientific worth such as few other collections possess. The circumstances under which objects are found, particularly the skeletons, and one competent to make deductions from those circumstances, are frequently the only clue that the objects themselves in their relation to the main purpose of such explorations—the understanding of the people of whom they are made, does not apply here. The iron in the place of the lead, and the skull of the horse in the place of the human head, will be found in the stone walls of the ruins, where one might expect to find it in the place of the lead, and the skull of the horse in the place of the human head, will be found in the stone walls of the ruins, where one might expect to find it.

The drive between the two camps becomes a familiar experience. It is made by some one in a buckboard almost daily, Mr. Cushing keeping close touch with the progress of the excavations. In the early weeks of my stay the intervening region is still a desert, with a clearing only here and there, so we cut straight across country through the various patches of mesquite, sage-brush, and greasewood to the neighboring, where we see the first sign of the way over these broad valley-plains than one might think, in spite of the landmarks presented by the neighboring mountains, for the spotless sea is difficult to find amidst the general flatness of the land and the uniform character of the surrounding objects, which, amidst the various rambling cut-aways, make even the road itself hard to follow until one has made the acquaintance of its details through familiarity.

The landscape undergoes a rapid transformation in the course of a few weeks. Here and there, the plain is dotted with the camps of laborers engaged in clearing it, consisting of Mexicans at work for some subcontractor, who has undertaken the job. Our nights are enlivened by the brilliant brush-fires gleaming around us in all directions, near and far. The mesquite trees are cut down and their roots and branches are burned away by the soddening combustion, leaving the ground ready for the plow when that instrument shall eventually be brought into requisition, which will probably not be for two, or even three years, for the mellowed and rooted mesquite has thoroughly soaked the ground where the plow has been cleared, and the only labor now required is to irrigate and harvest; the next year, even the labor of sowing is unnecessary. The crop springs up from the self-sown, ripened grain, and often, the second year, there is still another volunteer crop as abundant as the first.

The growth of sage-brush or greasewood is cleared off with slight progress or cost by the camp, as the hay and hay team is dragged across the land by a pair of horses, one attached to each end. The horses are displaced by the powerful leverage at their bases as the beam is dragged over them. The turning of the haybeam is the reverse direction and completes the destruction, either yanking the beam up by the roots, or breaking off the brittle wood close to the ground. The beam is finally gathered into great piles and burned, making a strong, clear smoke, which rises in the air, and from which the name of the town has been derived.

It is not long before the whole country is cleared, changing the aspect of the locality entirely. The land stretches away almost as smooth as a floor for miles, the uniformity in contrast with the rugged mountains-chains around giving it a certain attractiveness akin to beauty. The tents of the settlers follow those of the clearing parties. It is an easy matter to become domiciled in this region, with its mild climate, cool nights, and the numerous springs. Not unlike those of the southern states, and with a frequent supply of fresh water, and with evident ostentation before the tent of a new-comer, looming up prominently from a distance.

The greater part of the land is inhabited by cattle, and the expanse is taken up under the Desert-land Act, which, in order to encourage the reclamation of the desert, enables a citizen, or a man intending to become a citizen, to take up a whole section of 640 acres, a square-mile, in the arid regions of the country, on condition that it be cleared, irrigated, and cultivated within three years from the time of entry, or the payment, at the end of that time, of either $1.25 or $2.50 an acre, according as the land is within the limits of a railway-land grant or not, the latter or "double-minim" price, being charged in that event; so that, for $800 or $1,000, one can obtain a square-mile of land, and, as only one-fifth of the amount has to be paid at the start on making the entry, the man who has $1,000 to spare, and no money to pay for the land, may purchase it for $400 or $800, and the government, besides a handsome profit, if it be brought under cultivation at once.

The greater part of the land is also obtained by settlers under the Homestead Act, which, in order to encourage the reclamation of the desert, enables a citizen, or a man intending to become a citizen, to take up a whole section of 640 acres, a square-mile, in the arid regions of the country, on condition that it be cleared, irrigated, and cultivated within three years from the time of entry, or the payment, at the end of that time, of either $1.25 or $2.50 an acre, according as the land is within the limits of a railway-land grant or not, the latter or "double-minim" price, being charged in that event; so that, for $800 or $1,000, one can obtain a square-mile of land, and, as only one-fifth of the amount has to be paid at the start on making the entry, the man who has $1,000 to spare, and no money to pay for the land, may purchase it for $400 or $800, and the government, besides a handsome profit, if it be brought under cultivation at once.

Before I leave the valley, in mid-April, the greater part of this land, which I first saw as a primitive wilderness, is green with young grain. It will not be long before it presents the same aspect as the agricultural regions of the United States, and with regions of such great volume close by Las Acequias. Driving towards the latter camp from Los Muros, we see Mesa City simply as a long line of trees in the distance, with a few houses of recent settlers scattered here and there in the open on the higher side. It seems but a single line of trees bordering some irrigating canal, but, when we have once penetrated it, we find that it is the border of a beautifully embroidered
town, with neat houses and long, shady avenues enclosing many a square-mile of vineyard and orchard. The little gurgling streams that run rapidly everywhere by the roadside beneath the rows of tall cottonwoods, which, with all their great trunks and spreading boughs, are but a few years old, are the secret of this prosperity. The gravelly soil of this spot was depopulated by the less intelligent Gentiles of the tribes that were above them in the world of the plains; the Mormons at once saw that, for fruit-culture, it could hardly be surpassed. Mesa City, like scores of other Mormon towns that have sprung up in this part of the world, is a typical example of what can be done by intelligent and systematic cooperation in a community, great economies being effected by the union of all the proprietors of the land in introducing a water-supply for irrigation, and economically administering it, as well as in the distribution utilized to the utmost; also by a well-considered arrangement of the land under common agreement, that enables great economies in the cutting and subdividing the timber and the waste land to pasturage; by carrying on work in common, and thus effecting a great saving in labor; and again by establishing cooperative stores, where all members of the community can purchase the supplies in great variety at substantially cost-price, making, of course, a great saving in the expense of living. The Mormons accomplished all this by their superior methods of organization acquired in their years of isolation from the rest of the world; the necessities of their situation, as well as their devotion to a common cause, teaching them the advantages of working in cooperation, both for the individual and the community. For this reason the Mormons are, as a rule, far more prosperous than their Gentile neighbors.

SYLVESTER BAXTER.

OFFICE BUILDINGS. THE CORCORAN BUILDING. THE KELLOGG BUILDING. THE ATLANTIC. THE PACIFIC. THE BALTIMORE SUN'S BUILDING.

Three years ago there was nothing, as the term is understood in other cities, that could be classed as an office-building in Washington City. To-day we have several that claim attention, at least, for their magnitude, convenient arrangement and cost, as well as one or two for their artistic effect. The Corcoran Building, on Fifteenth Street, built some twelve years ago, was the first attempt at the construction of a large building devoted principally to office purposes. This building was designed by Mr. James Ren- wick, of New York, and cost in the neighborhood of $200,000. The ground-floor is taken up entirely by stores fronting on Pennsylvania Avenue, Fifteenth and F Streets. To reach the first office-floor, it was formerly necessary to climb a flight of steps, between eighteen and twenty feet high, and the elevator started in this second story. Recently, a great improvement has been made in this respect from plans by Claas & Shultz, architects, by sacrificing a part of one of the stories, narrowing the original stairway and changing the space thus gained into a hall leading to the elevator, which has been extended to the ground-floor. The building is rectangular, the interior rooms and water-closets being lighted by a large light-well covered with glass. These rooms are poorly lighted, and the windows in the exterior is built of red and buff brick, and the design is a modern Renaissance. The effect produced by the composition is not at all pleasant, as it has the appearance of a huge box pierced by numerous small and distinct openings, each treated with pilasters, cornice and pediments in buff. The main cornice of the building, as well as the cornices and pediments over the windows, are built of boldly pro- jecting ornamental stone-carving, and the use of brick and stone in the building is not the proper material for such heavy projections, as the brick have been falling from the cornice so often that it has been frequently necessary to replace the balconies. The original designs were drawn by Mr. Cottrell, the oldest member of the corncr and substitute galvanized-iron in its stead.

The Kellogg Building, on F Street, designed by R. I. Fleming, was the first building devoted entirely to office purposes. It is con- ventionally planned, with well-lighted rooms and fine interior arrangements. The design is nondescript, stiff, poorly proportioned and inartistic; in fact, such a design as one would expect from a designer who was brought up as a carpenter.

The Pacific finished about two years ago and The Atlantic completed last fall, both of which are situated on F Street, are alike ex- cellent in their arrangement, size and grouping of the rooms, eleva- tors, stairways, water-closets and other small conveniences, as notice boxes and speaking-tubes for each room. From an artistic standpoint they differ materially. The Pacific is commonplace to the last degree. This is made the more striking because of the evident effort after architectural effect, made by the introduction of pilasters, segmental arches and moulded brick, all put together in a monotonous manner and with poor proportions, which produces disagreeable effect. The Atlantic is a good architectural composition, if the ground-floor is omitted when it is taken into consideration. This floor is supported by small iron columns—small in comparison with the large stone piers which are above, and are largely in evidence throughout. The stories are built of Seneca brownstone, which is decidedly reddish in tone. The windows are grouped in three large semicircular open- ings, which are divided by large stone pilasters. These pilasters and fifth stories are grouped under three arches, with brick piers and arches, and terra-cotta caps and panels, with stone lintels and cornices. The third story is a row of small semicircular openings flanked by small rectangular openings, and it is the distribution utilized to the utmost; also by a well-considered arrangement of the land under common agreement, that enables great economies in the cutting and subdividing the timber and the waste land to pasturage; by carrying on work in common, and thus effecting a great saving in labor; and again by establishing cooperative stores, where all members of the community can purchase the supplies in great variety at substantially cost-price, making, of course, a great saving in the expense of living. The Mormons accomplished all this by their superior methods of organization acquired in their years of isolation from the rest of the world; the necessities of their situation, as well as their devotion to a common cause, teaching them the advantages of working in cooperation, both for the individual and the community. For this reason the Mormons are, as a rule, far more prosperous than their Gentile neighbors.

The Sun Building, erected by the Baltimore Sun on F Street, is decidedly the most costly and pretentious office-building in the city. It has been completed in the last year. While the Atlantic Building was designed by Mr. J. G. Hill, ex-Supervising Architect of the United States, the Sun Building is designed by Mr. Hill's successor, also ex-Supervising Architect, and Mr. Hill's predecessor. The designer in the case of the Sun Building has not been nearly so successful in the treatment of his material as the designer of the Atlantic. The front of the former is in white marble. With the exception of the first two stories, the windows of which are grouped into two large and one small round-arched opening, which are de- signed in a free, classical style, the design of this building has nothing to recommend it to favorable consideration. From the second to the eighth story the spaces are occupied by two long or elong- ated oriel windows, springing from the exterior facade, and through and through the apparent integrity of the arches of the second story. All the windows above the second story to the roof are made on the same pattern (and it is an insignificant and unclassical pattern), making the whole building a monotonous mass. The story, with its shaw French roof and a central tower, seems to have no reason for existence, unless it is intended by its ungainly stiff- ness act as a foil for the five monotonous rows of windows. Decidedly in this building's favor is the fact that it is well and substantially built, and its construction fireproof. The plan is of the dumb-bell form, with the stairways, elevators, and water-closets placed in the narrow central portion on two light-wells. It cost about five hundred thousand dollars, so I understand—a large amount in Washington for a building about 115 by 150 feet. There is a history connected with the selection of a design for this building, which is of interest to the profession as a warning against going into competi- tion without clear instructions, or with merely verbal instructions: several architects were informed that they could submit sketches, which would be examined by a committee, and that the rejected ones would not be paid for. The four or five archi- tects mentioned availed themselves of the tempting bait, which was to be the most costly business structure in the city. The competi- tion ended rather flauntingly, but not without the discovery, more, discovered much to their chagrin, that the contract for making the plans had been awarded to an architect who did not submit a sketch in the competition. Two competitors wrote for their plans, repeatedly (the others were returned, I think, in a short time after they were submitted), but did not receive them for some months. One set, in particular, was written for, repeatedly, and several windows were returned in this set, giving as reasons they were not returned that one of the Sun's agents would be over in a day or two, and would bring them with him. On the first two or three trips the agent forgot them, but would bring them the next time. Finally, they were returned by this same forgetful agent. It is a little strange that it did not occur to the Baltimore Sun's business men that two cents would have returned the sketches by the United States Post Office. All the sketches, on the arrival of the Sun's agent, were sent to the office of the architectural firm, where ex- act of the retained sketches was very much surprised at the remark- able similarity between the design of the first two stories and the general plan of the building with a sketch of the first story. Whether this was simply a coincidence, or the proprietors or their agents can tell.

All the office-buildings mentioned ran up above the adjoining property forty feet, or more, and all were designed for the purpose of office use. The upper stories depend for at least a part of their light upon windows in the side walls. This, of course, will prove unfortunate in the adjoining property for the reason that the buildings to the sides of the office-buildings, in which case the light in many of the rooms will be limited to a serious extent.

It would not do to complete the subject of office-buildings with- our mentioning the various office-buildings erected by the firms of the plans of W. M. Poinsett & Co. This building is on a corner, constructed in simple brickwork, and is unobtrusive, but effective, in its design. Being on a corner and narrow, the rooms are well lighted. It has an elevator and other office conveniences.
The School of Architecture, Toronto, was employed, and the few circular letters, written to the Minister of Government, addressed to them, requesting them to meet him for the discussion of a scheme he had in hand of establishing in connection with the School of Engineering a full course of instruction in applied chemistry, applied mechanics, and architecture. The invitation was extended to a number of manufacturers, skilled mechanics, and others having interests of a similar character, and on the 15th of the month, when the meeting place, one hundred and fifty to two hundred representative men met the minister, and a very interesting and lively meeting was held. The minister directed the attention of the assemblage to the various kinds of skilled labor now required to carry on the industries of the country, and the best means of rendering it more productive, and, therefore, more valuable; 2, to the consideration of what courses of instruction would be necessary to provide such skilled labor at home as is now supplied from abroad; and 3, to inquire what industries (if any) not yet established in Ontario could be made productive with the capital and the number of skilled laborers, a minister called upon the engineers and builders, and then upon those interested in the manufacture of wooden goods and of dyes, to inquire if they could supply the knowledge of this was confirmed and strengthened by the answers given to his questions. It was shown that no means existed in Canada for the testing of the strength and properties of building materials, and that the various kinds of building materials in the best, according to given quantities: they go upon their own practical experience with regard to ironwork, and upon private experiments with cement and mortar, but this at least is unsatisfactory, and by no means equal to the satisfaction of having materials tested on the spot by proficients. The minister was also told that the architects would undoubtedly make their pupils attend classes in chemistry and other sciences, and that architects in this country, in order to be properly educated, must be acquainted with the art and practice of building a school to be established. A scheme will be presented at the next session to the Legislative Assembly, and it is certainly to be hoped that no time will be lost before this contemplated school will be developed and in working order.

It is many years since we have had a "green" Christmas in Canada. But two days before Christmas the last vestige of snow in the streets of Toronto was cleared away and the thermometer turned 40°, and sometimes above, with the lengthening days and the fairly clear atmosphere, it is hard to realize that this is January, and not April. Quebec and Montreal keep a little colder, as a rule, than Toronto, and there are warm days, but the temperature of the west is very high above the average. Consequently, building operations proceed almost without interruption and without much risk. Many people who intend to build next year would have been glad to have got their houses started a couple of months ago, but, unfortunately for them, there was no weather-prophet to tell them we should have no winter, so far. Consequently they took the advice of the architects, and the weather was fine. The week before the New Year there were deepening changes of temperature to which the climate is subject at this season render it impossible to say what a day may bring forth: it is necessary to cover up the week's work every night, for otherwise it will be lost in the morning. The good people of Montreal have had an anxious time; the question has been daily: Will the cold be severe enough for the necessities of the winter season? There have been long and enthusiastic parades and festivities, but it was decided that they were held too often, and if held once in two years they might be conducted on a more attractive scale, and would prove a greater novelty, and, therefore, attract more visitors. The ice palace is, of course, the central feature, and, with the exception of last year when no eclair was held, it has been constructed of huge blocks of ice, averaging two or two-and-one-half feet thick, cut in the river, brought up to the site, hoisted by derricks and being slightly shaped with a hatchet, set in position, where usually they soon freeze together. This year, however, the ice is only about one foot thick, entailing more labor. Messrs. Henderson and Kinzie, architects of the Chicago city palace, which usually occupies a considerable area, and rises to a general height of forty to fifty feet, with towers in addition. For sale at 500 a foot, the former can never compete, but the request was not generally responded to. But the necessary restrictions on the account of the peculiarity of the material to be employed, did not allow of very great variety in the material, consequently the same firm of architects who had undertaken the work on previous occasions carried it out.

In addition to the already numerous churches of the Roman Catholics in Toronto, and other religious bodies, the city is becoming more and more the scene of public religious worship. The churches of the Protestant denominations, the Episcopal, and the Presbyterians, are in no ways behind the Roman Catholic churches; some of them are much larger, and some are already approaching the capacity of the Roman Catholic churches.

The editors of the "American Architect and Building News" desire to offer a few words of advice to the members of the profession, who are not engaged in ecclesiastical matters, and who have the opportunity of visiting the city at the present time, to visit the numerous churches, and to see the progress which is being made in the construction of the cathedral. It will not be long before the work will be completed, and the city will be endowed with a church that will be a great source of pride to the citizens. It is not only a religious building, but it is also a work of art, and a monument to the skill and industry of the workmen who have contributed to its construction. The city is also filled with public buildings, and the visitor will find much to interest him in the way of architecture. The city is not only a centre of commerce, but it is also a centre of education, and the visitor will find much to admire in the way of public schools.

The editors of the "American Architect and Building News" desire to offer a few words of advice to the members of the profession, who are not engaged in ecclesiastical matters, and who have the opportunity of visiting the city at the present time, to visit the numerous churches, and to see the progress which is being made in the construction of the cathedral. It will not be long before the work will be completed, and the city will be endowed with a church that will be a great source of pride to the citizens. It is not only a religious building, but it is also a work of art, and a monument to the skill and industry of the workmen who have contributed to its construction. The city is not only a centre of commerce, but it is also a centre of education, and the visitor will find much to admire in the way of public schools.
expedition, this ship-railway in Canada will probably be the first in use in the world.

Toronto has in hand a piece of engineering that will by its result add considerably to its trade facilities, and the first sections of the work are nearly completed. The River Don is a small river to the east of Toronto, running in a southerly direction into the bay, so small and narrow, that even in the season of highest water level, and after inundations, the whole district would be a swamps. A scheme for straightening and deepening this river was determined upon, the shores were cut away, and work was pushed forward. The land reclaimed from the annual inundations was to be reclaimed, and thus a new district with water facilities for transportation was to be prepared for warehouses and factories. Mounds or banks, in some parts 70 feet high, have been cut through and entirely removed, and the place now represents a desolate waste, flat as a pancake, with a wide canal in the centre. The new line of the Canadian Pacific Railroad will entirely follow this new bank. It is estimated that the land reclaimed and levelled, with the advantages of the canal, will be as valuable as any land in the city, the price being $200 per foot front. The total reclaimed area is about 60 acres, valued at $12,000.

Ottawa has in hand a scheme for the construction of a bridge to connect the two shores of the Ottawa River at a distance of about two miles from the city, east from Rockcliffe, near the residence of the Governor-General, to Gatineau Point. The cost is estimated at $25,000,000, but the corporation expect the Provincial and Dominion Parliament will contribute towards the expenses.

The government has been notified that the Chaudière Falls at Ottawa is to be replaced by a new bridge, to cost $39,000. This little bridge is well known to most visitors to the city, from the view the Parliament has obtained in the new direction, and the Chaudière Falls in the other. The volume of water over these falls is considerable, and they are well worth a visit. “The Devil’s Cauldron,” on the south side of the river, is one of those pits into which the water rushes at a terrific rate, sounds and boils, and never comes out again. Under the bridge are the chutes for the lumber rafts, by which they are taken from the higher to the lower level of the river. In the season distinguished visitors to the city are usually treated to a voyage on a raft, a rather exciting and slightly dangerous species of summer tobogganing. The new bridge will be 239 feet long by 43 feet wide.

Corresponding Secretary

Secretary

Hose-Ports in Party-Walls


To the Editors of the American Architect:

dear sir,—I saw in a recent issue of your paper, an article on Iron Shuttles and Solid Rods, in which it is recommended that one shutter be left so as it can be easily opened from the outside. Now while that would be of some advantage it would be very small, and does not solve the problem of preventing large fires. The objection at a fire is, of course, the material burning in the building, as the building itself, without the material, would not make much of a fire, and can be extinguished from which a sufficient quantity of water can be brought to bear upon the goods on fire, it can be easily extinguished. The penetration and effect of streams from the street can be seen by a line representing the front of the building marked for window openings. A line for the street, it will be found that above a certain height the stream has no penetration and consequently no good effect but rather acts the other way as it has a tendency to create a draught. The proper way to fight a fire is from the inside which is done when possible: but at times it is impossible to reach the material burning from the inside, the fire department is driven to the street which necessitates street streams. It is at this point that owners and occupants of buildings should be forced to beef up the department by the payment of taxes. It is a foolish and tedious job of cutting through party-walls by fire has suggested to me the advisability of having a permanent orifice in the party-wall that could be utilized by the department and would respectfully ask your opinion on the same.

E. Stevens.

Primitive Well-Drilling.—Abbe Huc thus describes the system of deep-earth boring practiced in the district in which he has for some time resided. A wooden tube six feet in length is driven down to the bed of the river. The tube is held in position by a large flaxstone, having a hole in the centre to allow the tube to pass through and to project a little above it. A cylindrical mass of earth is then driven into the tube, and in the end, by a lower end, and having lateral notches or apertures, is jerked up and down in this tube at the end of a lever, from which it is suspended by a rope. This kind of "monkey," representing the debris of which, converted into sludge by water poured in, finds it way through the lateral apertures into the interior of the cylinder. By raising them latter at intervals, this sludge is removed from the bore hole. The rate of boring in rock of ordinary hardness is one foot in twelve hours. Only one man is employed at this laborious work. By this means wells of 1800 feet deep are sunk in about two years by the labor of three men, relieving one another every six hours.—Boston Transcript.
The exterior of this house is stained with **Cabot's Creosote Stain** for Shingles, Fences, Clapboards Etc.

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply. They are the only exterior Stains that do not contain kerosene.

Prices are 50, 75, and 75 cents per gallon according to color. Send for samples on wood, and circulars.

Samuel Cabot
70 Kilby St., Boston, Mass.
LIGHT-HOUSEES.
THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XCV.  Copyright, 1889, by TICKNOR & COMPANY, BOSTON, MASS. No. 683.

JANUARY 26, 1889.

Entered at the Post-Office at Boston as second-class matter.

THE INVESTIGATION of the superintending Architect's office, if it has not revealed such depths as some of the New York Tribuneman suspected, has brought out some matters of interest to the profession. In regard to the accusation that he had made his examination-papers for draughtsmen so difficult that none of the candidates who presented themselves for appointment under the Civil Service Regulations, nor the many who had passed them, could answer them, Colonel Freret said that many of the draughtsmen at present in the office could answer them, and gave a long list of those who were able to do so. He mentioned, also, that the only person to whom he had given any appointment since he took charge of his office was one of these. The idea that any one was adapted to turning the candidate's hair grey, with the object of keeping out Republican assistants and getting in Democrats, appears to be unfounded. One of the investigating committees drew from this evidence the singular inference that the Civil Service Regulations cannot be applied to architects and draughtsmen. A more sensible conclusion, we think, and one which is more in accordance with the general opinion in the profession, would be that a position in the Government architect's office presents very little attraction to the better class of young architects, and that the men who can answer questions such as Colonel Freret's, of whom there are plenty to be found in private offices, would rather struggle for many years against poverty and neglect, with hope and ambition to console them, than to bury themselves for the best part of their lives in what the Tribune calls the "fat berths" of the Treasury Department.

A still more singular charge, to which Mr. Freret was called to answer, was that of having neglected, when he employed outside assistance in preparing plans for public buildings, to advertise for proposals for such assistance, as the law requires in the case of mechanics' work. As the same law requires that the contract shall be made with the lowest bidder, a comparison of the proposals for furnishing plans would be only less curious than an inspection of the plans which would be furnished at the lowest price; but Mr. Freret explained that the work needed for his purpose was personal service, and that, by Secretary Fairchild's direction, it had been regarded as being outside the intention of the law relating to contracts with mechanics. Senator Morrill raised a question of some significance, whether it would not be better to have all the business of the superintending architect's office done by unofficial persons, to which Colonel Freret replied that the principal architectural associations of the country had urged this, but that he was not in favor of it, except so far as might be necessary to expedite the Government business. Notwithstanding this assurance, the senators are inclined to suspect that Senator Morrill has his own opinion on the subject. As the investigation, which is, fortunately, in the hands of some of the best men in the Senate, will undoubtedly help to open the legislative eye to some points in the Government practice of architecture which it has never before been able to perceive.

THE British Architect has something to say in regard to the Consolidation scheme proposed by the professional societies in this country, which is worth hearing. In commenting upon the discussion which took place on the subject at the Convention of the Western Association, it takes up Mr. Sullivan's remark that the new Institute "should be broad and democratic;" that it "should not set up factional barriers," but should welcome all the thoughtful, earnest, ambitious men in the profession, and so on. It is not very surprising that Mr. Sullivan should have been understood to advocate the admission of all "thoughtful, earnest, and ambitious men," without inquiring as to whether they possessed, in addition to these qualifications, the important one of a knowledge of their business; and the British Architect fears that the American Institute may suffer, as the English societies have, by the admission of men concerning whom no one wished anything unfavorable, but whose presence in the Institute will repel the higher trained architect and will win the favor of lesser men, but rather the reverse, in membership in a society which already contains those whom they know to be far inferior to themselves in attainment. That a similar consideration kept the French out of the hands of the best English architects from joining the British Institute, is tolerably certain, and it is with a view to making membership more honorable, as well as more difficult, that the system of compulsory examination has been adopted, and seems to be working successfully. In this country, we are inclined to think that a similar system of examination will be adopted; it will strengthen the association, increase the qualifications, and the revival of the efficiency of the Institute. There is no question that the State professional associations are strongly in favor of requiring proof, from an applicant for admission to their ranks, that he possesses the necessary qualifications. In many States petitions have been drawn up by the professional societies, and presented to the Legislatures, praying that persons who cannot pass a strict technical examination may be forbidden to practice architecture within the State; and the Boston Society of Architects, one of the largest and most independent in the country, some years ago adopted a rule requiring all new candidates for admission to the society to pass an examination. There is no need of being in a hurry to impose such a standard everywhere. As we all know, the technical training now accessible to American students of architecture was unknown when the older members of the profession began their career, and there are scores of men highly honored in the profession, and with reason, who never heard of the Accademia, or their influence on Greek architecture, and who would be hard put to it to explain the use of the pediments in fan vaulting. To force these men through an examination suited to the graduate of a professional school would be ridiculous, yet their admission, on evidence of honorable and successful practice alone, places us under no obligation to admit without examination the youth who has neglected all the opportunities which his senior would have so eagerly seized. If we keep in mind the maxim that examinations should be devoted to finding out, not what a man knows, but how he has utilized his opportunities, we shall not go wrong. At present, the standard in the remoter States must be different from that in New England and New York, but if each State Chapter will devote itself to attracting and keeping in its fold material of this description, by means which as it finds most efficient, all the members of its general body will have reason to be proud of belonging to it.

SOME one might make an interesting book, for architects, by describing the successive scandals, alarms, revolutions, quarrels, disappointments and fatalities which have attended the construction of the Albany State-House. The last grief that has afflicted the unfortunate proprietors appears to relate to the new ceiling of the Assembly Chamber, which replaces the famous stone vault. It seems from the New York
papers that the specification required that after the ironwork was in position "the whole ceiling" should be "covered with first quality kiln-dried quartered white oak, wrought out and finished in the same cabinet fashion, of the several shapes, sizes and thicknesses called for by the plans, sections and details;" all carved work to be done "in an artistic and spirited manner by first-rate carvers, who understand the motive and intent of the design." Then they specified, "By the understanding that the idea of the ceiling was intended to be covered with oak, and the contract price, two hundred and seventy thousand dollars, would seem to be large enough to provide for using that material; so it is not surprising that certain members of the Assembly, being told that the ceiling was to be entirely of plaster-of-Paris, expressed a dissatisfaction which culminated in the appointment of a commission of three experts, to investigate the matter. We imagine that the office of expert to the Albany Capitol has become rather a thankless one, for two of the gentlemen appointed immediately declined to serve, and the third, being confined to his house with serious illness, could not serve if he would, so the Assemblymen most interested organized themselves into an informal investigating-committee, and had a stage built, from which they could examine the ceiling closely. It then appeared that there were some oak casings, or veneers, over the iron and wooden beams, but that the "artistic and spirited" carved work, together with the paneling, consisted entirely of plaster-of-Paris, spread on a backing of jute canvas, and painted to imitate oak. On seeking an explanation of this particular interpretation of the contract, it was pointed out to the Assemblymen that another clause in the specification provided that the panels were to be of quartered oak, as shown, properly glued up and finished, or if papier-mâché was used instead of oak, the panels are to be finished toward the cypress. Now, the clause does not seem to be any mention of papier-mâché in the specification, and the sentence has a curious air of interpolation.

WETHER interpolated or not, the clause seems to have met with the approval of the superintendent of the work, who very frankly explained that he had decided that carved panels would look better than flat ones, and as it would be very expensive to make them in oak with the dome-like form which he preferred, he had directed papier-mâché to be used, and that this compound of burlaps, asbestos and plaster-of-Paris was the sort of papier-mâché that he approved. In his opinion the panels were much better made of this material than of oak, as the oak would crack with the heat of the fire, and the papier-mâché "would remain perfect for an indefinite period. We should say for ourselves that the fire would rather have an oak ceiling, cracked in every direction, than one adorned with "spirited and artistic carving" cast in plaster, but this view of the subject does not seem to have suggested itself either to the superintendent or the Assemblymen, whose principal anxiety, aside from a suspicion that they have paid for something a good deal more expensive than what they have got, seems to arise from the notion that the plaster papier-mâché is likely to be disintegrated by the heat and dryness of the air at the top of the room, and to fall on their heads.

ACCORDING to the report of the Royal Commission appointed to investigate the causes of the conflagration which recently destroyed the Palace of the Quinamian at Rome, November, the fire service in the Imperial City seems to leave something to be desired. As might be supposed, the palace, crowded as it is with precious objects, is, in theory at least, protected by the most complete modern appliances for extinguishing fire. There are, or were, several pumps and engines in the building, besides a system of stand-pipes and hydrants, and telegraph-alarm lines communicating with the metropolitan stations; and a corps of firemen is always on duty. The fire was first observed about nine o'clock in the evening, bursting through the windows of the rooms on the ground-floor. The alarm was at once given, and the palace detachment of firemen appeared promptly on the scene. The next thing was to find the key of the room in which the engines and extinguishers were locked up. This did not take long, but as the room turned out to be one of those which was blazing most fiercely, it was useless to attempt reaching anything in it. The next resource was to telegraph a signal to the metropolitan stations,

but, as the wires or batteries were out of order, the signal could not be transmitted. There was a telephone from the palace to the city-stations, which, however, also proved to be out of order and unanswerable. In the meantime some of the firemen had been detailed to open the hydrants, and were looking for the keys, which had been mislaid. After the search had finally been given up, the commander, with praiseworthy energy, directed that the pipes should be broken, since they could not be opened in any other way. They were cut, however, with axes and hammers, but proved to be quite dry inside, the water having been for some reason shut off at the mains. By this time a group of soldiers had arrived, who formed a line and passed buckets from a neighboring fountain, to be emptied on the flames. While the city authorities were aroused, and two hand-engines soon made their appearance, which poured tiny streams into the blazing building. These were followed by men belonging to the steam fire-engine corps, who drove up in cabs or arrived on foot, ready for service when the engines themselves should come. This was a delay, however, of about an hour and a half in the appearance of the latter, owing to the fact that the Roman fire-department has no horses, but makes requisitions on the omnibus companies for motive power, and the omnibus companies, which receive no money for this service, do not show remarkable alacrity in furnishing them. When the engines finally arrived, it was discovered that no one had thought to light a fire in them, and an hour more was spent in remediying this deficiency and getting up steam. Toward midnight, however, they began to work, and in three hours afterward the fire went out.

HE well-known establishment of Haines, Jones & CabIlbry, of Philadelphia, now organized as a stock company, has, for the past two years carried out a simple plan of sharing profits with its employees. The sum divided this year among the men is ninety-one hundred dollars. This is six and one-half per cent on the total wages of each workman who has been with the firm long enough to be entitled to one-twelfth of the profits, or about three weeks' extra pay for each man. There are few persons who would not find a bonus of three weeks' extra income at the end of December in each year extremely convenient, and we imagine that the Haines, Jones & CabIlbry men reacted with considerable satisfaction, the night before New Year's, upon the occasions when they had made a special effort to make their work systematic and efficient, and resolved, for the ensuing year, to make these occasions more frequent, and to use their experience in promoting still more harmonious operation of the factory which they help to conduct. For the next year, they promise to make the profits exceed six per cent on the capital, and be shared in full by all who worked for the company during the whole year.

MR. GEORGE B. HATHORNE, at one time a very prominent architect in New York, died in that city about two weeks ago. Mr. Hathorne was a native of Massachusetts, but had spent most of his life in New York. He was a man of quiet tastes, but an excellent architect, and devoted to his profession. He was one of the early members of the American Institute of Architects, and for many years took a prominent part in its proceedings. Much of his work was out of the city, Springfield possessing, perhaps, his most important buildings. He was unmarried, and leaves no near relatives.

THE New York Mail and Express announces that the Trustees of Columbia College have decided to establish a Department of Electrical Engineering in connection with the School of Mines; in fact, theased to do so if a competent department is not already in existence. This new department, it appears, at any of the American universities. Columbia, therefore, will have the honor of taking the lead in the matter." While we wish the new school all possible success, and do not doubt that it will deserve it, the claim that it is the first of its kind in the United States needs modification. The Massachusetts Institute of Technology having for several years maintained a Department of Electrical Engineering, which is very popular, and has graduated some of the most noted young electricians in the country, while, if we are not mistaken, there are two or three other schools of the kind of high reputation.
The fate that befell not the bas-relief of Henry IV over the central portal of the Hôtel-de-Ville, at Paris, has already been noted, and whether the bas-relief of the same monarch on the Hôtel-de-Ville, at Lyons, shared a similar fate during the Revolution when the city was besieged by a Republi- can army under Kob- lermann, or during one of the numerous upris- ings that followed can- not be ascertained; perhaps, as the city was de- stroyed in revenge for maintaining a de- fence for two months, it is likely that the Hôtel-de-Ville suffered at that time, or if not then it may have fared ill. When the strik- ers, thrown out of work by the commer- cial disorganization which followed the Revolution of 1830, seized the building in 1831 and, presum- ably, pillaged it. It is possible, too, that the bas-relief now extant on this building is the third of its kind that has been placed there, for the original may have been erected in the lifetime of Henry and so have been destroyed when the building was burned in 1792. At all events, the illustra- tions show that the building at some period of its existence was restored, and that the place of honor is still accorded to the bas-relief of Henry IV, by Legendre Hérédial, a native sculptor.

Coustou's bronze bas-relief of Louis XIV, which still ornaments the central fronton of the Invalides, was also subjected to a certain amount of injury at the hands of the Paris mob in 1793; but thanks to its in- accessible position or to an unexpected ac- cess of sentimentality on the part of the in- surgents—who may have reasoned that the Invalides was a highly useful and valued charitable in- stitution, and that Louis XIV, whatever his misdeeds, did one good act for posterity in founding it, and so deserved, in so far as this particular effigy was concerned, tender treatment at their hands—a per- sistent attempt was not made to dislodge it; so, though bat- tered with stones and shot, it was suffered to remain till more peaceful times admitted of its rehabilitation, in 1816, by Cartellier.

The inscription on the bas-relief reads: Ludovicus Magnus militibus, regali munificiis in perpetuum providens, atque aequo sermone, et meliora requisiti magistro debutor. Amongst others that succeeded was the Château de Villedô (ibid), of which, how- ever, there remains a doorway which once opened from the avenue into the garden, and still bears upon its fronton a bas-relief of Mar- shed Lesdiguieres by Jacques Richier.

The Hôtel-de-Ville, at Compiègne, which was built between 15926 and 1599, in the reign of Louis XII, was decorated with statues of saints in niches, and in the place of honor, in a niche like that most familiar one at Blois, was an equestrian figure of Louis XII, either in the round or in high relief. This figure was replaced by a similar figure of Louis XII at a later period, which was less greatly dis- mounted during the Revolution. This building was restored some fifteen years ago, and a bronze bas-relief of Louis XII, by Jacqemart, executed in 1869, now holds the place of honor.

The Hôtel-de-Ville, at Rennes, now bears in a similar position an equestrian bas-relief of Louis XIII the work of the Sculptor Mil- homme who in 1818 thus replaced an earlier bas-relief of the same kind which had been destroyed on August 13, 1793.

The famous house of Jacques Cour, at Bourges, formerly bore an equestrian statue of Charles VII, and a more humble one of the lord warden of guano. It was shown mounted on a mule, which, for some now unaccountable reason, was shod backwards, so that it would have puzzled an American redskin to know how the animal was travelling.

In the same category should be mentioned the figure of Oldrado (or Orlando di) da Tresseno, Pedest of the city, on the wall of the Palazzo della Ragione at Milan, a building erected by him between 1229 and 1233. This figure, in high relief, representing a personage famous, or infamous, as having first burned heretics at the stake, is shown "with bare head and hair cut close in the neck, after the modern fashion, riding on a heavy-limbed horse. The group though wanting in life has a certain heroic truth to nature, and is interest- ing as being one of the first works of its kind made in Italy since the days of Justinian."

But equestrian sculpture had other forms of application in archi- tecture than as bas-reliefs in the frontons of public buildings. Surface-ornament, either in high or low relief, was, of course, the form in which it was most commonly used from the times of the Egyptian and the Assyrian to the present. The use of the horse as a feature of decorative construction is comparatively rare, about the only instances being found in Southern India at Madura, Seringham and elsewhere, where the horses take the place of canailleurs to sup- port the superincumbent structure.

The horse friezes of Classic times are too familiar to all need description here, but there are to be found in many countries build- ings in the decoration of which the horse has been introduced effectively, ingeniously or ridiculesly, but almost always with a purpose which can sometimes be deciphered, but oftener cannot.

One of the earliest of modern examples is to be found in the façade of San Michel, at Pavia, an early Lombard church, across the front of which at irregular intervals stretch five sculptured equestrian bas-relief, amongst which are easily discernible figures of horsmen, centaurs, Pogasi, and wild horses mixed with other fig- ures at the whole day, who, in art are supporting some of the fables of mythology which accident has singularly disjointed. The want of connection and arrangement, and the seeming lack of appro- priateness of such sculptures as parts of an ecclesiastical structure, suggest that the building offers an early instance of the once

---

1 From Lindsay's "Handbook of Italian Sculpture."  
2 From Lindsay's "Handbook of Italian Sculpture."  
3 From Lindsay's "Handbook of Italian Sculpture."  
4 From Lindsay's "Handbook of Italian Sculpture."  
5 From Lindsay's "Handbook of Italian Sculpture."  
6 From Lindsay's "Handbook of Italian Sculpture."  
7 From Lindsay's "Handbook of Italian Sculpture."  
8 From Lindsay's "Handbook of Italian Sculpture."
common fashion of rebuilding into a new building the artistic wreck-age of some earlier pile. To be sure the figure of the archangel, trampling down a dragon over the central door, shows that some portion of the work was especially prepared for its present position—perhaps all may have been, for through the whole range of medieval sculpture it is impossible to always satisfactorily explain the presence of the many figures and groups which, while undoubtedly grotesque from a modern point of view, it is wholly impossible to determine whether they are intentionally or unintentionally so.

The triumph of St. George over the dragon has been immortalized in stone in so many places by so many notable artists that it deserves consideration later as a special subject; but, besides St. George, there were many other heroes of saintly legend who performed their feats on horseback, and there are many churches where St. Martin, St. Hubert, St. Paul and others are more or less intelligibly and artistically preserved in marble, stone or bronze. Besides these, there are legendary heroes and historical personages of doubtful authenticity, who are honored in the same way upon some altars in what is supposed to be their natal town. To search these out, enumerate them and briefly recount the associated legends would be an odious task, and it will, perhaps, be enough of an indication of the character of the field which might be explored, if there is here given the story of King Gradlon, whose the frightened citizens splashed through the rising tide toward the shore. The horse struggled nobly, but being overweighted was losing ground every moment, when St. Gwenoldi, who alone kept pace with the king, commanded him to cast Dubut into the rising tide, as it was thought there was no possibility that this disaster had overthrown the city. The king, feeling that the saint voice God's will obeyed, and saved himself. The legend is a famous one and is celebrated in poetry as well as prose. Tom Taylor in his translation of the Ballads of Brittany thus renders a portion of the "Drowning of Ker-Is":

Awake, Sir King, the gates unsear!
Rise up, and ride both fast and far!
The sea flows over old and far!
Now cursed' forever morte she be,
That all for wine and harlotry,
The sluice unbarred that held the sea.

"Say, woodman, that won't in the forest green,
The wild horse of Gradlon hast thou seen
As he passed the valley-walls between"

"On Gradlon's horse I set not sight,
But I heard him go in the slacks of the night
Trip, trip—trip, trip,—like a fire-fought white.

The annexed cut shows the model for the statue which is now in place on the Cathedral at Quimper, the work of the sculptor, A. Menard, made necessary by the destruction of the original statue by the Revolutionists in 1793.

Another cut shows the church as it existed for many years, but it now bears a different aspect, for one of the many works of restoration and completion entrusted to Viollet-le-Duc was the completion of its western spires, in 1888, the funds being raised by subscriptions of two-hundred pieces contributed by the frugal peasants of the country. The actual work of construction was carried out under M. Bigot, the architect of the Depart.

The mention of Viollet-le-Duc's name gives a reason for introducing here a reproduction from a pen-drawing made by him of the king to open the gate just as the tide reached the walls. Reused from his sleep by the report of the pressing danger, Gradlon, with unselfish parental affection, sought his daughter, and then his horse, following the feeling crowd with his daughter en groupe as previously stated.

The Flight of King Gradlon. After a Painting by E. Luminet.

The Flight of King Gradlon. After a Painting by E. Luminet.
the Romanesque church at Surgeres, France, (twelfth century) upon the façade of which exist two fragments of equestrian sculpture, bas-reliefs in niches high up on the wall.

The Bretons, at once the most superstitious and the most religious portion of the French people, have two other curious monuments which have interest for us, one the famous Calvary at Plougastel, a rich mass of crude sculpture, in the round and in the flat, which presents scenes from the New Testament which involve more than two hundred figures of large size. The equestrian element is here represented by the half life-size mounted figures of two centurions who balance one another at either end of the middle arm of the three armed or pontifical cross which is the important feature of the composition. This calvary is a rallying point for the pilgrimages which are incessantly made to and fro over the face of Brittany. It was erected in 1502-4, at a time when the province was ravaged by a great plague, and was restored in 1867. The other object is also a calvary, at Pleyben, which is likewise large but somewhat less elaborate in treatment. The equestrian figures, here four in number, are at the corners of the pedestal on a level with the foot of the cross.

One of the most ordinary forms of sculptural decoration applied to architecture is the representation on the façade of a cathedral of a whole college of saints and holy fathers, or a complete series of the departed sovereigns of the kingdom. These are usually bestowed each in his own niche, and, as a rule, are pedestred figures. The

what marred by the narrowness of the tabernacles in which they are placed, the heads and tails of the horses protruding on either side in a very awkward manner. A more agreeable, if somewhat bold and seemingly untenable treatment is to be found on the front of the cathedral at Lucca, where, his horse’s feet supported on corbels only, St. Martin, in the round, is shown in the act of dividing with his sword his meagre cloak, that he may give half of it to the beggar-man who stands at his stirrup. This work is ascribed to Guido di Lucca, an artist of the thirteenth century. Unused corbels on the opposite side of the arch seem to show that a similar figure once occupied or was intended to occupy a corresponding position.

King Gradlon is not the only one who has mounted to the topmost pinnacle of material estimation; there are a few other instances where it has been found worth while to set an equestrian figure as high above ground as possible. The most recent instance of this is the monument to the Duke of Brunswick, at Geneva, which is closely patterned after the tombs of the Scaligers, at Verona, in this particular. But there are others of a slightly elder time which should be noted. Why the brewers of Brussels should hold in special honor Charles, Duke of Lorraine, can be explained by those familiar with the history of the Netherlands in the last century. Possibly
he, during his rule as stadtholder, did the guild some real or trifling favor, confirmed a privilege, abated a tax or some such thing. Perhaps he was merely a jolly good fellow, with his cabinet and his candle, and so became a sort of patron saint of the craft. At any rate, he never recovered from the shock of being struck by the Hotel des Brasseurs, at Brussels, bears on its gable top an equestrian figure in gilt against one of the towers of the Hotel de Ville, sculpted by the sculptor Jacobot, about 1834. This is the fourth equestrian statue that has been placed in the town. The first was a statue in stone of the Elector Maximilian Emanuel of Bavaria, by Simon, a goldsmith of the city. This statue was conceived in the Classic style, and was placed in the square of the Lion. When the French invaded Belgium during the Revolution this statue was destroyed and half a century passed before the void was filled by another. A model of the statue of the Elector of Bavaria exists in the National Museum at Munich.

Still another misplaced horseman can be seen apparently riding over the roofs of the cathedral at Mayence.

Jean Lebogere Hard (in Herald).—Born at Montpellier, 1795. Died 1855. His name is remembered as a pattern for those who write the history of the family's arms and heraldic devices. Principal works: Nascis, Hebe, Eury- lida, Psyche, St. Martin, St. Denis, St. Walter, St. Elapsed, and other portrait busts.

Grille kast Courton.—Born at Lyons, 1787. Died 1846. Brother of Nicolas Courton, another well-known sculptor. Studied in Paris under Suvoyes; gained the grand prix and went to Rome, where he stayed from 1821 to 1825. Some of his best works were made for the garden at Marly, including the "Horse Tamer." Now at the entrance to the Chateau Elegante, also Rome, Old St. Paul, and theork of Nicolas Philippe, was the group of Bacchus and his|Mpsent, and another for a Roman Catholic hospita In the Louvre.

Francois de Fonteyne.—Due de Lignelles, Countess of France. Born 1695. He was by far the greatest of the French sculptors. His statue of the King at the Luxembourg, begun by Peyre Montlezant and unfinished by Drouais, was given to the Louvre in 1796. He made Marshal and Duke and others of the King. He made the statue of the Monument to the Memory of the Conquest of the Cape of Good Hope for the Petit Palace. He sculpted the equestrian statue of the Duke of Berri at Berri and the statue of the Duc de Guise at Poitiers.

Jean Joseph Jacquy.—Born at Auxerre, 1722. Died 1775. He was a great sculptor and was one of the friends of the Rococo style. Among his works are a group entitled "The Gold Age," and statues of the "Beggars" and "A Roman Widow." [To be continued.]

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

The Hotel des Brasseurs, Brussels, Belgium—East End of the Cathedral, Mentz, Germany. (Gelatin print, tuned only with the Imperial Edition.)

See article on "Equestrian Monuments."

A STATION ON THE LINE OF THE BALTIMORE & OHIO RAILROAD.

Mr. A. H. Bieker, Architect to the Corporation.

The building contains two waiting and toilet rooms, ticket-office and baggage-room, on first floor. On the second floor there are telegraph- offices and sleeping-apartment for night operators. The building is built of mountain boulders up to sill line, above this of brick. The interior finish is of red-oak.

The Hotel de Ville, Rheims, France.

The last number of the Moniteur des Architectes brings us this print just in time to include it amongst the illustrations of the article on "Equestrian Monuments."

The Old Hotel de Ville, Lyons, France.

This plate is reproduced from the "Tableaux Historiques de la Revolution Française," in connection with the article on "Equestrian Monuments" elsewhere in this issue.

Facade of San Michele, Pavia, Italy.

This plate reproduced from Ramée's "Le Mysage Monumentale et Archéologique" in connection with the article on "Equestrian Monuments" elsewhere in this issue. The building is attributed to the Lombard kings but belongs to the late eleventh century.

The Hotel de Ville, Compiégne, France.

This plate, showing the building as it now exists, is referred to in the article on "Equestrian Monuments."

The Hotel de Ville, Lyons, France.

Taken in connection with the print of the building as it existed before the post-Revolutionary restorations, this illustration referred to the title of the article on "Equestrian Monuments" elsewhere, affords an interesting study.

HÔTEL DE VILLE, COMPIÈGNE, FRANCE.
FUSILLADES DE LYON, COMMANDEES PAR COLLOT-D'HERBOIS.
Le 14 Décembre 1793, ou 24 Primaire An 2ème de la République.
ARCHAEOLOGICAL CAMPING IN ARIZONA. I.-IV.

As the work proceeds, the obscure hints and indications concerning the life of this ancient people become clearer and more plain. All the incident of how history, archaeology, and the traditions retained by the few remaining tribes contribute to the interrelation to reveal a picture of the past with graphic fidelity is afforded by a certain thread which Mr. Cushing followed up in course of his researches, until it led to the conclusion. Briefly it must be stated here. The hypothesis of the late Mr. Spaniards and the discovery of a certain pueblo, the "kingdom" of Cibola, or Zuni, as containing a population of so many within and so many without, was in itself a statement, this has been accorded no particular significance by historical authorities. But here in these excavations Mr. Cushing came across frequent remains of a different class of dwelling than the urban houses, standing in clumps of three, or four, or just out with the boundaries of the town. Then he recalled a folk-tale of the Zunis, about the sacrifice of a maiden who died to the outside town. The Zunis to-day have certain persons who, for various shortcomings, are compelled to live across the river, outside the town, though not numerous enough to form a distinct community. All these facts combined in Cushing's mind with certain distinctions: that these peculiarly situated and constructed dwellings were the habitation of an ultra-mural, low-class, agricultural and border population, and that it was this group who was the town-dwelling Indians in pre-Columbian days. Among these domesticated animals were turkeys, and probably rabbits, and perhaps still another very important kind, as we shall see. Mr. Cushing has found, in his linguistic investigations of the language, how the past of a people may be recorded in the structure of their idiom as plainly as fossil-reminisce tell the story of the geological past, or contain the record of a species in the gradual modifications of the evolutionary chain. The Zuni tongue has a word for this outcast, ultra-mural population, which conveys the meaning of "self-thrust out," or, "cast out by their own acts";  it is, voluntary outcasts. Such a people, in some circumstance, some act of desperation perhaps not even intentional, place a ban upon themselves which forbids either them or their descendants to live in contact with those within the walls. A permanent outcast class is thus formed. This is quite in accord with primitive religious beliefs. It is notable that in Peru there was also an outcast class in the pre-agricultural, and Peru contains many analogies to this pre-Columbian condition. It is notable that the Sudras, the low-caste population of India, are tillers of the ground. In excavating the remains of one of these ultra-mural houses, a group of animal figurines was found buried together. They were crudely, but realistically made animals with long ears and without horns. The Zunis have not only the practice of making figures of sheep, horses, and other domestic animals, which they sacrifice for an increase of herd. As these ruins were unquestionably pre-Columbian, and as, of course, there were no sheep here in those times, the problem was: What were these effigies meant for? Their resemblance to the llama is so marked as to be noted at first sight by Doctors ten Kate and Wortman and other observers. This, taken in connection to other evidence, led Mr. Cushing to the belief that among the domesticated animals of ancient times people there was a species of the llama family. The other evidence was found in the numerous petrographic inscriptions abounding in the South-west, in the traditions of the Zunis, in their popular language, and in the lore and fairy tales of the early explorers, which speak of a domesticated animal answering to this description among the Pueblos of that day. To be conclusive, however, it needs the finding of the bones of the species among the ancient remains — something that has not yet been done. But while the testimony of the old Spanish explorers is strong, it is notable that they do not mention seeing the animals themselves, so that at that time they must have been domesticated and had long been kept. Cushing has, however, accumulated an important mass of testimony well enough to justify laying it before the scientific world to await the time when the required links shall be found, encouraging others to look in the same direction.

It is well known that North America was the home of the archaics, or llama family, the ancestor of the Old World camel, and the fossil-reminisce of many others are small, have been found by paleontologists, while no fossils have, I believe, yet been found in South America, the present home of the family, — limited to four species there. Two of these species are domesticated there, and have been since prehistoric times the llama, the only beast of burden that existed among the aboriginal population of the New World; and the alpaca, which was bred for its wool. As these species are, therefore, comparatively new in South America, and as it has been something of a puzzle for naturalists to account for their presence there; and, moreover, North America was the home of the family, it is not unreasonable to suppose that the domestication of the species of anichro were already domesticated among the ancient populations of this part of the world; that they were taken to South America by the Spaniards, and that all the various species of the family into new environments, where the conditions proved unfavorable, and brought about their extermination. Some may have remained in South America, and the various species may have been distributed through the various tribes of the people. But the little knowledge of the Spanish conquest, when descriptions of them were heard by the invaders of Cibola. As serious epidemics are often known to sweep out amongst domesticated animals. It is not unlikely that something of the sort may have swept the last out of South America, which would account for the fact that none of them were seen by the Cibolas.

One day Mr. Cushing, Don Carlos, Ramon and I, with a Mexican laborer, proceeded to explore the great cave in the face of Central Butte, near the town of Tempe. By its position Mr. Cushing determines it to have been the "motherplace of sacrifice," for the neighboring ancient town of Los Honorables. The Butte is built boldly from the plain, forming a lofty cliff. In its precipitous face the dark opening of the cave shows like the deeply recessed entrance of a monster's mouth. We climbed this, and standing at the mouth of the cavern, we surveyed the little valley stretching out before us. The prospect is enchanting. It is the height of spring-time, the 9th of March. Verdant fields rich with young grain spread for miles beneath an embankment of trees, their long branches marked by the threads of irrigating water gleaming in the sun. Here and there a house may be seen almost concealed beneath a mound of earth, and away upon the clustered town, accented by puffs of steam from the train just arrived.

Don Carlos leaves us and drives into the town, regretful that our errands prevent him from sharing our explorations, and the rest of us turn to make for the mouth of the cave. Descending a steep way, with its dry, sandy surface, the air, and a great deal of sun. The day is sunny and dry, and at a considerable distance outside the cave was perceived the odor peculiar to caverns in this country, coming from the breathings of the bats and the terrestrial rodents that inhabit it. The rapid junction of these has brought into the cave a quantity of material for a great abundance. As this cactus bristles with its sharp spines like a porcupine, it is a marvel how they ever manage to transport it from the surface. It is no uncommon sight to see the inhabitants of themselves after the style of St. Sebastian with his arrows, or the old masters. Throughout Arizona that of such caves are found covered with a deep bed of chollas. But wherever white men have entered — and the prospectors for mineral have been about everywhere — they have almost invariably set these chollas on fire, for the sake of the spectacular sight of the animals scamper out of that far away in the earth. The chollas are exceedingly inflammable, and blaze like tinder. The fire communicates to the accumulated guano, and smolders down beneath the surface to a considerable depth. Thus, when the cave is a sacrificial one, as is apt to be the case, great masses of animal remains are destroyed to afford a man's motion for unhinging the minds.

This cave had, of course, shared the usual fate. But several months before, Mr. Cushing had visited it and had a number of interesting sacrificial relics, and the indications were that a systematic search would reveal rich finds. So Ramon and the laborer took pick and spade and began to dig over from the entrance inward. The cholla bed was soon covered with the broken fragments of rock that had been falling from the roof and sides through the thousands of years that had covered it. But the depth of the deposit was very great, and the laborers fell in bedded in guano and a surface of loose ashes. Our search was soon rewarded, for relics abounded everywhere. How long the cave must have been used for sacrificial purposes cannot be conjectured. The relics must have existed by Robinson's skeleton, and of course cannot disturb a sacrificial place, even of an enemy, fearing to provoke the hostility of the gods and spirits that guard that spot. As it was, we found them in large quantities, both in charred fragments, in white examples more or less charred, and many that had escaped the fire entirely, protected by their depth, or some intervening rock. The relics were chiefly sacrificial cigarettes, made of cane; also prayer-wands and plumes, and sacred tablets. Great masses of

*Continued from page 24, No. 482.
Auguste Rodin, Sculptor—II

Though Rodin now began to earn a more living, and was pleased with the change in the character of his vocation, the reward of life was by no means at an end; in fact, the worst one was about to begin. If he had endured many frustrations in his early days, he had had at the same time enjoyed a large amount of pleasure in the pursuit of his work. At the age of sixty-six, he had at the same time enjoyed a large amount of pleasure in the pursuit of his work and developed his artistic insight, sharpened his sensibilities, given greater authority to his instincts, and began to formulate a scheme of his own for sculptural work. His work was concerned. All this had become a force which he hardly realized.

A sculptor: young, but going at a great pace over a safe route, and free from any serious obstacle. He had constantly worked from life in his own studio, always seeking the finest points of his art, the harmonious arrangement of masses, the expression sculptural effects; working slowly, thinking much, observing clearly, and trying to reproduce the model with exactness in all its outlines, interior and exterior. It was his only and his sole way of getting happiness—endeavoring to make good sculpture. But when he began with Bellesue he found that the latter's method of producing sculpture was entirely different; that the main object was to cause the &quot;wrong head&quot; of the sculptor, and that no good sculpture was possible. To accomplish this, the living model was dispensed with, haste took the place of thought and observation, a bad style of modelling was practised, and a macerated impression made for the sculptors. To Rodin this was unpleasant and injurious. All that he had so painfully acquired during the past six years was now to be made subservient to this method simply to gain his daily bread. He had burned with new his desire for the great injury, to him as an artist, and that, had it not been for the intense urgency of his temperament and the persistent habit of working at home and leisure, it would not have been possible to raise my wages.

Mr. Cushing makes a reconnaissance of the butte and comes across a smaller cave. A rattekeen is conveyed across the water and from the cave, engaged in the excavation of the cave, we found that the day was nearly closed, and we had nearly ten miles to go for supper. Don Carlos came with the team, and we emerged in about the most picturesque-looking condition imaginable, with hair and clothing filled with the unlovely dust and faces griny with it. But our treasure-trove was worth it; besides many other valuable specimens, it included, counting what were found the next day when Mr. Cushing completed the exploration, the remains of the other sacered buildings.

Before we start for the camp, Mr. Cushing makes a reconnaissance of the butte and comes across a smaller cave. A rattekeen is conveyed across the water and from the cave, engaged in the excavation of the cave, we found that the day was nearly closed, and we had nearly ten miles to go for supper. Don Carlos came with the team, and we emerged in about the most picturesque-looking condition imaginable, with hair and clothing filled with the unlovely dust and faces griny with it. But our treasure-trove was worth it; besides many other valuable specimens, it included, counting what were found the next day when Mr. Cushing completed the exploration, the remains of the other sacered buildings.

Among the important investigations made by Mr. Cushing is that of their system of irrigation, which was both elaborate and extensive. The lines of their canals are too many to be given in the over the plains, and a map of the canals supplying the Slado group of ruins is made by Mr. Garlick. Sections of the canals are excavated to reveal the method of their construction, which proves to have been peculiar. The canals contained a smaller channel running along as a sort of groove in the centre, so that a cross-section resembled in outline that of a vessel. The valley branching off from the larger channel was apparently to securely the maintenance of a flow in the smaller channel when there was not water enough available from the river to give a flow in the larger one. The width of the section of the canal was such that the velocity, with the minimum of evaporation, such as would have been impossible with the shallow flow in the flat bottom of a broad canal without this supplementary device, appears likely, also, that the primary object of the action of the elements to a level with the surface of the country, and it was not until the growth of the vegetation of spring-time that their course could be traced, being crossed by lines of banks between which the plants caused by the gravelly banks, and the richer soil between and on either side. These lines were shown beautifully in some photographs.

In the main, the canals were found that the supply-ditches led off just above the level of the supplemental, or keel, canal. To prevent the wearing away of the bank and consequent shalling at the point of junction, the acute angle at the branch was hardened by burning it under a hot brush fire, being baked to a coarse terra-cotta, and a projection from the opposite bank to deflect the water into the branch channel was similarly treated.

Sylvester Baxter.
this time working from nature, but could not make my hands as good as theirs, and I could not understand why. But when I got my hands all right from life, I then saw that theirs were not well made, nor could I understand why those Rodins who worked from plaster-casts taken from nature. Then I knew nothing about casting from nature; I only thought of copying my model. I don't believe there are any examples of Rodin's work, with which the public could get out of nature all there was in it. As my memory was good, I copied in those days, at home, the pictures I admired at the Louvre. Many of the things I made in my studio were better than anything I have since done, and, biding my time, I think there might have been preserved. I would now give many thousands of francs if I could have some of those figures. Since that time, I have been busy, and, if I had had even one in those days, it might have been a world to me. Then I did not know that my work had any merit.

The thousand and one encouragements and helps that young artists usually receive from their elders for which, if they were not changed in any way to any recognizable degree, Rodin knew nothing about. He never came into close and instructive contact with any master, never thought of asking for tips and advice. The work, in itself, posed them too great to be approached by humble students like himself. Besides, he felt that by hard work he could carry to fruition the expression he had used to his mother—"I will work it through myself."

When other young sculptors were receiving medals at the Salon, and being encouraged by the government with prizes and commissions, Rodin thought that they must be very happy, though he did not envy their successes, at his humble lot. His world and the world around him were wholly distinct from each other. When the Franco-German War broke out work with Belleuse again suspended; Rodin applied himself heartily to the pursuit of his studies. He was then living in the Montmartre quarter, and had a studio in the Rue Hermitage, near the city walls. Like every other able-bodied citizen of Paris, he joined the National Guard, and was impressed as a private for his services.

He had no money, food and fuel soon became scarce, and misery, cold, and hunger were almost unbearable. They were at first glad to eat horse-meat, and at last a small piece of hardly eatable bread was all they had. To make two busts in terra-cotta of the officers of his battalion, for six dollars each, was a veritable godsend.

Fortunate for Paris, the war came to an end, the city was delivered, and Rodin managed to get money enough before the Commune began to start him for London, where he hoped to find work, though he knew no one in that city. As his old employer, Belleuse, was in Brussels, Rodin took that way of reaching his destination, thinking that he might be again employed. In this he was successful, and he began for the second time to put into shape the sketches of this enterprising sculptor. After he had been at work for a few months at the extravagant salary of thirty cents an hour, Belleuse made an exhibition of his things, and Rodin, also, put some of his own terra-cotta heads and figures in a shop-window in the Rue de l'Étoile at Antwerp, near the front of Belleuse, which was the way of reaching the highest idea of competing with him. He soon learned, however, of the danger of even a similitude of competition with a business sculptor. When the next pay-day came round, Belleuse parentally suggested to Rodin that he should consider how to make his living independently. Although no reference was made by Belleuse to the two exhibitions, Rodin saw the point. It was a discharge, and the workman accuses himself of considerable misfortune at that time. Nevertheless, he was agreed, for he had just sent all the money he had to Paris, saved ten dollars; he was in a strange land, had not enough to proceed to London, no prospect of work in Brussels, and only this small sum to depend upon. Even this had come from Rodin's payment of two years, or rents, some terra-cotta which he had sent there before the war. With the ten dollars Rodin laid in a stock of provisions, a good lamb being the cheapest, and determined to work for himself and do a little waiting for events.

In the meantime Belleuse had made a successful sale of his works, while Rodin had not sold anything. The heads and figures that he had made for Belleuse sold for many times what he had cost him, and it puzzled Rodin to think that he should be discharged by an employer who was making such large profits on so small returns. But Rodin had three years of his life saved from store of food and was wondering what to do next, when he encountered a Brussels sculptor, named Van Rosbrogh, who had some talent for making figures of infants, and who had worked for Belleuse in his absence before the war. Finding Rodin unemployed he proposed to Rodin that they should form a partnership for the purpose of executing some large works of sculpture that he could get to do from an architect. It was a large idea, andRodin was agreed to this proposition, on the conditions that he should sign no contracts, but share equally in the profits. As it soon appeared that Van Rosbrogh was a good-for-nothing drunkard, as well as a worse one to see, Rodin had to dispose of his share of the business, keeping him out of the studio as much as possible, and did all the work himself.

Their studio consisted of two large groups for the outside of the Money Exchange, and two large carvatures for the inside. For the King's and Ducal Place and the conservatory, each, two large bas-reliefs, and other decorative figures for private buildings. Rodin went to his task with vigor, and pushed it along with an untiring enthusiasm. His models, made partly from life, were four feet high, or one-third the size of which they were executed in stone.

The Money Exchange and the spire of St. Paul's, each five stories high, had been promised to Belleuse, but Van Rosbrogh had sufficient influence to get it away from him. He also learned that the fact of his being a Frenchman had decided why all his work was given to the company to do. The prices they charged were very moderate, and though Rodin worked very fast he could succeed in gaining merely ordinary wages.

In 1874, soon after the completion of the Brussels commissions, they engaged to go to Antwerp, to make monument, in commemoration of J. F. Loos, a Burgomaster.

The commission for this monument had been given to a rich shipowner, who had the ambition to pose as a sculptor. He agreed to pay the two sculptors two thousand dollars for making the plaster models of five figures, life-size. But Rodin, thinking it a good chance of getting a large commission, consulted his friends, and concluded he could not make the statues, decided to make them full-size, or nine feet. Unfortunately he was throwing pearls before swine, and received the reward often meted out in pay, i.e., nothing. The contractor would only pay fourteen of the twenty dollars promised; though he was very willing to put his name on the monument, as its author. Nor did Rodin's annoyances begin or end here, and of them he says: "I made the figures as pleased, as I did everything I ever made, but our employer did not like them. He wanted them in the Rubens style of sculpture, and he would come to the studio when I was working and say: 'Rodin, you do not work, you do not care what you are doing—there and—oblige Van Rosbrogh to alter them, to their great disgust.

It was a hardly and vigorous, but Van Rosbrogh's changes, and the wretched way that they were executed in stone, had made them round, heavy and lifeless. I was so long with this work, and I could not look at these figures, and never went near them while they were being cut. Misery as this was done, the workman gained more money for what they did than I got for my work. Although I was in feeble health, a severe cough making my nights miserable, and the workman those figures with the greatest ardor from a decorative point-of-view, and it was while I was making the figure of the sailor that I was struck with its resemblance to the statues of Michael Angelo, though I had not had him in my mind. The impression astonished me, and I wondered what should cause it. I had always admired Michael Angelo, but I saw him at a disadvantage. My studies had been a blind search after the movement of figures, and I was, for the first time, impressed with its resemblance to the compositions of the great Florentines. I tried to understand and explain it to myself, but could not. My interest and curiosity were greatly awakened, and to satisfy my mind of the reality of this resemblance, and to confirm my hope of its depth and value, either as the result of my long years of effort, or as the effect of my admiration for him, I made a lot of sketches to see if I could get the same character, but without success."

As badly as the figures on the monument were executed in stone, they produced sufficient interest to vegetate Rodin without thought about his future. He still thought to suspect that they were not the handiwork of the person whose name was upon the structure. This suspicion grew to such proportion that he went to Van Rosbrogh and earnestly advised him to get rid of Rodin. "But how can I do this," answered the sculptor, "I am a very valuable man." "Easy enough," answered the disturbed ship-owner, "Don't give him any more work." The suggestion was passed on to the partners, and all was well. Nor was Rodin treated so cruelly. He returned to his old studio in Brussels, at 111 Rue Sans-Souci, and began, with the little money he had saved by the latest economy, "The Age of Brass." Knowing a captain, connected with the Belgian War School, Rodin asked him to send to his studio some of his young soldiers that he might select a model. Of the eight or ten thus placed at his disposal, he selected a Flemish young, twenty years of age, named Neyt, a fine noble-hearted boy, full of fire and valor. (To be continued.)

THE LUMBERMEN'S DEMAND FOR A NEW LIEU LAW

WHE annual agitation of the Massachusetts lumbermen for a more favorable legislation of the lumbermen's lien law is in favor of legislation giving to material-men an absolute lien without notice to the owner and irrespective of payments made by him to the contractor, has been going on for some years, and is likely to reach its culmination this year. The lumbermen have petitioned the Legislature for such a law, invariably without success; and there is little danger of this present movement proving successful, but it is another step in the right direction. A number of years past the lumber dealers have petitioned the Legislature for such a law, invariably without success; and there is little danger of this present movement proving successful, but it is another step in the right direction.

"See The American Architect for June 20, 1887."
to resist the hill by organized effort. Hardly any scheme could be devised more unjust or inequitable in itself, or more likely to injure the interests of all persons engaged in building opera-
tions than the plan of putting material on a par with labor, and
giving an absolute lien to both.

Owners of real estate, of course, will object, because it would
compel them, without any means of self-protection, to run the risk of
paying for things by their buildings, without getting anything for it.
Practically, the large owners, capitalists, and trustees, who would
be apt to employ legal advice before building, would not be the ones
to suffer; for they could and would protect themselves either by exact-
ing of the contractor heavy bonds with responsible sureties, or they
would withhold until the end of the job a much larger proportion
of the contract money than is now customary. So far as the owners
of real estate are concerned, it is not probable that moderate mortgagors
will build houses and stores for themselves to occupy, upon whom the burden
of the proposed legislation would mainly fall.

Contractors, however, would suffer heavily. The smaller ones
would be driven out of business entirely; those possessed of moderate
capital would not be able to swing so many contracts as under the
present system, and a great part of the business, that relating to
large buildings, at least, would tend to concentrate itself in the
hands of the few builders; possessed of sufficient capital or credit
to get along without large advances on their contracts, or who could
furnish goods, security. They would also suffer by reason of the
unequal power which the material-men would have over them if any
dispute should arise as to the quality of the material furnished: dis-
advantages in intramural relations might easily be forced by the material-men, by threats of stopping the advances by putting on a lien.

This whole question concerns the architect also, for although he has
nothing to gain by it, yet it seems that the result of this legislation, the cost of building houses should, in many cases, far exceed the estimated sum, the blame would, rightly or wrongly, attach to the architect. The legislature would be
encouraged for selecting irresponsible contractors, or permitting unscrupulous
sub-contractors to furnish material.

We think that on the whole and in the long run, the material-men themselves would not be injured; inasmuch as among them who were not privileges of selling goods to an obviously irresponsible contractor might, perhaps, save a debt here and there; but the general result to material-men would not as a class, would not be what was intended. Any bill that tends to increase the cost of building must tend to diminish in like
proportion the amount of it; and probably the new business methods,
which the change would necessitate, would compel material-men either to raise their prices, or to withdraw from building. It is fair to assume that any material-man who should make a practice of selling goods to irresponsible contractors, then lie by without giving notice to the owner, selling him into paying out the contract money,
and then jump upon him with a lien when the building was done and the money all paid, would not get extensive employment from the
job. But the only people pushing the matter, are curiously enough, the
lumber dealers. Why these people alone among material-men should be so persistent in their demand for this change is a little difficult to understand, unless it be that the business and kinds of wood dealt in
are particularly lax.

At a two-days' hearing before the House
Judiciary Committee, last year, where the lumber dealers were out in
strength, two prominent facts brought out were the alleged desire of their trade to have an honest contractor business, and the wholly mistaken idea that the legislation, such
they demand, is common in this country. Their real object is, of course, to eliminate irresponsible contractors, but to do so they
shall be out of the business they can with them, and then, through the intervention of the State, make innocent third parties pay for their materials twice over.

Nor has such legislation commended itself to the judgment of legislators in other States of this country. In only five States, viz.,
Maryland, Delaware, Kansas, Missouri and Minnesota and seven
Territories, has such a law been approved. In some of the States
are qualifying provisions for the protection of owners. In Pennsyl-
svania, New Jersey, and, we believe, also in Virginia, similar laws
have been rejected, but the conditions under which these laws have been
repealed. In none of the States and Territories in which the lumber
dealers' scheme obtains, is the collection of debts facilitated by any
right of attachment on more or less process such as we in New England are familiar with. The claim of the lumber dealers that the great State
of Massachusetts should ignore the essential principles of right and
justice, disregarding all the precedents furnished by the rest of the
New England States, in order that contractors in that commercial and industrial centers of New York, Pennsylvania and Ohio, in fact of every State and Territory in this country, except those mentioned above, and
take its building laws from the new and thinly settled territories of
Idaho and New Mexico, is preposterous and altogether unlikely to prevail.

To be continued.

A CHURCH MOVED BY A TREE ROOT. — The foundation of a church in
San Lino, Cal., has been shifted seven inches by the roots of eucalyptus
trees, and the latter are therefore to be cut down. The trees are
perfect giants, their tops reaching thirty feet above the church's steeple.

Cleveland Leader.
PROGRESS OF THE ARCHITECTURAL SOCIETIES' CONSOLIDATION MOVEMENT.

NEW YORK, N. Y., January 17, 1889.

To The Editors of The American Architect:

Dear Sir, — A rather novel competition, if it may be so-called, came under my notice recently which may interest your readers, and comment on the same by yourselves may not be lost on the committee whom the citizens have vested with power to act in their service and whose interests, of course, resemble those of the citizens in whose behalf the proposition was made: these: a certain city being about to increase her school accommodations, were beseeched by architects of all sorts to secure the job, until it finally came down to a matter of the price at which they would do the work. Some offered their full services without compensation! Finally, a selection was made of one who represented to the committee that he was building numbers of school-buildings, which the committee evidently swallowed whole, though, in fact, by the old school-houses he was superintending were under investigation which resulted in his dismissal for certifying payments for the building which was not paid for. In other words, these promises and specifications from the foundation, and the specifications had provided for only 2 x 10 joists for long spans over large school-rooms and in other ways were entirely inadequate, if followed. When the bid for the work was notified to the architect, which was in accordance with the specifications and the workmanship, the architect, instead of giving testimony in an action with a builder, and, after he had given his evidence the learned counsel on the other side on cross-examination of an engineer who had examined the schools he had just been employed to superintend and if he had not been dismissed on account of incompetency, which question he tried to dodge, but chalked up, finally admitted. This city has, I think, fallen into bad hands, and would have done better if an architect is both capable and honest had been employed by them to take charge of the expenditure of a hundred thousand dollars or more of money, even if they had to pay five to seven per cent for his services.

SINEX.

[We think our correspondent must be mistaken in asserting that "architects of all sorts" beseeched this committee to secure the job. — Ed. American Architect.]

THE PETCHIKAPU WATERFALL. — Marvelous stories are related by the few Mongolians and Naxapee Indians who have penetrated far into the interior of Labrador respecting a cataract, beneath whose terrific leap Niagara pales into insignificance. But one white man has ever seen the falls, and the Indians' ideas of measurements and distances are so imperfect that, even where their stories agree, it is exceedingly difficult to deduce from them anything like reliable data. An expedition of Messrs. S. F. Holme, F. R. G. S., and an exceptional Fellow of All Souls' College, Oxford, to explore the interior of Labrador and investigate these falls, unfortunately, failed in its object, the explorers having been much hindered by the calculation of the distances and the exact location of the cataract, and compelled to return in consequence of running short of provisions. They got so near to the object of their expedition, however, that they were enabled, from the general configuration of the country, to form what must be a tolerably correct estimate as to both the location and magnitude of the cataract. This estimate agrees with the description of the great fall, the author of which, the Rev. Mr. Maclean, who visited them in 1839, and whose farther progress into the interior was stopped by them, states, to have been 1,500 feet above the falls at 1,500 feet, but says that the cataract itself is not more than 100 feet across. The height of the falls he estimates at 1,000 feet above the river. This estimate was confirmed by experiments recently made by Messrs. Holme and Duff in the interior, and who thirty years ago was in charge of Fort Nascapee on Lake Petchikapu. One of the same party of explorers, judged against the cataract and finding it the obstinate refusal by the Labrador Indians to approach them. They believe them to be haunted, and think it impossible to look upon them and live. Kennedy was conducted to them by an old Indian named Louis-over-the-fire, who, being an Iroquois did not share the superstitious belief of the Montagnais and Naxapees. Messrs. Holme and Duff were principally misled by the erroneous statements and calculations as to distances contained in Professor Hinds' "Labrador." the leading authority upon this virtually unknown country. The falls
are on the Grand or Petshkapows River, which flows into Hamilton in-let. They are thirty miles above Lake Wannikapson, a body of water which is itself forty miles long, and situated 150 miles inland from the mouth of the river. The river is too swift to permit of the passage of a boat from the mouth of the river, so that the expedition of Mears, Holmes and Doff has brought to light the fact that the best works heretofore projected for connecting anything but railroads were correct. They agree, however, with Professor Hind that the elevation of the immense tablettes which forms the interior of Labrador is about 2,240 feet above sea level, and that the height of land and the descent from the elevated tablettes is quite sudden. This is particu-larly true of the first mile and a half, a drop of over 602 feet in the thirty miles commencing with the falls and ending at Lake Wannikapson. There is a slight rapid below the falls, but none near the lake, and near the axis of rotation of the grand feature, in a number of places, as little, if anything, short of 2,000 feet. They are formed by a great deal the highest falls in existence that are composed of any great volume of water. There are many mountain torrents that fall from a greater height, and the great full of the Yosemite Valley measures 2,595 feet, but there is a distinct branch of the Wawiga, on the other hand, has a height of 164 feet only.—Boston Herald.

**Engine Foundations.**—An engine foundation, says the Age of Steel, bears the same relationship to the structure which has afterward to be raised upon it as the foundation of a house bears to the house itself; but of course the latter ought to be firmly bolted to the founda-tion so that the two forms one immovable mass. It should be bored and placed in the ground so that no mortar is necessary, as it is not known for sure that this will be a danger of springing in the bed, and foundation, which is the rock of Ages, and the foundation being twice as strong as the bed, will be parallel. The higher the speed of the engine the more substantial should be the foundation, for vibration and tremor ought especially to be resisted. The quality of a good concrete is perhaps the best substance to make a start with, but its size ought of course to be determined by the nature of the soil upon which it is to rest. If it is a rock bottom the bed can of course be fastened directly to it with but a mere pretense for a foundation between; but should it be sandy or a soft concrete of surface large area should be first laid down as a foundation, and then the brick or stone or other best cements, or if it is proposed to use stone the larger the blocks used the better it will be because it is necessary that the cement be so thoroughly and uniformly carried throughout the bed of the foundation itself that it might be well built before the foundation is completed and thoroughly set; when in position and found thoroughly true, the jumps may be filled and packed with melted sulphur to in-sure rigidity. With a bad foundation no engine can be expected to run long without deterioration, and there is no part of the detail of engine fixing which is of more importance than the foundation.

**The St. Louis Bridge.**—The beautiful bridge built by Captain Eads over the Mississippi River at St. Louis, bold in its design and ex-ceptional in its details, is to all intents and purposes complete, but the impression of its importance would be greatly magnified if the part below the surface of the water, which bears the massive towers, and the rods supporting the pillars, were above water. The height of the water above the river, could be visible. There are three steel arches, the centre having a span of 626 feet, and each side arch a span of 402 feet. The arches are formed by the use of 3,300 tons of steel, and each composed of two cylindrical steel tubes, 18 inches in exterior diameter, one acting as the upper and the other as the lower of the arch. The toes of the arches are 103 feet below the water, which gives ample safety below. The thickness of the steel forming the tubes runs from 1.37 to 2.18 inches. These upper and lower tubes are parallel and 12 feet apart, connected by a single system of diagonal bracing. The double tracks of the railroad run through the bridge adjacent to the side arches at the elevation of the highest point of the lower tube. The carriage road and footpaths extend the full width of the bridge, and are carried, by braced vertical posts, at an elevation of 23 feet above the railroad. The river is 1,130 feet wide and the main arch of the bridge 1,380 feet long. Though the bridge has had an ordinary high wind, the only approaches on each side are masonry viaducts, and the railroad connects with the city station by a tunnel nearly a mile in length. The great difficulty of the rail connection, which is placed on one side acting as a counterpoise for the construction on the other side of the pier. They were gradually and systematically pro-jected over the river, without support from below, and they met at the middle of the span, when the last central connecting tube was put in place by an ingenious mechanical arrangement, and the arch became self-supporting.

**The Duchesse de Galliera's Revenue.**—The late Duchess of Galliera, who died recently, in her will left an endowment of $30,000,000, to be used, it is reported, to build a hospital, to have a statue in her native city of Genoa. Whenever the traveller turns he will be shown schools and colleges, infirmaries and hospitals, and this endowment is founded by the Duchesse de Galliera. Now that the Duchesse is dead no time should be lost in removing from the entrance hall of the Galliera Hospital, in London, a portrait of her agent and relative, who decamped with $4,000,000, the money paid to his credit by the Duchess for the building of the hospital. The poor old general, if rum does not live, used the money to save a minor-Tiffon from disaster. At any rate, with the Duchesse's death, the tablet of revenge" should cease to disfigure the walls of a noble building which has been erected in the name of charity, which covers a multitude of sins, and of humanity, which condemns them.—Exchanged.

**A New Tomb for the Habsburgs.**—It has been decided to con-struct a new tomb for the Austrian imperial family, the vaults under the Church of the Capuchins affording no more room. More than 100 of the family's personages are buried beneath the floor of the confraternity hall. The new vault, to be made of marble and the burial place of the Habsburg family since the early part of the seventeenth century.—New York Evening Post.

**TRADE SURVEY.**

Once more reference must be made to a worn-out topic in order to pick up some pointers for trade and business possibilities. Boston and New York financiers are just at present very interested in railroad building. What lines to build, how much money to invest and, in general, what to do after their railroad-building interests begin to come in the coming year. Within sixty days the programme will be completed. There is an anxiety among those who have the greatest interests at stake to have all matters pertaining to the relation of the railroad as this government disposed of one way or another, right or wrong. If rightly disposed of, they know that there is a plenty of grand opportunities for good investments. If wrong-fully disposed of, they can have the satisfaction of knowing what to do and what course to pursue till things come right again. There is a long reign in the public mind that the railroad interests will be put under support of control, and a more complete control than is now exercised. Our best statesmen and statesmen do not believe wholly in the idea of regard to an over-construction of railroads, on the contrary, they believe that at the present time the tendency is to bring about a great period of easy running, for five or six years past for great railroad-building enterprises. The work is of two kinds: First, the construction of long lines in remote sections of the country, where the prospects for the future are favorable for America; and second, the construction of short lines mainly in the Southern States, which have large revenues from the railroads which are under the control of the people and used as a means of transportation to do. Wore to do so, manufacturers of material would at once take advantage of the encouragement hence the hard times of the game, and, if possible, bring about a reduction for all kinds of material that they will need. It would look as though there were some concert of action in this direction. During the past three months the fewest has been contracted for than during any like period for five years past. Even this year manufacturers of material have been able to secure apparent large requirements. The same applies to other branches of rail-road-building material. The country does not absolutely need more railroads, but its wants are not therefore satisfied, and there are sections of country through which roads could be constructed with advantage. There are sections where there are indeed only a few railroads, and as soon as a line is built in this direction the railroaders do not enter into competition, and in less time than is possible. It is in this country where it is in the West, where railroaders are organized in order to profit by this increasing demand. It is for this that the financiers are putting their money into railroad work. There is but a little of steel and iron that has been sold in the last few months. Prices are sinking in all markets South, West and East.活动

The lumber trade, considering the season of the year, is active. Prices are firm and in all markets for hardwoods, as oak, hickory, and birch, the combination hold. The Northern lumber interests are in fine shape and the weakness of the South is to be seen in the lumber lower beyond the Mississippi than ever before in a single year. One reason for this statement is that these people are in serious trouble about the being borrowed, and the indications point that as much more will be bor-rowed in the coming season than before. The South is processing to the profit of a number of agencies that are losing money on farms report a demand for all the money they can secure. In some quarters paymasters are not being promptly paid, but investors are learning to select their localities where their securities can be best located. The hardware manufacturers throughout New England are getting down to work, and are now running more efficiently than during the fall to supply the wants of the coming spring and summer trade. The by-products of the steel-making industry are very active, and the activities of the Primary Steel-makers, in the West are scarcely any better fixed. The makers of wood-working machinery are moving slowly on account of the very slight capacity in this direction is fully up to all the requirements. Plug-makers and winder manufacturers of elderine Gouin are meeting at Washington to formulate plans for a renewal of the agribusiness at this stage, early because the believers in governmental work anticipate an attack on the government's post. The most current demand has been, and still is, the need of money is increasing, and that the supply is diminishing; that the government's post is being done on credit that is due, and that the control of money is centring into fewer hands. These allegations may or may not be true, but there are signs in business circles of justifying the allegation of a more or less generalized disease in some time in the near future. Real dangers are, however, not often seen in these signs of danger, and most of the people are not afraid of making a large investment, but the realists are that the financial question will settle itself, and that the control of the currency of the country will not be secured by class interests.

S. J. PARSHALL & Co., PRITZ, Boston.
The exterior of this house is stained with
CABOT'S CREOSOTE STAIN
for Shingles, Fences, Clapboards Etc.

These Stains are very durable
and give a much more artistic effect
than paint, while they are cheaper,
and very easy to apply.

Our Stains contain no water and
are the only exterior Stains that do
not contain kerosene.

Prices are 50, 50, and 75 cents per gallon
according to color.
Send for samples on wood, and circulars.

SAMUEL·CABOT,
70 KILBY·ST···BOSTON·MASS.
DETROIT HEATING AND LIGHTING CO.'S (BOLTON PATENT) HOT-WATER HEATER.

THE ADVANTAGES OF HOT-WATER HEATING.

The advantages of hot-water heating over all other methods are manifold. It is the most healthful system known to the scientific world, the most economical in the consumption of fuel, the most durable and the only one which is absolutely safe; it requires the least care, and in its simplicity outranks the plainest of all plain stoves.

By this system an even temperature, soft and pleasant and free from all poisonous gases, is obtained, and controlled in all parts of the building, regardless of the outside temperature. There are no draughts or blasts of hot or cold air so inseparable with the operations of the hot-air furnaces.

Heat is obtained by the hot-water system as soon as the fire is lighted and continued until after the fire is out and the water cold. With steam no heat is secured until the water boils, and the fuel consumed up to that time is wasted. With the hot-water system the heat is controlled at the furnace, the fire and fuel being directly and immediately regulated to meet the requirements, while with steam the valves of the radiators are made use of and the fuel in the furnace frequently consumed to no purpose. Numerous tests and years of experience prove that a good hot-water system will consume from twenty-five to thirty percent less fuel than the best steam plants, and from forty to fifty percent less fuel than a hot-air furnace.

The hot-water plant is not subjected to the wear and tear caused by uneven pressure, expansion and contraction of pipes and regulators that is common to the steam system, and properly put in will last three times as long. Its longevity in comparison with hot-air furnaces is even greater.

The hot-water system cannot explode, as there is never any pressure except the weight of the water, the pipes being open to the atmosphere. There is absolutely no danger from fire, as the fire-box is encased in iron and brick, and the pipes and radiators cannot be heated above 130° to 190°.

The simplicity of a good hot-water system is one of its chief merits. It requires less attention than an ordinary base-burner stove.

THE SPECIAL ADVANTAGES OF OUR HOT-WATER HEATER.

The fire-pot and heater is so constructed that it possesses the largest heating surface of any system now offered the public. (See cut.) It is thereby able to heat a larger volume of water in a shorter period of time than any other and is, therefore, more economical in the consumption of fuel. This superiority is obtained partly by using wrought-iron tubes instead of cast-iron, which are thicker and consequently require more heat to affect the water within; partially by the vertical arrangement of the tubes, whereby the water begins to circulate with the first heat (a news-
in such a manner that no useless fire-bricks intervene or elbows can form to absorb any part of the flue gas.

In point of durability there is no heater that can equal it. In addition to the advantages in its construction, above noted, this heater possesses a merit not to be found in any other. The entire heater is practically one piece, all parts being screwed together. There are no holes, flanges or recesses to leak in to --fatal defects that are the source of constant annoyance and frequent repairs in other heaters. Only the very best materials and the most experienced workmanship are employed in its manufacture.

The cut which shows how the heater is encased in brick and iron, speaks of its perfect seal. The insulation (generally in the cellar or basement) is further security in this respect. The exposed surface of the covering, either at top, bottom or sides, does not give forth a particle of warmth. A sulphur match left for months on the top will not ignite, and wood, or even paper, can be left on the exposed plate of the heater.

The extreme simplicity and cleanliness of the heater adds to its superiority over all others. Every portion of the heater is plainly visible, ready of access, and can therefore be cleaned easily. There are no recesses for soot to accumulate in. The fire requires less attention than an ordinary coal stove, a replenishment of fuel one or two times in twenty-four hours being sufficient during average winter weather, and once in twelve hours being necessary only in extreme cases. No skill is required in firing. Any desired heat can be obtained at once, and an equitable temperature maintained in every room in the house regardless of distance from the heater. The heater is entirely non-inflammable in its operation.

References and further information will be cheerfully furnished upon application to the DETROIT HEATING AND LIGHTING CO., DETROIT, MICH.

"HIS SECOND SUCCESS." Over twenty years ago, Mr. E. T. Barnum, of Detroit, conceived in a small way the manufacture of wire and iron work. By industry and perseverance the business rapidly increased, and gradually outgrew the different quarters at which it was conducted, finally becoming so large that Mr. Barnum found it to his advantage to incorporate, although he still continued to be the sole manager.

The business was then pressed with redoubled energy. A large factory, the largest in the world, was built and thoroughly equipped with the very best machinery then known, nearly all of which was especially constructed for his work, and an immense fortune seemed to be practically within his grasp.

But one morning Mr. Barnum saw that factory, with every evidence of prosperity, and with no warning of any impending evil, go up in smoke, leaving only the bare, blackened walls. However, with that unerring energy which had built up one fortune, he commenced again, even before the smouldering ruins were cold.

This was in 1883. It was a difficult and disheartening task to again trudge slowly along the streets and through wholesale storerooms in which he had pressed for so many years, and down which he had been so recently and suddenly hurled, but he kept quietly and steadily at work, and is now again firmly re-established with new works built under his own supervision and for his own special use, and equipped with the latest improved machinery.

The present factory is located at Nos. 715, 717, 719 Grand River Avenue, where everything in the line of wire and iron work can be had in and ample stock of other perfected articles.

Mr. Barnum sells goods not only in every State and Territory in the United States, but in Canada, Australia, Brazil, Europe, in fact, there is no considerable portion of the civilized world but what is more or less familiar with his work.

Mr. Barnum is proud of his second success and his course is a good illustration of the fact that in this country all obstacles and misfortunes are overcome by intelligent, diligent and patient work.

He has just issued an illustrated catalogue which will be mailed upon application. All correspondences should be directed to E. T. BARNUM.

P. O. BOX 56, DETROIT, MICH.

TRAP-SEAL PROTECTION Letter from Mr. Putnam to the Sanitary News, containing the "Trap-Vent" with the "Sanitas" system of plumbing, in reply to Mr. Homan:

TO THE EDITOR: Your correspondent, Mr. Homan, in reply to my letters on "Trap-Seat Protection," asserts that a simple S-trap, protected against siphonage by some form of automatic air-supply, is better than an antisiphon or seal-retaining trap on the ground of cleanliness.

Several important considerations affecting this question seem to have been overlooked by Mr. Homan, which appear to me to be sufficient to reverse his conclusions; and, as these considerations are founded on very careful experiments of mine, some of which have never as yet been published, I will avail myself of your invitation to contribute our experiences on the subject, to present them here. They may be summarised as follows:

1. No automatic air-supply has ever been invented, nor probably ever will be, which will form a reliable protection against siphonage, although such a form of air-supply, as your correspondent recommends, seems to me to be much more reliable in many ways than the ordinary back-vent pipe.

2. The scouring action of a trap are due not to the absolute size of its holy, but to its relative size as compared with the discharge outlet of the fixture it serves.

I have found a common S-trap used under an ordinary small-outlet wash-basin, nearly filled with a jellie-like fluid, through which the waste-water passage left was no larger than a man's little fingers, and a small hole in the free outlet of the basin, and not more than a tenth of the capacity of the trap and pipe when now.

There are no "greatly enlarged cavities" in a scientifically designed (the "Sanitas") seal-retaining trap. When such a trap is used under a fixture having an outlet as large as its waste-pipe, and the fixture is properly used, so as not to fill these pipes, it is "dead," the cessation of effluent will be sufficient to keep all parts of the trap clean.

When such a trap fouls, the fault is in the fixture or in its usage, and not in the trap.

With improperly formed or used fixtures any trap will, and must, necessarily foul in time, and an S-trap is no more exempt from this fate nor capable of being freed of fouls, than any perfectly straight and smooth pipes will foul under such circumstances.

The safe rule to avoid this trouble is to construct every fixture on the principle of the flush-tank, and to use it as such, and it is self-evident that no other practice will keep the waste passages clear.

2. Ordinary S-traps, recommended by your correspondent, are liable to lose their seals and are especially prone to the action of air, which may produce an equal pressure above them, with the result that the automatic air-supply forms no protection whatever; whereas, our seal-retaining trap is formed with reference to withstand those adverse forces, and, properly set, it affords perfect security in these particulars.

Properly installed, water in an ordinary S-trap is too small, and the trap is not scientifically designed with a view to the perfect preservation of its seal against evaporation.

The automatic air-supply is infinitely better than the back-vent system in this respect, inasmuch as it does not materially increase the evaporation of the water-seal; but the S-trap is at an advantage. In a well-designed seal-retaining trap all danger from evaporation is practically avoided.

4. Accepting, then, as evident (as we must) the fact that any pipe or any trap under improperly formed or used fixtures will foul in time, it becomes clear that the seal-retaining trap is safer than a vented S-trap, because even a partial obstruction of the venting makes the mouth of the air-supply, and thereby at once destroy the entire value of the device without announcing it to the house-owner; whereas, a clogging of the former will simply retard the outflow of the waste-water, which will at once announce the obstruction and lead to its removal. It is not until much clogging destroys the ability of the trap to resist siphonage, since the relative proportions of the interior remain the same, and the very obstruction which prevented the escape of the waste-water also prevents siphonage and the escape of sewer-air. Practice has shown this theory to be true, after a test of five years.

It is now well known that the mouth of the ordinary back-vent pipe becomes quickly clogged by grease under kitchen and pantry sinks, and this objection to back-venting is now considered so serious that many practical plumbers are using its abandonment on this ground.

Now, the mouth of the automatic air-supply pipe is, in this respect, precisely the same, and is clogged in exactly the same manner; hence, it must be condemned on the same grounds.

Your correspondent objects to "enlarged cavities" in traps. What is the mouth of the automatic air-vent pipe but exactly such a cavity? It is worse than that, since it is a cavity placed precisely where it will be first and easiest filled with filth, and when filled it will never be washed out again since the scour does not reach it. Still worse than that, it is a cavity which, when once entirely filled, will cause the air-pipe to lose its original protecting power, and prevent the escape of the value of the entire apparatus is destroyed.

Finally, worst of all, this loss of protecting power occurs without the slightest warning to the house-owner.

The mouth of the air-supply is, and must be, placed at the upper side of the trap or its outlet-pipe. Grease and allied matters which can cause obstructions in the usual wash-basin passages by adhering to them are lighter than water, and must float, therefore, to the top. Hence, it is evidently exactly there that clogging must first take place, and cavities placed there, like the mouth of the air-supply pipe, must be the first to be clogged, and in practice it is found that this is the fact.

With our seal-retaining trap, on the contrary, no such dangerous cavities exist. The water-
passage is substantially of the same caliber throughout, and even should clogging through careless usage take place, it could do no harm, but would at once announce itself and be removed.

5. The automatic air-supply pipe, in combination with a trap, forms a somewhat expensive and delicate combination, involving quite a number of joints throughout its several parts, and the use of delicate moving parts and sensitive adjustments and also of free mercury. It would also seem as if water thrown up by back-pressure into the valve and the manifold trap might in time easily destroy its operation.

The self-retaining trap, on the contrary, is simplicity itself, has no moving parts, and is of solid and durable construction throughout.

6. To recapitulate, then, the very arguments raised by your correspondent in favor of the S-trap, with automatic air-supply, are real, the fact of the matter is that the S-trap is more in favor of the unvented anti-siphon trap.

The former (the vented S-trap) is not secure against siphonage; has no resistance whatever in itself against back-pressure or capillary action; is not constructed with a view to resisting evaporation; has, as a necessary part of its construction, an "enlarged curved outlet," which may easily be plugged by grease and filth, and where such clogging is fatal to its operation and extremely dangerous to the houseowner; and it is expensive, complicated and delicate in construction.

From all these objections our self-retaining trap is free, and its practical trial for many years has amply demonstrated the truth of the statement. Respectfully yours,

J. P. PUTNAM.

CHANGE OF PARTNERSHIP.

The partnership heretofore existing between the undernamed under the firm name of Haines, Jones & Cadbury, has this day been dissolved by mutual consent.

THOMAS J. JONES,
JOHN W. CADBURY,
JOEL CADBURY,
WILLIAM H. HAINES.
November 9, 1888.

HAVING purchased the plant of the late firm of Haines, Jones & Cadbury, we would call attention to our facilities for supplying all kinds of plumbers' and steam-fitters' supplies, and solicit a share of your future trade.

HAINES, JONES & CADBURY CO.,
1336 RIDGE AVENUE, PHILADELPHIA, PA.

SOME NEW SYRACUSE STRUCTURES.

The scaffolding, which has encumbered the Everson and Lynch Blocks, on South Salina Street, has been removed, and two handsome buildings are presented to view. There is a certain similarity in the structures owing to the free use of pressed-brick and terra-cotta.

The Everson Block, which adjoins the Welting Block, is from designs by Messrs. Baker, BueLL & Talor, and is as near first proof as it is reasonable to make it, being constructed solely of iron, stone, brick and terra-cotta, none of which have very good burning qualities. This building is seven stories high, and has a frontage on Salina Street of forty-four feet, and from cornice to sidewalk it is just 100 feet. The ground-floor will be taken up with a double store 40 x 15 feet, divided through the centre by a massive iron columns. The second-story front will be finished for occupancy by a bank, and will be fitted with stone and steel vaults. The front of this building is very attractive, and is beyond question the most imposing structure on South Salina Street. The piers each side of the stores are of Carlisle brown sandstone, and the second and third stories are of the same material, the third story front is of iron, brick and terra-cotta. No wood is used, nothing but iron girders and pillars from cellar to roof. The chief attraction centres in the terra-cotta work, which is of very choice design. It shows what can be done with architectural terra-cotta, whether used in friers, walls or the main edifice. Mr. Everson, of this city, have the contract for the mainwork.

The Lynch Block adjoining from designs by Architect Russell, shows a magnificent front, stone, pressed-brick and terra-cotta being the materials employed. There are some fine designs in the terra-cotta work, which is furnished by the same company as are the Everson. The work is being erected by Messrs. O'Brien and Hollikan, and is a six stories high, and reflects great credit upon its designer. These two blocks, artistically considered, are the handsomest structures on Salina Street.

The new Grand Opera-House Block is being rapidly pushed. There was a hitch over the employment of non-union marble masons by Messrs. Ryan & Rafferty, which was adjusted by Mr. Moore going ahead with the work himself. The plans and elevation for the block have been perfected by Architect Russell, and McElhattan & Son, the New York theatrical architects, will attend to the plans for the opera-house proper. The block will be four stories high, with an additional mansard in the centre of the block. The ground floor will have space for six stores, running from Genesee to Fayette Streets. The opera-house will be located on the second floor, as in the old building, and will be reached by a twenty-foot lobby from Genesee Street. The upper-stores of the block fronting on Genesee Street will be devoted to offices and halls, and every foot of space will be utilized. The building will be constructed of Trenton brick and terra-cotta, some of the latter showing some very fine carving. This work is also furnished by the New York Company. The style of architecture belongs to no particular place or period, and may be considered as "modern." The general arrangement of the interior of the opera-house will differ very little from the old structure. It will be much more elaborate, and will be a model structure of its kind, with every precaution for safety and means of exit in case of fire. What it will cost to erect this new temple of amusement, Messrs. Moore and Lynch will know when they get through. It is intimated that it is contemplated to add another story to this structure, which would make it five stories, with mansard.- Syracuse Real Estate Record, December 8, 1888.

MAHOGANY.

In our desire to extend our business in the sale of Mahogany it occurs to us that if more were known regarding this standard wood, its adoption and use would become much more general. We believe an impression exists that it is an expensive wood only to be indulged in by the few — this however is not the case.

The facilities for procuring Mahogany in its native country and the devices for reducing it into lumber have so improved, that its cost is now in prices of the raw material, of some of our domestic hardwoods, notably Cherry.

We are prepared to supply Mahogany of the best texture and grain as low as fourteen to sixteen cents per foot on cars in New York — the grade known as "seconds" at seven to eight cents per foot — and a grade between these limits. In measuring these grades last mentioned allowance must be made for faults, and there are very many places where for small work these grades prove very advantageous.

The cost of working Mahogany is certainly not greater than any of the domestic woods — computing then for any given work, this being in prices of the raw material, the cost of Mahogany over the domestic hardwoods will be found to be small.

It is universally acknowledged that Mahogany wargs less, stands better, and is in every way more reliable than any other wood known: it is the only wood that grows more beautiful with age, all other woods grow dull and uninteresting as they grow older. It has also been called the "king of woods," and it imparts to an interior, a tone and richness conceded by all. Will not therefore the intrinsic value of a private residence or a public building finished in Mahogany warrant the use of this wood at a greater difference in cost than we have here set forth?

It appears to us to be a vast deal of misinformation regarding Mahogany, we are led to place before you the actual facts. We are sometimes met with the assertion that there is now no Mahogany, that it is all "Baywood." As well might one argue that there is now no Black Walnut from the fact that it is not supplied from Ohio and Indiana. We make this assertion from Ohio and Indiana, but largely from the Indian Territory. Thirty years ago Mahogany was commercially designated as "St. Domingo" (from the Island of St. Domingo) and "Baywood" or "Bay Mahogany" (from the vicinity of the Bay of Honduras in Central America). The Central American woods were rightly condemned as being too soft, of light weight, straight-grained, and characterless: in later years it has ceased coming to this market, but one cargo having arrived at the port of New York (now the largest Mahogany market in the world) in six years. St. Domingo Mahogany likewise exists, we may say, in name only. The original growth of the Island of St. Domingo has been long since utilized, and the importation of small lots at exceedingly long intervals are only of the small and stunted second growth, crooked, stained and defective, individual logs of good size and quality are now and then to be secured. The markets of the world are now therefore supplied primarily from Cuba. The Island of Cuba furnishes considerable quantities of a smaller size (more especially valuable for small work) which is hard and of good texture; but the great bulk of the Mahogany used in later years is supplied from the forests of this country. Cuba now, however, produces not only our largest and most beautiful grades of Mahogany, but also some of the softer and less desirable grades, somewhat resembling the Baywood or Honduras Mahogany of old time, though still better.

This we regard as an important fact to be noted by architects and others interested in the use of Mahogany, for here arises the
FEBRUARY 2, 1889.  

SUMMARY:

Our New Department.—Reporting on the Present Condition of the Albany Capitol.—The Cost of that Building.—A Decision against a boycotting Trade Union.—Terrestrial Settlements.—Changes in the Linen Fumacnic System of Sewerage.

BUILDERS' HARDWARE.—XVII.

Illustrations:

The Algonquin Club-house, Commonwealth Ave., Boston, Mass.—Two Street Views in Quebec, Canada.—Suggestions as to the Construction of Slow-burning Houses, Churches and Hospitals.—House at Rochester, N. Y.

SLOW-BURNING CONSTRUCTION.

A Guide to the Quebec Exhibition.

BUILDING LAW.

Communications.

Costs and Publications.

Notes and clipped articles.

Trade Surveys.

With this number the American Architect opens a new department, which it is hoped will prove very useful to practitioners. For a long time the editors have had in mind the desirability of maintaining a department like that which forms an important portion of the French technical journals, in which questions involving legal points should be answered, and, if of general interest, discussed at some length by competent lawyers. Their aim is to supply their subscribers, both privately and through the columns of their journal, has shown them not only how valuable to architects and builders timely advice of this sort may often be, but how much more valuable it is if it is always ready, and is to be implicitly relied upon. The persons who can furnish such advice are by no means numerous, even in the legal profession, and the editors consider themselves fortunate in having secured the services of a lawyer not only very thoroughly trained, but experienced to an unusual degree in building cases, and familiarized with the technicalities of construction by many building operations carried on under his care, either in his own name or as trustee for others. His own introductory remarks, to be found in another column, will best indicate the character of the work which he is to do in the interest of the subscribers to the American Architect, and the editors neal only add that they have reason to believe that the work will be well done, and that those who consult the department will receive advice which may be depended upon as having been carefully weighed, and based upon accurate knowledge of the subject.

A RESOLUTION has been introduced in the New York Legislature directing the Supervising Commissioners of the Capitol "to make a thorough examination of the present condition of the Capitol building; to ascertain the kind and quality of materials and labor that will be required to complete the same, internally and externally, according to the plans and specifications therefor already adopted and now in force; and to make as full, accurate and detailed an estimate of the cost of such material and labor as they may be able to prepare.

They are also empowered "to suggest modifications or changes in the plans for the building, or for any part thereof, making a detailed statement," in regard to any such modification, and are directed to "express their opinion as to the length of time that will probably be required to complete the building according to the plans which they may recommend," and to report in full on all these points "on or before the fifth day of February next." On the twenty-first of January the resolution was read twice in the Senate, and, if it passes there, it must go to the Assembly for concurrence, so that, supposing other business to be suspended, and the resolution pushed through with all possible expedition, the Commissioners will have, at the utmost, twelve days in which to "make a thorough examination of the building," concretize "modifications or changes in the plans," and prepare detailed estimates of cost, not only of the cost of changes at all the work remaining to be done under the existing plans and specifications. It ought to be unnecessary to say that any plans or estimates prepared under such conditions would be perfectly useless and ridiculous, but as the New York Legislature has now spent a hundred millions of dollars in taking the structure of the building, year after year, on just this system, it would seem there are some people who still need to have the lesson impressed on their minds that to employ four independent architects on the most important structure in the State, to accept, without expert advice, designs from each, which, after they had been half carried out, the others are employed to demolish and replace by something else; to leave all the architects in the dark as to what each is expected to do, and, after each has done a great deal of work which turns out to be in his colleagues' province, to appoint some one else to execute a miscellaneous mangling of the entire assortment of designs; and finally, to disgust all the architects by shabby treatment, and, finding their zeal chillied, to seek a substitute for it in a succession of commissions of all sorts, is not the way to secure either rapidity or economy in building, whatever other objects may be attained.

It would hardly be credible that the Albany Capitol, even in its present unfinished condition, is by far the most costly building of its character. The estimate, of course, is guesswork, but I assume the estimate for the successions, and of the expenses. The Capitol at Washington, from 1793, when its cornerstone was laid, up to 1878, had cost, including all expenses of repairs, supervision, furnishing, alterations and minor items, less than thirteen millions, and in eighty-five years of constant use all the furnishing, and much of the structural part, must have been several times replaced. The Patent Office has now cost nearly as much, but this, we suppose, includes rebuilding after the disastrous fire; and the Treasury, a more expensive design than the Capitol, has cost seven millions. Of the other seats of the ocean, the architectural wonder of the century is the Palace of Justice at Brussels, the largest known building in the world, which covers two hundred and seventy thousand square feet, or nearly twice the area of the Capitol at Washington, with a mass of sculpured and polished marble, and cost, concurred in by nineteen foreign countries, is estimated to cost about twenty millions. The palace stands on the edge of a precipice, so that the foundations were enormously expensive, yet the whole was finished complete for ten million dollars. Undoubtedly, building is somewhat cheaper in Belgium than in Albany, but the real reason why the people of Brussels got at least four times as much as those of Albany for about half the money is that they had sense enough to select a design carefully, to employ its author honorably, to pay him properly for his services, and to let him carry out his plan without blundering interference, and without upsetting his calculations, and those of the contractors, every few months by neglecting to make appropriations, or by letting loose upon the work a new set of commissioners with power to change everything at their own sweet will. Whenever the New York Capitol is finished, it will be inaugurated, not with the rejoicings of Buenos Aires, but from the proceedings of nearly every one who has ever had anything to do with it, including the tax-payers. The various architects, who have worked harder, and brought more knowledge to their task, than any one else, have suffered most. The late Mr. Richard- son, to whom, we may well say, the Capitol owes most of its fame, did some of his best work for it after his tiny salary had been cut down, by a vote of the Legislature, to a sum which would not much more than pay for the paper and ink used for the drawings. He nearly decided, as he told us at the time, to resign, but other work came in, from the proceeds of which he could pay out of his own pocket the draughtsmen who were helping him to endow the State of New York with a structure to which Mr. Freeman awards the highest praise that he bestows on any modern building. We can wish for the public the professions of art for art's sake, the successions, the better than that such transactions may for the future be impossible in connection with public buildings. There is good reason to hope that our architects have nearly done with submitting their work, and their fortunes, to the whims of persons
who know, and care, nothing about their art, and when they have fully made up their minds in this respect, they will be in a position to demand such treatment as their brethren abroad receive in return for services no more valuable than their own.

A DECISION has just been rendered in Ohio which will, we hope, serve to encourage in the managers of trades' unions a little more decency than they have hitherto shown in regard to the means which they employ for coercing employers to do what they have a grudge. A firm of contractors in Cincinnati happened in some way to offend the Bricklayers' Union. This is by no means a difficult thing to do with most trades' associations, as the income and influence of the leaders is dependent on the frequency and ferocity of the strikes and the pressure and power which they found, as usual, a trifling work. Misunderstanding was nursed into a struggle which was carried on for ten months, with the help of all the cowardly weapons that the modern "Knights" delight in.

The first step was to induce non-union men to leave the firm's employment, and to threaten those with vengeance who should take their places. This was followed by appeals to persons who had contracts with the firm to break them, and to dealers to refuse to sell materials to them. Notwithstanding all these malicious proceedings, the firm prospered, and the Union managers had the usual circular printed and distributed among them, informing the public that the firm employed unskilled men, and did inferior work as contractors. At this point the firm thought the matter had gone far enough, and appealed to the law. By the time it had heard the testimony, the jury was unanimous in a verdict against the plaintiffs. The question that it considered was the amount of damages that should be awarded. Naturally, the actual loss that a person or a firm suffers from such foul attacks is, in most cases, incapable of exact estimate. The law does not allow the jury to take a handsome sum from the officer of the corporation and consider it as a consolation for the injury done to his feelings; it can only award such a sum as will reimburse him for his actual loss of business or reputation; and it is not surprising that one juryman thought that seven hundred dollars would pay for all the actual harm that the Union was able to inflict, while another thought it would be a trifling sum to suffer, and considered that thirteen hundred dollars was a fair amount to award. Finally, these diverse views were harmonized, and a verdict was brought in for thirty-seven hundred dollars, twenty-seven hundred of which the jury thought was a fair estimate of the pecuniary loss caused by the publication of the circular, while it considered that one thousand dollars would pay for the damage due to the previous proceedings. The next thing will be to collect the money. Like private persons, unions which have no property can damage other people's business as much as they like, secure in the knowledge that no one can ever suffer from their actions. And, if we bear this in mind, the execution had been issued the financial condition of a good many unions would be found less flourishing than their treasurers' reports indicated. Perhaps a good way would be to ascribe a statute, under which, in the case of such wanton mischief as that inflicted by the Union, in default of the Union, in default of the Union, the money might be collected from the suffers. After all, the damage they had caused, might be sold as slaves for a limited period, and the proceeds of the sale applied to satisfy the judgment. This method of disposing of the cases would have two advantages. Not only would justice be secured in favor of the person aggrieved, but the unscrupulous would have an opportunity for practising useful industry, such as they seem to find it difficult to meet with under ordinary circumstances.

The people who live near oil-wells and salt-works ought to take warning from the fate of some villages in England, in the county of Cheshire. According to the Builder, the property-owners in the town of Northwich have petitioned the Government and the Royal Commission to see that the damage which has resulted from the working of the salt-mines in the vicinity. The surrounding district, like that about Syracusa, in New York State, is filled with wells, from which are pumped enormous quantities of brine, containing about twenty-five per cent of salt. The brine is covered by a layer of mud, but a million tons of salt are thus manufactured in Cheshire every year, and sent away to all parts of the world. The removal of all this matter from the subsoil causes settlements, which have been more serious and extensive this year than ever before. In the region about the village of Winsford more than one hundred acres of land have sunk, and are now covered with water to a depth of twenty feet. The Winsford market has sunk thirty feet, and one of the houses in the village has gone down so far that only the top of the roof is now visible above ground. Throughout the entire region, streets, houses, bridges, and gas and water pipes are moving so rapidly that continual rebuilding and repairing is necessary. The memorial reports that the salt-mines have undermined the houses, the salt on which the houses of the citizens rest, and keep the money; while the citizens themselves not only have to spend large sums in rebuilding their own dwellings, but are taxed to repair the highways and other public property; and it prays that an impost may be laid on the salt trade sufficient to pay the damage caused by its prosecution.

The British Architect gives some figures from the reports of the public gas companies in England which are interesting. In many cases there are no difficulties in obtaining gas, charge fair rates, and appropriate the profits to public improvements; but there is certainly a surprising difference, either in the circumstances under which the gas is distributed, or the economy with which the manufacturer is carried on, which shows itself in a great variation in the profits derived from the business. The lowest price charged for gas in 1887 was in Plymouth, a small city in Devonshire, where it was sold for forty-two cents per thousand feet, and at this price the year's business earned a dividend of thirteen and one-quarter per cent on the capital invested. The highest price charged was a dollar and eighty cents per thousand cubic feet, in Watton-on-the-Naze, and even at this rate no dividend was earned.

The Royal Academy of Science of Turin announces that the prize founded by the will of Dr. Cesare Alessandri Bressa, amounting to twenty-five hundred dollars, and awarded to authors and inventors of all nations, will be awarded at the end of December, 1890, to that competitor who shall have made the most important and useful discovery, or published the most valuable work in physical or experimental science, natural history, mathematics, chemistry, physics, or art, with some point in geology, history, geography, or statistics. The prize will be awarded by the Academy of Turin, and all its members, resident or non-resident, are excluded from the competition.

Visitors to Europe this summer can entertain themselves in London by visiting the Spanish Exhibition, which is to open there in April. The President of the Exhibition Company is the Duke of Wellington, who ranks as a Spanish noble, and the affair promises to be interesting. Among other things, a magnificent bullfighting ring will be built, and the Restoration bullfights will be shown daily. It is said that these will be free from the cruelty usually accompanying them, so we suppose the bulls will have their horns cut off. A special point will be made of the costumes of the various provinces, and natives of Cordova, Salamanca, Granada, and the Basque provinces will be seen in their native villages, engaged in the sports or occupations peculiar to them. In manufactures Spain is not particularly rich, but Cordova leather, Toledo steel and damascened work, laces, and cigars, will be exhibited.

Mr. Sanders, of St. Petersburg, has revived, in a modified form, the old Lienau pneumatic system of sewerage, with improvements that seem to make it practically available in many cases where the other is not. Under the Lienau system the entrance of water into the sewers is as unavoidable as manure; and cleanliness does not suffice to keep the house-drains of Amsterdam, exhausted periodically by suction, but not flushed, sweet enough for American taste; but the Sanders system encourages the use of water, disposing of the matters with which it deals by means of ejectors, which will transform the sewerage into a pure outfall, but work more freely with liquids. It is probable that when a severe epidemic of diphtheria shall arouse the public again to the importance of sewerage in our inland towns, disposal by irrigation will be generally preferred. In this case there will be many improvements needed in the methods of conveying the sewage to the irrigated fields. The pumps, settling tanks and stand-pipes which have hitherto been employed are cumbersome and expensive, and a good system of ejectors, buried far enough underground to be out of reach of frost, and operated from a central station, might be less troublesome, as well as more efficient than tanks and stand-pipes.
BUILDERS' HARDWARE—XVII.

LOCKS.

ANY one who should visit the mediæval museums of Europe, and should take the trouble to see among the curiosities of iron—work some of the elaborately wrought and apparently intricate locks of the fourteenth, fifteenth and sixteenth centuries, would hardily think of comparing those unwieldy and cumbersome devices with the locks that are turned out in such quantities by our best modern manufacturers. And yet, if the older contrivances are examined attentively it will be seen that the difference between the old and the new is one of finish and delicacy, rather than of idea or mechanism; and that, with the exception of a few noteworthy inventions for obtaining a greater security against picking by an ordinary thief, the locks of to-day are exactly the same, in principle and arrangement, as those which were made centuries ago. Indeed, it is rather strange that with all the inventions which have been made during the nineteenth century and especially within this generation, and notwithstanding the inventive genius which American industry has brought to bear upon the subject, the Yale system should be, after all, very nearly the only invention of practical utility which is a direct departure from the older methods of lock making. Probably a large proportion of the readers of this paper can distinctly remember the time when pin locks were almost unheard of. It might be said in explanation of the seeming fruitlessness of mechanical research upon this subject, that there was really very little that could be discovered or improved upon, as the real principle of a lock is so simple and too definite in its nature, not to have been thoroughly appreciated and exhausted long ago; but the same could have been said before Linus Yale brought his Yankee wit to work upon the subject, and it would be impossible at present to foretell what discoveries may be made or what radical changes brought about in the appliances for locking our doors. Possibly our descendants may some day wonder at the locks of the nine-teenth century, even as we wonder at the cumbersome pieces of mechanism and the ponderous keys of our great grandfathers. At any rate, we will not do to claim that what is perfect, or that the record of progress is entirely closed. A very few years ago the Yale lock was pronounced to be complete; but some very radical improvements have been made in it since then, and the opponents of the system claim it has yet many defects both in construction and style. So it would not be strange if our best locks should one day become obsolete.

But if the progress which has been made in the essential, mechanical principles of lock manufacture is small, the improvements in finish and the reduction in the cost of the locks have been marvelous. Less than a century ago, locks were made entirely by hand, and very crude affairs they were, too, costing a great many times the price of a better article of to-day. At present, good, well-made, well-planned locks can be had at prices varying from twenty-five cents to five dollars, suited to all needs and all conditions; while the amount of real security afforded is of a much more tangible nature. And with the improvements in niceness and delicacy of arrangement, it has been possible to affect a change in the style and weight of the keys which the present generation can only faintly appreciate. The old-fashioned keys were heavy, cumbersome, and so large that no one ever thought of carrying them about the person. Now they are made so small that the keys for an entire house can be carried in one's vest pocket. Formerly the strength of a lock was judged by its weight, and it was considered essential to have heavy bolts or levers, and strong springs, requiring considerable force to operate; while now, all the parts are so well adjusted and so light, that a touch is sufficient to put the mechanism in operation.

The fundamental principles forming the basis of all locking constructions, include a bolt which is moved by the direct action of the key, while secondary bolts or levers drop into such positions that the lock bolt cannot be forced back except by breaking some portion of the mechanism. The secondary bolt is usually termed a lever, and either acts by gravity, or by the aid of a spring—usually by both. The key is so made as to first raise the levers, and then to shoot the bolt by a single turn of the hand. These principles have governed the manufacture of locks since the days of Adam, and apply equally to the ponderous locks of the Middle Ages and to the corrugated-key locks of the Yale & Towne Manufacturing Company. Complications have been added to the construction of locks in the shape of multiple levers, requiring nicely fitted keys, or fancy wards which would allow none but the right key to enter; and there have been special forms devised for bolt uses, working by combinations of letters, by dials, or by clockwork; but in the locks used about an ordinary house, the principle is always the same—that of a key simultaneously lifting one or more levers and moving a bolt.

In order to clearly illustrate the antiquity of the principles upon which modern locks are constructed, it may be of interest in this connection to refer to a few of the older forms. A rude style of lock which has been used in Eastern countries for ages, no one can say how long, but certainly for over two thousand years, is approximately shown by Figure 277a. All the parts are of wood, including the key. The bolt is channelled on the inner edge, and slides through heavy wooden staples in which are arranged a number of pegs, of varying lengths, fitting into corresponding holes bored through the top of the bolt. The key consists of a flat piece of wood somewhat smaller than the channel which is cut in the bolt, and in use, is inserted lengthwise of the bolt. On the end of the key are pins spaced to correspond with the pegs in the staple. It is evident that while the pegs are caught in the bolt itself and in the staple, the bolt cannot be moved; but when the key is inserted, the pins will be directly beneath the holes in the upper part of the bolt, and by raising the key, the pins will lift the pegs just enough to clear the joint between the bolt and the staple, and the bolt can then be moved at will. In this lock, the action of the key is almost exactly the same as in the Yale lock; namely, to lift a series of pins of unequal lengths so as to bring the bottom of each on the same line, though the Yale key has other functions, as will be noted later.

Figure 278 shows a key which was dug up in Pompeii. It was evidently intended to operate a warded lock, a style which was in almost universal use up to thirty years ago. Figure 279 illustrates a fine old Elizabethan lock. This could be described as a fully-developed lever-lock, the springs on the levers being arranged in exactly the same manner as the locks which are sold over the counter to-day. Strip-"
The various parts of a lock will need some definition and explanation, in order to prevent any ambiguity in the terms. Figure 280 shows the general shape of the ordinary key, in which A is called the bow; B, the shank, and C, the bit. The difference between the keys of to-day and those of two or three generations ago has been already alluded to. Many of the hand-made locks are still provided with the old-fashioned, heavy brass keys, but the "Tale" locks have prejudiced people against anything but a flat key, and nearly all manufacturers use them in one form or another. A few lock-makers have keys which are arranged to fold up like a knife, to be used in connection with rimlocks, or with locks requiring a very long key, but generally the key is of nickel-plated, with a flat shank and a thin bit. When the cuts on the bit are on the side or edge, as shown by the cut, it indicates a tumbler or lever-lock, while cuts on the top or bottom show that the lock is fitted with wards. Many of the old keys preserved in museums are made with very elaborate bits, cut in curious and intricate patterns. In some instances the cuts correspond to equally intricate wardings in the lock, but generally they are purely fanciful. When the shank of the key is tubular, it indicates a lock which can be operated from one side only, such as those used for drawers, etc. All keys for door-locks now have solid shanks.

The bolt which secures the lock, is generally made quite heavy where it projects beyond the face-plate, but is thinned down inside so as to be as light as possible, and to give space for the levers. The talon, A, Figure 281, is the notch in the under side of the bolt in which the key works. The post, B, is the part which catches in the levers, preventing the bolt from being forced. Guide-posts on the case of the lock fit in the slots, C, one of the same posts often serving as a pivot for the levers.

The most primitive form of lock would be one consisting simply of a bolt, which is shot back and forth by the key. But as any other key or even a wire would answer equally well, some obstacle must be interposed to prevent picking. This is done by connecting the bolt with a series of levers or tumblers which permit only the proper key to be used. The two terms are used at present synonymously. Figure 282 illustrates a typical lever. There are from one to five levers in an ordinary lock, and they are usually placed one over the other, pivoted over the guiding-post, and the bolt-post is so arranged as to fit through one of the cuts, A, when the bolt is thrown back, and through B when thrown out. The connecting gatings, C, are cut at different heights, so that the levers may be lifted unequally in order to turn the bolt to move. When the key is turned in the lock, the bits, which are cut to match the levers, bear against the bellies, D, lifting the levers simultaneously until the gatings are exactly on a line with each other. The key then catches in the talon of the bolt, the bolt-post passes through the gatings, and the levers drop as the key turns, catching behind the bolt-post and effectually preventing the bolt from being forced back. This is, generally speaking, the function of all lock-levers, though there are many variations from the form in a few locks.

The levers, of course, slide one over the other, and in common locks they are laid closely together. In the best of hand-made work, however, and in a few of the machine-made locks, the levers are separated, either by side-wards cast onto the thickness of the lever, or by intermediate strips of brass which bear on each other and on the levers only at certain points, thus reducing greatly the friction between the parts.

A somewhat different form has been much used in English locks, which is shown by Figure 283. In this case the levers are beneath the bolt. On each is a post which works in slots and through gatings cut through the bolt. Price, in his "Treatise on Locks," which is a very valuable and interesting work on the subject, as it was understood up to 1860, makes the distinction between levers and tumblers, applying the latter term to the device shown by Figure 283, and the former to that illustrated by Figure 282. His distinction seems to be a fair one, though seldom made in this country, where what he calls tumblers are little used.

A little reflection will cause one to comprehend the number of changes possible in a lever lock. The levers may be transposed, and within certain limits the heights of the gatings may be varied, so that with six levers there can be as many as 7,776,000 changes, two of which can be of the same key. Simple transposition, without any variation in the heights of the gatings, will give 720 changes. Among the many forms of locks, intended not only to increase the difficulty of picking but also to show if the lock has been tampered with, it consists of a spring so arranged that when one of the levers is lifted too high, as would naturally be done by any one attempting to pick the lock, it is caught and held in such a position that the bolt-post cannot possibly pass through the gatings. The spring is released by raising the key and turning the bolt out more, but no key can unlock the mechanism until the detector spring is released. This is a very ingenious arrangement, and at one time was considered as absolutely burglar-proof, though it is now very seldom met with in the market. 1

The wards of a lock are fixed obstructions which are attached to the inside of the lock-case, so arranged that none but the proper key can pass and reach the levers. Formerly the confidence in warded locks was so great that levers and tumblers was used very little, but that feeling has entirely passed away. Modern locksmiths use wards very sparingly, and limit themselves to small shoulders or ridges, cast on the inside of the upper and lower case-plates, which require corresponding cuts on the upper and lower edge of the key-bit. They do not add in the least to the burglar-proof qualities of a lock. At one time, however, locks were constructed with very elaborate wardings. Figure 284 illustrates the wards of a French lock about one hundred and fifty years old.

The wards consist of two brass plates, one each side of the key-hole, with a series of ridges forming a semicircle on each, the ridges being star-shaped in section. The key-bit is cut out with a star pattern which has to exactly fit the wardings.

This is one of the simpler forms which the ingenuity of French locksmiths at one time delighted in, and though seemingly proof against intrusion, can be overcome with very little trouble, by a judicious use of a few stout wires.

There is a great difference in the quality and arrangement of springs used in connection with a lock. In regard to material, the best is, undoubtedly, phosphor-bronze, but springs of this material require to be so large in order to have the desired stiffness, that their use is not always practicable, especially as they can be used to advantage only in the shape of flat-bands. The springs, which hold the levers in place against the bolt-post are usually made of round steel or brass wire and are attached directly to the back of the lever, as shown by Figure 285. A separate spring is necessary for each lever. It is sometimes desirable to attach the spring to a secondary lever acting directly on the top of the main lever, Figure 286, as in a case where the levers move up and down in the lock instead of being pivoted together. With such an arrangement the edge of the secondary lever is shaped so as to fit over the top of the primary lever, thus obviating

---

1 This work is entirely out of print, but can be found in most of the larger public libraries. It is complete and thoroughly illustrated.

2 The detective-spring was an important feature of the celebrated "Chuckie" (English) lock.
any difficulty of the levers slipping by each other, or of the wrong springs acting on the levers.

The latch is a feature of the modern lock which our ancestors did not enjoy. Except in the case of store-doors, all door-locks are now made with some form of spring-latch. There are three distinct kinds of latches commonly used, the simple spring-latch, anti-friction latch and front-door latch. The cheapest form of ordinary spring-latch consists of a bevelled head, projecting from the face-plate of the lock, with a shank inside the lock, about which is coiled a strong spiral spring, keeping the latch pressed out. The inner end of the latch-shank is forked and hooks under each side of what is termed the follow, through which passes the spindle of the door-knob. Turning the knob either way draws back the latch. The objection to this arrangement is that while only a very slight spring is really necessary to keep the latch in position, a pretty strong spring is required so that the knob shall not turn too easily: otherwise, every time the door-knobs were touched the latch would be opened. Consequently in the better class of work a door-latch is usually fitted with two springs, one of which is operated when the latch is pushed back by the door being closed, while both springs are acted upon when the knob is turned.

In this way the requisite resistance can be obtained for the knob, and, at the same time, the latch will close easily. A latch so arranged is termed an easy spring-latch. There are several methods of attaching the two springs. Ordinarily, spiral brass springs are employed. Hopkins & Dickinson and, we believe, a few others, are able to introduce into their locks spiral-springs made of phosphor-bronze, which, it is claimed, will keep its elasticity much longer than steel or brass. The different methods by which the springs are attached and the knob operated will be made clear when the various makes of locks are described, later on.

The ordinary form of latch is made with a V-shaped bevel, the long side of the bevel striking against the jam-plate. Enoch Robinson, of Boston, was, it is believed, the first to patent an anti-friction strike, as it is called. Figure 286 illustrates the construction of his device, which is incorporated into all of the locks which he makes. It is simply an application of the principle of the old bell-lever crank. The action of the anti-friction strike is to raise the latch-bolt from the bed of the lock and carry it back without friction on the sides. Actual tests have been made proving that it requires less force, in the direction on this side of the anti-friction strike, to force the lever back, than is required to push back the latch by straight pressure against the apex of the 'bevel.'

Figure 287 shows a form of anti-friction strike used by several other manufacturers. There is no difference in principle between this and the "Robinson" make, though the appearance is a little different; the "Robinson" strike being in the centre of the bolt, while the others are on one side, also in "Robinson's" strike the pin is on the latch and the slot in the strike, while in the other anti-friction strike they are exactly the reverse. Figure 288 shows a form which is made by a few manufacturers, being listed in the catalogue of both J. B. Johnston and the Nashua Lock Company. It consists simply of a steel rocker attached by swivel pins to the bolt, the lower pin passing underneath the shank of the bolt. When the door is closed the latch, instead of moving straight back, swings on the lower edge of the rocker, being lifted from the lock-frame, and thus reducing the friction. The gain by this device is, of course, less than by the others previously described. Yet another form of so-called anti-friction strike is made. Figure 289 shows the Boston, for his spring-latches.

It consists, essentially, of an adaptation of the well-known car-door latch, the latch-strike being hinged at the base and attached by a loose-pin to the latch-shank at the top, while the face of the latch-strike is curved slightly. This device makes really a very efficient anti-friction strike. The only objection to it is that the wide plate necessitated by it cuts the door a great deal, and many persons do not like it on that account.

The custom in regard to latches varies in New York and Boston. In New York the outside knob is generally fixed firmly so as not to move at all, while in Boston the knobs are arranged with a swivel spindle permitting either to be turned without acting upon the other, and the mechanism inside of the lock is so devised that by pushing a button or a slide the outer knob can be held fast. In cheaper forms of front-door locks, the knob-spindle is made without a swivel, and security is obtained by a bolt on the inside.

Latches are designated as being either right or left hand, though the distinction is one which is confined entirely to the latch. A left-hand lock belongs to a door fitted with left-hand hinges, as has been previously explained, the term right or left being decided by whether the door turns on the hinges when opening in the direction of the hands of a clock or the reverse. Locks are also designated as being either left or right hand reverse bevel, the reverse bevel applying to a door which swings out instead of swinging in. That is to say, in the case of a front door, for instance, if it swings out the right hand latch would be on the outside, but the latch bolt would be just the reverse in arrangement from what it would be, relatively, on an ordinary front door swinging in.

Figure 290 will fix this distinction clearly in mind. The figure is taken from the catalogue of the Yale & Towne Manufacturing Company. It is believed that the distinction between right and left, and reverse bevels is seldom appreciated by architects. 
It is very often desirable to have a latch which can be reversed so that if any mistake is made in ordering, the lock will not be useless. Reversible latches are made in several ways the latch shank being generally of such shape as to permit its being turned over and worked in the opposite direction, without interfering with the action of the lock.

Locks wear out not so much by actual failure or breaking of the parts, but by the lever and key wards being worn so that the key will not lift the bolt to pass. Key-wards are the slight projections which are cast on the inner face of the lock-plates to form an additional obstruction to the passage of strange keys. Of themselves they affect the value of a lock but little, as the key will operate as well without as with them, so that the part which actually wears out is the edge of the levers against which the key acts. The question is striking and interesting, when a lock is used continually, will in time wear off the surface of the lever so that it will not rise quite sufficiently to allow the bolt-post to pass. The springs, also, sometimes become brittle, and the bolts operating the latch will wear so as to work loose and rattle, but a little tinkering can remedy any of these difficulties. It costs but a trifle to have a new key made which will fit a partially worn-out set of levers. New springs are inserted at a trifling cost, and if the latch-spring is lengthened a trifle the rattling of the following can be obviated; so, there is, really, no reason why a fairly good lock should not last indefinitely. It is, also, a very simple thing to make a new combination of the levers when they cease to work smoothly, and renewed life can thus be imparted to an apparently worn-out set of works.

In judging the intrinsic worth of a lock, therefore, the following considerations should be carefully observed:

First: Good material for the use to which it is put.

Second: Careful adjustment, so that the parts will work easily and will stand any possible strain in use.

The secret of the value of a lock is in the levers, which should be so made as to ensure a minimum of friction, of material not easily corroded nor easily worn away; and they should be adjusted to secure the greatest amount of security against picking, with springs not too easy, nor so hard as to strain the levers.

A very good test of the workmanship of a lock can easily be made by shooting out the bolt, removing the cap to the lock-case, and then pressing in strongly on the bolt, at the same time lifting the levers, one by one. If the gatings are accurately fitted they should all bear equally against the bolt-post, so that the gating of no one lever would catch on the post as it is lifted by. Few of the ordinary locks will stand this test successfully.

Intricate combinations, made ostensibly to prevent the lock from being picked, add very little to its value for ordinary house work, may be safely disposed of. Any lock can be picked which is operated by a key, so that a good three-lever lock affords all the intricacy and gives one all the protection that could be desired. A lock has a personality of its own, and so much of its value depends on the maker that it is wise in purchasing to always get the best; keeping in view simplicity, and the points previously noted. A cheap, but well-made lock is better than an expensive one which is put together in a careless and indifferent manner.

[To be continued.]

**ILLUSTRATIONS**

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

**The American Architect and Building News.** [Vol. XXV. — No. 684.]

**HOUSE AT ROCHESTER, N. Y. MR. THOMAS NOLAN, ARCHITECT, ROCHESTER, N. Y.**

**SLOW-BURNING CONSTRUCTION.**

In order to meet the frequent calls for plans for the safe or slow-burning construction of office-buildings, dwelling-houses, and other buildings in the factories which come under the supervision of the Mutual Companies (such demands have more than once been made in case of lock-shops, and hospitals), certain studies are herewith presented which may be a good basis for suggestion and for further improvements.

These plans, even if they prove to be crude and imperfect, will certainly assure greater safety than can be obtained with the present form of churches, schools, and hospitals are built according to the common practice of combustible architecture.

The ordinary method of building a wooden dwelling, hospital, or the like, consists of a series of wooden cells; the walls constitute another series; the roof is the worst and most dangerous of all; the cell costs, with the material being connected in some more or less open way with all the rest.

Provision is made in many contracts for cutting off the communication between the cells of the main floor and the vertical cells in the walls, either by means of a layer of sand between the sill or by some other suitable means; the intention of these safeguards being to prevent either vermic or fire passing from the cellular thickness of the walls to the cells in the first floor, and thus throughout all the floors and partitions to the roof. These provisions of the contract are excellent on paper, but, when left to the average supervision of the architect they are apt to fail; the mice almost always find a way through the smaller cracks, and the rats follow; the fire also finds its way everywhere through all the cracks with the utmost facility. The writer knows from personal experience that even if the best precautions be put into the contract, and even if the work be supervised day by day by the owner himself, all the customary devices may utterly fail to keep rats and mice out of hollow woods.

But even if the common contract precautions suffice to keep vermin from infesting the house, yet the customary plan of construction utterly fails to prevent the passage of fire from cell to cell, and through the same cracks by convection, resulting in a constant circulation of air. This circulation of air, although it may be slow and somewhat obstructed, yet practically destroys the value of the air-spaces in the walls, which walls are assumed to be non-conductors of heat because of this air-space. It is admitted that, if air be encased in a substantially tight cell free from circulation, it may be one of the very best non-conductors of heat and cold; but the air-spaces in the walls of a wooden building, as ordinarily constructed, are nothing but a fraud; there are small open-air ducts connected by cracks and crevices everywhere.

It is generally assumed that the air-space is in the nature of things one of the best of non-conductors, without much regard as to how the air is caused; but the error of this assumption was disclosed by the experiments which were made at the instance of the writer a few years ago for the purpose of determining the conditions most favorable for preventing a loss of heat by radiation from steam-pipes. In the course of this work, which was of the most thorough nature both to the sanitary and thermal aspects, the exact nature of the materials tried, it was found that an air-space was a very good conductor of heat by reason of circulation by convection, which resulted and effected a very rapid transfer of heat; on the other hand, the air-spaces in the walls of a wooden building, as ordinarily constructed, are nothing but a fraud; there are small open-air ducts connected by cracks and crevices everywhere.

It may be interesting to cite the fact that an air-space would transmit a quantity of heat represented by the number 1302, the radiation of heat through wood, and similar substances, as computed by the numbers 301 to 237, according to the amount of pressure applied to it. Charcoal was found to be subject to about the same rule as wood. The application of these results to the construction of buildings leading to the conclusion that the most non-conducting of heat may be attained by cutting up air-spaces in such a manner as to prevent circulation by convection, or by the combination of one air-space with another.

An effort has, therefore, been made to make framing-plans and specifications, which are submitted herewith as studies of the question, for the construction of the class of buildings under consideration, in which the timbers shall be so arranged that the builder will be obliged to go out of his way and to work on an entirely different framing-plan, in order to connect one cell either in the floor or wall with any other cell in any other part of the building.

To the motive

---

1 Circular issued by the Boston Manufacturers Mutual Insurance Company.
Associated Mutual Insurance Cos.
Plan for a Slow Burning Wooden Church.

Plan:
- Panel
- Panel
- Fixed sash
- Panel

Inside Elevation:
- Floor beam
- Panel beam

Note: Plaster is shown in solid black.

William Archdeacon.

Section:
- Foundation
- Capstone
- Hollow brick wall
- Window stool
- Tie beam

Note: Panel to be anchored with wall.
Associated Mutual Insurance Cos.
Plan for a Slow Burning Brick Hospital or Dwelling

If the building is of considerable size, the ends of the beams should rest on Box Plates.

Floor Beam 10" x 6"
A half-inch air space must be left at both sides of the beam for ventilation. This will render one special provision necessary, to wit: a plate of tin or sheet iron under the mud plank over the end of beam, to cut off live or mice.

Horizontal Section at AB
A STREET IN QUEBEC, CANADA, SKETCHED BY R. BROWN JR., ARCHIT.
A STREET IN QUEBEC, CANADA. SKETCHED BY R. BROWN JR., ARCHT.
Associated Mutual Insurance Cos.
Plan for Building a Slow Burning Dwelling House.

If the hearth is made of one and a half inch on the inside of walls, and one inch on the outside of walls, if planed, as writing will be smudged.

Dining Room
Kitchen
Parlor
Chamber
Porch

Plan Type Studying
"Boston"
is to compel the builder to do his work well in this particular, even if he does not care to do so, or might not know how.

The framing plan of the proposed dwelling-house has been made by a student of architecture (Sketch No. 1), and a framing-plan and method of plastering for a dwelling-house have been devised under my own directions. Although some improvements to the plan of the dwelling-house are respectfully suggested, it is thought that the framework of the church, it is suggested that there is no reason why there should be any new obstacle to the downward passage of sound; therefore, the money customarily expended in sheathing or plastering the underside of the joists and the open-iron or timber-construction may be adopted on this story in any and every case. If this floor is made of two-inch plank grouted with mortar, the same will be quite as comfortable as when the bottom is of sheathing-paper, and then finished with a good, hard-top-floor, brick preferred, the cold air of winter may be permitted to circulate freely through the cellar or basement without any danger of passing up through solid floors, to the discomfort of those who occupy the stories above, and the upward passage of sound will be very slight. If the heat required in the main floor or story be brought in near the centre of each room a little below the ceiling, with right provision for ventilation, the floor will be well warmed at any and all times; while, on the contrary, if the heat be brought in through registers in the floor, it will rise and accumulate near the ceiling, while the lower part of the floor, which is the commonest, will remain cold. Under the common conditions of bringing the heat in through registers in the floor, there will be nearly stationary planes of different density, which would be a great discomfort to the occupants. In this way, as it consists of sheathing, or sheathing-paper, and very little in the upper one, while by the overhead system there may be a very free circulation; even basements with stone floors, which have been in use in many factories, can be very well finished, and steam-heating-plants can be placed in the usual way at the sides of the room, near the doors, having been converted into useful rooms, with warm floors, by merely changing the position of the same heating-pipes from the sides to points near the ceiling, ten or twelve feet from the windows.

To return to construction: even if the mill construction is considered the best interest of the whole house, if it is thought that the downward passage of sound through the upper floors cannot be sufficiently prevented, then the motives of the architect may well be to make use of about the same quantities of timber and board which are now required in ordinary framing, but so disposed and so consolidated that, without requiring much more material, the cells in walls, partitions, floors and roof may be absolutely separated each from the other, the frame being at the same time made still more, if not better, in every way; the substance of the roof also made thick enough to save the attic or upper story from being an oven in summer and a refrigerator in winter. To this end the plans of the dwelling-houses are for the sake of the windows, and floor-beams may be 10 x 6 inches; studs, 4 x 6 inches, placed five feet on centres. These sizes may be substituted for the ordinary plan of a 2 x 4 inch frame, which is made of fir or pine, as little or no increase in the quantity of material required in the lower story; the second story is drawn in the ordinary way. The nothing being the foundations, placing the sill thereon, and the method of adjusting the girders and posts, are so devised that even the most uninitiated builder cannot connect any number of cells anywhere without using more ingenuity than he usually employs in ordinary framing, or connecting the cells with such connections. The diagonal furring and lathing covering the wall into a truss, strengthening the building, and this system of plastering on the lower story, also lends itself to the separation of the cells in the best manner.

If the second story should be built of 2 x 4 studs, bored and not planked, one special provision will be called for to cut off the second-floor cold from the first. The second story, too, should have blocks between the studs; but even if this were neglected, little harm would come from it, because there is no open way from the first to the second floor. It may be suggested that a cheap method of making small wooden dwelling-houses much safer from fire, and also warmer in winter as well as cooler in summer is to fill-in between the studs, and then the air within this filled cell ashes should be mortared, just enough mortar being used to bind the material. In this way many buildings of bad construction have been made safer, and the growth of cold from the ground, and the drift of cold from the floor is entirely stopped. Those who have discovered after the spaces between the studs set up inside of brick walls with a view to the supposed non-conduction of an air-space, that their buildings have been made much warmer in winter, cooler in summer, and better after the air spaces and the heat had been poured from the top into these spaces between the studs; than they were before this precaution had been taken.

These plans and specifications are submitted as primary studies only, subject to suggestion and to improvement. The same problem needs to be solved for the construction of brick dwelling-houses and offices, as well as those and the steel which supports the roof. Boston and the customary forms of contract call for insubstantial stops at every floor, behind the furring or lath board. In the plan of the house, as had been the case with many of the houses, or offices constructed under the present system are there not a number of more or less open ways, by which vermin or fire will be spread from floor to floor? Cannot some framing or floor-plan be devised by which the ignorance of the builder, and the want of workmen or contractors may be rendered incapable of opening a way for fire, except at an increase of the cost or of the work? The suggestion of the writer sketched here (Sketch No. 2), is to build the walls themselves in such a way that, when the floors and the furrings are placed in position, the projections from the brick wall and chimneys will interfere with the air-spaces, thus making the necessary stops without requiring any additional or special work to be done.

In order to stop the air-spaces which are of necessity left between the brickwork or mortar, and the frame, the suggestion is made that the furrings will be placed in position supported by brickwork, which will cut off any possible connection with the air-spaces in the stories below or above. A horizontal wooden support to the studs is placed lower than the floor, or wall, which is constructed of brick, or blocks, or mortar between it and the bricks), in order to provide for the same shrinkage that may occur in the floor-timbers. The plan may be as follows:

1. With economy.

2. With the rule-of-thumb methods of carrying out plans and specifications the motives of which the builders may not themselves understand, so that the faults in the present methods of construction will be cured without the extra work of putting special stops at each floor. It is in this way that the mutual underwriters have made it impossible for the builder to proceed unless they separate the framing and their plans and methods of construction have been considered and approved, and the underwriters' plans and methods of construction have been approved by the building inspection officers; and this system of conducting and keeping in mind the whole plan of construction, will be most suitable for the purposes upon which they take risks. In the case of the hospital or asylum, again, if the mill floor and open spaces be cut off from the main building in the manner suggested, the basement or the central building, the central common cellular doors may be; but, according to the plans submitted, there may be no direct connection between these cellular doors. It is assumed that when such attention is given to the slow-burning construction of a hospital or asylum as would be implied by giving attention to this suggestion, the same reasoning would forbid any of these, as it is certain that they would permit the building or structure to get out of control, which now render so many of this class of buildings costly, dangerous and unsuitable. The solid deck-roof of pine, not less than three inches thick, would become a necessary element in this plan of construction.

The basement floor had also better be of plank, laid over a properly prepared concrete, in such manner that it may not decay and without any open space between in which fire or vermin can exist. Of such plans for basement floors we have more than one which have stood the test of time. Respectfully submitted.


London's Water-Supply. — A somewhat alarming view of the condition of the water-supply of London is taken by Major-General Scott in his official report published in the annual volume of the Local Government Board. "On a general view of the whole circumstances," he says, "it seems evident that the question of the water-supply of the north and east of London has entered a critical stage, and it may be said that the restriction in the supply found necessary by the East London Company during the past summer [1887] was a premonitory symptom of difficulties and a sufficient indication of the dangers which are already felt." The Board also remarks "that at no very distant period the margin between supply and demand may become perilously small; and that, at any rate, in the case of some of the companies, the question how the existing sources can be supplemented from others outside the waterheads of the Thames and Lea, is one of which the consideration cannot be long deferred." — Full Moon [January].
A Glimpse of Quebec

In the course of the descriptive sketch which I have ventured to bring to your notice this evening, I have diverged too much from the beaten paths in which an architect is supposed to tread; I ought to say, in explanation, that these observations on Quebec are chiefly the result of a brief holiday tour, and not the outcome of any serious study; and, if I become too lurid, I must plead the holiday attitude or present the plea of "general interest" allowable by our rules regarding topics whose relationship to architecture and the fine arts is not apparent.

When the heat of summer makes us long to leave the dusty city and our routine work, a visit to northern climes, to mingle for a time with a foreign race and hear another language spoken than our own—to sojourn in a country whose life and aspect is a perfect contrast to our own—gives rest and health.

Nowhere will the sportsman find a better field for rod and gun than round about Quebec; and to the lover of the picturesque, to the artist in painting, poetry or romance, this northern city gives themes of surpassing interest.

The scenery in the surrounding country is delightful. Other landscapes may be grander, more varied; but none more interesting to the student from the human existence and association wrought for three centuries into the very soil. It has what Matthew Arnold called "the charm of beauty which comes from antiquity and permanence of rural life."

The harbours of modern progress and the effects of increasing commerce have touched this northern capital but lightly. The conservation of its religious life has left the spirit of a bygone century in every stone. In some aspects it is still medi eval. The streets from the country round, gather now in quaint groups in the marketplace, just as they did a hundred years ago. They bring their flowers and fruit full many a mile. Their quiet horses stand in rows beside the wagons looking as much domesticated as the house cat.

Priests and nuns move in groups along the narrow streets or walk in procession on saintly days as in the days of the old régime, and on every hand there is some landmark, some old building to remind us of stirring events in the life of the old colony—New France.

As in the case of the ancient capital of Scotland, so here, Nature has bestowed a site of incomparable grandeur. Abruptly from the noble river rises the rock round whose base clusters the lower town, while higher up the churches, monasteries, towers, terraces and ramparts spring, until we reach the citadel which crowns the lofty summit.

A brief study of the topography of the place shows us at once a natural fortress. From the geologist we learn that the land on which the city stands was once an island, for at Cap Rouge, about eight miles above Quebec, the formation of the rocks distinctly shows that a channel of the St. Lawrence forked northwards, and probably followed the present course of the Charles River. From Quebec to Cap Rouge the bank is formed by towering rocky headlands, the slope on the northern side to the valley, in many places being almost as steep.

From the terrace called Dunham, on a summer's evening as we stand more than two hundred feet above the river, a truly magnificent panorama lies before us. So steeply does the cliff fall away from the terrace that we look down on the chimneys and roofs of the lower town, and wonder how the people there live under the snowdrifts of winter's long reign. The broad, sombre river flows northwards and eastwards from the Isle of Orleans. On the northern shore the eye

on Flavien St.

sous le cap.

On the northern shore the eye

A paper by Mr. Robert Brown read before the Boston Society of Architects.

Friday, Feb. 1, 1900.
around with his collection-box, guarded and shadowed by the verger, resplendent in scarlet and gold, and carrying his insignia of office aloft, I never dropped a coin more gratuitously than the piece at the altar rector in gorgeously embroidered vestments, the acolytes in the attendance, the wafting of fragrant incense from burning censers, swung first towards the altar, then to the choristers and lastly to us, the Abbe' Deschamps, priest of the fons et origo di monte, had knelt the general address. To me the climax came near the close of the service, when the organist, a consummate artist, played slowly and softly, what to my astonished ears was nothing more or less than the old familiar air:

"Waste this dull town to me, Bobadil Addar."  

Laval University, which is near the cathedral, contains a large museum. In one room there is a collection of one hundred and thirty-three paintings, several of which, it is said, were sent to Canada by Abbe' Deschamps, priest of the fons et origo di monte, Paris, who resided a few years in Canada during the French Revolution. He bought these paintings from some of the old nobility who were then leaving France, and sent them to Canada. Among the collection are three by David Teniers, two by Salvador Rosa and one by Tintoretto.

In the seminary chapel which adjoins the university, are a number of valuable paintings by celebrated masters, all unfortunately destroyed by fire on New Year's Day of last year. Some writers in referring to these paintings in Quebec, have been quite sceptical as to their genuineness. I cannot speak from the standpoint of an expert in this branch of fine arts, but my impression was that many of these paintings had all the characteristics of the several old masters whose names are attached to them, and referred generally to the large paintings which are framed and hung on the walls of the various chapels and churches, it is immaterial, when we consider their decorative value and the interior.

After the cathedral, the most interesting chapels are those of Sainte-Marie-in-the-Boule and the Hotel Dieu. At the former you talk with a monk veiled behind a grille, at a barred opening in the hall, and a servant is sent to show you the chapel. The convent was founded in 1641 by Madame De la Peltrie, and afterwards rebuilt in 1686. A monument to the memory of Montcalm is in the chapel, and here lie his remains.

Quebec is a city of contrasts. On a Sunday afternoon I entered the town by the place where once stood the Palace Gate, through which Montcalm rode in hot haste to defend the town. Sounds of primitive music came from a building up the street; the Salvation Army had taken possession. I turned the corner of Laval University, paused, left, and heard a softer strain of music coming from the convent walls. I opened a door and entered an outer garden from which, beyond another wall, I saw through two torches a helmeted statue of the Hotel Dieu. The veil of the nuns rising and falling as they sang the sacred chants. In the chapel, to which visitors are admitted, were a few worshippers; the arched opening to the side chapel was filled with a metal grating which hid the nuns from view.

The early history of Canada, when Jesuit priests went out to Christianize the Indians, is filled with many a martyr's story. There is nothing in all the annals of the Eastern Church to compare with the terrible fate that befell Jean de Brebeuf, a man of noble lineage. It would horrify you were I to relate his torture, yet never old man die more bravely or heroically. "His family sent from France a silver bust of his masque, in the shape of a tower which was a recess to contain his skull, and to this day these are preserved with pious ear by the nuns of the Hotel Dieu."  

One of the most beautiful examples of the French art of the day is the architectural design of the Hotel Dieu. It was the work of a man who was an artist in every sense of the word. The mind that could design such a structure, could not have designed another.

The history of the city of Quebec contains one to suppose that the building and decorative arts never attained to any marked excellence, nor could this be otherwise. The people were too much occupied with religious work and exercises; or else they were engaged in war with the Indians, and later with their neighbors, the British colonists, while the majority of the population were occupied in the forests, tilling the land, the harvests of corn and seed, were but half developed.

The historian tells us that in the seventeenth century the nuns of the Hotel Dieu made artificial flowers for altars and shrines, and adorned the altars of the Church. It is said that the nuns of the Hotel Dieu made exquisite canes, which were sold at a high price and were highly esteemed. The nuns of the Hotel Dieu are said to have made the most beautiful and elegant canes and needles in Europe.

The story of the history of the hotel Dieu is a story of the history of the city. The city was built on a rock, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it. The church was built first, and the nuns were the first to occupy it.
The American Architect and Building News. [Vol. XXV. — No. 684.]

The barns in the rear of these cottages were quaint-looking and admirable in color. At the apex of many of the gable-ends the roof projected, as in sketch, forming a kind of hood. In the city many old-looking buildings are to be seen with similar projecting roofs. A telescope form of chimney, such as appears in another sketch, is another feature occasionally found.

From the roofs, one soon notices that lodgers are left there all the year round, which would seem to indicate that repairs are frequently needed, owing probably to the frequent use of unpainted timbers. And yet, in spite of its drawbacks as a roof-covering, this material is essential, to the artistic taste, as a means of producing a very charming effect. It soon, by exposure to the weather, assumes a steel gray and gray-green appearance, and those portions which turn rusty have the color of burnt sienna. The effect in the distance is to relieve masses of dull gray by a glistening sheen, like gold, on the rustier roofs. I saw, on the way to Montreal, an old windmill that was almost black, covered with a dome-hipped roof, which shone like burnished gold. It seemed hard to believe that it was simply rusty tin. In the design of the belfries, you will observe that the lower tier of arched openings is almost invariably repeated above on a smaller scale. These belfries often have finials and crosses of wrought-iron, generally light in appearance, as at the Ursuline Convent. There are also iron crosses by the roadside, on the way to Ste. Anne, which doublets came from France.

In the early days, when the ships sailed only once or twice in the year to the old country, the governors and intendants were much given to writing what might be termed long-winded epistles to the minister on the advantages of commerce as home. But considerate of the young colony’s claims, it is more than likely that much of the church interior furnishings, such as paintings, metalwork, and stained glass, came from France.

Glimping into the waysides cottages as we passed, we could often see an old chair or a table, plain and simple in form, but undoubtedly ancient. It seemed, therefore, that the town would not be complete without an old curiosity-shop, and when we found it, this, too, was satisfying. It partook very much of the character of a museum, and must be a perfect mine to the archaeologist and the antiquarian. It was a rare and varied collection: swords, bayonets, and bayonets picked up on the field of battle; bullets and cannon-shot; a piece of the chain that moored one of Jacques Cartier’s ships; old Indian curiosities; wax and color, tomahawks, cologne, leather, silver plate, metal and china ware — filling in all things strange and foreign, and perhaps France or England, none of which would be found here.

Many painters in France represent green fields with a color which any one at all familiar with the work of different schools would recognize as distinctively French. Now, around Quebec, I saw more than one case in the fields to show the same amount of French imagination, or had the landscape become susceptible to French influence, and thus resembled the mother-country? I should be glad to know how many of those who have been in both Old and New France, whether this theory has any truth to it.

From what I have already remarked about the rural districts, it is almost needless to add that the figure-painter, also, finds charming subjects to work upon there. In a word, it is a picture-painter’s paradise.

The aim of this department will be to answer such questions of law arising out of building transactions, and of general interest to the profession, as may be sent in to the editors by subscribers and others, and from time to time to discuss in a more general way the various legal questions which are continually arising between architect, contractor, and client. The principles of law applicable to building disputes will be presented, so far as practicable, in the language of the layman, rather than in the technical garb of the lawyer’s brief, and as concisely as possible. Any future or more detailed answers than the scope of this department and the space at its disposal will permit, can be accommodated on special application to the editors.

The aim of this department will be to answer such questions of law arising out of building transactions, and of general interest to the profession, as may be sent in to the editors by subscribers and others, and from time to time to discuss in a more general way the various legal questions which are continually arising between architect, contractor, and client. The principles of law applicable to building disputes will be presented, so far as practicable, in the language of the layman, rather than in the technical garb of the lawyer’s brief, and as concisely as possible. Any future or more detailed answers than the scope of this department and the space at its disposal will permit, can be accommodated on special application to the editors.

A greater diversity of service is expected of the modern architect than of any other class of professional men. He must not only be skilled in construction but must look after the financial interests of his client; he must act as arbitrator in disputes between the latter and the contractor; and he is expected to pass on every question of law that arises during his employment. All this wealth of responsibility is expected to be attended by the client’s disposal without extra compensation; and it is not strange that oftentimes the architect gets weary and the client dissatisfied.

These cannot generally be referred to a lawyer, partly, because the owner will not stand the expense, and partly because an accurate and ready answer to many of them would demand a more thorough knowledge of all building methods than the usual possess. An acquaintance, therefore, with the laws applicable to building transactions is essential to the architect; but it is not such an easy thing to acquire. The law-books devoted to the subject are few in number, and totally inadequate in substance from the standpoint of both architect and lawyer; study of the building cases in the law-reports is laborious in the extreme, and altogether unluckily...
to lead a layman to correct conclusions. Practically, therefore, the usual road to accurate knowledge of the law for builders, architects, and owners is the vexatious path of litigation.

It is, therefore, the more general works, the books on agency, on real property and on contracts, that the layman in search of building law must digest, and that is generally a task for which he has not time.

The characteristic feature of the English common law as distinguished from the jurisprudence of continental Europe, founded much less on the traditions of the Roman law, its freedom from special branches and special rules applicable to particular subjects only. The fundamental principles of the common law are extremely few, and they are of general application. There is, indeed, the "building law," but it is no set of rules of special and peculiar application to buildings. There is no special law of party-walls, there being no such thing in such a "building law" as in continental law.

The rules of law applicable to buildings operations are complicated or uncertain; they are, on the contrary, few and simple; but for this very reason, and because of their general character, they are usually taken for granted in the cases and books on building. It is, therefore, the more general works, the books on agency, on real property and on contracts, that the layman in search of building law must digest, and that is generally a task for which he has not time.

The superintending board of engineering, or the convention of the engineers, if such a thing as the superintending board is established, has no legal authority over the building law, as it is nowhere provided for; it is in the hands of the government and the legislature. And if, as in the ease of the hotel at Kansas City, where I understood a trust was created in the top of the building slipped and landed in the cellar, causing several thousand dollar loss, and where combined with the contractor, the architects—though their plans were found to be held for the mishap because they were the superintending-boards—if I say, such troubles should arise in my work, where I stand? And I ask, if there is any kind of law to eliminate this unjust risk of element?

It has seemed to me that the owners have a distinct right to look to me to perform the duties of the engineer, and not only have to do with the building law, as it is nowhere provided for; it is in the hands of the government and the legislature. And if, as in the ease of the hotel at Kansas City, where I understood a trust was created in the top of the building slipped and landed in the cellar, causing several thousand dollar loss, and where combined with the contractor, the architects—though their plans were found to be held for the mishap because they were the superintending-boards—if I say, such troubles should arise in my work, where I stand? And I ask, if there is any kind of law to eliminate this unjust risk of element?

Any suggestion that can help me to adjust this business on a proper and safe, and professional basis, will be greatly appreciated by,

Yours respectfully,

VITRUVIUS.

[We should say that "subscriber’s" best way would be to furnish drawings and specifications for the building, receiving for them the usual commissions for such limited services and one-half per cent, and when it is understood that his responsibility ends there and the owner provides for the same, he may see to it that the entering of the work by the architect for the supervision of the building, the only fee for which he would be to pay him, would be at the time, as well as the money, extended to the building, the French law calls it. To expect the architect to keep a deputy on the ground, committing his fees to the receiver.

During an experience of more than twenty-five years’ gas-fitting, lighting many thousands of country buildings of all classes, we have had barely ever seen specifications furnished by either architect or owner where there was any kind of responsibility, may seem right to an owner, but it hardly will to any one else; and an architect who would take so grave a risk deserves no sympathy from the profession.—Ed. American Architect.]

COMBUSTIBLE ARCHITECTURE AGAIN.

Boston, Mass., January 22, 1899.

To the Editors of the American Architect:

Dear Sirs,—Under the title of "Church Vestry Destroyed," the Boston Herald, under the date of Monday, January 21, gives an account of the destruction of the Berkeley Baptist Church, which was a large and expensive structure, purported to be of stone. The firemen on reaching the fire "found the whole roof of the vestry blazing," and with great difficulty the fire was prevented from penetrating the hollow roof and the hollow walls of the main church, which was barely saved.

The cause of the fire is said to have been a defective fuse; this may be a very good guess, but one who has studied the common confusion of this class of buildings may venture to guess that during the variable weather of last week the furnace was lighted when the weather was cold, and when the temperature was then warm, back action may have taken place through the furnace air-box, probably made of wood, setting the floor and hollow wall of the vestry on fire; the fire being immediately communicated to the roof, which was on a sparsc of space between the wall and the ceiling and the roof proper.

A loss of twenty thousand dollars and four firemen injured is the price that the owners paid for their carelessness.

This is the third instance of similar fires in Cambridgeport in recent years. In the previous case, a second church upon the same spot where the previous one had been burned, having been destroyed in the same way. I ventured to recommend under the name of "Ignis Fatuus," that the Building Committee should advertise for a safer method of combustible architecture, which should ensure the very protection against the dangers that the firemen are to danger. Whether or not this plan was followed in the building of the church for the third time I am not informed.

I venture at this time, in the light of the fire, to send you three suggestions, which I hope will be of more use to the owners than to the firemen.

1st, let "Ignis Fatuus" pay what the work is worth.

2d, let "Silent" pay what the work is worth.

3d, let the first pay the second, and the second pay the third.

The firemen have been employed nearly all the time in taking out piping from houses imperfectly piped, and doing what may be described to rectify inferior work. During the last thirty days we have found three buildings in the suburbs of New York in such a condition that the gas-fitter has been compelled to go out and repair the work. If the owner wishes to have the architect supervise the building, the only fee for which he would be to pay him, would be at the time, as well as the money, extended to the building, the French law calls it. To expect the architect to keep a deputy on the ground, committing his fees to the receiver.

During an experience of more than twenty-five years’ gas-fitting, lighting many thousands of country buildings of all classes, we have had barely ever seen specifications furnished by either architect or owner where there was any kind of responsibility, may seem right to an owner, but it hardly will to any one else; and an architect who would take so grave a risk deserves no sympathy from the profession.—Ed. American Architect.]

PIPING A HOUSE FOR GAS.

New York, January 20, 1899.

To the Editors of the American Architect:

Dear Sirs,—The complaint of "Silent" is most interesting, and we hope it will provoke discussion. No part of the construction of a building, of equal expense, is more important, and none so universally neglected by the contractors and architects, as that of piping.

During an experience of more than twenty-five years’ gas-fitting, lighting many thousands of country buildings of all classes, we have had barely ever seen specifications furnished by either architect or owner where there was any kind of responsibility, may seem right to an owner, but it hardly will to any one else; and an architect who would take so grave a risk deserves no sympathy from the profession.

How may these difficulties be avoided?

1st, let "Silent" pay what the work is worth.

2d, let the first pay the second, and the second pay the third.

It is safe to say that no house to which even the smallest gas-machine made would be attached can be honestly piped for thirty dollars. No gas-house itself sells for less than fifty dollars. In a matter of so much importance, and where the cost is so trifling, why should not the owner, selecting tradesmen of financial responsibility and known skill, order the gas-fitting done as I have suggested, by asking, in a general way, for bids from anybody and everybody, without providing, first, suitable specifications for the work, and, second, insisting on a certificate signed by an inspector known to be competent? We have furnished printed directions and specifications in detail for the piping of large cotton factories which we did insure—owing to its faulty construction—we thought it might not be inconsistent to give our members some hints, so that they might construct safe memorial churches, or other buildings to an appreciable extent, on these principles. We submit these sketches merely as studies, for what they are worth.

Yours very truly,

Edward Atkinson.
60

American Architect and Building News.

TJie

of.

GILBERT & BARKER MANUFACTURING COMPANY.

THE CHURCH OF GAUDALUPE, MFXICO.
HARTFORD. Coys., January

22, 1889.

To THE EDITORS OF THE AMERICAN ARCHITECT:
Dear

Some of your readers may be interested to know that
Sirs,
"
massive frame surrounding the
miraculous
picture of the
Virgin in the centre of the high altar of the church at Guadalupe,
published in last issue, is of solid gold, and was given by a wealthy
the

'

merchant who had been,

it

is

alleged, benefited

by the Virgin's

in-

terposition in his affairs.

The double
in

organ

The

down from the altar to the
of solid silver.
not able to vouch for, but, while I was at the

balustrading reaching

middle of nave

frame, I

am

is

church a few months ago, the organ was undergoing partial removal
and I inspected the railing, and found it cast hollow, with a shell
one-quarter inch thick, apparently of pure silver throughout.
Silver js not dear in Mexico, and in the thin, dry air preserves its
brilliant lustre a long time without rcpolishing.
In this church of Guadalupc are hung numerous effigies in silver
of portions of human bodies which have been healed
by the Virgin's
miraculous powers.
Yours very respectfully,

MELVIN

II.

XXIV.

No. 684.

shocks upon the teeth of the gear, and in that way acted as a buffer
preventing the gears from committing a mechanical suicide. A steam
engine, used to operate the dynamos for lighting an insurance building
in New York, gave a great deal of annoyance to the occupants by the
It is supposed
which was transmitted throughout the building.
jar
that the motion of the engine was in rhythm with the key-note of the
building. The makers of several engines tried to solve the problem,
which was at last achieved by one firm, who bolted the beil of their
engine to a timber raft which rested upon a layer of hair felt such as
is used for non-conducting coverings for steam pipes and boilers, but
fourteen inches thick. This felt was placed upon the masonry foundation recently prepared for the engine, and surrounded by a heavy
timber box which prevented its spreading. An engine, used to operate
the electric-light plant in one of the principal hotels in New York City,
gave annoyance to the guests because, when it was in operation, beats
could be heard all over the building, notwithstanding that the engine
was situated in a tightly-closed room in the basement. After various
other expedients had failed, the doors to this room were taken down
and replaced by double thicknesses of carpet fixed upon the framework.
This served to break up the rhythm in such a way that the
sound was not heard throughout the building. Sawdust has been used
for foundations in many instances, and there are numerous towns in
the United States which have been built up from small villages originally around a sawmill, and the sawdust from the mill has been used to
fill up low places which have afterwards served as building lots.
In
course of time such filling becomes very compact, and does not appear
to waste by decay.
Engineering*

of suburban buildings suitable for gasolene-gas for many years, and
have distributed thousands of them to architects and owners without
charge, but have never in a single instance seen one of them used.
So long as owners and architects are so singularly and conspicuously indifferent to the character of work done, how can gas-fitters
and plumbers be expected to care.
"
"
Probably Sinex got more than thirty dollars' worth of work in

the case he complains

[VoL.

THK

combination of electric-light interests which has been Ions: under discns.-ion, has been finally partially effected by the United States and the
These companies will control some 7<'0 patents and
Westiiisslioiise uniting.
represent a capital of $10,000,001). The manufacturing capacity at present

HAF-GOOD.

15.000 lamps per day. and new works will be erected at New York and
Pittsburgh to expand production to any desired limit. This unification of
It means, among other thinsrs,
interests is significant in many respects.
that a good many patents that ha\e heretofore been unused will hereafter
be developed, and that a great deal of work will be prosecuted w inch it was
to the individual interest of the companies to hold in {-heck. While this is
in the form of a monopoly, it is one of those combinations which will
naturally result in much good. It is probable that the cost of tlei trie
lighting w-ill decline rather than inctease. The reports from the leading
companies all over the United States all speak of an unusually active
condition of business. During the past ninety days more business for
electric-light conveniences have been received and ordcrf d, it is stated, than
during any previous twelve months. Manufacturers of machinery of all
sorts of equipments and supplies are now crowded with work, and this
conditions of things is not likely to be changed by any decadence of demand
is

j

A "CLOSE CALL." One of the worst frightened men in Fall Kiver,
Mass. recently, was Alderman Durfee. He happened to be standing
on a ledge of rock from which building stone was being quarried.
Everything was quiet, but he finally noticed a man crawling towards
him cautiously on his hands and knees. The alderman naturally inquired why this was being done, and was informed that for the past ten
minutes lie had been standing on top of a dynamite cartridge, and that
the crawler had been trying to set it off by means of an electric wire.
The alderman's heel was upon the wire and had grounded it, and that
was the only reason why the blast did not go off.
Fire and Water.
,

Mr. II. Leonard, M. I. C. E., the late chief
BRICK FOUNDATIONS.
engineer to the Bengal 1'ublic Works Department, gives in Indian
Ettghieering an interesting account of experiments carried out by him
at Akra with a view to determining the proper proportions of brick
foundations in alluvial soil. The experiments were made on a large
scale, the piers being of a size such as might be used in real work, and
the indications obtained are correspondingly valuable. First, with regard to the pressure permissible, Mr. Leonard found that with a
ptessure of one ton per square foot on the soil there was practically no
sinking, whilst with two tons the sinking was decided, and sufficient to
cause bad cracks. If one part of a building were built with a pressure
of two tons per square loot on the foundations, and another part with
one ton only, the unequal settlement would be, he considers, quite
sufficient to cause bad cracks
hence the load on the foundations
should be under one ton per square foot, or if over should be equal on
all the piers.
Experiments were next made on the proper depth for
Trials were made with foundations at two feet, six
the foundations.
inches, or just below the usually disturbed soil, at four feet where the
alluv
al
true
deposit was undisturbed, at eight feet where a different
though not better soil was touched, and at eleven feet where the soil
was soft and wet. The foundations at two feet six inches were found
to be affected by heavy rains, whilst those at eleven feet sank more
than those at four feet and eight feet, and Mr. Leonard finally concludes that in undisturbed alluvial soil the foundations of important
buildings should be laid at a depth of between four feet and six feet.
The third point examined was the proper spread to give the brickwork
in such soil, and from these experiments he concludes that for a pressure of one ton to the square foot in Bengal soil the thickness at the toe
of the slope should not be less than one foot six inches and the stepping at an angle of not more than forty-five degrees.
Engineering.

,.,.,,.

.,

,

;

The ordinary conception of a foundation
exact proportion to its rigidity, and that the more
unyielding it is, the better it serves its purpose. And while this assumption may be true "in supporting a heavy load, yet where questions
soft answer will turn away wrath," as well in
of impact enter, the
At a factory in the United States some
dynamics as in polemics.
which
were
used to change the direction of main shaftbevelled gears
mill
to
from
one
another, were at the end of very heavy shafts,
ing
which ran in pillow blocks, simply bolted to an outcropping ledge, which
was dressed to a level for the purpose of sustaining the foundations.
Some of the teeth of these bevelled gears would break from time to
time, and in a most unaccountable manner. The accident might be deferred for three months, or it might occur at any moment.
Various
expedients were tried, and finally that of taking up the pillar blocks
and placing them on seats of raw hide which had been soaked in oil
these gave the bearings enough elasticity to prevent a concentration of
FLEXIBLE FOUNDATION'S.

is

that

its

virtue

is

in

;

for an indefinite period. The demand for elect ric-li^ht goods from all
sections of the country, from small towns in the far West and Southwest,
as well as from the larger cities, is large. The activity in electrical circles is
a fair sample of what is uoing on in many other directions. The projectors
and promotors of industrial enterprises arc entering upon their new work
for the coming season.
A resume of the extensive operations projected

during the past thirty days may be, presented in the compass covering
almost every kind of manufacturing enterprise. Throughout the South,
cotton-mills, agricultural implement-works, wagon-factories, rolling-mills,
blast-furnaces, besides innumerable small manufacturing establishments,
are all projected for construction as soon as material can be luid. Louisville will become quite a manufacturing city if all the schemes that are projected aro carried out. Mississippi has already made wonderful progress,
and several large companies ate now preparing to operate in that State, in
railroad construction, in the establishment of ship lines, in cotton-mills,
in lumbering operations and in many others.
A great, deal of money will
LIII
01 i^ui
Alaska this
im> year,
be
uc invested
Northern
miii*n>i
uiieBbcu in
icnr, and four or five long Hues will be
ii

it

the others of fifty miles in leu
Along the Atlantic coast numerous enterprises are talked of, most of
them the property of Northern capitalists. Late advices from Kansas City,
Omaha and Minnesota show that indications from these centres can be relied upon as general that there will be larger building operations nudettaken
tins year than last.
One reason is that last year's investments have been
unusually profitable, another is that the country is rilling these localities
and that the country is bein^ developed. Omaha is becoming a very important commercial centre and important railroad schemes will make that a
sort of centre.
Basides this, numerous small manufacturing enterprises
are springing up in Montana, Colorado and Utah and they are drawing
capital and enterprise in their wake. In Minnesota, St. 1'atil, Duliith and that
region of conn try, those, who will make investments as the railmad situation
clears are waiting. The solution of the railroad question will erase a great
many difficulties in the way of farmers, miners, lumbermen, and the coppermining interests as well as the agricultural and commercial interests and
the paper interests of this wonderful section.
Not one single branch is
threatened with restriction. Enlarging operations will probably be reported
within ninety days in every branch. The leading lumber antb.nities are
predicting on improvinz trade and are intending to prepare for it when it
In New York City there is a growing accumulation of money. The
coniRs.
surplus there is now in excess of -520,000,000. This is an encourngtnjt thTng
Financiers are pleased at the manner in which borrowers are rejust now.
paying their loans everywhere. Very few failures are taking place. The
great bulk of obligations are being promptly met. Bankers find but little
demand for money, yet it must be remembered that there is an increase in
the amount of business that is being done by the use of negotiable paper.
Business men are interested in keeping as near to the cash system as possible.
Bankers themselves nre disposed to favor an increased supply of
money to meet the enlarging business, operations, but they are not willing
that it should be issued otherwise than under the supervision of
banking
interests whose business it is to measure the requirements of the country, so
far as money is concerned and to meet that demand. The railiorid
que'-tinn
is generally gliding toward a quiet solution.
Two or three meetings have
been held within ten days and the serious obstacles which then taxed the
patience and ingenuity of the most experienced railway managers for years
past are now likely to be adjusted.
f

coll . t ,.,,cted,

S.

J.

PARKHILL &

Co., Printers, Boston.


FEBRUARY 2, 1889.

The American Architect and Building News.

GABOT'S
ANTIPYRE

Ye defeate of ye moderne Apollyon

With this material wood-work can be thoroughly protected from fire at a cost of less than one cent per square foot.
It can be had in all colors at 30 cents per gallon.
Send for Anti-Pyre circulars and samples

--- S A M U E L . C A B O T ---

70 KILBY ST. BOSTON, MASS.

ALSO SOLE MAN'FR. CREOSOTE, SHINGLE STAINS.
February 9, 1889.

Entered at the Post-Office at Boston as second-class matter.

Summary:


Communications:


The chance of this catastrophe, by which the State might possibly have to pay out thirty-five hundred dollars in fines for worthless designs, besides what would be paid later for properly studied ones, would not greatly alarm a private person, who would consider a sacrifice of one-fifth or one-sixth of one per cent on the cost of a proposed building not too great a price to pay for the privilege of cancelling hasty and injudicious engagements, and setting himself free from all the other architects, informing them of the action of the Legislature, and pointing out that under the circumstances nothing was left to those who wished to compete but to hand in their drawings on or before January 28. When that day arrived, ten designs were found to have been submitted. Two accomplished architects, one of whom had already studied the problem thoroughly as professional adviser to the Legislative Committee on the State-House, while the negotiations for the site were in progress, were called in as experts, and an award made and reported to the Legislature on the appointed day. By this award, the first premium, of fifteen hundred dollars, was awarded to Messrs. Brigham & Spofford; the second, of twelve hundred dollars, to Mr. John Lyman Faxon; and the third, of nine hundred dollars, to Mr. H. S. McKay, all of Boston; and Messrs. Brigham & Spofford's plan was, in the report of the Commissioners, recommended for adoption, and modifications were so sincerely hope that this may be the end of the matter, and that the design will be carried out by its authors with satisfaction to all concerned. In justice to their design, it should be mentioned that they were employed by the State, some time ago, to make complete measured drawings of the present State-House, and of the plans and levels of the site for the extension. In doing this work, which was admirably executed, it would have been strange if the knowledge of the conditions so gained had not shaped itself, as their work proceeded, into some idea of the best plan for satisfactory designs. It seems so fairly to be regarded as having had, perhaps, several months of study before the other architects knew anything about the matter. Possessing this advantage, it may have been fortunate for them that the decision was made before the other architects who chose to compete had had time to make a similar study of the question, and were not hardly point out how fortuitously or fortu- nately was for the great majority of the Massachusetts architects that they withdrew in time from a contest which, as it turns out, would have been so unequal, even if it had been unequal in other respects.

Case involving a principle of great importance to architects was recently decided in the Court of Common Pleas in New York. A well-known architect, Mr. Robert, brought suit to recover the value of his services from a client for whom he had built an apartment-house. The client, Mr. Aitken, claimed an offset of one thousand dollars from the bill, on the ground that "the area of the floor provided in the chimney was inadequate for the service of the boiler, so that the proper consumption of the coal could not be secured," and that he would, in consequence, be obliged to build a new chimney-due on the outside of the building, the "necessary cost and expense" of which would be a thousand dollars, as claimed. It was proved that the architect asked the contractor for the steam-heating about the size of the floor he was going to install, and it was agreed that one of his buildings, the floor of which had been temporarily cleared of the respectable architects by the extension of the time and the remodelling of the programme, might present an apology for a sketch, and demand the stakes that the State had incostiously pledged.
DOORS & DOORWAYS.

- Palazzo Tolomei - Siena -

Entrance - S Giovanni Lucca.
After the Abp. Ufect

From the House of Punta Pompeii.

Doorhead - Isle of France - after Uart.
The chance of this catastrophe, by which the State might possibly have to pay out thirty-five hundred dollars in fines for worthless designs, besides the pay later for properly studied ones, would not greatly alarm a private person, who would consider a sacrifice of one-fifth or one-sixth of one per cent on the cost of a proposed building not too great a price to pay for the privilege of cancelling hasty and injudicious engagements, and setting himself free to conclude more satisfactory arrangements for the administration of his investment; but it frightened the legislators, who decided that their thirty-five hundred dollars must be saved at all hazards, and rejected the resolution. The Commissioners, with much perfect courtesy, immediately informed the State architects, informing them of the action of the Legislature, and pointing out that under the circumstances nothing was left to those who wished to compete but to hand in their drawings on or before January 28. When that day arrived, ten designs were found to have been submitted. Two accomplished architects, one of whom had already studied the problem thoroughly as professional adviser to the Legislative Committee on the State-House, while the negotiations for the site were in progress, were called in as experts, and an award made and reported to the Legislature on the appointed day. By this award, the first premium, of fifteen hundred dollars, was awarded to Messrs. Brigham & Spofford; the second, of twelve hundred dollars, to Mr. John Lyman Faxon; and the third, of nine hundred dollars, to Mr. H. S. McKay, all of Boston; and Messrs. Brigham & Spofford's plan was, in the report of the Commission, recommended for adoption, with modifications. We sincerely hope that this may be the end of the matter, and that the design will be carried out by its authors with satisfaction to all concerned. In justice to their design, it should be mentioned that they were employed by the State, some time ago, to make complete measured drawings of the present State-House, and of the plans and levels of the site for the extension. In doing this work, which was admirably executed, it would have been strange if the knowledge of the conditions so gained had not shaped itself, as their work proceeded, into some ideas of the best plan for satisfying the public, and these ideas fairly regard as having had, perhaps, several months of study before the other architects knew anything about the matter. Possessing this advantage, it may have been fortunate for them that the decision was made before the other architects who chose to compete had had time to make a similar study of the problem, and we need hardly point out how fortunately it was, for the great majority of the Massachusetts architects that they withdrew in time from a contest which, as it turns out, would have been so unequal, even if it had been unexceptional in other respects.

CASE involving a principle of great importance to architects was recently decided in the Court of Common Pleas in New York. A well-known architect, Mr. Hubert, brought suit to recover the value of his services from a client for whom he had built an apartment-house. The client, Mr. Aitken, claimed an offset of one thousand dollars from the bill, on the ground that "the area of the flue provided in the chimney was inadequate for the service of the boiler, so that the proper consumption of the coal could not be secured," and he would, in consequence, be obliged to build a new chimney-flue on the outside of the building, the "necessary cost and expense" of which would be a thousand dollars, as claimed. It was proved that the architect asked the contractor for the steam-heating about the size of the flue he would require, but, according to the instructions, the court held that the architect, not the steam-heating contractor, was responsible for the failure of the latter to know his own business, and that the architect must pay the thousand dollars claimed. We presume, from a somewhat extended acquaintance with such cases, that there is some uncertainty as to the responsibility of the new chimney being built, and that the owner, after he gets through chuckling over the ingenious device by which he transferred a thousand dollars from an architect's pocket to his own, will find that the old flue really answers very well, and that it can be made to work, after all, pretty well, with a few changes, and so on. The fact is, as every architect who has studied the subject knows, that not one flue in five hundred for boilers devoted principally to heating is made of the dimensions required for the "proper," that is, the economical co-
The American Architect and Building News. [Vol. XXV. - No. 685.]

sumption of coal. The obvious reason for this is that, if the dimensions of the flue are calculated by the rules of proportion to grate-surface used in designing the chimneys for power-plants, where economic consumption of coal is given as the utmost importance, the owner, when he sees the plans, is horrified to see how little the chimneys will cost him. To his mind, it appears to block up most of the rentable portion of his building, and he flees to a steam-heating contractor, who soothingly assures him that a twelve by sixteen flue, or even an eight by twelve, in case of need, will do very well, and, as is probably true, that he has often utilized the latter for boilers where nothing better was to be had. Nothing is said then by either party about the "proper consumption of the coal," and the indifferent owner, after relieving his feelings by going about amongst his friends and denouncing his architect as a " crank" on the subject of fumes, and warning them to have nothing to do with him, comes back to the office and requests that the matter may be left entirely to the judgment of the heating-contractor, who "guarantees the results." In most cases this ends the matter; the owner works as well as house-heating boilers generally do, and the owner congratulates himself ever after on his good fortune in having headed off the architect in time to prevent him from spoiling the building with his huge chimney. In the five hundred instances, perhaps, the owner, ar- rived, as many persons are, by the presentation of a bill to an ironing-room, with a large number of quotations from the architects' pocket; but even the possibility that an occasional individual may try to take advantage of it acts as a continual menace to the profession. We shall leave comment upon the legal aspects of the case to other hands, but, from the point-of-view of practical architects, we cannot help feeling how serious a misfortune it is that such a case as this could not have been taken up by a powerful protective association and carried, if necessary, to the Supreme Court of the United States, so that the law might be settled, once and for all, and the professional contractors be relieved of such machinations shaped upon the action. As we all know, most steam-heating contracts include a guaranty that the work, if carried out according to the prop- osal made, shall be efficient and satisfactory. As this guar- anty is a serious matter for the contractors, they usually seize any opportunity of getting the work done for less than the original price by unscrupulously withdrawing it, reserving their right to complete the contract without it. It is needless to say that work done on a heating- contract under guaranty seldom fulfills the guaranty when first completed, and is only brought to conformity with it after several successive struggles, which work done on such a contrac- t after the guaranty had been withdrawn might safely be warranted not to do anything that was required of it; so that architects are very careful to avoid giving any advice or in- structions that might be tortured into an interference with the contract. In the light of this decision, however, it appears it is the architect who furnishes the guaranty in all cases, while the steam-heater gets the money. If the architect meddles in any way with the latter's method of carrying out his contract, the guaranty clause of the contract is immediately withdrawn, the work, when completed, proves inefficient, and the owner pays the contractor in full, and requires the architect to put in new heating-apparatus at his own expense as a penalty for not interfering with the contractor's operations. It may be that this is the law, which, according to the highest authority in England, is quite a different affair from justice, but we are willing to entertain a doubt on the subject.

WHILE we are considering the subject of heating-contracts, and the sort of guaranty that the manufacturers of heating apparatus are supposed to give with their goods, we may draw a less very well known receipt to the attention of the editor of La Construction Moderne. The writer of the letter, an architect, says that one of his clients, who had just opened an ice-cream saloon in a new building, began to think, on the approach of winter, of means for warming his room. He wrote to an establishment in Paris for suitable apparatus, and the Parisian firm returned him a guaranty for the chimney-flue, and, on the arrival of the heating apparatus, set up, ready for use, and left it. The new owner, however, found, on taking possession of it, that it would not heat the room, and that a fire would hardly burn at all in it. He complained to the Paris manufacturers, who altered and lengthened the chimney, until, as they said, everything was in proper order. The new arrangement proved no better than the old, but it was hardly possible to make any change in the middle of winter, so the proprietor endured the cold, as best he might, until spring, when he telegraphed the manufacturers, who had described his condition at length. They offered to take back the original stove, and put in a larger one; and the proprietor agreed to this, but, on returning home, he reflected that the new stove, which would be six feet high, and nearly a yard in diameter, would occupy an entire room, and therefore he telegraphed back the same day to the manufacturers, de- clining the proposed arrangement, on the ground that he had concluded to have a furnace put in the cellar by a local con- tractor. The Paris firm replied, offering to take back the unsatisfactory stove, on condition that they should be permitted to build the new furnace; but the saloon-keeper thought he had had enough of their goods, and went on with the local furnace- man, who put in a perfectly satisfactory apparatus. Mean- while, the original stove had been shipped back to the manufacturers, who acknowledged receipt, and not mentioning that they had put it in storage. All this part of the transaction took place in May, and the saloon-keeper, who had paid forty dollars on account for the unsatisfactory stove, probably thought that he had paid dear for a disagreeable ex- perience. Seven months later, however, in December, the Parisian manufacturers sent a demand for the balance of the price of the rejected stove, amounting to forty-four dollars, to- gether with a bill for storage, and another bill for the price of the large stove which they had agreed to furnish in place of the unsatisfactory one, but which had been countermanded by telegram, less an allowance for its return.

THE saloon-keeper, who thought in paying half the price of a guaranteed apparatus, which had turned out perfectly unsuitable to him, and had been returned good for nothing by the makers, to be sold to some one else, he had done all that could be expected of him, applied to his architect for advice in regard to the new demand, and the architect applied to the law contributor of the journal, M. Ravon, who replies unhesitatingly that the Parisian manufacturers are technically in the right, and that the saloon-keeper will have to pay the bill. In France, as here, although a furnace-maker is presumed to guaranty the proper working of an apparatus which he sets up, he must be allowed all reasonable opportunity for making good his guaranty, and the fact that the apparatus fails to do what it was warranted to do must be clearly established before expert and impartial witnesses. In this case the proprietor had refused to allow the manufacturers to make good the deficiency in their apparatus by substituting another, and he had not called in experts to establish its defects, but had taken the apparatus back as a part of the contract, not mentioning anything but his own assertion that it was useless to him. The manufacturers, on the other hand, had proceeded cautiously and legally. On being notified that the stove was unsatisfactory, they had twice offered to replace it, first by a new stove, and, after that refused, by a piece of apparatus, which the saloon-keeper had rejected, of nothing but its own assertion that it was useless to him. The manufacturers, on the other hand, had proceeded cautiously and legally. On being notified that the stove was unsatisfactory, they had twice offered to replace it, first by a new stove, and, after that refused, by a piece of apparatus, which the saloon-keeper had rejected, of nothing but its own assertion that it was useless to him. The manufacturers, on the other hand, had proceeded cautiously and legally.
The American Architect and Building News.

BUILDERS' HARDWARE.—XVIII.

It has not been the intention to consider in detail any articles of hardware which are not in actual daily use at the present time; but there are a few styles of locks which are entirely obsolete so far as the American trade is concerned, but which should be included in any study of the subject. If one wishes to thoroughly understand the principles of modern lock-making, and the processes of elimination and survival of the fittest which have brought the manufacture to its present state in this country.

Figures 291 and 292 illustrate the old "English Bramah" lock. This consists of a revolving cylinder in which is disposed radially a series of flat sliders working up and down through slots in a fixed horizontal plate. The sliders have notches on the outer edges, cut at different heights, so that the cylinder can revolve only when the notches on the sliders are on a line and level with the plate. The sliders are forced outward by a single central coiled spring. The key consists of a tube, on the sides of which are straight grooves corresponding to the desired depression of the slides, with a shoulder to turn the cylinder. The locking-bolt is moved by an eccentric attached to the cylinder. The notches on the sliders are disposed as irregularly as possible, and false notches are added, with corresponding false widenings of slots in the plate. All of the sliders can be pushed in farther than is needed to bring the notches on a line with the plate, so that the lock is picked with great difficulty.

"Cotterill's" lock, Figures 293, 294 and 295, is another example of English ingenuity. The portion which is acted upon by the key consists of a rotating flat disk or cylinder containing ten or more slides moving in radial grooves and pressed towards the centre by springs. A fixed ring or plate is fitted to a circular groove on the face of the disk, and has slots corresponding in position to the radial slides. There are also grooves cut on the edge of the slides, so that when the key is in place the slots on the slides coincide with the circular groove on the disk, permitting the whole to be revolved. When the key is withdrawn the slides are forced in different degrees towards the centre, so that the solid portions intercept the groove in the disk, in which position it is held fast by the fixed ring. It is believed that this lock never has been picked.

A lock which in its time was a strong competitor with "Bramah" and "Cotterill's" locks, and was equally impregnable, is "Day and Newell's" Paratopic bank-lock, an American invention which was in great demand at one time, but has long since ceased to be manufactured. It has the curious property that the key, which is made with movable bits, can be changed at will, so that the lock can be opened only by the key which was last used to shoot the bolt. The lock has never been picked. Figure 296, which is taken from Price, is too complicated to fully illustrate the workings. Figure 296B, while not exactly like the lock, embodies the same arrangement and will serve to make the construction understood. The letters refer to both figures. There are three distinct sets of levers, A, B and C, each admitting of a sliding or lifting motion up and down, the levers A having springs which keep them pressed down, D, and the levers C being constantly forced up by a spring of lesser strength E, so that the levers C will always move up and down exactly as A are raised or lowered, the tops of C bearing against the bottom of extensions to A. The levers B have no springs, and slide up and down between studs attached to a wing of the bolt-tail, so that when the bolt is shot, the levers B move with it. F is a dog or lever, which is hinged to a stud on the bolt at the top, and hinged with a bent elbow attached to the lock-case at the bottom. On this dog, F, is a tooth, and on the edge of each of the tumblers B are notches corresponding in mutual distance with the difference in lengths of the movable bits of the key. Furthermore, the levers A are each made with an arm G which fits into a corresponding notch in the levers B, and the levers B have each an arm H which exactly fits between two arms on each of the levers C. Figure 296 shows the lock with the bolt thrown, and Figure 296B, shows it drawn back. When the key is turned in the lock, the bits, no matter in what order they may be arranged, lift the levers A. These, by means of the arms G and H, lift the other sets of levers in exactly the same proportion. The key then forces out the bolt, and the levers B are withdrawn from the arms G and H, but before the arms H are entirely free from the arms on the
levers $C$, the notches on $B$ are caught on the tooth of the dog $F$, the levers $B$ being then held at exactly the relative heights to which they were raised by the key on opening. The key, continuing to turn, then allows $A$ and $C$ to drop to their original position, and the bolt is then locked. It is evident that only the proper key will answer to unlock the combination, as unless the levers $A$ and $C$ are raised in exactly the same position they were when the bolt was shot, the arms $H$ cannot enter between the arms on levers $O$, and the bolt cannot be moved. There are several other features of the lock, such as detector plates, wards, etc., which need not be noticed here. A circular curtain protects the keyhole, and a solid partition prevents access to the levers, while if any attempt is made to discover the combination by applying pressure to the bolt and tentatively rising the levers $A$, the arms on the levers $B$ and $C$ which have notches on the ends will catch on each other and be immovable as long as the pressure remains on the bolt. Varieties with an eight-lever lock and eight-bit keyed, over 5,000 different combinations can be made.

A very ingenious idea which seems not to have survived the test of years was embodied in another English device—Parnell’s Defiance lock. The peculiarity here is in the key, which has an expanding bit. When out of the lock it has the appearance of a key-blank. Eccentrics in the lock force out the proper bits to act on the levers, and the keyhole is guarded in such a manner that a key which could enter and was without expanding bits, would simply turn without effect.

In the classification of locks which would be right to move the levers could not enter the keyhole.

As previously stated, none of the foregoing are now used in this country, but from them several of our best locks have been derived. Prior to 1851, all the best locks used here were of English make, but from causes which must be understood, a subsequent chapter, American locks came to the front about that time, and today an English lock would be looked upon as a curiosity in our hardware trade.

Turning then to our own recent manufacturers, there are several varieties of locks which are commonly found in the market. The “dead-lock” consists simply of a bolt thrown by the action of the key on the levers, but does not include any knob or latch. A “mortise lock” is one which is mortised into the door, and always includes, as commonly understood, both bolt and latch. A mortise lock is generally operated from either side. A “rim-lock” is one that is placed on the face of the door. It is generally made with a nicer-looking case than the mortise locks, and requires longer keys and tighter adjustment of the knob-spindles. A dead-bolt may be either mortise or rim, and in the all-important speaking, the locks are understood to have both bolt and latch. A “rebutted lock” is one which is mortised into the door-frame like an ordinary mortise lock, but the face-plate is rebated so as to fit the door to it, and has its lock plate attached. This form of lock is used only for front double-doors.

In New York it is customary not to rebate the front doors, but, we believe, generally speaking, in the West such locks are necessary. Special locks are usually made for front and vestibule doors. The lock for the front door includes a dead-bolt and a latch operated by a knob from within, and worked by a key from without. The vestibule lock consists simply of a latch worked by a knob from the inside and a key outside, the same night-key answering for the latches of both front and vestibule doors. Here again the locks for those which are so arranged that they can be opened from either the inside or the outside, but when locked from the inside cannot be unlocked from the outside. There are many varieties of hotel locks. Generally they are made in sets of fifty, one hundred, two hundred, or more, as desired, and as high-priced, that is to say, the tumbler are so arranged that one key will unlock the whole series, though the individual keys of the different locks will not unlock each other. Again, they are sometimes made so that the lock can be locked from the inside with one key, and unlocked from the outside with another key, so it can unlock it from the outside, but the master-key cannot unlock it after the bolt has been thrown from the inside, and after the bolt has been thrown twice from the inside nothing can open it from the outside. Such locks are intended to be used where two persons room together, but do not want to be open at the same hour, each wishing to be secure against intrusion, and yet leave the lock so it can be opened by his comrade.

Locks are made both by hand and by machinery. Boston, at present, seems to lead the country in lines of hand-made locks. Indeed, it is doubtful if in any other city such an industry could so long survive the extended application of machinery to lock work as it is here.

But in Boston the old ideas are slow to go, and the people are loath to give up a thing once tried and proved, merely because there is something else in the market, even though the something else may be cheaper. There is no question but that a machine-made lock, if the manufacturer is thoroughly conscientious, is better than one made by machinery, especially as the hand-made lock manufacturers, thus far, never have catered to a cheap trade, and have always kept their goods up to the very highest mark. In the hand-made locks the levers are carefully and accurately adjusted, nearly all the interior fittings are made of brass, and, while in some respects hand goods may be inferior in fineness of polish and smoothness of exterior appearance, no one ever denies their excellence. But, on the other hand, the cost of hand-made goods is so much higher than those made by machinery that they are gradually being driven out of the market, especially since some of the best of the machine-lock manufacturers have succeeded in turning out such admirable goods. To the uninitiated the best of the machine-made locks are quite as good as any that are turned out by hand, while the progress of machinery has been so great that it is possible to obtain almost any desired accuracy of adjustment. Of course, the best of locks, even those which are nominally machine-made are fitted by hand. Only in the cheapest forms are locks left as they come from the machine.

In regard to locks, as to so many other things, may be divided generally into six classes. This division, of course, is not absolute. Locks are made in all grades, and are of all prices. Some very good locks are made in cheap form, and some very poorly designed locks are listed at a high price; but for general convenience this will be explained as follows.

First, the cheapest form of lock made, with iron face and bolts, steel spring, and a single lever: P. & F. Corbin have a lock of this description which sells in the market for a $1.50 a dozen to our own customers.

Second, a lock with brass face and bolts, all the rest of the construction iron, one lever; average price $4.00 to $4.50 a dozen.

Third, brass face and bolts, all the rest iron, with two levers; $7.00, or with three levers $8.00 per dozen.

Fourth, anti-friction latch, brass face and bolts, three levers, $17.00 per dozen.

Fifth, front door lock and latch, $1.50 to $4.50 each.

Sixth, hotel locks, $2.50 to $5.00 each.

Hand-made locks may be divided according to cost into five classes, generally speaking:

First, single lever with brass face and bolts, $1.50 each.

Second, three levers, brass face and bolts, $2.50 each.

Third, anti-friction strike, three levers, brass face and bolts, $3.00 each.

Fourth, anti-friction strike, all brass-work, $5.00 each.

Fifth, front door locks from $8.00 up.

The foregoing classification of machine and hand-made locks according to price does not imply two classes in regard to either efficiency in working or nicety of plan. The machine and hand-made locks are designed on exactly the same principles, and the differences are but slight. Still the hand-made locks are, throughout, better than a relatively corresponding grade of machine-made locks.

[To be continued.]

DEUTY PAID ON A PHARAOH. — An absurd instance of the length to which the policy of protection is carried by French douaniers was fairly given to us today by M. Maspero, the Consul General, going back from Egypt a royal mummy. Of course the case had to be opened at Marseilles. Being told it contained a Pharaoh, the officer looked up "Pharaoh!" in the tariff; but, as it was not to be found, he decided that Pharaohs, being an article of which there was no mention, would be taxed according to the highest scale. So M. Maspero was made to pay as for dried fish. For years an Egyptian mustard had been imported and the ordinary duty on mustard charged. However, the French customs one day decided that the mustard contained flour and should be charged a higher duty. On a further analysis a homoeopathic quantity of an ingredient not in the tariff was found, and so the mustard was held to fall under the heading of unspecified spices," and accordingly a duty of 24s. a hundredweight is now payable on thirty-shilling mustard. Pickles are called in the French tariff "conserves au vinaigre." Last year, however, it was discovered that pickles mostly in the guise of ginger rolls or garnet papers! Pickles were forthwith subjected to an extra duty. — "London Daily News."
AUGUSTE RODIN, SCULPTOR.—III.

'THE VENUS OF WILLUN,' he said, "is a sublime body of matter, in a certain degree of coldness, that the sculptor has succeeded in giving a life-like expression to. "It was the most difficult thing she had ever done, and yet she felt that she had done it without any effort."

Rodin, too, was a sculptor, and he, too, was a realist. He was a man of great sensibility, and he felt the beauty of a thing as it existed in nature, and he translated it into his own art. His works were not mere copies of statues, but they were new creations, new visions of beauty.

One of his greatest works was the 'Carmen,' which he made for the Paris Exposition. It was a huge figure, and it was placed in the garden of the exhibition. It was a great success, and it was bought by a rich man who was a great art-lover. Rodin was gratified by the success of this work, and he felt that he had achieved a great victory.

But Rodin was not content with the success of his 'Carmen.' He wanted to do something greater. He wanted to do something that would be a monument, a symbol of something that was great.

So Rodin went to the bottom of the sea. He went to the bottom of the sea to make a sculpture that would be a monument to the sea. He made a statue of a man who was standing on a rock, and he made a statue of a woman who was swimming in the sea. He made these sculptures to show that the sea was a great force, and that it was a force that could be overcome.

Rodin was a great sculptor, and he was a great artist. He was a man who was able to see the beauty of things as they existed, and who was able to translate that beauty into his own art. He was a man who was able to make something new, something that was beautiful, something that was a symbol of something that was great.

Rodin was a great sculptor, and he was a great artist. He was a man who was able to see the beauty of things as they existed, and who was able to translate that beauty into his own art. He was a man who was able to make something new, something that was beautiful, something that was a symbol of something that was great.
sculpture, there is nothing else great, though some of it is excellent in execution."

It was in Brussels, in 1872, that Rodin exhibited "The Broken Nose" in the Artistic Circle, and received, for the first time, a good deal of commendation for it. They came from Biot, the engraver, and Bauré, a sculptor. The mask was generally admired and helped to make him friends. Among them was Mr. Jules Perot, who is one of the nearest physicians, who proved to be lame. He came, examined his patient, performed an operation and made a number of successive visits. When I asked him for his report," relates Rodin, "I was surprised when the doctor seeing, no doubt, that we were not rich, said, very timidly, that he thought that a dollar and twenty-five cents would not be too much. I was so charmed with his conduct that I went soon after to see him, and by his wish, that I was happy to have made his host as an acknowledgment of my appreciation of his kindness. He hesitated at first, but soon afterwards, consented, and I made it in terra-cotta. It was exhibited, later on, that he endowed some of his friends and made some inquiries in regard to my capacity. Another bust that I enjoyed making, and one of the best I ever executed was of an apothecary, named Vanberkaeler. He had a remarkable head, of pure Flemish type, with a slight touch of Greek in it. These busts were exhibited, and very highly and justly spoken of by the Brussels papers. The apothecary's nose especially, was praised for its power, its character, and lanceability and nobility of style. "A veritable bit of the antique, did not its coat reveal its time and place?" The bust of "La Petite Annette," which the French Rodin had made in Strasburg, was also shown in Brussels and greatly admired.

Although he had fairly good friends in that city, they could do but little or nothing for him. To all intents and purposes he was quite a stranger, and no Society did not attract him. His home and his studio were his heavens. His general want of close friends, or even interested acquaintances, was often the cause of serious trouble, as the following incident will illustrate: When he went to Brussels he left in his studio, in the Rue Heremel, a large number of precious sketches, a quantity of valuable plaster casts and a clay figure, of a life-size type, upon which he had worked for two years, had cared for through the war with great difficulty, and upon which he set a high value. All at once, the owner of the studio, one Robinet, took the fancy that he wanted it, and without even informing Rodin, sold it to a junk dealer. It was truly, as he mournfully says, one of the cruellest events of his life.

As a whole, Rodin's experience in Brussels was like that of all artists everywhere who are entirely given up to their work. The world cares little for them or their art: it only cares for those who care for it. Art, pure and simple, has never won for its creator any particular personal attention, nor is there any reason why it should. Occasionally the artist and man of the world are joined together in one person, as in the case of Rubens. Rodin's groups, bas-reliefs and busts were, forgotten as soon as made, and as things go, there was no reason why their author should be longer remembered.

T. H. BARTLETT

THE LOTUS IN ANCIENT ART.—I.

THE ICONE CAPITAL AND THE LOTUS.

The object of this paper is to call attention to certain previously unknown or insufficiently developed facts, relating to the influence of the lotiform capital, a hitherto unrecognized conventional lotus form. This topic will be found to lead over to that of the anthemion, another word for the one all-important typical form of Greek ornament,—in its various modifications the most unusually current feature of modern decoration. The anthemion is a hitherto unrecognized conventional capital, a lotiform capital, and in its early history that of the later Greek spirals and scrolls is also involved. In the demonstration to be offered on this subject, the "egg-and-dart" motif, a hitherto unrecognized lotus motive. The most apparently improbable, yet most easily demonstrated case of lotus decoration in Greek art is that of the "egg-and-dart" moulding. Its association with the Ionic capital and other Ionic details is an interesting point connected with the lotiform origin of the latter.

The suggestion that the "egg-and-dart" moulding is derived from an Egyptian lotus basket is based on modern observation, but his interpretation of the evolution is unsatisfactory. I was not, however, aware of his suggestion when my own conclusions were formed. The suggestion that the Ionic capital in a lotus form may also be previously published but without attracting conviction or attention. In this case also the interpretations hitherto given of the evolution are insufficient and in this case, also, my own observations were without knowledge of the work of others. As publication is universally admitted to be the test of precedence, I only mention the fact that the entire series of observations was made independently, because they have all been arrived at by the study of lotus forms found on Cypriote vases, and because the clue offered by these vases is in my own conviction the only correct one—the only starting-point that will compel from experts in history, in archeology and in decorative art a recognition of the facts asserted.

This has not been hitherto accorded the suggestions of the lotiform origin for the Ionic capital and the "egg-and-dart" moulding by any standard authority, nor has the slightest notice of the hitherto taken of the isolated suggestions which were correct intuitions of most important facts.

As regards the anthemion, the rosette, and the Assyrian palmette (to be mentioned presently) I believe that both my observations and demonstration are unanticipated, as the demonstration is in all cases. From the observations bearing on the Ionic capital and anthemion, the Corinthian capital and other should prove to be a later and remote phase of the same initial motives.

The now generally accepted theory of the Ionic capital and the usual acceptance of the rosette and anthemion as identical with the Greeks obtained them from Assyrian ornament, by Phoenician transmission and by way of Asia Minor. This theory will prove to be no longer tenable and the Assyrian palmette itself, hitherto considered the first form of the anthemion, will be proved an Egyptian lotus motive, not a conventional palm-tree as hitherto supposed.

That the Greek spirals and Greek frets are of Egyptian derivation is already obvious from recent publications. Mr. Joseph Thacher Clarke has offered convincing proof on the long-debated subject of the Egyptian origin of the Doric shaft in a recent number of the Archaeological Journal (Vol. XXI). Archeologists and metaphysical proof have also been lately published on the head of the Doric Triglyph.8 The discoveries at Naukratis, the most important and ultimately the only Greek Colony of the Nile Delta, of which the Boston Museum of Fine Arts offers such interesting findings, have given impetus in various ways to the disposition to connect the origins of Greek art with influences from Egypt.

As the demonstration to be offered for the lotiform origin of the Ionic capital, of the anthemion, of the rosette and of the egg-and-dart moulding, will, if it proves satisfactory, only substantiate and take a point of view for the theory of Greek art with influences from Egypt which has already been acknowledged probable or clear in important particulars. In 1873 when the Cypriote pottery of the Cosmopolitan collections was first exhibited in New York, I called the attention of friends whose testimony is still available to certain cases of lotus decoration, such as appear on the vase in the Metropolitan Museum of Art, herewith

8 Prisse d' Avennes:" Histoire de l'art Egyptien;" Bohlenmann:" Mythology;" Ornamenten;" and "Tigrus;" "Ägypten und Syrien." Bildende Kunst," 19th (colored illustrations at the close of Duran's "Balkans der Griechen").
Competitive Drawings for
Proposed New
World Building

Richardson Archt.
121 East 25th St, N.Y.
figured, with enlarged details from similar vases (Figures 1, 2, 3.) which seemed to me to argue a lotiform derivation for the Ionie capital. The lotiform derivation of the Ionic capital was first suggested, but on other, and I think it will appear on less satisfactory grounds, by French students in 1875 and 1885. In 1875 Georges Colonna-Cecalci (since deceased) published an article in the Revue Archéologique in which he supposed that the lotiform capitals, now known and known as the sarcoptite of Athisn, in which he also published one of two tomstones found with it and also now in the New York Museum. One of these is figured at 4. He asserted this stile to be a conventional representation of the lotus in which the triangular portion between the volutes figured the ovary of the flower. The volutes themselves were interpreted as petals curled over and the introse scroll above being supposed to represent the stamens. It will be subsequently shown that the details of this interpretation are all erroneous but it will also appear that the intuition regarding the entire form was correct. As the lotus is an Egyptian symbol of the Resurrection, the suggestion in this case was extremely apt although this point was not made by Colonna-Cecalci.

In 1885, Mr. Dacier, the distinguished explorer of the ruins of Susa, and the lotiform origin of the Ionic capital in his "Monuments Antiques de la Perse." His starting-point was a form of Egyptian capital found in relief representation at Karnak (eighteenth dynasty): figured at 5. He interprets the scrolls as representing lotus petals conceived as curling downward under pressure and the object between them as a representation of the ovary. It will appear later that this interpretation which corresponds essentially with one by Colonna-Cecalci, is also incorrect in detail but correct as to result.

In 1886, a summary of the literature of the Ionic capital up to date, was published in the American Journal of Archleology (Vol. II, No. 11), by Mr. Joseph Thacher Clarke which did not include the suggestion of its lotiform derivation. This led me to examine the New York Cypriote vases more closely and to connect the lotus motif with them with others, to be subsequently illustrated, in such a way that the lotiform fact may now be asserted definitely and conclusively that the Ionic capital is derived from a conventional form of lotus flower and that it is of Egyptian origin. My view has been adopted by Prof. Allan Marquand, of Princeton, in a recent number of the American Journal of Archleology, (Vol. IV, No. 1). It has been considered with much interest and I believe with approval by Prof. A. L. Frothingham, Jr., of Princeton, the editor of the Journal and one of the most expert of experts. The investigations on the Ionic capital led me to those on the anthemion or palmette, a more important, because a more universally employed decoration and there seems to me, to be no escape from admitting that they are a necessary consequence of the demonstration for the Ionic form.

The interest of the related observations is considerably enhanced by the recent successful efforts to naturalize in this country the various water-lilies, commonly known by the one name of "lotus" and by the opportunities to observe the natural flower which many of us have recently enjoyed. Mr. J. H. Soutivault, of Bearden-town, N. J., and Mr. Benjamin Grey, of Malden, Mass., are florists who have been especially prominent in this connection. From the lily-ponds of the former the fountain basins of the various parks in New York have, for instance, been very generally stocked with lily plants of all three kinds known to the ancient Egyptians. The cut numbered 6 shows a selection of details from these plants, combined from sketches made in Union Square, New York.

The plant most generally quoted as a "lotus" is now extinct in Egypt and Africa, but still grows in Asia. It bears the flower so well known in Oriental art and decoration as the emblem of Buddha. According to botanical terminology, this Nymphaea speciosa is not a lotus. It is distinguished by the peculiar seed-pod seen on the left of the cut, shaped like the spout of a watering-pot and containing seeds about the size of small bell-flowers, by a bulbous, tulip-like shape of bud, by much larger petals than belong to the lotus proper, and by the fact that its leaves grow by the centre in bell-shaped form on erect stems rising above the water. Botanically speaking, the word "lotus" is confined to the large white water-lily, Nymphaea lotus, and large blue water-lily, Nymphoides calycina, but the flowers of all three kinds of plants are closely allied in appearance, aside from distinctions of color. All resemble the common pond-lily, although superior to it in rigor, beauty, and size. Unlike the pond-lily, the flowers of several species rise high above the water on erect stems. The leaves of the white and blue lilies float on the water. The pond-lily occasionally exhibits a phenomenon as regards the calyx leaves, which can be more distinctly observed in the Egyptian monuments, by being raised high above the water. In the Egyptian varieties of the lotus the calyx leaves forming the outer coarse green envelope of the bud and papyraceous floral bracts, are, like the sepals, set free and raised, as far as the calyx is concerned, by the outer lilies and form the floral crown.

The suggestion of Colonna-Cecalci and Dienstoy that the Ionie volutes represent curling lotus-petals is not supported by any related appearance of the natural flower, as the petals never curl downward or outward. When the lotiform origin of the Ionie capital has been universally conceded, the details of the interpretation would not be a matter of vital importance. As long as these intuitions of the true origin of the Ionie capital have not been quoted or mentioned by a single authority, it is important that this interpretation which compels acceptance, the first step in this direction is to insist on the point that the lotus-flower occasionally exhibits a phenomenon which was observed by ancient decorators in a manner to which the Ionie volutes fairly correspond. The different lotus-varieties, as above described, are occasionally distinguished by naturalistic coloring in Egyptian design, the blue lotus especially; but more frequently only the form of the flower is indicated in a variety of color combinations of purely conventional character. It does not appear that the rose-lotus, Nymphaea speciosa, had a more distinctly sacred character in Egypt than the white and blue water-lilies, although this has been sometimes supposed. Egyptologists simply speak of the "lotus," without distinction as to its varieties in the information given as to its sacred significance.

The opinion of Wilkinson, expressed in his "Ancient Egyptians," that the lotus had no sacred significance must be abandoned, in view of the numerous opinions of later authorities. It was a symbol in the Resurrection, according to Pictet ("Pantheon Egyptien," p. 62). It was the flower sacred to Osiris, the God of the Resurrection, and usually crowned the altars of offerings to him. The four "Genii of Amontil," 2, c., of the world of departed spirits, are for this reason sometimes represented in Egyptian pictures of the "Last Judgment" and otherwise as standing on the lotus. Bouquets of lotus-flowers were presented to the goddess at the beginning of time, and doubtless for this same reason. According to Masséna, the lotus was one of the mystic forms or habitations of the departed spirit. According to Pisses d'Avennes, the lotus was an emblem of life and of immortality.

The association of the lotus with Osiris explains that with Horus, the child of Osiris and Isis. The infant Horus appears frequently in Egyptian temple-reliefs seated on the lotus, or rising from it. In his various guises of hawk, of hawk-headed human being or human-headed hawk, the lotus constantly appears as his attribute, as it is also that of Isis. The identity of Horus with the sun and with the solar-winged disk (Pictet has constantly represented one of the Egyptian monuments thus explains, also, an association of the lotus with solar worship, and involves the fact that the lotus was a symbol of the sun, which can, moreover, be absolutely demonstrated from monuments to be subsequently quoted. Finally, the flower is known to have been a generative emblem. For this significance, the association with Osiris in his generative and reproductive character is sufficient demonstration. The association of the lotus with Phallus represents a common characteristic of the Egyptian divinities. As the Apis

1 A Proto-Ionic capital from the site of Naxos.
Bull was considered an incarnation of Osiris, the association of the lotus with Apis is also a frequent appearance on the monuments. The third member of the Egyptian Trinity was Isis, the spouse of Osiris, mother of Horus and Moon-Goddess. To her, also, the lotus was consequently sacred.

In the decorative motives of the Egyptian tomb pictures, borders, panels, niches, columns are the elements that appear on the ancient and almost exclusively dominant form. In the temple architecture it forms the basis for all capitals anteating the Ptolemaic period (see Reber's "History of Ancient Art"). The Egyptian words for lotus and for the capital of intercolumniation as appears from the illustrations of Maspero in his "Histoire des Peuples Anciennes de l'Orient." Although the papyrus has been frequently considered as having suggested the motives of decorative form, the actual evidence is inconclusive demonstrated. Other confusions of lotus-forms with that of a supposed papyrus can be also shown to have been made and increase the admittely overwhelming preponderance of the lotus and its derivatives in Egyptian decorative art which is almost exclusive of other forms as regards surface ornament.

The preponderance of lotus motives in Egyptian art and decoration, being sufficiently explained by the dominance of the Osiris and Horus cult and by the well-known hieratic and symbolic character of all Egyptian art, we have no difficulty in recognizing the source and reason d'être of the lotus motives so constantly found in the decorative art of the Phoenicians and on the vases of Cyprus.

The solar cult was a dominant one among the Phoenicians and their adoption of Horus worship, of the winged solar disk and of various forms of lotus decoration, is enhanced by the available illustrations of their well-known dependence: Egyptian influences.Réan speaks of Phoenicia as a "province of Egypt in middle of the Mediterranean Sea." The raising of the lotus and resurrection of Osiris is distinctly connected with localities on the Syrian coast, and the worship of Osiris is known to have been especially affected by Byblus, of which support the earliest Phoenician colonists. Amasis, the Egyptian, is also recorded to have been in time a distinctive cult of Amathus, one of the oldest Phoenician settlements in Cyprus. Such special points are not as important as the general one, that Phoenician development exhibits a preponderance of lotus forms and derivatives, similar to that found in Egyptian art and explained by it. The close and early relations between Phoenicia and Egypt are made especially vivid by the fact that the cedar oil on which the Egyptian were absolutely dependent for their general method of emboilment (the second in the scale of costliness and pomp) was entirely supplied by Phoenician commerce and manufacture.

The dependence of early Cypriot art on the Phoenicians of Syria, and the general dependence of the Phoenicians on Egypt for many mythological conceptions, and for the symbolism, forms and motives of their own hieratic art, thus justifies a treatment of Cypriote decorative art from a standpoint which regards it as a unit in the matter of its lotus motives, and which justifies the search for analogies between decorative motives of Cypriote capitals and stiles and those found on its pottery.

The stiles in question were tombslutes. The pots, as will be seen, were as a rule decorated with a lotus and as the lotus was the Egyptian symbol of the Resurrection, and also of a solar Horus worship expressed by the lotus, the association is palpably significant. The worship of the moon and of a moon-goddess, either Isis herself or one assimilated to her, or both, is well-known to have been a prominent feature in the religious life of the ancient Egyptians. The lotus, as the association of the lotus with Isis worship above explained are also in point.

As for Phoenician capitals, which are known by a number of reliefs to have especially favored the Iamic form, we may, without insisting in all cases on a symbolical significance, which can be shown to have existed in space cases, simply point to the general fact that Phoenician architectural decoration was especially derived from Egyptian sources, and that lotus Ionic forms can be demonstrated to have existed in Egypt near the eighteenth century B.C. (beginning of the eighteenth dynasty). One illustration of this fact is offered by the painted illustrations of architectural capitals in wood or metal, of which an illustration is offered at Fig. 7, from a tomb at Thesos of the time of Menephtah, son of Ramesses II. The Ionic form appears distinctly in the upper member of this capital.

As regards the pottery of Cyprus, it is not necessary to assume that the decorative motives possibly a certain degree of the symbolical significance of the lotus decorations so universally found on them. The Greek colonists of Cyprus borrowed the Phoenician art before the dawn of recorded Greek history, and before there was an Ionian culture; but, with a certain amount of adaptation and confusion, they perpetuated these Phoenician forms down to the time of Alexander the Great and after. In the demonstration to be subsequently offered we are thus freed at the same time from difficulties regarding the question of dates, and from the suspicion calculation of which one form is shown at Fig. 11, to be the original starting-point of the Assyrian proto-Ionic. The palmette form itself has been universally considered a derivative from the palm-tree, as represented on Assyrian reliefs (Fig. 12), and Mr. Clarke supposes the predominant motives of decoration as represented in the Period of the Ionian and the Ionian Ionic, and published in support of this view three details of ivory plaques from Nineveh, in the British Museum, one of which is shown in Fig. 12. These details differ from the palmette forms between 10 and 11, and might fairly be considered representative of similar lost architectural caps. As the Greek

"Der Stil in den technischen und technischen Künsten."

Fig. 7. Fig. 8. Fig. 9. Fig. 10. Fig. 11.
antheon (typical form from an Attic vase at Figure 14) has so far been always referred to the Assyrian palmette and to the Sprig, although through that ornament, the attractions of a theory which unites the antheon and the Ionic capital as developments from the same starting point are apparent, and the connections between them in Figure 14 are too obvious to be disregarded. Moreover, two other
devouring to arrive at an estimate of the probable cost of excavating each puddle trench or, therefore, of making an estimate of the cost of execution and the ultimate success of any puddle trench. Hence, the site of an embankment is finally fixed on, its geographical forms and structure should be very carefully investigated, not only by means of borings, which, taken by themselves, are generally misleading, but by trial pits, the number depending on the length of the trench, sunk well into the strata in which it is proposed to found. Great is the difference in the amount of work done per man day, both in excavation of materials, at about the same depth. For instance, in trap or whinstone rock at a depth of 40 or 50 feet from the surface, a man can excavate 6 cubic yards per day, at a cost of about $8 per cubic yard, whereas 22 cubic yards of sandy clay have been removed at the same depth, costing only about $2.5d. per cubic yard. It is obvious, also, how seriously the expense of excavation of an otherwise easy material may be augmented by the presence in it of water in large quantities, quite apart from the mere question of pumping. This is, perhaps, best exemplified by sand, which, when taken with earth, is nearly as costly as anything else, but when it is changed into running sand by the addition of water, the cost of excavation often gives an infinite amount of bother. In the case in point, for a time, only a "siphon" cubic yard could be got out per man day.

The next points to be taken in the matter of the excavation have to do. For the first 3 feet the soil can be cast out as it is dug, but below that depth either a staging must be introduced, and the stuff cast on to it, and from it again to the surface, or in the wings of the trench it may be wheeled in. In the case of rock, if the depth exceeds 12 feet or 15 feet, mechanical aid must be called in, and the materials excavated raised to the surface by horse or steam-power, by appliances similar to those employed for lifting the water in a well. If this might be anticipated, the reduction due to this cause is not so rapid down to a depth of about 16 feet. It then becomes gradually less, until after 30 feet is reached, it is comparatively slight, and is due almost exclusively to the diminution in the cost of the labour and to the diminishing amount of light which reaches the bottom of the trench as the depth increases, especially in winter. Additional depth also means additional pumping-power, which must not be left out of account.

**Puddle.**—The cost of puddle varies in proportion to the distance from which it has to be conveyed to the embankment and the nature of the clay, boilered upon requiring much more working to make it into good puddle than some of the softer clays, and it also requires to have a great many stones picked out, though this is frequently carried too far, a few stones, if they are not too large or allowed to touch one another, being in some respects rather an advantage than otherwise, as they tend to prevent the clay from cracking and fissuring, in contracting, and also somewhat increase its weight. If water for "soaking" the clay is not obtained from artesian wells, it must be pumped. For the boggy water from the Peatsy Works, about 60 hp is needed during the peak time. If it is generally best to "soor" the clay as close to the bank as possible to reduce the weight of material transported, and also be possible to use the water from it for the purpose of washing the soil. In the Peatsy Water-works one of Priestman's diggers was worked with very good results for lifting the puddle from the heaps and casting it into the trench. Puddle in the trench usually costs somewhat more than that in the well, and other things being equal, on account of the pumping required and the labor expended in removing timber.

**Miscellaneous Earthworks.**—Most of the remarks already made with reference to the cost of excavating puddle trenches apply to that of sinking deep foundations, in which neither caissons nor coffer-dams are used. In excavations, when barrow work is resorted to exclusively for the removal of the soil, the work done per man engaged depends considerably on the length and gradient of the barrow road; if this be level or nearly so, an additional wheeler must be put on for every 30 to 35 yards of distance, or if on a slope of say 1 in 10, the length of the stages would require to be reduced to 25 yards. In the case of rock, the cost of breaking the degree of hardness of the rock to be considered in estimating the cost of its removal, but also the way in which it is "bedded" forms an important item. Especially is this so in taking out rock for foundations, and there is much more scope in this class of work for the exercise of economy in the judicious use of explosives, etc., than in ordinary earthwork.

**Concrete work.**—In making concrete, the labor expended per cubic yard is greatly dependent upon its mass form, and the amount of face work, if any, per cubic yard. In foundations, under ordinary conditions, about 22 cubic yards can be milled, or brought to permanent level, by hand labor, whereas in confined positions, such as in coffer-dams, etc., this may fall as low as 3 cubic yard per man day. It is always of importance to place the mixing-platform as nearly as possible at the same level, as well as having a position where the concrete is required, on account of the disproportion of the materials caused by a tip of a considerable height; and to wheel it down a steep incline is hard on the men and leads to the loss of time.

In making the screening-well at Aercrnawke Reservoir and Water-works, which was constructed of concrete faced with bricks, only 14

---

Footnote:

1. From a paper by Mr. A. Fairlie Bruce, read at a meeting of the Civil and Mechanical Engineers' Society.
cubic yards were done per man day in the lower part of the wall where the concrete had to be wheeled down a slope of 1 in 10, whereas 2.55 cubic yards were done per man day in the upper part with a barrow road at 1 in 5. In designing concrete work, both with a view to economy and to obtain as fine a finish as possible, the corners were cut as few as possible, and with large "splays," and the curves as large a radius as the exigencies of the work will admit of, in order to get a good day's work for the same number of men. Making all due allowance, however, for economy in labor, to be effected by careful design and management, the cost of concrete-work is chiefly dependent, the labor being no more than the local conditions governing the price of cements, etc. If cement and sand are dear, and a good rubble is easily obtained, it is often cheaper to use it than concrete, and in many cases quite as efficient, and the cost of breaking stones is saved, and somewhat less sand and cement is needed than is required for concrete at, say, 6 to 1. Masonry.—The price of masonry, like that of concrete, is of course affected by the same factors, and can be investigated and weighed before its cost is estimated or its class fixed on; that is to say, whether it is to be brickwork, ashlar, or rubble, supposing the particular requirements of the projected work admit of such a choice.

Ashlar.—Save in special cases, such as important copes, etc., in most cases of engineering work where it is necessary to use ashlar, "dabbled" or "swallowed" work will be found sufficiently fine, and the time demanded for them is only about half that needed for "dropping," and one-third of that for "polishing," so that they might with advantage be more frequently substituted for these. The labor, however, while nothing better can be used for work below ground, such as retaining-walls, etc., than good solidly built rubble, faced with what are called in the North Anchor Points, or the "setting." Some squares from 1 to 1.5 cubic yards can usually be done per man day at this description of work in light retaining-walls, etc., of 2 to 3 feet thick without a crane, and with a crane in vibora pits. In heavier masses of masonry, such as arches, heavy retaining-walls, etc., there are 2.55 cubic yards can be done per man day. In one of the abutments of the Clyde Viaduct as much as 5 cubic yards were accomplished per man day, but in this case the stone used was quarried immediately alongside the building, placed by the quarry man even straight onto the work, which enabled very large stones to be used. In Northern Italy, where good building stone is usually very plentiful, 4 cubic yards can be done very cheaply, the best class of hydraulic masonry, built of mortar, composed of one of Casalit cement (an Italian copy of Portland cement), one of Casalit hydraulic lime, and four of sea-sand, only costing 10s. to 12s. per cubic yard in the neighborhood of Genoa. If river-sand is used, the price is reduced to 8s. a cubic yard; but this latter, being formed by the action of water on limestone rocks, contains silica, and consequently a very inferior mortar is the result.

In conclusion, the author may say that no greater mistake can be made than to fall into the habit of reserving the subcontractors of the concrete work of the Parthenon, as the enlargement of the cause of the Republic, that he enrolled the boy in a scholastic life, such was the enthusiasm which the Parthenon had for the architecture of the Parthenon, that he decided to train him in the arts. He turned his attention to drawing; and, when about sixteen years old, he began seriously to take lessons, working early and late. In 1897 he went to Paris to complete his education, engaged by the Voumey upon the Voumey column. This and the stirring events which were quickly succeeding one another, seem to have made him a violent Bonapartist; and we find him and four or five fellow-students throwing the heads of the soldiery as often as possible at Dijon and the Progress of the Pope of Corsai, on his return from Elba. Rude and his friends stood on the steps of the theatre, and as the troops passed (some 18,000 men) the crowd clapped their hands. He was at first astonished, but unmoved; but, as the cry was repeated over and over again it took effect, and the soldiers joined in with a unanimous cheer. "Vive l'empereur!" and next day the officers followed suit. After Waterloo, Rude joined David the painter at Brussels, where a great deal of his work was accomplished, and where he married Sophie Freminet, an accomplished artist and musician. Besides being a painter, Rude was a great copyist, and his collections of engravings and models were the admiration of all his contemporaries. Although his wife had no money to continue his "Pécheur Napoléon," she suggested that they should sell some necessary garments; "Nous vivrons avec nos membres," said all artists are not blessed with such self-sacrificing partners, unhappily; but, then, Rude's wife knew the trials of making bricks without straw, and the miseries of being stayed from carrying out great ideas for want of a little necessary filthy lucre.

Whatever Rude may have been as an artist, his private life was exemplary. He loved his home and his work, and in the evenings when not drawing or meditating, he read the French classics and music. An indefatigable worker, and in merit the equal of any of the sculptors of his own time; he never was received at the Institute, in which he was allowed to belong; but he was immediately annexed upon one occasion to the persuasion of his friends, and became a candidate. Promised by many that he should have their votes, the election proved that he had had none. But there was no love lost between him and the Immortals; for, while he called them the petits, they dubbed him "l'homme à la barbe"; and when he heard of his unsuccess, he said to his wife, "Tu vois bien, Sophie, qu'il faut que je laisse poser mes mouchoirs, on dirait que je verse pour entrer à l'Institut." Perhaps M. Dantiet is not quite wrong in his estimate of "Les Immortels." Of Rude's work as a sculptor M. Bertrand speaks enthusiastically. He considers the sculptor to be a very delightful man, and the "Mercure" of Jean de Bologne. In this I cannot agree, nor in M. Bertrand's estimate of Rude's other works, for his classical temperament predominates in all the works which are most graceful; and his religious ones, Thorwaldsen's false sentimentalism. What can be weaker and more mauldlin, for example, than his "Baptism of Christ" in the church of the Madeleine, Paris; and, although his "Départ des Volontaires," on the Arc de Triomphe, has a certain grandeur in the "movement," it decidedly approaches clay-trap. The Salons for the last eighteen years have contained "Libraries" of remarkable grandeur in effort and far less shirking. Again, what can be more hideous than the "Napoléon 1er s'éveillant à la Posterité," in the Parc de Ficin. A plinth, on which rests a rock and an eagle in the agony of death; at the summit Napoléon sleeping peacefully, later, like the great men of the French Renaissance have left behind them. Even amongst the moderns, surely the work of Boucher, of Carpeaux, of Chapo, of Paul Dubois, Farguère, Guillaume, Moreau-Vaillant and of many others, quite equals or excels that of François Rude. Whether Rude would have made a better design for the completion of the Arc de Triomphe, than that which was temporarily placed upon it some years ago byfavre, is very doubtful — but perhaps the work of the carvers from the Alpes is preferable. But if one cannot agree with the author in his estimate of Rude as an artist, we may endorse his views upon the man and the teacher: "N'en crainez pas qu'on vous repousse avec orgueil, débattant et gagnez vous-mêmes, pour que vous fussiez toujours de votre mieux. ... Pourquoi elle soit vase, conforme à la nature, une œuvre aura toujours ce qu'on en conviendra, sans doute, sur scène renferme de mille motifs de décoration, et le caractère; substituer à la nature l'intuition d'airuit, les procédés d'écriture, c'est effacer les différences des sexes et des œuvres, et réduire tout ce que l'on fait ce usured d'individualité qui est l'apanage de l'art qui est l'apanage l'humanité, ses qualités et caractères. Il opposera l'œuvre de l'artiste qui précède résumera l'individuation de l'artiste entamée maintenant dans nos œuvres et affirmée dans son œuvre, tout comme une œuvre engendré par le caractère de l'artiste et monumentales: Viges le Parnasse. These are sentiments which every one in our own day will echo, and which are the doctrine of modern realists: "Au fond, l'art ne s'ajoute pas à la nature; il l'embrasse, l'emporte sur elle." — François Rude, par Alexis Bertrand. Libraire de l'Art, cité d'Avant, 20, Paris.

THE FINAL PAYMENT CLAUSE IN BUILDING CONTRACTS.

It has been suggested to us by an architect of this city that a synopsis of the lien laws of the different States and Territories...
We have accordingly prepared the following schedule of what, in our opinion, after careful examination of the various statutes, is the longest time allowed for the filing of claims against real estate by subcontractors, material-men, or other persons furnishing labor or material to the principal contractor:

<table>
<thead>
<tr>
<th>State</th>
<th>Time Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>4 months</td>
</tr>
<tr>
<td>Arkansas</td>
<td>90 days</td>
</tr>
<tr>
<td>Arizona</td>
<td>90 days</td>
</tr>
<tr>
<td>California</td>
<td>90 days</td>
</tr>
<tr>
<td>Colorado</td>
<td>90 days</td>
</tr>
<tr>
<td>Connecticut</td>
<td>90 days</td>
</tr>
<tr>
<td>Delaware</td>
<td>90 days</td>
</tr>
<tr>
<td>Florida</td>
<td>6 months</td>
</tr>
<tr>
<td>Georgia</td>
<td>90 days</td>
</tr>
<tr>
<td>Idaho</td>
<td>3 months</td>
</tr>
<tr>
<td>Illinois</td>
<td>3 months</td>
</tr>
<tr>
<td>Indiana</td>
<td>3 months</td>
</tr>
<tr>
<td>Iowa</td>
<td>3 months</td>
</tr>
<tr>
<td>Kansas</td>
<td>3 months</td>
</tr>
<tr>
<td>Kentucky</td>
<td>3 months</td>
</tr>
<tr>
<td>Louisiana</td>
<td>3 months</td>
</tr>
<tr>
<td>Maine</td>
<td>3 months</td>
</tr>
<tr>
<td>Maryland</td>
<td>90 days</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>90 days</td>
</tr>
<tr>
<td>Michigan</td>
<td>90 days</td>
</tr>
<tr>
<td>Minnesota</td>
<td>90 days</td>
</tr>
<tr>
<td>Missouri</td>
<td>90 days</td>
</tr>
<tr>
<td>Montana</td>
<td>90 days</td>
</tr>
</tbody>
</table>

In Mississippi the time is six months if the amount is over $100. In Iowa and Louisiana, and in Mississippi for amounts under $100, there is apparently no time fixed for filing liens in favor of the owners.

It is probable that in some of the States where the longer periods obtain, it was not the intention of the Legislature to give to laborers and material-men such extended time; but we have constructed the schedule according to what seems to us to be the most unfavorable interpretation of the law from the owner's standpoint, with a view to finding such time as shall, with all necessary caution, protect the owner against the claims of all parties other than the original contractors. The time that original contractors, that is, parties dealing directly with the owners or for filing liens, is, in some States, different from that given to subcontractors and others; the owner, however, can protect himself against a claim of lien from all persons with whom he deals directly by requiring a release of all claims on the property before the contract is finally settled. The time for the final payment need not be deferred beyond the last day on which it is possible for third persons to file liens against the property.

The contract should, however, provide that the final payment shall not be due for a period exceeding by a few days the time allowed subcontractors for filing liens; as the exact day when a building is actually completed, or work on the contract ceases, is often a matter of dispute. It is best to defer the final payment until five or ten days after the time apparently open for filing liens has expired.

The following is submitted as a final payment clause for use in contracts to be executed in Massachusetts and the assumed good for other States with the necessary change as to time indicated by the above schedule:

"Thirty-five days after the said work shall have been completely accomplished in accordance with the terms of this contract; provided, further, however, that no lien shall then have been filed against the property and remain undischarged, and that said contractor shall render to the owner a satisfactory receipt for the amount paid him for the work under seal of the State, as a part against the owner's estate, and shall also (if requested) furnish satisfactory vouchers, receipts or other evidence that no claim against the said estate can be made by any person or persons who have furnished labor or materials for the work embraced in this contract."

The Harlequin Gorgeoeusness of Greek Architecture.


To the Editors of the American Architect:

Dear Sirs, — I wish to call attention to an unfortunate paragraph in the review of the "Architectural Exposition" (in this week's Architect, January 19) in which your correspondent attacks Greek architecture in such a hasty and unpardonable manner.

It is, perhaps, a human failing to slight and misunderstand that which is produced in our own day, but few who are not parochial in this subject can fail to feel that the glaring in itself and wilful so conspicuous in the midst of a criticism characterized by such conscientious aggressiveness and expressed with such simple force that it should shock New York, is unequal to the task. If your paper will take the trouble to look up the subject of Greek temples he may have occasion to reverse his decision as to their "harlequin grotesqueness" as well as to Mr. Brown's originality in drawing his Caryatid porch without any frieze.

Very truly,

H. F. KELLY.

[The writer of the article on the League Exhibition protests against being accused of a prejudice against Greek architecture. As to Mr. Brown's Caryatid porch, while he can certainly claim that the Erechtheum portico was the first, the author feels that the profiting after the treatment of the upper face of the architrave, give it an effect quite different from this design. The author does not perhaps settle whether even the Erechtheum portico had not once a frieze some 100 feet in length. The main question, however, whether the appearance which the Greek architects intended their buildings to have that is a "harlequin grotesqueness," "abstract form," and so on, as the remnants of the early part of the century materialists, or of the (harlequin grotesqueness) in people of the most profound intuition into the workings of the Hellenic soul, that a Greek was incapable of producing the portly of his Parian marble by covering it with pigment, and the desire of the temple of Athena the loathsome foot of the Slavonic conquerors during the dark ages, who danged the so-called "frieze" that was a fault of the most prominent idea of the Athenian temples, until it was shorn away, as was the case of the Temple of Magna Graecia, which no medieval barbarians had ever appreciated."

To the Editors of the American Architect:

Dear Sirs, — Will you kindly let me know through the medium of your paper, what you call "Southern Romanesque," also on theatre construction, where I can gain more information, and the price. You will greatly oblige.

Yours respectfully,

E. H. DAVIS.


The Fire on the Heath Stove.

Boston, Mass., February 4, 1889.

To the Editors of the American Architect:

Dear Sirs, — Can any one tell me whether the Fire-on-the-Heath Stoves, once manufactured by the Open Stove Ventilation Company, in New York, are still made, and if so, by whom, and what is the address? I have used half a dozen or so in my practice, and would have used many more, probably, if it were not for the extreme difficulty of getting them. The last one I bought I heard of, after many inquiries, and, at Salem, Mass., they say they have been the sole survivor of the race, and what I shall do when I next apply to, to recommend a nursery stove, or to get pieces to repair those I have already bought, I do not know.

H. F. KELLY.

How to Write for the Paper. — There are not a few scholars, fitted for even the Chair of Rhetoric, who are sadly uninformed in the art of writing. They have certainly read and pondered the masterpieces of the world, but their communications must receive a little — often a great deal — of "doctoring" before they are put into the hands of a periodical editor. Of course the editor will do what he can to help them, but he must formally be satisfactory. What they err in pertains mainly to the mechanical make-up of the manuscript. We note a few particulars: a long experience has convinced us that:

(1.) Abbreviations are an anomalous. No one who really knows how to write for the paper ever gives "Pres," "Min.," "V. Pres." for "President," or "Thurs." for "Thursday." Certain abbreviations are established and printed as such — "Mr.," "Hon.," "Mass.," "Eq." for examples. But when it is expected that the..."
The New Pei-tei Cathedral. — The new cathedral in Peking, which is to take the place of the Pei-tang, removed two years ago from the neighborhood of the Imperial Palace, after having for many years occupied the site of a small temple, was consecrated on December 8. Abbe Faires of the Lazarist Society designed the edifice and superintended its construction. The internal dimensions of the cathedral are 150 feet by 72 feet. The church is a masterpiece as a specimen of Chinese art. The glass, which was brought from France, arrived in Peking in excellent order. The building is not so large as the granite cathedral in Canton. The church is 246 feet in length, 102 feet in breadth of nave, 52 feet; height under the beams, 59 feet; height under the arched roof, 69 feet. The height was fixed in a convention between the Chinese Government and the Lazarist Mission, and one of the conditions imposed was that there should be no tower. These conditions added to the difficulties of the architect, but he is said to have overcome them, and the result is a church "completely beautiful."

It is said that the Chinese Government were to send representatives of high rank to take part in the ceremony, "as by the same token the exchange for the changes that occupied a troublesome and even dangerous question has been fully settled in the most satisfactory fashion of the Imperial court, the Tsung-li-Yamen, and Chinese public opinion." The bishops and government are "thus only left in the matter—and, on the other hand, to the satisfaction of the Catholic mission also." — London Times.

Sewage Disposal by the Gravitational Siphon System. — A method of sewage purification, depending mainly on aeration, was de-described by Mr. W. Kaye Parry, M. I. C. E., in a paper read at a recent meeting of the members of the Institution of Civil Engineers of Ireland. The process, which is the invention of Mr. W. H. Hartland, is as follows: The sewage passes from the sewer into a settling tank situated some feet below the sewer invert. This tank is constructed in the form of a siphon, and the liquid leaving it rises again to the level of the sewer invert. In this tank a separation of the solid dextrins and other heavy suspended matter takes place, and the effluent, on leaving the tank, is reduced in the fatty matter and the floatable particles that float on its surface. The liquor is now led through a number of settling tanks, where its surface is cleared of organic and inorganic impurities, and its passage is deprived of its greasy matter, whilst its solidity is at the same time neutralized by the lime. After this the liquor enters an aeration tank, where it is broken up, by means of a fan, to a finely divided state, in which, falling, comes in contact with a strong current of fresh air, and carries down with it a large quantity of oxygen. It now passes through a number of filter tanks, where it is broken down by a fine siphon into the precipitation caused by the oxidation takes place. The liquor, however, still contains some of the ammoniacal and nitrogenous elements of the sewage, and to complete the process filters filled with charred earthy refuse shale or other suitable material. When a high standard of purity is required it is also filtered through bone charcoal. Experiments have been made in experimental plants at Monkstown, Dublin, where, with the sewage being drawn from a sewer draining certain portions of Kingston. The first settling-tank was 4 feet square and 5 feet deep, but this was increased to 14 x 4 feet, and 1 foot deep. Some 1200 gallons of sewage were broken down in 8 hours, and 5 600 gallons of water were used. The oxygen used was 100 pounds broken to pass through a 1½-inch ring, and the second with 3 329 pounds broken to pass through a 1½-inch ring. The other filters contained 35 cubic feet of spent shale broken to pass through an 8-inch ring, and the other filters with 1000 gallons of sewage and 90 pounds of oxygen were used. The trials extended over twenty-five days, and the results were very satisfactory. Some of the effluent was quite sweet and free from smell. Experiment showed that 15 gallons per gallon of potassium permanganate were required to produce an equival-
The exterior of this house is stained with

**CABOT’S CREOSOTE STAIN**

for Shingles, Fences, Clapboards Etc.

---

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply:

> Our Stains contain no water and are the only exterior Stains that do not contain kerosene:

Prices are 50, 75, and 75 cents per gallon according to color.

Send for samples on wood, and circular.

**SAMUEL · CABOT,**

70 Kilby St. · Boston · Mass.
AMERICAN WINDMILLS.
February 16, 1839.

Entered at the Post-Office at Boston as second-class matter.

Summary:

On the Testing of Building Stone.

The Metropolitan Museum of Art.

Illustrations:

Letter from Chicago.

Letter from New York.

Letter from Canada.

Opening of the Howard Pyramid.

Illegal Commissions.

Societies:

Notes and Illustrations.

Trade Surveys.

The Western New York Association of Architects held its second annual convention last week, with an attendance of about twenty-five members. The usual questions, about the licensing of architects and the regulation of competitions, were brought up, and informally discussed. Mr. Carlin of Buffalo, the Secretary of the Association, read to the Convention the draft of a bill which he proposed to the Illinois Legislature, to restrain persons who have not passed a satisfactory examination, before a board appointed by the State, from practising architecture within the State; and a committee consisting of Mr. Carlin, Mr. Dockstader of Elmira, and Mr. Colton of Syracuse, was appointed to consider the advisability of presenting a similar bill to the New York Legislature. Another committee, consisting of Messrs. Curtis of Fredonia, Marling of Buffalo, and Walker of Rochester, was appointed to consider the subject of uniform contracts; and the committee on competitions was continued for the purpose of enabling it to draw up a set of propositions in regard to such matters, which it proposes to have adopted by the Association as suggestions, rather than fixed rules. We suppose it is needless, at this day, to point out the advantage to the profession of such discussions. Although the topic of competitions is tolerably well worn in the deliberations of architects, and of the regulation of practice hardly less so, some advance is made every year in both of them. About ten years ago, the Boston Society of Architects had a "Tract on Competitions" prepared, presenting the principles for which the profession has fought so long. As a tract, it was interesting, and convincing to architects, but the idea of attempting to induce the public to conform to it was at that time almost ridiculous, and we doubt whether many copies were circulated, unless as curiosities, outside of professional circles. A few years afterward the English architects, under the lead of a group of resolute and distinguished men, joined together to establish public competitions on a satisfactory basis, which soon secured the adherence of nearly every respectable architect in Great Britain, and has already completely transformed the relation of architects to important public work. After the formation of the Western Association of Architects in this country, the leaders of that body took early steps to impart an emphatic expression of opinion on the subject; and now the State and local societies seem to be in a fair way to finish the work by the adoption of rules which will be binding on their own members, and will soon become familiar to the comparatively limited public with which each society deals. The Missouri State Association has already formally adopted the principles generally approved in the profession; the Boston Society has done the same, and has issued a new pamphlet of rules and suggestions, of which each member receives a number of copies, for distribution where they may be needed; and if the Western New York Association, followed by the others, will do the same, the battle for justice and fair treatment will be nearly won.

Some of the people in Rhode Island are beginning to be sorry that they passed a new lien law last year, giving material men a lien, without notice to the owner, and sixty days in which to file the claim. A certain school-house has just been completed in East Providence, under the direction of Messrs. W. H. Walker & Son, as architects, and the full contract price, together with interest for the time it was promptly paid to the contractor, a man named Moulton, after the completion of the structure. About two weeks after the final payment to the contractor, Messrs. J. B. Gurney & Son, Fred E. Hovey, and J. C. Dodge & Son filed liens for materials furnished to Moulton, to the amount of five hundred and twenty-two dollars and some cents. No bonds were required of the contractor, and as he has just assigned his wages, and mortgaged his personal property, it looks very much as if the town would have to pay the amount of the liens, with costs. Naturally enough, the taxpayers blame the School Committee, or rather, the Superintendent of Schools, who were supposed, by the committee to attend to the matter, for paying the contractor in full before the time for filing liens had expired, and the Superintendent transfers the blame to the architects, who, as he says, gave Moulton certificates, on receipt of which he was bound to make payments. The truth appears to be that neither was much to blame, if at all. Moulton, it seems, went to the architects, saying that the Superintendent wished them to give him a certificate for a certain amount, and they, knowing that matters of payment are very often, much too often, in fact, arranged between the builder and the owner, or the representative of the owner, who have no knowledge of what was said, believed what he said, and gave the certificates, looking out that they did not exceed the contract price, and undoubtedly supposing that the Superintendent would take the necessary precautions to protect the town against liens. On his part, the Superintendent probably supposed, as he says, that the architects certificate amounted to an order to him to pay the sum mentioned at once, without inquiry or reserve. Of course, we know that this is an error, the architect's certificate being simply an expression of his opinion that the money is due, which imposes no obligation upon the owner to make the payment if he has reasons, which may have been given, for not agreeing with the architect, or forgotten by him, for not doing so, but it is a very common error, and the novelty of the law, under which this seems to be the first case, probably helped both parties to forget it. The next time that the town builds a school-house, it will probably require bonds from the contractor, and then advise architects who may be called upon to practise in Rhode Island to draw their contracts in such a way that a sum ample to cover all possible liens, for materials or wages, may be reserved until the time within which they can be filed shall have expired.

A German engineer has published some observations on the most efficient method of excavating through frozen weather, which we find copied in two or three of the foreign technical journals. Every one knows the difficulty of making any impression with ordinary tools on frozen ground, and a surface protected with paving-stones is even more intractable than ordinary material. Unless fires can be lighted upon the line of the excavation, so as to thaw the ground beneath them, the usual way is to pick, painfully and slowly, into the hard, tough mass until a sufficient depth is reached, or the frozen stratum is penetrated. According to Herr Schindler, who has carried his theory into successful practice, much of the labor incident to such work may be saved by considering that the ground does not freeze all at once into a homogeneous mass, but by successive stages, which produce a stratified condition, something like that of sandstone or limestone. If the work is carried on vertically downward from the surface, the material, whether of stratified stone or frozen earth, must be removed in small particles, while, by
taking advantage of the stratification, and working horizontally from a shaft or an exposed face, the material may be split off in large pieces through the seams between the strata. Where earth has been filled-in, the strata may be followed by the help of forges set up at their homes, small wrought-iron articles, which are shipped to all parts of the world. The managers of the new enterprise began their work with the sensible step of ascertaining the exact rents paid for the existing tenements by the persons who hold the land or in securing houses of their own. For this purpose, they distributed circulars through the quarters inhabited by working people, asking each householder who might receive one to give, over his signature, the number of persons in his family; the number of rooms occupied by them; the rent paid; the current value of land attached, to the house, and so on. Six hundred and forty-seven circulars were returned, properly filled out. From these, which certainly presented a tolerably reliable view of the condition of the working-people of the town, it appeared that the most expensive tenements were those in the immediate neighborhood of the railway station, which brought about twenty dollars a year per room, without water-service, or twenty-three dollars with water-supply. The attics in the same houses brought about two-thirds the rent of the first and second story rooms. Tenements at some distance from the centre of the town brought, for the first and second floor rooms about two-thirds of the rent of the more conveniently located ones, while the rent of the attics was very little less. In the outlying districts the average rents were about one-half those in the middle of the town. In regard to the number of rooms occupied by each family, it appeared that the people intelligent enough to reply to the circulars lived, on an average, two in a room. One hundred and twenty-one, out of the six hundred and forty seven persons who answered, said that their families slept three in a room, on an average, and in twenty-six cases there were four or five persons to a room. A comparison of the rents paid with the cost of the houses mentioned in the replies, including the value of the land on which they stood, showed that they brought in an average return of about eleven per cent a year above expenses; and in some cases the income was as much as fifteen per cent. As the account, which we find in the Deutsche Bauzeitung, justly says, these facts showed plainly that there was not only need of cheap and wholesome houses for workingmen, but that the rents which they would command would pay a good interest on the cost. A company was, therefore, formed, with a capital of forty-four thousand dollars, and the construction of houses commenced. The constitution of the company was much like that of similar corporations here, the liability of each stockholder for the debts of the company being limited to the value of his paid or secured interest in its property, and the administration being placed in the hands of officers elected by the members. At present, the company builds houses either for sale or rent, or buys them, to sell again, where this may seem advisable. Of those built by the company, some are detached, and some "semi-detached," as the English say, or "double," to use our word. A single family may occupy a hundred and fifty dollars for a single wall, and one hundred and fifty dollars. If a member wishes to hire a house, instead of buying it, he pays six per cent, net, on the value, as rent. By paying seven per cent, he is entitled to having the house valued five per cent as the net rent. When the sinking-fund reaches one-third of the value of the house, a deed of it is given to the tenant, who becomes thenceforth responsible for the insurance, taxes and repairs. The remain ing two-thirds of the value, which is secured by a mortgage on the property, is provided for by requiring the new owner to continue paying five per cent on the full value. Three per cent of this goes into the interest on the mortgage, while remitting two per cent constitutes a new sinking-fund for the extinction of the principal. For the other provisions adopted by the company we must refer persons interested to the original article, or rather, series of articles, or to their author, Herr Walther Lange. Besides, looking at the advancement of the small house horizontally as the work advances, and lift and break up the frozen earth in large sheets until the necessary depth is attained.

SOME good people in Remscheid, in Rhenish Prussia, have recently carried out a cooperative building scheme on rather a new plan. Remscheid is a town of fifteen or twenty thousand inhabitants, who occupy themselves principally in blacksmith work, making, with the help of forges set up at their homes, small wrought-iron articles, which are shipped to all parts of the world. The managers of the new enterprise began their work with the sensible step of ascertaining the exact rents paid for the existing tenements by the persons who hold the land or in securing houses of their own. For this purpose, they distributed circulars through the quarters inhabited by working people, asking each householder who might receive one to give, over his signature, the number of persons in his family, the number of rooms occupied by them; the rent paid; the current value of land attached, to the house, and so on. Six hundred and forty-seven circulars were returned, properly filled out. From these, which certainly presented a tolerably reliable view of the condition of the working-people of the town, it appeared that the most expensive tenements were those in the immediate neighborhood of the railway station, which brought about twenty dollars a year per room, without water-service, or twenty-three dollars with water-supply. The attics in the same houses brought about two-thirds the rent of the first and second story rooms. Tenements at some distance from the centre of the town brought, for the first and second floor rooms about two-thirds of the rent of the more conveniently located ones, while the rent of the attics was very little less. In the outlying districts the average rents were about one-half those in the middle of the town. In regard to the number of rooms occupied by each family, it appeared that the people intelligent enough to reply to the circulars lived, on an average, two in a room. One hundred and twenty-one, out of the six hundred and forty seven persons who answered, said that their families slept three in a room, on an average, and in twenty-six cases there were four or five persons to a room. A comparison of the rents paid with the cost of the houses mentioned in the replies, including the value of the land on which they stood, showed that they brought in an average return of about eleven per cent a year above expenses; and in some cases the income was as much as fifteen per cent. As the account, which we find in the Deutsche Bauzeitung, justly says, these facts showed plainly that there was not only need of cheap and wholesome houses for workingmen, but that the rents which they would command would pay a good interest on the cost. A company was, therefore, formed, with a capital of forty-four thousand dollars, and the construction of houses commenced. The constitution of the company was much like that of similar corporations here, the liability of each stockholder for the debts of the company being limited to the value of his paid or secured interest in its property, and the administration being placed in the hands of officers elected by the members. At present, the company builds houses either for sale or rent, or buys them, to sell again, where this may seem advisable. Of those built by the company, some are detached, and some "semi-detached," as the English say, or "double," to use our word. A single family may occupy a hundred and fifty dollars for a single wall, and one hundred and fifty dollars. If a member wishes to hire a house, instead of buying it, he pays six per cent, net, on the value, as rent. By paying seven per cent, he is entitled to having the house valued five per cent as the net rent. When the sinking-fund reaches one-third of the value of the house, a deed of it is given to the tenant, who becomes thenceforth responsible for the insurance, taxes and repairs. The remain ing two-thirds of the value, which is secured by a mortgage on the property, is provided for by requiring the new owner to continue paying five per cent on the full value. Three per cent of this goes into the interest on the mortgage, while remitting two per cent constitutes a new sinking-fund for the extinction of the principal. For the other provisions adopted by the company we must refer persons interested to the original article, or rather, series of articles, or to their author, Herr Walther Lange. Besides, looking at the advancement of the small house horizontally as the work advances, and lift and break up the frozen earth in large sheets until the necessary depth is attained.

THE French tribunals have made up their minds that the yield from a building of a house, not a house of business, especially for a public officer or a pri- vate individual, is not higher than the fair value of the house itself, paid for by self-respecting individuals. The having been accepted as the consciousness that the handsome mansion of his richer neighbor is not far off, and that it is worth an effort on their part to keep their cottage dainty and attractive, and to look after the appearance and manners of the children, so that they may not suffer by comparison with the carefully trained young people near by; while the corporate property, scattered in this way, is much less likely to suffer serious depreciation in value than if concentrated in a large area, which may be rendered nearly worthless by the establishment of some offensive manufacture near by.

THE Wiener Bauindustrie-Zeitung gives a recipe for a paint, to be applied to woodwork exposed to the weather, which, it says, is proof against all ordinary influences, and is tolerably cheap. "To a bucket of water, add half a bucket of agricultural tallow, and mix it with a little rosemary. Mix one part of zinc-white with two parts of lime-water, and the objects to be painted covered with a good coat of the mixture. When this is dry, which will be in two or three hours, a second coat is applied, composed of a solution of chloride of zinc in lime-water, or other substitute. By this means, the one of them is converted into a smooth, shining coating is formed, which is extremely durable, and the paint may even be used, instead of tar, to protect the ends of wooden posts in the ground. Another durable paint, which has the advantage of rendering wood covered with it fire-proof, is composed of one part each of salt, alum, slaked lime, sugar, and tannate of soda, with four parts of lime, mixed, and ground in lined oil. Three coats of this paint make a wooden object incombustible, and it is said to last for thirty years exposed to the weather."
ON THE TESTING OF BUILDING STONE. 1

The problem of ascertaining the suitability of a stone for any form of structural application is a complex and difficult one. Briefly put the question is this: by what methods in the laboratory is it possible to ascertain within the space of a few days or weeks the relative strength and durability of a stone for uses for which it may be intended, or even for many generations or even centuries. In order that the difficulties involved may be fully appreciated, let me present the main points to be considered. In the order of their importance, I believe they are

1. Resistance to changes in temperature.
2. Resistance to the chemical action of an acid atmosphere.
3. Durability of color.
4. Crushing strength and elasticity.
5. Resistance to abrasive action of dust and wind-blown sand.

The order as given above may be subject to modification to suit individual cases. In many instances the actual strength of the stone is a matter of little importance, and in protected situations the qualities mentioned under (3) and (5) may be of no essential value. In such instances the modulus of rupture, crushing strength and durability are the matters of greatest importance, while the extent of change of color can be left wholly out of consideration. In the arrangement given above I have had especial regard to stone exposed in the exterior walls of a building, and in a varied climate like that of the Northern and Eastern United States.

Before proceeding to a discussion of methods by which these essential qualities can be estimated, let me call attention briefly to the peculiarly trying conditions under which a stone thus exposed is placed, and offer a few criticisms on the methods now commonly employed.

None of the conditions under which a stone is commonly placed are more trying than those presented by the ordinary changes of temperature in a climate like that of our Northern and Eastern states. A stone takes up moisture to a low conductivity power and with slight elasticity. They are aggregates of minerals more or less closely coherent, each of which possesses degrees of expansion and contraction of its own. In the crystalline rocks these disjunctive elements are practically in actual contact; in the sandstones they are removed from one another by a slight space occupied wholly or in part by a ferruginous, calcareous or siliceous paste. At temperatures rise, each and every constituent expands more or less, crowding with resisting force against its neighbor; as the temperatures decrease a corresponding contraction takes place. Since with us the temperatures are ever changing, and within a space of even twenty-four hours may vary as much as forty degrees, in forty years from the date the stone there is continual movement among its particles. Slight as these movements may be they can be conclusive of one result, a slow and gradual weakening and disintegration.

The effects of moderate temperatures upon stone of ordinary dryness are, however, slight when compared with the destructive energies of freezing temperatures upon stone saturated with moisture. At a temperature of 20 degrees Fahrenheit the pressure exerted by water passing from a liquid to a solid state amounts to not less than 188 tons to the square foot, or as Professor Kelcie has strikingly put it, is equal to the weight of a column of ice a mile deep. The water filling the pores of a stone in a house-front to be saturated by a winter's rain and then subjected to temperatures perhaps several degrees below the freezing point shows signs of weakness and exfoliation after a single season's exposure.

Since then, as every quarryman knows, no stone however strong can endure the enormous strain it would be subject to if frozen solid while holes and considerable moisture were confined within its pores, it is but natural to conclude, as a matter of course, that other things being equal those stones are most durable which will absorb and retain the least moisture. This rule is not to be accepted, however, without a considerable grain of allowance, since a coarsely porous stone, though capable of taking up a large amount of moisture will also part with it readily, or if frozen while saturated will permit a considerable proportion of the expansive force of the water to be expended otherwise than in pushing apart the grains composing it. Otherwise expressed, the water will free out of a coarsely porous stone, while in a finely crystalline one it will expand and have. This is well illustrated by the common occurrence of water freezing in straight cylindrical or widely-expanding vessels, and in narrow-necked pitchers and bottles. In the first instance the open space above is sufficient to allow the expanding water to rise vertically. The narrow-necked vessel, on the other hand, is almost invariably broken.  

Still other objections to a porous sandstone than its liability to disintegration on freezing may be given. A stone front, while undoubtedly imposing, may become saturated by prolonged rains, and still hold tons of water confined in its capillary spaces, evaporating, and must render a house damp, requiring a larger outlay of fuel to render it comfortable. This matter is, in part, remedied by building double or in a three-story way, thus if a climate a stone house constructed otherwise would be well nigh uninhabitable. Moreover, a porous sandstone is, of all stones, most likely to afford foothold for the growth of algae, lichen and mosses. While it is not to be proved that all stones when actually injurious, they are, at least, suggestive of an unhealthy dampness. A stone covered by these organisms will absorb more water and give rise more readily to evaporation than one whose surfaces are not thus protected.

To ascertain, then, the porosity or ratio of absorption of any stone is an important test; to ascertain the ratio of absorption and resistance to freezing while saturated with water is another, and together they test the most conclusive of any one test yet suggested. Nevertheless, it is a matter which at present is almost wholly ignored. I will refer to some methods which have been employed to some extent in times past.

The second essential quality, that of resistance to atmospheric chemical agencies, is also one that architects, as a rule, ignore. Like the last, it needs, therefore, to be enlarged upon.

The atmosphere in its natural state consists of a mechanical admixture of nitrogen and oxygen in about the proportion of four volumes of the former to one of the latter. These quantities of carbonic acid, ammonia and vapor of water. In the vicinity of large cities, however, it carries in addition to increased quantities of carbonic acid appreciable amounts of sulphurous, sulphuric, nitric and chlorhydric acids, and in the rains in contact with the walls of buildings are capable throughout many years of time producing marked results, especially when combined with the influence of changes of temperature.

Carbonate of lime, the material of ordinary marble and limestone is particularly susceptible to the solvent action of these acids, even though they may be present in extremely minute quantities. Of these the uncrystalline limestones are most readily affected; the crystalline, if equally compact a trifle less so, and the dolomite still less.

It does not necessarily follow, however, that a dolomite will be more durable, since the essential change of stone in consideration. In the uncrystalline limestones the effects of an acid atmosphere are, perhaps, less noticeable since these stones are not, as a rule, used in finely finished work. The crystalline limestones (marbles) of course are more susceptible.

Kelcie found that slabs of marble exposed in the climate of Edinburgh lost their polish within the space of a year or two, and became completely illegible within a century.

Professor Julian found that in the city cemeteries about New York the polish on marble tombsstones did not often survive over ten years. The writer's own observations on the subject are to the effect that in the larger towns of New England marble tombstones will retain their polish for a period of from ten to fifteen years, and up to twenty-five or thirty years will preserve the surface of a slab with a minimum of polish changes. This time the surface becomes rough and granular, and the edges of the stone may be found filled with fine riffs in which particles of dirt become lodged or lichens take root, giving it a dirty and unkept appearance.

It is to this ready solubility of calcic carbonate that is also due, in large part, the poor weathering qualities of sandstones with calcareous cements. The calcite is slowly removed by solution, the siliceous grains thus become loosened, and falling away under the influence of wind and rain expose fresh surfaces to be acted upon. Certain of the ferruginous cements are likewise susceptible to the influence of the anhydrous rains; though the anhydrous oxide, as it exists in the Potsdam stones, is said to be less soluble than the hydrated oxide occurring in those of Triassic age.

The third essential quality that has hitherto been considered is that of durability, or permanence of color. Here, again, the chemical action of atmospheres are to be contended with. The possibility that a stone may contain certain constituents which on exposure to the atmospheric climate will change and produce new substances, or even a simultaneous change in color is apparently not fully realized. No better illustration of the prevailing ignorance on this point — unless indeed it was the case with the Iceland spar which was used by the creator in the exterior basement-wall in the new capitol building at Albany, New York. These are built of a light, and in its fresh state, uniformly gray granite. On exposure the numerous included parcels of pyrites change, assisting the expansive force of the gas to be expended otherwise than in pushing apart the grains composing it. Otherwise expressed, the water will free out of a coarsely porous stone, while in a finely crystalline one it will expand and have. This is well illustrated by the common occurrence of water freezing in straight cylindrical or widely-expanding vessels, and in narrow-necked pitchers and bottles. In the first instance the open space above is sufficient to allow the expanding water to rise vertically. The narrow-necked vessel, on the other hand, is almost invariably broken.

1 By George T. Merrill, Curator in the National Museum at Washington.
The American Architect and Building News.  

and utterly ruins otherwise beautiful work. While on the whole the presence of an easily oxidizable mineral may or may not be objectionable, it may occasionally be a great hindrance. The use of sandstone in the making of marble slabs is a case in point. If it is properly selected and prepared, it is usually of great advantage as a covering material. Scarcely a public building of any importance is erected but a long series of the tests is inaugurated at a considerable outlay of time and consequent expense. These tests are applied to represent the strength of all sizes and weights in the face of the fact that there is daily a stone upon the market that will not bear at least fifty times the pressure likely to be developed in a building. The stone in the bottom courses of the Washington monument, in this city, and that bears the entire weight of the superincumbent 550 feet, is a stone so weak and of such poor weathering quality as to be practically out of the market, yet its pressure-tests will show a strength many times greater than will be required of it under the most trying conditions of wind and weather. Indeed, I have yet to learn of a single instance in which a stone built into a wall has been crushed through any inherent weakness of the stone itself. Blocks have become broken, or scaled on the edges through unequal settlement or improper bedding, but I have not known of a single instance in which a stone properly laid has actually crushed through inability to withstand the strain are, I believe, few, so that they may almost wholly be left out of consideration. In short we may safely take it for granted that the majority of stones are fully strong enough for all ordinary structural application. What is desired is not a knowledge of its actual strength to-day but rather its power to resist for a much longer period, a more severe test than any of these exceptional circumstances. The tests as now applied will give no clue to this, whatever.

The elasticity of a stone is, I believe, a matter of much greater importance than is generally recognized. It was long ago observed that it was found necessary to build a long time to substitute iron in place of the stone towers of the Niagara Suspension Bridge. The original towers were of an impure magnesian limestone with seams of gypsum. Under the constant strain of surrounding air and water this gradually became porous, with rifts and cracks, rendering necessary their replacement by other material. Pressure tests would have shown the stone to have originally possessed a strength of only a necessary degree, which it was composed did not, however, possess sufficient elasticity and cohesive force to yield to the strain and regain their original positions when the strain was removed. Had a tough, impervious and tenacious rock like a diabase been employed, the writer ventures to assert, replacement would not have become necessary in our daily generation, so to say.

Objection No. 3.—That the power of any stone to resist the abrasive action of wind-blown sand and dust may in certain situations be an item worthy of consideration is not generally realized. The amount of actual wear to which a stone in the walls of a structure is exposed is naturally but little in comparison to that to which stones in walls and sills are subject from the friction of passing feet. Nevertheless, it is sufficient in many instances to be appreciable after the lapse of many years. It is now on exhibition in the National Museum at Washington a plate of glass formerly a window-pane in the light-house at Naussett Beach, Massachusetts, which has been subjected to sand-blown and dusting at a storm of not over forty-eight hours’ duration as to be no longer transparent and to necessitate its removal. The grinding is as complete over the entire surface as though done by artificial means. This same process is going on, though in a more gradual and less visible manner, in our city streets where the wind blows dust and sand sharply against the faces of buildings. The impact of these small particles is not sufficient to perceptibly wear away the fresh stone within a limited time, but it may often be sufficient to crumble the small particles already loosened by atmospheric action and expose new faces to be acted upon. Professor Eggleston states that in many of the churches in New York City Onion depositions can be seen where the tombstones face in the direction of the prevailing winds. In such cases the stones are sometimes worn very nearly smooth, the entire surface being detached from those alone. Illustrations of the mistake in laying soft and friable sandstones for walks and steps are so numerous I hesitate to touch upon the subject at all. At the present time the most pronounced case in point is that offered by the old flight of stone steps (lately removed) leading up to the western entrance of the Capitol building at Washington. These were of a soft sandstone and while they might have answered well for the original purpose of use it has been worn so down by the friction of thousands of footsteps to a very marked degree, the frontal edge of the tread being in some cases lowered fully an inch below its original position.

As to the commonly employed methods of testing: as a matter of fact no tests are now systematically made with a view of ascertaining the absorptive properties and resisting powers of any stone to the action of frost, although these are, as I have already noted, the most important qualities. In testing the absorptive powers, the methods adopted by both General Gillmore, at Staten Island, and Professor Winchell, at the Smithsonian Institution, are approximately as follows: Well-dressed and cut blocks, one to two inches in diameter were thoroughly dried, and after cooling weighed, and then immersed in water for periods of several days. They were then removed, the surface-water removed as quickly as possible, and the stone again weighed. The difference in weight is the increase in weight, of course, representing the weight of the absorbed water. In stating the result the increase was always designated in terms of a percentage of the original weight; thus a block weighing 300 grams dry weighed 301 when saturated the ratio was expressed as 1/4. This method when carefully carried out in all its details is sufficiently accurate. Care must be exercised in expelling to expel all previously absorbed water; and certain authorities have gone to the trouble of immersing the cubes under a hell-glass and then exhausting the air, to ensure complete saturation. This is an unnecessary precaution, and I would suggest it as a thing like such conditions either in its natural bed or in the walls of a building.

Previously, the best method for ascertaining the ability of a stone to resist the action of frost is to actually expose the blocks when saturated to freezing temperatures, and then, after several repetitions of freezing and thawing process, to note by weighing the actual loss by dissolution or, better yet, the loss in strength. Unfortunately, this cannot at all times and all places be done, and artificial methods must be resorted to. Brand’s process, as modified by Mr. Hrazil and Thomas, consisted in boiling the stone to be experimented upon for half-an-hour in a saturated solution of sulphate of soda (glaser salt), and then allowing it to dry, when the salt taken up by the stone would be expanded in a manner supposedly similar to that of water when freezing. This is now practically given up, as experiment showed that the salt excreted a chemical, as well as mechanical, action, giving results none. The tests made by Mr. C. G. Page, in 1847, with reference to the selection of stone for the Smithsonian Building at Washington are sufficient evidence that if the tests above adopted should be followed, it should be stated, were cut in the form of ineb-cubes. Each cube was immersed in half-hour in the boiling solution, and then hung to dry; this performance being repeated daily throughout the four weeks that the experiment lasted. The results obtained were as follows:

<table>
<thead>
<tr>
<th>Specific Gravity</th>
<th>Loss in weight, in grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marble, Lake-ter, Maryland</td>
<td>2.34</td>
</tr>
<tr>
<td>Marble, blue, Md.</td>
<td>2.623</td>
</tr>
<tr>
<td>Sandstone, course, Portland, Conn.</td>
<td>2.558</td>
</tr>
<tr>
<td>Sandstone, red, Seneca, Md.</td>
<td>2.672</td>
</tr>
<tr>
<td>Sandstone, Little Falls, N. Y</td>
<td>2.486</td>
</tr>
<tr>
<td>Sandstone, course, Nova Scotia</td>
<td>2.518</td>
</tr>
<tr>
<td>Sandstone, dark, Seneca Aqueduct, Md.</td>
<td>2.59</td>
</tr>
<tr>
<td>Sandstone, Arcity Creek, Va.</td>
<td>2.518</td>
</tr>
<tr>
<td>Granite, Port Deposit, Md.</td>
<td>2.589</td>
</tr>
<tr>
<td>Marble, Montgomery Co., Penna.</td>
<td>2.599</td>
</tr>
<tr>
<td>Marble, blue, Montgomery Co., Penna.</td>
<td>2.599</td>
</tr>
<tr>
<td>Hard brick</td>
<td>2.924</td>
</tr>
<tr>
<td>Marble (coarse dolomite), Pleasantville, N. Y</td>
<td>2.951</td>
</tr>
</tbody>
</table>

Results to which I wish to call especial attention are those obtained on the red sandstone from Seneca, Md., and that from Aquia Creek, Va. The first of these, with a specific gravity of 2.672, or a weight per cubic foot of 167 pounds, lost by disintegration but .70 grains. This was the stone ultimately selected for the Smithsonian, and the building as a whole is to-day probably in as good state of preservation as any of its age in the United States. The second stone, with a specific gravity of 2.23, or a weight per cubic foot of but 139.37 pounds, and which lost 18.6 grains, is the one used in the construction of the old portions of the United States Patent Office, Treasury, and Post-Office Building. This stone is very poor, and disintegrates so badly, that only repeated applications of paint and paint keep them in anywise presentable. The results obtained with limet and slate brick are even more striking: the one weighing at the rate of 230 pounds per cubic foot losing 16.4 grains, while the harder brick weighing 143 pounds, lost but 1.97. If anything can be learned from the series, it is that, with substances having the same specific gravity, the harder the better. In general the harder, the better, 1.97 grains which are the heaviest, bulk for bulk — will prove the most durable.

The results obtained on the coarse and fine blocks of Portland sandstone are of great interest. I believe it could freeze outside of the coarse stone and, therefore, create less havoc than in that finer grain, a probability to which I have already referred.

The pressure-tests that have been made in times past have, for the most part only been made in samples. The worst hollowed from the side of a piece, being deprived of the support of whatever value they might otherwise have had by the systematic manner in which the experiments were carried out. General Gillmore, as shown, in his admirable experiments upon cubes of varying sizes, that "at least within certain limits, the compressive resistance of cubes per square-inch of surface under pressure increases in the ratio of the cube roots of the sides of the respective cubes expressed in inches." So far as I can learn, however, these
Plate No. 40.

Billingborough.

Staines Peter and Paul, Haskan, Davork.

Northamptonshire.
results are wholly ignored, each architect or engineer working on an independent basis, testing blocks of such size and shape as are sent him, or are most readily obtained. Gillmore, as above noted, used two-inch cubes. The architect of the Congressional Library, conducting his tests, I believe, to use one-inch cubes. Tests on stone for the Philadelphia City-hall were made on blocks varying from six to eight inches in length, without regard to the size of the blocks. These many instances are limited only by the capabilities of the testing-machine, and, in the report of the last case alluded to, we find record of three blocks that sustained the maximum of load of the machine (sixty thousand pounds). Still another peculiarity lies in the fact that, in advertising for blocks to be tested, no mention is made of the manner in which these blocks are to be prepared. Tests conducted on masonry or even on stones necessity fills with incipient fractures, and such a block may crush under considerably less pressure than a really weaker stone which has been sawed to proper size and retains its natural strength. Such a stone, properly sawed, will give results perfectly validated through the ignorance of whoever may be in charge of the exact nature of the material experimented upon. All finely fragmented rocks, like the diabases, norites, diorites, and kersantites, are considered as granites. All calcareous rocks, whether magnesite or others, are, if of good color, marble; or, if of poor color, finely compact or amorphous, merely limestones. It is obvious that such a classification is not sufficiently precise to be of value.

I think there is no doubt but I have shown that, as first stated, the problem is a difficult one, and also that the efforts made toward its solution are of little value, except as showing what methods are to be avoided in the future. It remains to be seen if anything better can be suggested. I will briefly outline a method as such as being gradually shaping itself in my mind for several years past.

The subject has been very forcibly impressed upon me in connection with my duties as curator in the National Museum, and more particularly when preparing for exhibition the extensive Indian-stone collection made by the Tenth Census, a partial duplicate of which was also prepared under my direction for the American Museum of Natural History.

Assume, first, that the stone to be examined is designed for use in the exterior walls of a building, subjected to all the vicissitudes of our Northern climate, and to only such conditions as pressure and strain of the overlying superstructure.

All things considered, it seemed best that the experiments be conducted on two-inch cubes. These should be prepared by sawing and grinding, never by hammer and chisel. After drying at a temperature not exceeding that of boiling water, the ratio of absorption should be determined by complete immersion for a period of not less than forty-eight hours; the method, as followed by General Gillmore, is sufficiently accurate. The cubes should then be frozen and thawed while in a saturated condition, and the amount of disintegration ascertained by careful weighings. If the stone is a fragmentary rock, this would be done, and it is apparent that in accurate integration by freezing, it may be well to ascertain the loss in strength as well. This can be done by crushing the cubes after freezing, while still saturated, and also freshly-prepared cubes not otherwise tested. The freezing can be accomplished artificially by means of such apparatus as is used in making artificial ice.

The question of durability of color and resistance to atmospheric action can be settled only by chemical and microscopic tests. The condition of the iron, whether in the form of sulphide, carbonate or protoxide, is the main question to be considered. A little can, perhaps, be learned by submitting samples to the action of artificial atmospheric conditions, suspended in desiccators for several weeks, and then treated with acid solutions charged with acid fumes. The resistance to the effects of carbonic acid can, perhaps, be best determined as Professor Winchell has done, by placing the samples in a basin of water through which carbonic acid gas is kept bubbling. This test is scarcely necessary, except upon calcareous rocks or fragmental rocks with calcareous or ferruginous cements. The determination of the modulus of elasticity is important in the present case, and several methods are in vogue which are applicable with a reasonable degree of accuracy. When, as sometimes happen, it is desired to ascertain the relative powers of resistance to wear, as in pavements, or the wearing away of a stone border or a carefully-regulated sand-blast, such as is used in the Tigrisian process of stone-carving, this property might almost equally well be learned, however, by observing the manner in which the stone wears away under the test.

A very essential item in this connection is that the tests be conducted under the direct supervision of one thoroughly acquainted with the location of the chemical compounds, the origin, mode of occurrence, and characteristic manner of weathering. A purely theoretical knowledge is valueless, and only one who has devoted years of time to the work, both in the laboratory and in the field, can possibly be made a competent technologist. One gainfully occupied with all such work is that we are prone to expect too much, to obtain immediately results which, in the ordinary course of events, can be brought about only by the composed study and perhaps years of careful observation, study and experiment.
modern idols and fetishes worshipped by the aborigines of New Mexico, and objects from Mexico, Central America, Peru, and elsewhere. Another room is devoted to gems and objects in precious metals, and contains the Johnston-King collection of ancient gems; the Van Vechten collection of miniatures; cases of coins, watches, snuff-boxes, and silverware; and the Maxwell Galleries of engraved gems, pastes, cameos and rings. This is an exceedingly valuable and authentic collection, and, by the kindness of the owner, is on loan to the Museum for several years. Around the walls of this—the "Gold" room—are hung some magnificent Persian rugs, of which there are few in the U.S. This portrait of Spanish and Venetian beauties, all embroidered silks and Genoese velvets, loaned by Mr. Marquand. The Vanderbilt Collection of drawings by the old masters, with a large number of similar sketch and studies given in 1887 by the artist, includes some fine Rembrandt portraits. There has been a long gallery on the second floor, with several frames of etchings by Haden, Whistler, Jacque and others, given by W. L. Andrews. An album of engravings was a very handsome gift of the Hidden Edens. There are in this room, objects such as an ancient veneration and veneration which is without its good qualities, and some being excellent, by Juriaen Ovens; Hoogstraten (a man and woman on the same canvas); Franz Hals (two pictures), Jameson and Terborgh; in landscape, by Ruysdael and Teniers; and in genre by Teniers, with two copies from Bassano, Netscher, Zorn, and an exquisite small painting of "A Young Woman opening a Casement," by that rare and famous artist, in the painting of waters, one of which is a perfect gem of the gallery, and it would be an incredible monster of a collector who could have congratulated Mr. Marquand upon owning it who had been immersed by William T. Richards.

There is a very popular of the many well-known paintings which seem to be as usual, the modern paintings, two galleries being filled with the pictures given by Miss Wolfe; two with the other modern works, including such well-advertised canvases as Rosso Bonheur's "Horse Riding," dated 1867, "Defence of Callant's and Floty's "Thousnda," which are the property of the Museum; and one with its old masters, including the large and important example of Joshua Reynolds—the Hon. Henry Fox, "Guardsman"—given by Mr. J. S. Morgan. Then there is a gallery full of loaned modern paintings, and another—the Mee's men's, of players of art—holding a splendid collection of old masters, the like of which was never seen in America, when the country between two nations was given to the Museum, since its reopening, by Mr. Marquand. This makes seven galleries of pictures in all, and, in round numbers, five of foreign masters. Mr. Marquand has generously loaned his beautiful house of its choicest paintings and sent them here. This gentleman, and his name should be dear to all true art-lovers, is a man of few American artists—Mr. Quincey A. Shaw, of Boston, is another—who cares to gather any pictures but modern ones. He acts in the spirit of those words from one of the discourses of Sir Joshua Reynolds, which are inscribed on the walls of England's National Gallery. The works of the old masters and the modern painters have a claim to that respect and veneration to which no modern can pretend.

It is an unnecessary thing to criticize gifts, but if part of the large sums spent upon some of the pictures of the day (and of the day only) which have been presented to the Metropolitan Museum, have been used to buy good, not necessarily "important," examples of the work of the great artists of former centuries, it would be much better for everybody. The chief glory of the Marquand paintings is the portrait of James Stuart, Duke of Richmond and Lennox, which hangs at one end of the gallery. It is a life-size, full-length representation of a pleasant-faced young cavalier, with long, curling, yellow hair, who wears a black dress with gold embroidery, and stands full-length before us, one admiring on the head of a fine greyhound which looks up into its master's face. Van Dyck painted half-length portraits of this nobleman, one (a half-length) being now in the Louvre, and introduced the dog into one of them. The dog, it seems, had been killed when travelling on the Continent was preserved from assassination by this dog, which slept in his chamber and aroamed from his sleeping. It was a favorite animal of Charles 1, whose father and his were cousins, and received many favors from the King, which he well repaid. He was hereditary Lord Chamberlain of High Admiral of Scotland, was made a member of Charles's Privy Council when twenty-one, and appointed Lord Steward of the royal household and Warden of the Cinque Ports. He loaned Charles large sums of money to help his failing cause, and his younger brothers both entered the royal army and were slain. He lived five years after the death of the King, at whose execution he was present; (it is told that he offered to swallow the King's place), and was allowed the privilege of burying him. After this, he retired into absolute privacy and died; it is said, of the gradual effects of grief, in 1655, being then only forty-three years of age. This portrait formerly belonged to Lord Methuen, in whose library at Hackney Wood Court, it was described by Dr. Waagen over thirty years ago, and has been engraved by Earlam. It displays all the dignity, ease and refinement associated with Van Dyck's courtly sitters, and is a superb example of his powers as a portrait-painter. Some one has truly said that we cannot judge how much of the romantic interest and sympathy with which the subsequent generations have regarded this picture is owing to the picture of them, and their supporters by Van Dyck. The beautiful hound in this portrait is painted as carefully as his master, his affection towards whom being inevitably transferred to the dog. An excellent portrait of a lady by Van Dyck, and by Rubens there is an early work, "Pyramus and Thisbe," and a good portrait of a man. Of the Flemish school, also, we see a small and minutely finished "Virgin and Child," attributed to Jan Van Eyck.

There is a masterly little portrait of the child Don Balthasar, by Velasquez, and a larger one of the Dona Maria Anna, a stolid-looking young woman, with an enormous head-dress; and one other Spanish picture, a "St. Michael and the Devil," warm and bright in color, by Zurbaran. Of the English school, there is a charming portrait of the lady and gentleman by Sir Joshua Reynolds; a fine "Young Girl with Cat," by Gainsborough; and a warm golden-brown picture by Turner, showing the little port of "Saltsash." This was painted about 1812, and Mr. Roskin praises it as an example of Turner's later style. There are two small landscapes by Constable; "The Valley Farm," and "The Lock," both subjects which the artist has made familiar by several other representations of them; a good picture of A. Crome, and a beautiful small shore view by Bonington. Only one French artist is represented—Prudhon, by a sketch for his large painting of the "Association." W. J. Hunt, a single Italian present, to him being ascribed a "Female Head," with a man in a curious red hat, looking through a window, the whole in the delightfully quaint early Florentine style. A curious little portrait of a boy, of which the school is known in portraits, not one of which is without its good qualities, and some being excellent, by Juriaen Ovens; Hoogstraten (a man and woman on the same canvas); Franz Hals (two pictures), Jameson and Terborgh; in landscape, by Ruysdael and Teniers; and in genre by Teniers, with two copies from Bassano, Netscher, Zorn, and an exquisite small painting of "A Young Woman opening a Casement," by that rare and famous artist, in the painting of waters, one of which is a perfect gem of the gallery, and it would be an incredible monster of a collector who could have congratulated Mr. Marquand upon owning it who had been immersed by William T. Richards.

An "Adoration of the Shepherds," the authorship of which is given to Rembrandt, hangs near the grave head of a man in a black hat, from Lord Lansdowne's collection, by the same great artist, and whose best portraits are also here. These are the portraits of Van Beresteyn, burgomaster of Leyden, and his wife, which Mr. Henry O. Havemeyer lends to the Museum. They are the portraits of the great Dutch portrait-painter, and are in admirable condition, dated 1612, which, with their noble signature, is plainly to be seen on each. The figures are of two thirds length, life-size. These plain, shrewd, honest people, this middle-aged man, and the young girl who have stood outside the doors of Delft. This is one of the gems of the gallery, and it would be an incredible monster of a collector who could have congratulated Mr. Marquand upon owning it who had been immersed by William T. Richards.

Van Dyck's portrait was at the other end of the room and Rembrandt's portraits at this are the select ones of this good company of pictures. It is perhaps worth noting how nearly alike, and how few and sober are the lines which the painters have used in these portraits. Black, white and yellow—but what rich harmonies of color are the result.

The list of masters is closed by a "Christ before Pilate" (in diestemer) and an "Evee Hemon," both attributed to Lucas Van Leyden, and an interesting portrait by a master common to all the others—Jacquet. He produced innumerable pictures of all kinds—good, bad and indifferent. His name is "Unknown," and this time he is Dutch. All these paintings, save the two Beresteyn portraits, have been presented by Mr. Marquand. Several of them, besides the Van Dyck, are of no moment. The loaned modern pictures, most of which are lent by that well-known collector, Mr. George I. Senev, comprise Stewart's "Hunt of the Deer" (a Deposition of Berta, wife of Robert the Pious); Delacroix's magnificent sketch for his "Exultation from Eden" (belonging to Mr. Havemeyer); Isabey's "Blessing the Hounds," an important Vesalius; Gérôme's "First Kiss of the Sun" (on the Pramulo); two examples of Cazin; Bouguereau's "Tam O'Shanter," and many more.

From this review it will be seen how many varied attractions New York's Museum now possesses, and it is to be hoped that others, among her many rich men, may add their contributions to those so generously made by some of their fellow-citizens.
DESIGN FOR PLASTER CEILING
STORE BUILDING FOR FRED'L AMES ESQ.
LINCOLN ST., ESSEX ST., TUFTS ST & ESSEX PLACE
BOSTON, MASS.

SHEPHEY, RUTAN & COOLIDGE - ARCH'TS.

Heliotype Printing Co., Boston.
DESIGN FOR PLASTER CEILING
THE AGE OF FRANCIS I. PLATE 2.—THE TOMB OF THE CARDINAL D'AMBOISE IN THE CATHEDRAL, ROUEN, FRANCE.

[ SEALLE with the Imperial Edition.]

CHURCH OF ST. GILES, LURAY, VA. MR. GEORGE T. PEABORN, ARCHITECT, LURAY, VA.

The walls are to be built of native limestone, face-work on both inside and outside, and roof supports of undressed timbers so far as possible; and it is the intention to finish the whole interior in as simple a manner as possible consistent with churchly effect. The building is planned on about five tiers of galleries, and it is intended to be erected on the grounds of the Luray Inn, principally for use in the summer by guests there.

WAREHOUSE FOR F. L. AMES, ESQ., LINCOLN STREET, BOSTON, MASS. MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON, MASS.

"THE TALLEYRAND," BAR HARBOUR, ME. MR. DE GRASSE FOX, ARCHITECT, PHILADELPHIA, PA.

A mong the numerous blazes that are constantly occurring, Chicago has, within the last few months, been the victim of two, which, with a slight change of hour or circumstance, might have become a great calamity. The first occurred on December 5 at the Chicago Opera-house. The performance here had scarcely been finished fifteen minutes, and the actors were still in the building when a shower of fire was discovered. The building is unquestionably fireproof, and although this excitement is advertised and described on every programme and poster as being "the only absolutely fireproof theatre in the city," still in less than an hour all the auditorium was a complete wreck either by fire or water. This opera-house is not a building by itself, but occupies the lower stories of the court of a large office-building. The reason for such a location is that the laws of the State of Illinois are such that a charter to build an office-building pure and simple cannot be obtained. As a result all sorts of expedients are resorted to, in order to obtain charters for those syndicates that desire to build such buildings, and probably the large majority of them are incorporated as safety-depositories, safe vaults, private clubs, or something of the kind. As a matter of fact, the law as exists at all, consists of a closet in which is stored a trunk containing a watch or two. Owing to this a syndicate was formed to build an opera-house, although the opera-house itself was but a small part of the plan since the building is ten-stories high, while the theatre, as mentioned above, only occupies the space in a few lower stories that above becomes the court, from which many offices obtain their light. The office-building is undoubtedly fireproof, and possibly it was originally intended that the theatre should be so also, but it certainly did not prove such when the fire broke out. This fire, which started in an upper gallery, was apparently due to some defect in the electric-light plant, but the exact how and why does not seem to be really known, although numerous positive theories are not wanting. But, as is usual in theatre fires, in an incredibly short time the building was filled with smoke. Actors fled leaving their wardrobes a prey to the flames or the deluge of the fire-department. The inaccessibility of the building obliged the firemen to work slowly, but the amount of damage caused by the flames was small in comparison with that caused by the water, since every nook and corner was soaked. Although the money-loss was considerable, the work of repairs was at once commenced, and the theatre was again in full blast within three weeks. It is noticeable, however, that "absolutely fireproof" has now been changed to "fireproof"; but it would seem to be extremely questionable if such an announcement should be permitted by the authorities, since, in the ordinarily received sense, a building is called fireproof when the fire-depart- ment is only calculated to deceive the people, and in case of another accident might lead to more disastrous results than if the actual truth had been concealed, and each one was on his guard against a panic. Had this fire occurred only a few minutes earlier the casualties must have been numerous, and the whole city congratulates itself on the fact that such a disaster did not take place. Upon exa- mination by architects it was found that this so-called and much advertised "absolutely fireproof" theatre had an attic which, with the exception of a few girders, was entirely of wood, just the same as the cheapest theatre in the city. Moreover, the gallery was elaborately a wooden construction, owing to the fireproof character of the original gallery built on iron framework a slight of the stage was absolutely impossible from many parts, and in order to remedy this a wooden construction of a building that had never been used to be erected on the stage was erected. The second escape that we have had from a calamity was a fire in one of the highest, largest, and finest apartment-houses on the North Side. The building is seven-stories high, and it is intended to be used as both residence and office. This fire was extinguished with some difficulty, and the liquid gradually filtered through from one floor to another was something appalling. One person was injured by jumping from a window, but otherwise there were no fatalities. Many of the occupants were still abed: they hastened to arise, however, and several of them went forth in garments scarcely adapted to a cool winter's morning. The fire was started in the kitchen, by a fire that was first discovered, and this attic, being occupied as store-rooms by the occupants of the flats below, was filled with much that was light and inflammable, so that it burned right merrily. Although the fire-engines were promptly on the ground, the height was so great that even "smiessing" a stream from two engines had little effect, and it was necessarily some time, comparatively speaking, before the proper long-hose, hose carts could be arranged to work at such a height. By this time the fire had worked down, so that the upper story was smoking vigorously, but, when the streams once got to work, the deluge was such that the fire soon succumbed, but the burning with dirt and ashes that the liquid gradually filtered through from one floor to another was something appalling. One person was injured by jumping from a window, but otherwise there were no fatalities. Many of the occupants had been allowed to sleep in the attic, and the loss of life in such a high building might have been very serious.

A subject of an architectural school, or, at least, some kind of an extended course in architectural drawing at the Art Institute, is receiving considerable attention in the daily papers, and eventually something may come of it, although at present it does not seem probable that any very important action will be taken in the considered length of time. This agitation has been brought principally by the generous action of Mr. Robert Clark, who has given the Chicago Architect and Engineer, by way of a small test of thousand dollars, the interest of which is each year to be devoted to medals for the best work, and he has stated that he will give considerably more if a school is started. Several other gentlemen have intimated a willingness to initiate Mr. Clark's example, so that the matter is brought to a head, funds will probably not be lacking.

The outlook for building the coming season, if one may now judge by what architects say, is that there will be fully as many pieces of work as last year, but that the number of extremely fine buildings, especially office-buildings, appears to be somewhat limited: there will, however, be several important buildings of a semi-public character that will undergo repairs during the next twelve months, while an unusually large number of fine residences are already on the boards.

During the past few months Chicago has been favored, as never before, with art displays in all directions and of all kinds and is extremely remarkable to note the extraordinary growth of popular interest during the past year alone, in all art questions. We are getting so fully satisfied with our own appreciation of art, and this artistic spirit is so rapidly growing and developing in every one, that it seems a perfect matter of course that the Vere-stechigen collection should come here direct from New York before being exhibited at the other Eastern cities.

The first important display of the season was a collection of old Dutch and Flemish paintings belonging to Mr. Louis Ehrich. This exhibition contains some very fine and beautiful works, and a few canvasses by the great masters, still it contains many extremely good things of this period and gives as perfect an idea of the art of Holland and Flanders as many of the smaller museums of Europe, and if an exhibit of this kind shall be as well received as all fully exhibited here, it attracted great attention. Especially on the free days the rooms were crowded.

The Dutch pictures were directed by a small collection of the old Italian masters, which in their turn were much admired and now they have given place to the most remarkable exhibition ever yet shown to the Chicago public at the Art Institute, in the collection of the famous Russian, Julius Libby, which was opened to the public on February 1, and has ever since been thronged.

To the disappointment of many the artist, himself, does not come to America, but his pictures are hung by a Russian sculptor who, have literally taken possession of the Institute. The noble Greek and Roman gentleman (in plaster) have been unceremoniously hustled off into back rooms to allow for the proper display of this collection, which was sold by Mr. Julius Libby, as he will not have another opportunity to exhibit pictures of this quality.
exhibit savors possibly a little of the panorama with its little tricks of effect, but the result is so very varied as scarcely to be considered a success. It was that. The huge rugs, duplicated for the artist from those now in temple in India, are draped upon all sides with bits of Oriental armor, so that the servants in Russian costume, and the tea served from a samovar does not possibly seem entirely out of place with the surroundings.

If Verschagnin excelled in no other department he certainly would always be marvellous as a painter of architectural subjects, and his views of the Taj, and some of the mosques of India together with his scenes of the Kremlin, at Moscow, are wonderful revelations of the beauty of those monuments. At the same time that this collection is before the public at the Art Institute, the Chicago Artists' Club is giving an exhibition of the work of its members during the past year, and the result is certainly a credit to those painters who have their studios in Chicago.

Besides these various displays, there have also been in the course of the winter several fine exhibitions in the salesroom galleries, any of which would have been considered a treat a few years ago. This, not only are the painters busy but the sculptors' studios also being unusually full of work of a high order of merit, and bronze statues and bas reliefs are now being cast here for some of the most important sculptural work in the West.

As mentioned some time since in one of these letters, it was decided to try the plan of having Sunday opening of the collections of the Institute. This has now been in operation for nearly three months, and the results have been most satisfactory, and in some respects surprisingly so, for the experiment has been tried of exhibiting works of art without any railing or signs of "hands off," and up to the present the authorities have had no cause to regret this step. In one point, however, there is possibly a little disappointment: it was hoped that the poorer working-classes would especially take advantage of this fact that no admission fee was charged. Such, however, does not appear to have been the case, for the crowd consists mainly of the rather well-to-do class, who possibly cannot be interested either in art or anything else, but cannot get away from business upon a weekly day, so that the visitors are generally well-dressed and well-behaved. For some time a number of Chicago capitalists have been negotiating with parties at Richmond, Va., for the purchase of the old and historic dwelling house of Mrs. Anne Russell. Whether it will be a financial success or not, architects will be decidedly interested to watch the course of this building, if and as it proceeds, for, of all the curious building operations at Chicago, this will assuredly be the most remarkable one during the coming six months.

THE DAWNING OF A BETTER TIME.—RETRACTION.—THE WORK OF THE MAGAZINE.—THE GROWTH OF SOCIETY.

THAT there are better days in store for the profession, and that we stand to-day upon the threshold, none but the hardened pessimist can doubt. The tendencies shown in architectural discursions both public and private, the positions taken by the daily papers and by the more intelligent laymen regarding our work and our position, all confirm the progress made within the last dozen years and are assuredly full of promise for the future. The great trouble in our past history has been such as is inevitably associated with the deaths of the few notable, reaching factor in our already complex civilization, and the peculiar position of the architect making him both artist and engineer, both judge and advocate, has helped to retard our progress towards assured recognition. The architect of last a short generation ago had to justify his very right to exist, and his clients came to him, if they came at all, with an uneasy consciousness that they were indulging in an extravagance; deep in all our minds lacked analogies, drawn perhaps from political campaign literature, ancient republican simplicity and the effect despotisms of Europe. The architect seemed to them in someway associated with riches lived with the Baron Hausman and the Third Empire. This attitude on the part of the client was fostered and prolonged, indeed it still lives to a degree, by a variety of influences actively working within the profession itself. The first Art Institute, this has been the work of the well-known institutions of this earliest history, began their careers well within the memory of men now living and practicing; before their time, their works were and are synonymous terms and had identical functions. The only training then attainable was to be had only in Paris or in London, and with the influences of that training and, perhaps, some European travel fresh upon him our architect was thrown upon a community more self-centred, more intent upon the immediate dollar and less open to the higher and nobler ends of the question. But the necessity of youth was scarcely to be considered a loss that it would have been to all. The huge rugs, duplicated for the artist from those now in temple in India, are draped upon all sides with bits of Oriental armor, so that the servants in Russian costume, and the tea served from a samovar does not possibly seem entirely out of place with the surroundings.

If Verschagnin excelled in no other department he certainly would always be marvellous as a painter of architectural subjects, and his views of the Taj, and some of the mosques of India together with his scenes of the Kremlin, at Moscow, are wonderful revelations of the beauty of those monuments. At the same time that this collection is before the public at the Art Institute, the Chicago Artists' Club is giving an exhibition of the work of its members during the past year, and the result is certainly a credit to those painters who have their studios in Chicago.

Besides these various displays, there have also been in the course of the winter several fine exhibitions in the salesroom galleries, any of which would have been considered a treat a few years ago. This, not only are the painters busy but the sculptors' studios also being unusually full of work of a high order of merit, and bronze statues and bas reliefs are now being cast here for some of the most important sculptural work in the West.

As mentioned some time since in one of these letters, it was decided to try the plan of having Sunday opening of the collections of the Institute. This has now been in operation for nearly three months, and the results have been most satisfactory, and in some respects surprisingly so, for the experiment has been tried of exhibiting works of art without any railing or signs of "hands off," and up to the present the authorities have had no cause to regret this step. In one point, however, there is possibly a little disappointment: it was hoped that the poorer working-classes would especially take advantage of this fact that no admission fee was charged. Such, however, does not appear to have been the case, for the crowd consists mainly of the rather well-to-do class, who possibly cannot be interested either in art or anything else, but cannot get away from business upon a weekly day, so that the visitors are generally well-dressed and well-behaved. For some time a number of Chicago capitalists have been negotiating with parties at Richmond, Va., for the purchase of the old and historic dwelling house of Mrs. Anne Russell. Whether it will be a financial success or not, architects will be decidedly interested to watch the course of this building, if and as it proceeds, for, of all the curious building operations at Chicago, this will assuredly be the most remarkable one during the coming six months.

THE DAWNING OF A BETTER TIME.—RETRACTION.—THE WORK OF THE MAGAZINE.—THE GROWTH OF SOCIETY.

THAT there are better days in store for the profession, and that we stand to-day upon the threshold, none but the hardened pessimist can doubt. The tendencies shown in architectural discursions both public and private, the positions taken by the daily papers and by the more intelligent laymen regarding our work and our position, all confirm the progress made within the last dozen years and are assuredly full of promise for the future. The great trouble in our past history has been such as is inevitably associated with the deaths of the few notable, reaching factor in our already complex civilization, and the peculiar position of the architect making him both artist and engineer, both judge and advocate, has helped to retard our progress towards assured recognition. The architect of last a short generation ago had to justify his very right to exist, and his clients came to him, if they came at all, with an uneasy consciousness that they were indulging in an extravagance; deep in all our minds lacked analogies, drawn perhaps from political campaign literature, ancient republican simplicity and the effect despotisms of Europe. The architect seemed to them in someway associated with riches lived with the Baron Hausman and the Third Empire. This attitude on the part of the client was fostered and prolonged, indeed it still lives to a degree, by a variety of influences actively working within the profession itself. The first Art Institute, this has been the work of the well-known institutions of this earliest history, began their careers well within the memory of men now living and practicing; before their time, their works were and are synonymous terms and had identical functions. The only training then attainable was to be had only in Paris or in London, and with the influences of that training and, perhaps, some European travel fresh upon him our architect was thrown upon a community more
Saint Mary Magdalene, Chetwton Mendip.

Somersetshire.
Professor Ware made the interesting announcement at the last League dinner that the first installment of casts purchased under the Willard Trust had arrived at the Metropolitan Museum, and would soon be on exhibition. It seems that we owe promises to be a most complete and invaluable collection of casts of architectural works to the efforts of Mr. Pierre Le Brun, who persuaded Mr. Willard to thus dispose in his will of a fortune of some eighty thousand dollars. A commission was made, consisting of the Le Bruns, Father and son, and Messrs. Bell and Bloor, to expend this amount in the selecting, purchasing, and placing in the Metropolitan Museum of plaster reproductions of architectural works and details. Mr. Pierre Le Brun has visited at all the places in Europe where casts are to be had, and has succeeded in making a most interesting selection, which includes many subjects not before accessible and other interesting features. A model of the Parthenon is being made at a scale that will make it about ten feet long and five feet wide, with all the sculptures reduced from the original marbles. This is in charge of Mr. Oldhams, of the French architect and archaeologist, who will also superintend the coloring of this model in accordance with the traces of color discovered by his researches. The 129 cases of casts now at the Museum represent the expenditure of only one-quarter of the fund.

What with the bequests of splendid paintings of past and present schools, made by Miss Wolfe, Mr. Marpand and others, this bequest of a model of the extension of the Museum building, New York will now begin to take the rank wealth entitles her to, or, at least, she need no longer blush at her utter insignificance.

THE HUMOROUS SIDE OF COMPETITION.—THE ONTARIO PARLIAMENT HOUSE.—THE TORONTO BOARD OF TRADE BUILDING.

WHAT a capital subject for an incident in "Martin Chuzzlewit," or, rather, "for a public building of some small country-town," were the books being written now. How Dickens would have relished the humor of a dozen or so allimportant village authorities—the rector, the wardens, and a few of the richer men of the parish—beaming with self-satisfaction and radiant with complacency as they sit round the vestry-table and pass a resolution of invitation to all the architects of the kingdom to compete for a hundred-and-fifteen-dollar school-room. Perhaps the rector—often the only gentleman in the place—is not always to blame, indeed, as he is often overcome, by the loud vulgarity of a turbulent subscriber. He, poor man, has to submit and share the ridicule that such a company would call down upon itself from the humorous author.

Three invasions of this character have been in circulation recently. All publicly advertised, the invitation is clothed with a certain amount of decency, borrowed from the respectability of the previous proposition; but as is always the case, the true character of the people the competitor would have to deal with betrays itself. A bit of foolscap-paper, roughly torn off, just large enough to contain the words of the resolution, badly written by an office-boy, enclosed with a note from the secretary of the committee, who signs his surname without initials, as if he were “my lord.” Such is the amusing commencement usually.

An invitation that should have a more respectable stamp about it comes from a cathedral-owning town in Ontario. The charm about it is the innocence of the committee, “who will be happy to receive suggestions or plans for proposed additions to the cathedral, provided they are submitted free of cost.” This dear committee expects architects to travel three hundred miles, spend a day or so examining and measuring, and then to submit plans and suggestions on the charge of getting a job,” “for the cost.” In another competition for a $75,000 building, the architect whose plan is approved will be magnanimously presented with a check for $250. For this handsome remuneration he is to submit “a scale drawing and elevation, and the whole will become the property of the committee.” This may be considered a pretty good specimen, but yet there is one more, really very beautiful in its conception: a small hospital is required, the cost not to exceed $7,000; the requirements are all that is necessary and that can be put in for the money, but, say the “conditions,” “any design showing that accommodation can be supplied.” Thus the sum will have the preference. The grammar, as well as the sentiment, is truly noble.

At a recent meeting of the Toronto Architectural Guild, the executive committee was empowered to deal with such competitions as it might think fit on its own responsibility, without reference to the Guild, the intention being to instruct these committees “in the way in which they should go.” The question was raised as to why it was that the conditions did not ask for a subscription towards the buildings, to be forwarded by competing architects, together with their designs. The tariff question before the Toronto Guild had to do with subscriptions over from the large engineering firm of McLauchlan & Russell, and the subject was discussed interestingly. It was decided that the committee’s report, which was read, should be printed and submitted to each member, and a special night arranged; the committee was empowered to advertise the report for the greatest importance and requires some time for its elucidation.

Whatever is done must be done unanimously.

The Canadian Architect and Builder publishes with the January number an illustration of the design for the Provincial Parliament House of Ontario, by Messrs. Darling & Curry, and gives in its letter-press an account of the reprehensible proceedings of the competition, as on the competition itself. The plans and drawings were awarded the first position, but the expert who judged the designs “did not consider them entitled to a premium because of the limit of cost.” A second competition was entered into, the result of which was that the drawings, specifications, and details were prepared for this design and for the first premiated design. Tenders were obtained, and the premiated design came out at $842,000, and this one at $816,000. Both were Canadian firms. However, the Government would not proceed with the works because of the cost. Ultimately, they obtained a vote of $750,000, and submitted the two designs to Mr. R. A. Waite, of Buffalo, who was to decide on their relative merits.

The result was, both designs were thrown out, and Mr. Waite was employed to prepare designs of his own for the building, which are now being proceeded with. The contract let accomplishes the appropriation for the entire building ($750,000).

The competition for the Toronto Board of Trade block of offices was decided on January 26 at the Guild meeting. Professor Ware returned three sets of designs with his report, and the decision remained with the Committee as to which of the three should be adopted. Nineteen sets were sent in, two-fifths of these from architects in the Social Reconstructors' Congress. Messrs. James & James, of New York, are the successful men; the four invited competitors, two Canadans and two Americans, competing each for $400 for a window, are Englishmen, who opened their offices in New York about two years ago, and their design is very prettily got up in pen-and-ink, but it is a matter of considerable doubt as to whether it can be carried out for the stipulated sum—$200,000. It can hardly be said to have made the best choice, for the authors of this design appear to be little acquainted with requirements of a city such as Toronto, and the office rooms are so small in relation to the heating-apparatus. Light in the corridors, elevators, back offices and main staircases, except as may be provided artificially, is apparently considered unnecessary, our bright Canadian climate being accredited with powers which it hardly possesses, such as going round corners and along long, narrow passages, shining through walls three feet thick, and beautifully illuminated by the broad daylight, which can only be obtained with solid brick walls to, at least, fifty feet of its height. Neither are Canadians supposed to have nasal organs of very good size, for their windows are as some twenty-five by thirty-two for the water-closets, as they are for the buildings, while the urinals ventilate into the area which lights two offices and the staircase on every floor. Perhaps a description of this building may be worse to non-competitors, but so much interest has been shown by architects in the Toronto Board of Trade competition, generally in the Dominion, and the people, especially of the Province, that for the benefit of those unable to see the drawings a few words may be acceptable. The Secretary tells me that several matters of detail will be reconsidered: as, for instance, the excessive size of the restaurant in the basement; the want of space for coal and the heating apparatus; the arrangements of the banking-room which afford too small a place for clerks and give too much for the public; the awkward arrangement of putting the secretary’s office (on the Board of Trade floor) at a considerable distance from his room, and half-dozen other items which, had they been on hand in the outside, should have been considered before the design was accepted.

A member of the Board of Trade remarked to me when I was looking over the drawings, that for his part he thought it a very unsatisfactory arrangement that the committee should be entirely separate from the offices, and cut off from them by public passages into which they open, being carried up in one stack, in, as nearly as possible, the centre of the building, necessitating journeys on the part of tenants, with armfuls of papers and books along the public corridors, attended by a clerk to open the vails, and the like, and it would be a much better plan to invite to visit it, with perhaps a new “combination” every time. The building contains between forty and fifty office stories; only a small number compared with some of the other designs, and all the rooms are no less than twenty feet square, except as short as seven or three feet or so by cupboards and closets. The main hall of the Board of Trade suite of rooms is circular on plan, fifty feet in diameter, entailing a number of staffs of columns which have been worked in at corners in every direction. Externally, the design is good, in what we may call the present American style of bold features; the lower floors having heavy horizontal lines, and the upper semi-circular heads; but the treatment of these upper stories runs into Gothic, with gables over each window of the Board of
Trade rotunda. There is a high pitched roof at the corner of the site over the rotunda, with an open turret for a finial.

The three designs returned by the Professor to the Committee were by Messrs. Darling & Curry, Messrs. Hollowell & Jordan and the accepted one. The two former from Toronto, the latter from London, has been said the authors of the accepted design are English. For a long time the design by Messrs. Darling & Curry hung in the balance with that of Messrs. James & McEwan, but it is still doubt whether, after all, their design may not be carried out. There is still the question of cost, which, it is possible when tenders are received, may throw out the accepted design.

OPENING OF THE HAWARA PYRAMID.

M. W. F. FLINDERS PETRIE has at last accomplished the difficult task which he began last season. He has succeeded in forcing an entrance into the central chamber of the pyramid of Amenemhet II at Hawara, in the Fayum. In our last report of Mr. Petrie's work, we related how he had tunnelled a passage from the north face of the pyramid as far as the central chamber, which proved to be enormously massive and resisted all his efforts. The summer was then so far advanced and the heat had become so oppressive that the result was not surprising. Mr. Petrie at once went back to Hawara, and began by making trial excavations at various points round the base of the pyramid in the hope of discovering the original entrance. Failing in these attempts, he decided to call in the assistance of Mr. Petrie, of Cairo, and quarry down the thorough from the central chamber, which he had already reached last season. He made the discovery of the tomb three weeks to cut a very small vertical shaft through it, gives some notion of the vastness of the structure. Once in, the secret of the entrance was disclosed, and the explorer was free to track the path by which he might have made his way into the chamber had he succeeded in finding the point from which it started. That point proves to be outside the pyramid, and apparently at some distance from it; so that the tomb of the founder may have been entered from the adjoining Labyrinth, the site of which was identified last year by Mr. Petrie. This may, in fact, be what Herodotus intended to convey when he said, "At the entrance in the Labyrinth stands a pyramid forty fathoms high, with large figures engraved on it; which is entered by a subterranean-passage" (Book II, chapter 148).

Entry from a distance, by means of a subterranean-passage, is a novelty in construction, and has no precedent in any of the Gizeh pyramids (fourth dynasty), nor yet in those of the sixth dynasty, of which so many were recently opened at Saqqara by the late Mr. Petrie. The subterranean-passage dates from the first time that the plan of a royal tomb of the twelfth dynasty has been laid open, and it differs very considerably from the plan observed by the architects of the ancient Empire. The Great Pyramid and all the other pyramids of the Gizeh group of the pyramid of Meydum and the Sakkarah pyramids have the entrance passage in the centre of the north face of the structure, and at some height from the level of the desert; but the entrance to the pyramid of Amenemhet III is entered from the south side, and by an opening, not in the middle of the side, but at about one-fourth of the distance from the southwest corner. It is here that the subterranean-passage, from whatever point conducted, strikes the southern face of the pyramid. The ups and downs of the passages in the earlier pyramids are not many, and the obstacles placed in the way of possible intruders consist chiefly of a series of massive granite portholes, let down from above, after the mummy had been deposited in its last resting-place; but the defences of the pyramid of Amenemhet III are of a different kind, and more nearly resemble the baffling turns and windings and wells of the rock-cut sepulchre of Seti I at Thebes. It marks, in fact, the transition from the Memphite to the Theban style of sepulchre. "The passage," says Mr. Petrie, "does not run straight into the chamber, but at an angle of some degrees from the north of the floor. In a branch-passage leads eastward, the main line continuing on as a blind. The branch-passage (still going eastward) ends blank, but the entrance to another upper passage, the descending one, ends in a well leading to a short passage southward, which ends in another well now full of water. This well, I imagine, must lead to another short passage going eastward, whence a last well would descend into the chamber."

The pyramid, as Mr. Petrie feared and expected, had been broken into and plundered long ago—probably in the time of the Persian rule in Egypt. A forced entrance has been made from the south roof-trap into the sepulchral chamber, and anything of portable value which that chamber contained has, of course, disappeared. The chamber itself, which is three feet deep in water, is all but mono

ILLEGAL COMMISSIONS.

T he view of the fact that many in the community believe that architects, as a rule, do accept commissions, and that such successful men pay exorbitant sums for the privilege are apt to find movements instituted on the part of both the architects and material-men looking to a correction of public sentiment in this regard. We have already referred to the efforts of Mr. Petrie in his professional organizations. They have taken such steps as make it inexpedient, to say the least, for any member to take a commission or fee of any kind from any one except his legal client. On the other hand, certain leading material-men, not content with the simple denial of the assertion that they pay commissions, are energetically following up every charge of this kind, and by bringing
their assessors into court, either through libel-suit or otherwise, are showing that they are not to be trifled with in this manner. Prominent among those who are now acting in this manner are Merchant & Co., of Philadelphia. Out of a number of cases pending in different courts, they havearty engineers for their assessment in two instances, to the serious financial cost of those who have carelessly asserted that commissions to architects are the reason for the difference for the inaccuracy of the plates. With still other commissions, and being vigorously pushed, it is fair for the trade at large to assume that it is not safe to charge this house, at least, with dishonest practices. We hope their good work in this direction will receive the credit it deserves, first, from others in correlated lines of business; second, from those who, in justice to themselves, should equate the example thus set them; and, second, from the roofer and other sub-contractors, who may be of subjective advantage in bringing offenders to the teeth.

Commissions to architects are wrong — wrong to the man who receives them, wrong to the man who pays them, wrong to the house-owner, whose interests are trifled with whenever they are paid, and wrong to the consumers. The name fair name is not applicable to every transaction that is not strictly honest. It is manifestly appropriate that a house that has been conspicuous in its stand in the past for honesty in the plates should lose less in this movement.

But we say again we hope, for the sake of morals and good buildings, others will follow their example, and that the good work may go on to its conclusion — when no commissions will be paid, and no one will be accused of paying them. — The Metal-Workers.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—We enclose you the foregoing article from the editor of the Metal-Workers, which may be of interest to you, which is a very significant fact that architects will not hesitate themselves in actively in their own behalf as does this generous-minded ally of theirs. The institution of architects is not a few, but all — are always ready to accept a bill of work that is to be honored in some way or other in the profession than all the improper competitions that have ever been allowed, and we, who are members of this profession and societies to the same extent, will not investigate fully, only for the selfish reason that the public may know just how it is possible for the plate to do a job for one per cent or less, while his neighbor demands upwards of five per cent for what seems to be the same service. It is a matter that should receive the first attention of the new American Institute of Architects, who cannot afford to have good-membership a single member against whom the charge of accepting a commission or his work can be proved. The members of the New Institute should be above suspicion on this head even if they cannot design a hen-coop, or compute the commission on it. We probably hear more of these accusations that architects do themselves and at the same time we probably hear only a title of what the general public hears. It is vastly greater danger than the "law of averages" in the whole of our society, a long time back, that the unfair condition of competition as the cob is to the rattlesnake.

Yours truly,

THE MERCHANDISE BUILDING.

February 9, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—We have just finished our third suit against roofers in past five months, and have commenced the fourth against a firm who have charged an architect "with taking a commission, and our firm with paying him. As we have been instructed to send him a bill for $500 as a retaining fee, which he assures us, "will not be all required," you can understand what reform in the roof means. We propose to increase this suit to the end of it is ten times a month demanded, and we simply mention this to satisfy you of our intention in all such cases to stop at no expense.

Yours truly,

The Architects.

THE NINTH ANNUAL MEETING OF THE ENGINEERS’ SOCIETY OF WESTERN PENNSYLVANIA.

The ninth annual meeting of the Engineers’ Society of Western Pennsylvania was held in the commodious rooms of the Society in the Penn Building, Pittsburgh, Pa., on the evening of January 22d.

The reports of the Secretary, Treasurer and Chairman of the Library Comittee, were presented, the Secretary to be in a satisfactory condition.

The attendance at the meetings and the general interest shown in the proceedings during the year have been, indeed, flattering, the average attendance being fifty-three.

The meeting was called to order by the President.

The audit being made and the balance sheet presented, it was understood that the society was in a comfortable position.

The president read his address, giving a review of the points of interest to the members, and making some suggestions relative to future action. The election of officers for the ensuing year was held, and the recommendation of the Nominating Committee was adopted.

One of the members of the Braddock forty, A. E. Hunt, Jr., Vice-President; Wm. Metzalf and J. M. Becker, Directors; Col. S. M. Wickersham, Secretary, and A. E. Frost, Treasurer. After the election of five new members the meeting adjourned, but the members did not retire until they had gratified themselves with the tempting collation that had been provided as a surprise by a few of the members as a compliment to their felowshp.

A very pleasant "sociable" was thus indulged in to the pleasure of all present, which would they do well to repeat, as it affords culture to the "social qualities," too often neglected. The next meeting will be held on the third Tuesday of February (the 18th) at 9 o’clock a.m. at the "Thomson Electric-Welding Process." The President, other societies or other parts of the country, in Pittsburgh are kindly welcomed to call at our meetings or at the rooms at any time.

To the Editors of the American Architect:

In order to bring ourselves before the public, I have, as Secretary of the Club, been instructed to write to your paper and notify you of the existence of the Columbus Architectural Sketch Club. The Club was organized in April, 1887, and has steadily increased in membership.

We have lately moved into our new club-room, which has been fitted up at considerable expense.

There is another meeting of the sketches in the Thursday evening, each of which is devoted to a special subject.

Our programme is divided into four distinct parts, viz.: A monthly competition.

Papers by the members.

Free-hand sketches.

Black-board problems.

In June and December we have exhibitions of all drawings submitted in the competitions during the intervening six months. By publishing this letter you will confer a great favor on the members of the Club.

Respectfully yours,

HARRY W. LUMBY, Secretary.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

February 7, 1890.

Rochester, N. Y.

Dear Sirs,—Will you please explain to me through the American Architect, just what is meant by all the fixtures necessary to render a house fit for an occupant, as mentioned in the schedule of charges of the American Institute of Architects. For instance, if a client wanted a small cupboard or locker with an elaborately carved facing built into a wall of one of the rooms, or an expensive window-curtain, would these be included in the schedule of fixtures? Or say a fancy sidetable or clock or other numerous articles that may be built into a house. If these are all fixtures, then the only things that are not, are chairs and tables, and if they are not, where is the line to be drawn. An answer to this will greatly oblige.

Yours truly,

G. E. B. H.

This is a very indefinite expression, as architects learn to their cost, it is generally understood to mean that the architect is entitled to include, in the sum on which his percentage is reckoned, the heating-apparatus, the chimneys, furnace, stove, fireplace, steam-stoves, electric stoves, gas-stoves, gas-furnaces, gas-lighting, gas-plumbing, and so on, although the owner may have selected his own furniture, or made a contract for his own stove or hot-water apparatus, gas-fitting, plumbing, and so on. The reason of this of course is that the architect has to consider all these things in arranging his plans, and that the owner has no right to deprive him of compensation for his skill and labor in calculating the head of fixtures. Many others, however, consider this unfair to them, and charge fifteen, or a per cent per cent on the cost of the fixtures, as a compensation for selecting or designing them. While a doubt may thus exist as to whether mantels are "fixtures" or "furniture," there could hardly be any regard to sidetables or clocks, or even carved cupboards, unless they formed an essential part of the design of a room, and few clients would be unreasonable on such a point.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

February 9, 1890.

New York, N. Y.

Dear Sirs,—I see in No. 685 of American Architect a view of house at Albany, said to be that of Charles Pruy, Esq. It is a mistake, the house in question is the property of Robert C. Pruyn, Esq. for several years truly,

ROBERT W. GIBSON.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

February 12, 1890.

New York, N. Y.

Dear Sirs,—I notice in your issue of "January 26" there seems to be an impression that the Civil Service Examination Grade is too high. As a participant I did not find it so. It consisted of practical work, such as any draughtsman, worth $5.00 to $6.00 per day is liable to be called on to perform and should be competent to do. As for the charge that none of the candidates could answer the questions, my certificate from the United States declaring that I passed the

examination is proof to the contrary. I do not wish to defend or
uphold Mr. Ferret in reported actions at Washington, but believe in
giving credit where credit is due. — Edwin R. Storm.

THE BUILDING OF ROMULUS. — Professor Lanciani's "Ancient Rome"
throughout his admirable monograph of the Excavations at Rome.
Nero, or, at least, presents the matter in a manner which will appear
original to many people. The burning of Rome was undertaken as a
hygienic measure as well as a concrete demonstration of the power of the
Emperor. The author says: "Nero conceived the gigantic plan of renewing
and of rebuilding from the very foundations not only the imperial residence,
but the whole vast city. . . ." The metropolis was crowded and overcrowded
with shrines and altars and small temples, which religious super-
stition made it a sin to obliterate. The slightest work of repair
would interfere with the property of the owners, and gave occasion to
an endless amount of lawsuits and appraisals, and fights among the
experts, he bid himself of all other, more respect and simplest
rightway. He ordered his favorite architects, Severus and Celer, to draw
a new plan of the city, and to return it according to the best principles
of hygiene and comfort; then he caused an enormous number of wooden
beams and tents to be secretly prepared, and ordered fleets of grain-laden
vessels to keep readiest to transport the population to the new city
when the signal was given. Having taken all these precautions, and secured
the success of his strategy as far as human foresight could, Nero
ordered a fluvial evacuation of the city. It is interesting to note that, although of the four
teen regions or wards into which Rome had been divided by Augustus,
three were annihilated completely, and seven for the greater part,
not a single human life seems to have been lost in the gigantic con-
fla. The homeless crowds found a ready and comfortable shelter under
the temporary tents, raised by them in public parks near
squares; at the same time, a large number of vessels laden with grain
from Sardinia, Sicily, Numidia, and Egypt appeared at the mouth of the
Tiber. From this city, the official architect, Severus, and the designer,
Celer, in designing and building the city. The straight line and the right angle were followed, as far as possible, and among the new streets
was laid through the still smoking ruins. Haisty and irregular con-
structions were forbidden; the line of frontage of each new building had
to be determined by the official architect. Large squares were opened in place of fifty, thickly-inhabited quarters.
The height of private houses was not allowed to exceed double the
width of the street, and the officials were strictly watched in front of
these homes to provide the citizens with cool, sheltered walks in case of rain or ex-
cessive heat. In the rebuilding of the city, the emperor secured for
himself the line's above; and his golden house, of which we possess
such beautiful remains, occupied the whole extent from the Palatine
to the Quirinal, where now the Central Railway station has been erected.
Its area amounted to nearly a square mile, and this enormous district
was appropriated, or rather usurped, by the emperor, right in the
centre of a city numbering about two million inhabitants."

The Acropolis of To-Day. — The town of Athens, and especially
the Acropolis, is now passing through a very remarkable period in its
evolution. We are seeing the result of both those who favor and
those who oppose the restoration. It is not at all surprising that the
work of the great age of Athens as worthy of preservation, it is hard to see
why (for instance) the pedestal of Agrippa deserves to be restored
and the Parthenon to remain unreconstructed. Certainly nothing
is more picturesque and of higher historical interest. But now it is too late to regret what may
have been lost. Only two or three of the ancient pictures and statues,
and some purely classic charm may be found to have resulted from the tempor-
ary loss of beauty. — Athens Correspondence London Athenaeum.

TREKKING. — So indestructible by wear or decay is the African trek-
wood, that vessels built of it have lasted fully 160 years, to be then
broken up only on account of the poor sailing qualities on account of
frequent rusting. In fact, however, the wood is not one of the most remark-


shipbuilding, is notable; the latter, which is really the most valuable
timber produced in that country, is light and easily worked, strong,
durable, not liable to the attacks of the rivers and birds, and
resembles coarse mahogany. The tree requires some sixty to eighty
years growth to produce the superior grade of timber, and as a result
and of much it is used in England for this purpose. — Pittsburgh Des-
patch.

Prix de Reconnaisance. — The judgment of the Prix de Reconna-
issance des Architectes Amerisois took place at the Ecole des Beaux
Arts yesterday. It was awarded to M. Huguet, pupil of M. Blondel,

The chief value of many trade reviews of the day is found in the
truth that the facts and conditions are already the reverse of what and for
some of them are mere vehicles for erroneous opinions and statements.
Much that is said is written with a view to influence public opinion wrongly.
A plain statement of facts and conditions is demanded just at this
time, when the plans and programmes for the coming season are under con-
sideration. The fact will not be disputed that at no time has the spirit of
invention in Southern and Western mineral, lumber, mining and agricul-
tural associations been more vigorous and more active than it is at present, when
enjoying weeks' vacation in the newer sections of the country, looking after
the conditions and facts for investors set the standard. A gradual appreciation of value is in progress. More industrial enterprises
are projected at this time than ever. Southern journals which keep a
record of the new projects and the new efforts to invest in localities, South and West, cannot be easily
counteracted. There is something really true in the statement that the
States are appreciating, and the State assessments show it. Lumber manufacturers,
and mining and utilities, and manufacturers’ associations, are chasing each other in their haste and greed to buy cheap lands to hold them for the advance which increasing population and
influence make possible. The very difficult problem is how far to al-
locating these prospects, viz., the impression sought to be made by ill-informed writers of
articles that railroads are too much at present in this country. Nothing is further from the truth. Since January 1,3,590 miles of road have been projected. Prior to that date a careful estimate shows that between two and twelve thousand miles of road were
projected. This information is within the reach of any one who cares to obtain it. There are some railroad promoters of the very specific kind seen in other
States, but there is not the general indebitness which is not increasing. In financial affairs there is no need of apprehension. Since 1859, the circular medium has increased from
$1,400,000 to $4,000,000,000, and now stands at $425,000,000. With pessimists, facts like these go for nothing. The sun-
set of their doom is at hand. Speculators have but little chance. Yet all is not smooth sailing in the
business world. The trusts are thriving. New ones are coming up. Their
stocks are up. Some are secured on railroad or mineral ventures. Their
affairs, but all those signs do not portend evil of the general necesse-
ty grave. Our financial institutions are not those that are in the hands of
speakers. Our financial institutions are sound; our railroad-managers are in
the hands of those who can save their companies by a policy of
excessive competition and mileage. Shrewd and far-sighted business
management are more in demand than ever in our history, because of the
situation of agenies of a large character, the number of railroad
competing sources and centres, cornered schemers, defeated speakers,
repaired professional talents. The majority of boards have not the head
but trouble abroad, and observe only the reverse of the truth in plain stie-
ning or trade facts. It is a fact patent to all that there is now less idle
capital than ever, and less idle labor than perhaps with one or two excep-
tions; that more houses were built in the country last year than ever in our
time, and that the volume of building and the amount of work done in
in our entire history. The country is in a transition state, but it is
dangerous. It is a great blessing that the interests of the business of its men will solve the question of establishing a better one when the time comes. The complications and faith-dealers with business conditions and facts to-day are in the raptures of the business men.
The exterior of this house is stained with
GABOT'S CREOSOTE STAIN
for Shingles, Fences, Clapboards Etc

These Stains are very durable
and give a much more artistic effect
than paint, while they are cheaper,
and very easy to apply.

Our Stains contain no water and
are the only exterior Stains that do
not contain kerosene.

PRICES are 40, 60 and 75 cents per Gallon
According to Color.
SEND for Samples on Wood, and Circulars.

SAMUEL CABOT
70 KILBY ST. BOSTON, MASS
ITALIAN STATUES.
FEBRUARY 23, 1889.


VOL. X:V.

Entered at the Post-Office at Boston as second-class mater.

Copyright, 1889, by Ticknor & Company, Boston, Mass.

No. 687.

ARCHITECTURAL SHADIES AND SHADOWS. I.

SUMMARY:


BUILDERS' HARDWARE. XIX.

ILLUSTRATIONS:


ARCHITECTURAL SHADIES AND SHADOWS. II.

Earthquakes. I.

Books and Papers.

BUILDING LAW.

Societies.

COMMUNICATIONS:

Greek Architecture. Toronto Board of Trade Competition.

The Columbia College Architectural Course.

Notes and Clippings.

TRADE SECRETS.

The profession of architecture, as well as that of engineering, has suffered a loss in the death of Mr. Edward S. Philbrick, who died last week very suddenly, like so many other members of what may well be termed the anxious professions, on his way in the train from Boston to his home in Brookline. Mr. Philbrick was born in Brookline sixty-one years ago, and was therefore barely past the prime of his energy and usefulness at the time of his death. He graduated at Harvard College, and travelled extensively abroad while a young man. Being naturally clear-headed and observing, as well as energetic and industrious, he soon attained a high rank in his chosen profession of engineering, and the variety of the commissions entrusted to him, with his signal success in all of them, show that his abilities were of no common order. Early in his career he was engineer to the Boston and Albany Railroad, the most important road in Massachusetts; but his independent and investigating spirit found greater satisfaction in general practice than in the present of varied and difficult problems to be solved; and most of his professional life was spent in this way. He was still quite a young man when he was chosen to represent the State of Massachusetts as engineer in the construction of the Hoosac Tunnel, and many of the most important works of water-supply and drainage in the State have been carried out either under his direction, or with help of his advice as consulting engineer. Of late years he had been much interested in sanitary engineering, rather, perhaps, as a study than a source of profit; and the books and published articles in which he gave the results of his extended experience still form a very valuable part of the literature of sanitation.

Personally, Mr. Philbrick was remarkable for the dispasionate and truth-loving spirit with which he treated the problems presented to him. He had no theories, no prejudices, and no hollow enthusiasm. While he was far too kind and considerate to neglect another person's notions merely for the sake of showing the superiority of his own, he would accept no conclusion, either from himself or other people, which could not be shown to rest on a solid basis of facts; and it was, perhaps, the knowledge of this characteristic which made him more sought after, as a general consulting engineer, than any other person in the State. Although the diversions incident to the management of a large amount of property, belonging to himself and others, interfered with the number and extent of the professional commissions which he was able to carry out, they never interfered with his love for science, or prevented him from attending to the minutest details of the work which he undertook. They did, however, probably limit to some extent his reputation. It was inevitable that he should not sometimes have to choose between staying at home, to look out for the interest and comfort of his aged mother and his own family, and accepting important commissions at a distance, which would be sure to bring him professional renown; but, notwithstanding his energetic disposition and his consciousness of his ability to carry them out successfully, he used no longer to be the less brilliant, but more unfailing part, and spent contentedly at home in Brookline, or on his place at Newport, a life which he would not render more gratifying to his own ambition at the cost of the comfort of those dependent upon him.

IWO very strange building accidents have taken place this week. In Chicago, the Owens Building, a new fireproof structure, sixty feet square on the ground, and fourteen stories high, was almost completely ruined on Sunday morning by the failure of some of the terra-cotta blocks in the floors. The building was nearly completed, the floors, of iron beams filled-in with flat arches of terra-cotta blocks, were all in place; the roof was on, and the various rooms put up. For some reason, a part of the terra-cotta filling in the tenth floor gave way, at a time when very few men were in the building, and fell to the floor below. The arching of this floor was also weak, and the shock of the fall of the blocks from above set it away where they struck, and the whole fell together to the eighth floor, where the same effect was put up. For the time the increasing mass had reached the fifth floor its momentum had become irresistible, and this floor, together with all those beneath it, was torn out, beams and all, and precipitated to the cellar, while the walls on which the ends of the beams rested were badly cracked and shaken that they may have to be pulled down. Fortunately, no one was in the upper stories, and at the sound of the fall of the first terra-cotta blocks in the ninth story, the men in the lower stories, some eight or nine in number, rushed into the street just in time to save their lives. The cause of the collapse will probably be easily determined by expert examination. It will be remembered that a somewhat similar accident took place in the United Bank Building in New York very soon after its completion, the terra-cotta blocks of several of the floors falling out by their own weight. In this case it was found that some of the workmen, who were unaccustomed to the use of the flat-arch blocks, had fitted them in upside down, so that they hung by the adhesion of the mortar, and even this was diminished by the fact that they were laid in winter, many of them without removing the ice which covered them, and that the mortar froze between them. As the New York Bank Building in New York failed singly, so that nothing was necessary but to replace the blocks and refinish, but, under circumstances a little different, the result might have been very similar to that at Chicago. The other accident reported took place at Hartford, where a building 14 stories high was inexplicably blown up, perhaps by the explosion of the steam-boiler in the basement, although, as no fragments of the boiler have been found, this is doubtful, and eighteen or more persons were instantly killed, while many others were severely injured.

The Third Annual Convention of the National Association of Master Builders was held in Philadelphia last week. From the reports in the daily papers we should say that, as is apt to be the case in conventions where the business is not previously laid out, and carried through with a strong hand, the work done was rather of the hand-to-mouth kind, the convention waiting until some one offered a resolution of some kind, and then passing it, neither or rejecting it, without looking to the establishment of any definite policy. Perhaps, however, the official report will make a different showing. Certainly, the leaders of the Association have ability and penetration enough to secure the adoption of a policy, if they see occasion for it. The most notable paper read before the convention appears to have been one sent by Mr. Hatfield of New York, but read by Mr. McArther, in which the author is reported to have said that "the architect's position was that of an umpire, or judge, whose duty it was to guard the interests of the owner, as well as those of the builder." Why it should be the duty of the architect to guard the interests of the builder we are unable to imagine. That it is his duty to judge fairly, in controversies between the builder and the owner which he
The investigation into the construction of the papier-maché ceiling over the Assembly Chamber at Albany is still going on, with endless charges, counter-charges, denials and rejoinders, but with very little result so far as any elucidation of the charges, in question, is concerned. The whole question of whether it may be necessary to explain, is not whether members of the investigating committee have been bribed to shut their eyes to the facts, or whether the newspaper correspondents have been guilty of criminal libel, but whether the papier-maché ceiling now in place is worth the two hundred and seventy thousand dollars that it cost; and, if not, who got the difference between the amount paid for it and the true value, and through whose fault did the State make so bad a bargain.

The first question could be answered by experts in six hours, and the Legislature would then have some definite basis for further action. It is certain that the papier-maché cost only a fraction of the contract-price of the ceiling. The manufacturer, Mr. Sinclair, refuses to disclose what he was paid for it, but says that it was under thirty thousand dollars, and the newspaper correspondents profess to have ascertained that the exact amount was a little more than eleven thousand, five hundred dollars. If this report, which Mr. Sinclair does not deny, is correct, we shall have two hundred and fifty-nine thousand dollars as the cost of erecting a stage and putting up the new ceiling in place of the old one, with the necessary supports for it. We may, and we know, believe that the first-class builder could settle the point after reading the specification and looking at the place, and the ground would then be cleared for the inquiries into the disposition of the money, about which the world outside of politics cares very little. It seems that the drawings for the ceiling were made by an architect named Rowe, the seventh architect, if we are not mistaken, who has been employed on the building, without counting the experts who have been brought in for temporary service. This gentleman, who seems to have done his work well, and to have been entirely innocent of any connection with the subsequent financing, received the usual treatment accorded to persons who furnish designs for public work in having his flat, carved-oak panels summarily converted into "dome-shaped" or "conical" caissons of paper pulp and plaster, cast in gelatine molds, at the instance, so far as can be discovered, of the superintendant. As to the committee which had the matter of the construction in charge, and made the contracts for the ceiling, we believe that no member has yet been found who had even read the specification. Some of them had a general idea that they had signed a contract for a " Dickson," but they seem to have then dismissed the whole matter from their minds, until they discovered that the ceiling was likely to drop on their heads in bits of plaster of Paris. We perhaps are too obtrusive in presenting the merits of the profession of architecture, but it certainly seems to us that the services of a master builder, or a carved oak ceiling artist, was as much as was specified, for five per cent on the cost, would be cheaper than those of the combination of architect, superintendent and committee, who have spent more than a quarter of a million dollars in such a way that no one can tell where most of it has gone.

FIRE AND WATER calls attention again to the discussion which has been going on in the newspapers about the value of iron shutters in protecting buildings from the effect of conflagrations outside of them, and makes some very timely remarks on the subject. The history of the curious case in New York, where a building considered nearly fireproof was destroyed, with its contents, because the firemen found it for a long time impossible to open the iron shutters, or break through the brick roof, so as to throw water on the blazing goods inside, has been copied into nearly all the daily journals in the country, and many the better-to-do in considering in reasoning from the smallest possible number of facts, the newspaper theorists have decided that buildings would be better off without any shutters at all, and there is some danger that they may persuade owners of store property in some cases to refuse to use them. It ought to be needless to say that this would be a grave mistake, and the underwriters' associations should be on their guard against the dissemination of such notions. Of course, the real object of shutters is to keep fire on the outside from entering a building, and they accomplish this object a hundred times for every time that they prevent firemen from reaching a blare inside the building so protected. Moreover, there is no necessity for fastening iron shutters in such a way as to keep firemen from opening them from the outside. In New York, where burglars are more dreaded than fire, as there is no insurance against their actions, we have seen iron shutters useful on the inside, but in Chicago, if we are not mistaken, it is the rule to arrange the shutters so that all of them can be opened from the outside, and in many places one window in each story is protected by shutters so arranged. One of the best shutters that we have seen is a patented one, which fastens into the inside, with a latch hooking over a bar, in the usual way, but has on the outside a plate, connected with a small lever passing through the shutter, by which the latch can be lifted. The plate protects the small opening through which the lever passes, and so arranged that by directing a powerful stream of water upon it, from a fire-engine or hydrant, the lever is moved, lifting the latch, and allowing the shutters to swing open, which they do under the pressure of light springs. A shutter of this sort is as safe against fire as anything that can be made, yet it can be opened in a moment from the street by the firemen, without requiring ladders, which can hardly be used if a fire is raging on the opposite side of the street, or after the flames have burst out of the lower windows of the building to be dealt with.

USEFUL piece of apparatus has come into use in Germany in the shape of a travelling electric light. The system is very simple; the light, which is electric, it, is mounted on a wagon, something like that of a steam engine, containing boiler, fuel-box and water-tank, complete for a night's service. A dozen or so of jointed poles, a corresponding number of arc-lamps, and a supply of wire complete the equipment, and the whole is readily drawn by a pair of horses to the place where it may be needed. On its arrival, the poles are set up where required, and stayed with wires fastened to stakes driven into the ground; the lamps are hung to them and properly connected, and the engine is set in motion. The lamps immediately kindle, giving a light nearly as bright as day over the whole neighborhood as darkness is needed. Any number of lamps, from one to fifty, may be operated from a machine of suitable power; and as they may be suspended anywhere, and are not affected by rain or wind, it would seem that the apparatus might be very useful to connect the Emperor with his opposite numbers, and other officers who have to carry on night-work on an extensive scale.

The Emperor of Austria has conferred a signal honor upon the noted Vienna architect, Baron von Schmidt, who was ennobled some years ago as a reward for his professional achievements, and has now been called to the Austrian House of Lords, and "as the Emperor entertains toward him." The German technical journals call this the highest honor that has ever been conferred upon an architect, and it is certainly a very great one.
BUILDERS' HARDWARE.—XIX.
ORDINARY MODERN DOOR-LOCKS.

In considering the locks at present in the market, it is manifestly impossible to even mention all of the styles and varieties, nor has it been found practicable to gather reliable data concerning all of the different makes. It was believed, however, that those illustrated will serve as fair criticisms of what the market is producing. The descriptions will be limited chiefly to such as are used about an ordinary building. Time-locks, bank-locks, safe-locks, prison-locks, etc., are too complicated to come within the scope of this treatise, and are, besides, quite outside the line of what could fairly be termed builders' hardware.

An analysis of the various styles of locks can be best followed by taking the different examples according to the use to which each is put. They may, then, be classified as:

First, dead-locks.
Second, ordinary lock and latch combined.
Third, front-door locks.
Fourth, vestibule-locks.
Fifth, hotel-locks.

Any of these, except the first, may have anti-friction strikes, and may be mortise, rim, or rebate, and all can be master-keyed. Consequently in these five categories can be included all ordinary house-locks.

DEAD-LOCKS.

Figure 237 is a type of the most simple form of dead-lock, manufactured by Russell & Erwin, having five plain, pivoted levers, permitting of 120 changes in the lock by transposition of the levers. The same style of lock is made with as few as one lever. A. G. Newman manufactures a very good store-door lock, Figure 298, in which the levers slide up and down but are not pivoted together. Figure 299 illustrates the "Standard" store-door lock, manufactured by the Yale & Towne Mfg. Co., a very strong, well-made, and almost unpickable lock. The bolt-tail is the full thickness of the bolt but is made with a shell so that the tumblers work within the bolt, as it were, and the key, instead of acting against the under side of the four levers, works through the center, and, instead of acting directly upon the bolt, simply rotates an irregularly-shaped cam. The side figure showing the bolt and the cam alone, will illustrate how this lock works. The levers in this example are of steel, as in all the "Standard" locks.

Neither of the foregoing offers any special protection against picking, except such as results from careful fitting, or, in the Standard lock, from the difficulty of reaching the levers through a small key-hole. Figure 300 shows a "Robinson" store-lock, in which the inside of the bolt-post is cut with a square notch. If an attempt is made to pick the lock by exerting a pressure on the bolt while the levers are raised tentatively in succession, the notch in the post will catch in corresponding notches on the edges of the lever gatings, holding the levers so they cannot be moved in either direction. Two of the levers only are so notched, the uppermost lever having a plain groove to prevent the posts from catching when the proper key is used. This is a hand-made lock, with all the works made of brass except the bolt-post.

Figure 301 shows another "Robinson" lock in which the post and gatings are notched in the same manner as the preceding example, but in which additional security is obtained by attaching the post to a thin plate, sliding up and down in the bolt-tail, but held down by a spring lever such as those which work against the main levers. The post and the gatings are so arranged that if the levers could be so fitted as to bring the gatings exactly in a line, the bolt could not be moved, as the post would be too low down to pass. The post, as well as the levers, has to be raised, and on account of the notches, which prevent any tentative picking, this can be done only by the proper key. The works of this lock are all of brass, except the sliding parts of the bolt and the bolt-post which are of steel. The key is tubular, and the lock can be opened from one side only. It is an old style, and is little used at present.

A lock which is asserted to be absolutely proof against picking, is the "Dietz" lock, Figure 302. In this the locking-levers are not touched at all by the key, being separated from the key-hole by a collar or partition on the bolt-tail, so that no wire or picking instrument can reach the levers through the key-hole. There are two sets of levers, exactly corresponding in thickness and bearing against each other only at the shoulders, as shown by the figure. The key-bits first lift the primary-levers, which are fitted with the stronger springs. The springs of the secondary or locking-levers then force the latter down in proportion as the primary-levers are raised. The secondary-levers are so arranged that the gatings are above the line of the lock-post, rather than below it as in ordinary locks, and it is evident that by raising the primary-levers to the proper height the gatings of the secondary-levers can be brought exactly in line to permit the bolt-post to pass. But to prevent picking by the tentative process, one of the secondary-levers is made with plain gatings but the others are finely notched to correspond with notches on the post, so that if any attempt is made to force the bolt, the levers become fixed. The bolt is moved by a key-cam similar to that shown by Figure 299. The small slide at the bottom of the lock is simply to prevent the cam from turning too far. The "Dietz" lock is machine-made, but is first class in every respect, with all-brass inside works. The agents maintain that this lock never has been picked. The description may seem complicated, but the lock is very simple in action, and it is one of the most satisfactory of its kind in the market.

[To be continued.]
ARCHITECTURAL SHADeS AND SHADOWS

INTRODUCTOry NOte BY PROF. W. R. WARE.

T is a number of years since I ventured to contribute to the columns of the American Architect and Building News that I would put in the line of light the subject of the shadow. The outline of the shadow cast upon any surface is called the line of shadow.

3. Shade and shadow do not imply the utter exclusion of light; the darkness of the surface the cover is mitigated by indirect light reflected from a multitude of objects: from the earth, the clouds, buildings and trees, and from the particles of the atmosphere which are suspended in the air. This diffuse light of every possible direction, softening the shadows and lighting up corners otherwise as dark as midnight. Such light, made up of indirect rays, is called diffused light. Sometimes the rays from some one general direction predominate, as light from a marble pavement or smooth sand, or from the side opposite the sun by reflection from vertical walls. In such cases the reflected light sometimes are sufficiently strong not only to illuminate those shaded surfaces presented most directly to its rays, but even to cast secondary shadows upon them; while the shaded surfaces which are turned away from the rays, are left in shadow. However, the use of these diffused and reflected lights alone that render visible objects lying in shadow or shade: without it all shades and shadows would become mere areas, outlines, or lines. The form of an object casts a shadow on an adjacent surface, and that is the reason why shadows are so commonly used by the architect, the painter, and the sculptor. In architectural drawing, the precision and intensity of these reflected shadows, as they are called, are generally exaggerated, the breadth of the predominant rays being assumed at such an angle as will most strikingly bring out the forms; i.e., back and upward to the left, as if coming mainly from the ground and from vertical walls opposite the sun. Vertical walls on the other side, which are turned away from the rays, become shaded.

4. The object of architectural drawing is to render clear and intelligible the forms of a subject, whether it be a building, a picture, such exaggeration is perfectly legitimate. In the same way, nearly all the phenomena relating to the intensity, as well as to the direction of the ray of light itself, are treated in a precise and conventional manner, in accordance with the conventional character of all representation by elevations, sections, and plans. This may be seen by referring again to the cornice in Plate I, No. 1. In No. 3 the stone cornice drawn from actual observation which, in No. 1, is drawn according to the conventional method. In diffused light, as it is on the north side of a building, or on a cloudy day, the same cornice would appear as in Vol. 2, in which light from overhead predominate, while the reflected light is very feeble, owing to the absence of any direct light to be reflected. Reflected shadows are, therefore, wholly wanting.

5. The contrast between No. 1 and No. 3 illustrates the difference between the phenomena of direct and of diffused light, and thereby also makes clear one of the differences between architectural and pictorial drawing. The lights of the architec- tural draughtsman rarely, if ever, has to occupy himself with those produced by artificial light.

6. These lessons of light in every possible direction, softening the shadows and lighting up corners otherwise as dark as midnight, will make the reader appreciate why, as I have said, the shadow is a term of art, and that the shadow is a term of art. The works of the architect, the engineer, the painter and the sculptor, and the foreman of the building itself, are treated in a similar spirit, with broad, flat surfaces of light and shade. Moreover as the shape of the shadow depends partly upon that and partly upon the form of the illuminated body, and the shape of the shadow does not depend upon any shape of the surface on which the light falls, it follows that the shadow and the form must be carefully delineated in order that they may give precise indications as to the real form of the surfaces in question. This is, indeed, perhaps the chief reason for representing them at all in architectural drawings, the artistic considerations involved being of secondary importance.

1 By A. D. F. Hamlin, Instructor in Architecture in the School of Mines-Columbia College.

88 The American Architect and Building News. [VOL. XXV.-No. 697. natural light, as the architectural draughtsman rarely, if ever, has to occupy himself with those produced by artificial light.

6. These lessons of light in every possible direction, softening the shadows and lighting up corners otherwise as dark as midnight, will make the reader appreciate why, as I have said, the shadow is a term of art, and that the shadow is a term of art. The works of the architect, the engineer, the painter and the sculptor, and the foreman of the building itself, are treated in a similar spirit, with broad, flat surfaces of light and shade. Moreover as the shape of the shadow depends partly upon that and partly upon the form of the illuminated body, and the shape of the shadow does not depend upon any shape of the surface on which the light falls, it follows that the shadow and the form must be carefully delineated in order that they may give precise indications as to the real form of the surfaces in question. This is, indeed, perhaps the chief reason for representing them at all in architectural drawings, the artistic considerations involved being of secondary importance.

1 By A. D. F. Hamlin, Instructor in Architecture in the School of Mines-Columbia College.

88 The American Architect and Building News. [VOL. XXV.-No. 697. natural light, as the architectural draughtsman rarely, if ever, has to occupy himself with those produced by artificial light.

6. These lessons of light in every possible direction, softening the shadows and lighting up corners otherwise as dark as midnight, will make the reader appreciate why, as I have said, the shadow is a term of art, and that the shadow is a term of art. The works of the architect, the engineer, the painter and the sculptor, and the foreman of the building itself, are treated in a similar spirit, with broad, flat surfaces of light and shade. Moreover as the shape of the shadow depends partly upon that and partly upon the form of the illuminated body, and the shape of the shadow does not depend upon any shape of the surface on which the light falls, it follows that the shadow and the form must be carefully delineated in order that they may give precise indications as to the real form of the surfaces in question. This is, indeed, perhaps the chief reason for representing them at all in architectural drawings, the artistic considerations involved being of secondary importance.

1 By A. D. F. Hamlin, Instructor in Architecture in the School of Mines-Columbia College.
importance. The elevation, for instance, can show only two of the dimensions of a building, its height and breadth. But if the shadows are cast on a large canvas or wall, the effect is as if the dimensions of its various parts almost as accurately as if a plan were given, while the representation is far more vivid and attractive. In Figure 2 the shade and shadows convey a lively idea of the elevation of its various parts.

7. Surfaces exposed to the divergent rays of artificial light, are, as has been said, less brilliantly illuminated in proportion to the square of their distance from its source. But though this cannot happen with the parallel rays of sunlight—(all terrestrial objects being virtually at the same distance from the sun), there are other reasons why surfaces exposed to direct light are not represented as all equally brilliant. The degree of their luminosity is affected by the color and texture of the surfaces themselves, and by the angle at which the light falls on them. The darkness of a surface is materially affected by its exposure to reflected light, by the contrasted luminosity of the surfaces near them, and by their remoteness from the source.

8. Color. It is hardly necessary to say in the first place, that dark-colored objects are naturally represented as less luminous than light-colored or white ones. It is worth while, however, to point out that, especially when drawings are made in black and white, this consideration is often disregarded, brick, stone, marble and wood being all represented as of the same "value."

9. Texture. Rough objects appear darker than smooth ones, the little eminences into which their surfaces are broken up having each a minute shade and shadow of its own, the magnitude of which depends upon the steepness of its sides and the angle of incidence of light (Figure 2).

10. Angle of Incidence. Surfaces turned fully towards the light are more brilliantly illuminated than those on which the sun shines obliquely. But it is only on rough surfaces that, through the multiplication of minute shades and shadows, as above explained, this difference at all incidence is at all noticeable. The light upon a smooth column of marble, or even of sandstone, exposed to the noonday sun, appears of nearly uniform intensity, so that the curved surface looks almost flat. If the shade upon the dark side of the column, lighted only by reflected light, is also of nearly uniform intensity, it follows that whereas in-doors, where it is exposed to diffused light alone, a column or other cylin-
drical surface passes gradually from the highest light on one side to the darkest shade on the other, in sunlight shows one side light and one side dark, the light and shade meeting abruptly at the line of shade. Both are apparently flat, and the column, except for the shadows of base and cap, looks nearly round a slightly rounded corner, instead of cylindrical (Plate I, No. 5).

11. To avoid this effect it is customary in architectural drawings, especially those drawn to a large scale, to tone down the lights to the line of shade, as if the stone were rough or the sun declining (Plate I, No. 4). But this should be done with moderation, and not at all when the scale of the drawing is small as in No. 5.

12. Contrast. Where two surfaces of different luminosity meet, the lighter one appears by an optical illusion to be lighter and the darker one darker, along the line of contact; and, curiously enough, this is the more marked the less intense the illumination. In a polygonal prism for example, especially if the light to which it is exposed is not very strong, each face will seem darker along the edge nearest the light and lighter on the other, than it really is, making it appear concave instead of flat (Plate I, No. 6). This is often witnessed upon octagonal chimneys, especially towards sunset. This illusion serves to brighten that mentioned in the previous section. The shade upon a round column enhances the apparent luminosity of the light side just where the diminution in the angle of the light tends to impair it, making the light side look quite flat. At the same time the light, by contrast, enhances the apparent depth of the shade where there is none together, so that the line of shade forms an abrupt boundary between them (Plate I, No. 5).

13. Distance. Finally, it is to be observed, that the apparent intensities of lights, shades, and colors, are alike affected by distance.

This is what is called "Aerial Perspective," and is due partly to the imperfect transparency of the air, partly to the different apparent scale upon which objects at different distances are presented. This phenomenon, which is conspicuous enough out of doors, may also be detected across a room. It is customary in architectural drawings to have the objects represented as if they were brought nearer the spectator, to be seen direct by the eye, as in nature, and not reflected from the painted surface, or, as it is termed, the "preservation of the values."

14. The supposed illusion of this kind is produced by the moon, which ordinarily is seen in the full glow of the sunlight upon it and looks absolutely flat. Where, however, the edge of the moon is exposed to the sky, it appears in an eclipse, its apparent diminution of its illumination appears perfectly goblin—a reddish ball instead of the ordinary dim face.

15. The lights and shades in a room are so confused that it is always difficult to identify correctly the name of every gradation of light and dark, and to distinguish between the effects of aerial perspective and those of diminished illumination.

...somewhat to exaggerate this effect, making the more remote parts of buildings less vigorous in light and shade, as well as in color, than those nearer the eye (See Plate I, No. 7).

16. From these considerations it follows that:

First. The shade upon an object is not so dark as the shadow which it casts, since the surface in shade is, in general, turned, towards the reflected light, and the surface in shadow is turned away from the reflected light and towards the shaded surface, so that it is doubly dark (See Figure 1).

Second. The line of shade is the darkest part of the surface, since it is exposed neither to the rays of direct light, like the light side, nor to those of reflected light like the dark side, both sets of rays being tangential. Moreover, it looks even darker than it is through the effect of contrast, as has been already pointed out. This phenomenon is often very conspicuous in a few, or white on a white road looking sometimes in the strong light reflected upward, as if a black thread were tied around its number. Even in the diffused light of a room the line of shade upon rounded surfaces is often conspicuously dark (Figure 5).

Third. Surfaces in shade or in shadow are seldom perfectly flat in tone, some parts appearing lighter or darker than others by contrast with the surfaces next them, or being really lighter or darker than that for reflected light being of terrestrial origin is divergent, and more powerful near its source than at a distance.

It is customary, therefore, in architectural drawings to make shades and shadows darkest next the sky, by contrast, and lighter as they approach the ground, from which the chief reflected lights are supposed to come; to make the small and narrow shades and shadows darker than the large ones; and to make the large ones darker on one edge than on the other. Window-openings and doorways are made darkest at the top as if modified by reflected light from the ceil (Figure 6); and in arcades and archways the shadows are sometimes made darkest below, in recognition of the effect either of contrast with the sunlight below, or of a diffused light, doubtfully reflected, from the ceiling above (Figure 7). When an opening occurs within another opening, the two are generally graded in opposite directions (see Figure 8, and Plate I, No. 7).

Fourth. When a cast shadow extends to the top of the body on which it falls and consequently across and beyond as the light and shade coincide with the shade as in Figure 9. In this case the
light of shade, though obscured, exists as the line of division between the shade and the shadow, that side of the object turned towards the light being in shadow, and that turned away from it in shade. If in a drawing the shade is made lighter than the shadow, as in Figure 10, the line of shade reassures itself and becomes again visible. As a matter of fact, however, there can be no such sudden change of intensity from shadow to shade except on adjacent surfaces meeting at an angle, for only by such abrupt change of direction can one of two adjacent portions of surface be exposed to reflected light. In Figure 10 along the line of shade from a to b there is no such abrupt change of direction in the surface as would expose the shade to strong reflected light while their surfaces are still farther from the adjacent shade. The change of luminosity would be gradual as in Figure 9, and the line of shade would exist as a mathematical and theoretical boundary between the shadow of the abut and the shade of the columns.

Summary up to this consideration, if we adduce, we may state their results in the form of maxima, as follows:

I. Surfaces in shade are turned away from the light, surfaces in shadow are turned towards it. Consequently,

II. No shadow can be cast upon a surface in shade, nor upon a surface already in shadow except by reflected or artificial light.

III. None but illuminated objects can casts shadows.

IV. Individuals of shadows are darkest that fall on the broadest side of an object, and small shadows near large lights seen by contrast darker than large shadows near small lights. (See shadow of cap on octagonal pillar, Plate I, No. 8.)

V. Shelves and shadows are darkest near the edges adjacent to the light; they are lightest in those portions most exposed to reflected light, that is, those most turned away from the sun.

VI. Shadows are darker than the adjacent shadows. The lightest shadows (that is, those most affected by reflected light) are darker than the feeblest lights.

Maxim II is not infrequently violated, one shadow being represented as crossing another although cast by the same light, as in Figure 11. The error is manifest when we reflect how not only the surface already in shadow cannot be further darkened except by the exclusion of the reflected, diffused, or artificial light which would otherwise reach it. Sometimes one also sees the absurdity committed of representing an unilluminated object as casting a shadow, as at a, Figure 11, which is evidently impossible, and contrary to the principle of Maxim III.

15. Plate I, No. 8, is from a photograph of a plaster cast in full sunlight. The intensity of the high lights where the solar rays are normal to the lighted surface; the delicate gradations of half-light near the lines of shade on the minutely-roughened surface of the fruit; the darkness of the line of shade; the intensity of the cast shadows, especially where contrasted with adjacent high lights and in recesses where no reflected light can penetrate; the generally darker tone of the shadows as compared with the shades, and the brilliancy of some of the reflected lights cast back into the shadows, excellently illustrate the principles just set forth, and prove their foundation on the facts of nature.

[To be continued.]

CHURCH, ANN ARBOR, MICH. MR. W. G. MALCOMSON, ARCHITECT, DETROIT, MICH.

THIS plate exhibits the accepted design for a church building now in course of construction, under the auspices of the National Christian Woman's Board of Missions. Exterior shows roughly-squared header stone. Interior finish is oak and ash, natural. Estimated cost about $20,000.

DESIGN FOR THE PROPOSED MUNICIPAL BUILDING, WASHINGTON, D. C. PREPARED BY MR. W. J. FOLK.

COTTAGE AT WATCH-HILL, R. I. MR. HOWARD HOPPIN, ARCHITECT, PROVIDENCE, R. I.

PROBATE COURT AND REGISTRY OF DEEDS, EAST CAMBRIDGE, MASS. MESSRS. WAIT & CUTLER, ARCHITECTS, BOSTON, MASS.

EARTHQUAKES. I.

FATHER IGNAZIO GALLI, director of the astronomical observatory at Vellettria, near Rome, has just published a long and very detailed memoir on earthquakes, which casts an unexpected light upon a momentous scientific problem. Father Galli is a Roman, very conscientious and persevering — one who for several years has applied himself to the fathoming of the phenomena of aerial electricity, as well as of those which are connected with terrestrial convulsions. I have the honor of knowing him personally, and I have had occasion in several conversations to notice the spirit of research, observation and critical power with which he is animated, and without which science reaches only chimerical conclusions. He is one of those churchmen who do not believe that the brutalities and mysteries of nature are at enmity with the respect which we owe to the divine being. He thinks, on the contrary, that every scientific advance enlarges the limit of human knowledge and increases the sum of lawful well-being and the security which man enjoys in harmony with the views of Providence such as the Christian society conceives.

The work which he offers to the meditation of the world of scientists consequently deserves to be taken into serious consideration, and although conserved to the examination of certain meteorologial and telluric phenomena, it interests in a very different way architects and engineers; for it furnishes very exact and useful indications as to the best means of protecting structures against damage by earthquake.

One of the most interesting parts of the book before us is that where the author recounts the history of the different beliefs and theories which have been advanced in this subject. All true seismae have always believed that the earthquake proceeds and propagates itself by the vibration of the soil. In ancient times they had stranger notions. Pliny believes a consequence of the explosion of thunderbolts in the interior of the globe. Aristotle attributed them to dry exhalations from the soil, which of itself, according to him, not only produce convulsions, but thunder and wind. Averroes, in speaking of the terrible earthquake which devastated the Province of Cordova, in his native country, in 1139 (566 of the Hegira), mentions a plant called the "earthquake plant," and in so doing informs us that at this time they believed that the upheavals and rending of the soil had the property of giving birth to a special flower. This points without doubt, in the case of Averroes, to seeds borne from neighboring islands, perhaps the Azores, by the furious winds which ordinarily accompany this kind of phenomena; and as these seeds found the soil deeply disturbed by the violent vibrations, they prospered there rapidly, and offered to the eyes of the astonished inhabitants the fruit of an unexpected vegetation.

The invention of powder gave an unexpected appearance of truth to Pliny's theory. The effect which the explosion of mines produced made people believe that the entrails of the earth contained
ONE OF FIVE COTTAGES TO BE BUILT AT WATCH HILL R.I.
HOWARD HOPPIN, ARCH'T.
PROVIDENCE, R.I.
PROPOSED MUNICIPAL BUILDINGS
WASHINGTON D.C.
ARCHITECT: WILLIS POLK
ARCHITECTURAL SHADES AND SHADOWS. — PLATE I.

No. 1. Cornice in Direct Light: Conventional.

No. 2. Cornice in Diffused Light.

No. 3. Cornice in Direct Light: from the Object.

No. 4. Doric Column: Large Scale.

No. 5. Doric Column: Small Scale

No. 6. Octagonal Pier and Cap.

No. 7. Elevation showing Aerial Perspective.

Shade & Shadow on Plaster Cast.
deposits of sulphur and nitrous matter which the sun's heat or subterranean fires suddenly lighted, thus forming formidable explosions. They began to believe in consequence that there existed under the surface of the ground an reservoir of fire and matter, which the supposed action of sulphur and nitre was added of that bimetal and vitriol.

Descartes thought that the mechanical action of these hypothetical explosions was that of a pendulum, and the experiments of the early years of the present century, since the discoveries of Priestley and Cavendish, place it in the extraordinary explosion of the volcano of Etna, which was the first eruption that could be ascribed to the agency of heat. For it is certain that the earth's crust is formed of two distinct layers, the superficial one consisting for the most part of the rock, and the other of the vitreous and/or metallic substance which constitutes the interior of the earth. The first of these layers is composed of granite, basalt, and other rocks, while the second is composed of iron, nickel, and other metallic minerals. The two layers are separated by a transition zone, which is composed of a mixture of the two, and is known as the mantle. The mantle is thought to be about 2900 km thick, and is composed of a variety of materials, including rocks, minerals, and gases. The mantle is believed to be responsible for the Earth's magnetic field, and is thought to be the source of the Earth's heat, which is thought to be generated by the slow radioactive decay of uranium, thorium, and potassium.

In the evening of December 30, 1883, so violent was the shock that shook the city of Dorignac, near Douai, in France, that the first floor inhabitants were forced to seek refuge in the attics. Many of the miners at work in the pits heard only a subaudible rumbling, but did not perceive the least motion of the earth. M. Domeyka, instructor in mineralogy at the University of Louvain, was at the time on leave of absence, and was at the mines when the earthquake occurred. When he arrived at the mine, he found that the miners at work in the pits had been thrown to the ground by an earthquake, of which, beneath the surface, he had no indication. He added, that according to his experiences of the machinery of the earth, such shocks when they were below ground, than when they were upon its surface.

The waves could be multiplied without stint, and would demonstrate to the farthest limit the proof that, at a depth of a few metres, the oscillation of the ground does not take place, and that between the superficial crust, where the vibrations are transmitted, and the lower strata, where the phenomenon is absolutely imperceptible, there is an intermediate layer, where it is only sensible in an acoustic form. Finally, all the observations bearing upon this subject have equally established that earthquakes are propagated really in the form of undulations of the ground. At Albano, for instance, the inhabitants of that country were perfectly familiar, in 1829, with this phenomenon, which, for a certain length of time, was reproduced in their houses; they called this an unanswerable demonstration of the existence of these waves, and treed toiling, bowing themselves and rising up again, as did the mast of ships that float upon the sea, and they stopped in the water as they would in the undulation of the tides. If we had this warning, might pass on its way. A soldier, a friend of the author, told him that in 1879 he was sitting, one May evening, in the open field, and all of a sudden he felt himself lifted up and saw himself standing in front of him a strong wind.

Finally, in his admirable work on volcanoes and earthquakes, M. K. Fuchs describes with great minuteness these undulatory movements in the earth, and gives them a name, a designation, which is known as seismic. The word seismic is derived from the Greek eisikos, meaning "earth," while the movement is propagated in a determinate direction. During the severe shocks the earth seems to have lost its solidity, and the earth's surface is raised up, and falls back, but sometimes the movement of the ground can actually be seen.

The still superficial ideas which obtained regarding the transmission of earthquakes to the地面 of the earth, were developed by Alvaro, and finally the phenomenon was explained by the Italian mathematician, Antonio Abbe, who showed that the waves were transmitted through the earth in the form of undulations. The phenomena of earthquakes were first described by the Greek geologist, Dolomieu, in 1749, and by the Italian scholar, Galvani, in 1782. They showed that the vibrations of the earth were transmitted through the earth in the form of waves, and that these waves were propagated through the earth in the form of undulations. The phenomena of earthquakes were first described by the Greek geologist, Dolomieu, in 1749, and by the Italian scholar, Galvani, in 1782. They showed that the vibrations of the earth were transmitted through the earth in the form of waves, and that these waves were propagated through the earth in the form of undulations.
I would seem as though there were no room in the aesthetic and literary world for another history of art, and, in a certain sense there is certainly no very crying need for many such works as Lichtenstein and Von Reber have given to artists; still, a very tangible evidence that the lists are not yet full is afforded by William Henry Goodyear's recent "History of Art," a work which would more fittingly be designated by the humble title of "hand-book," as, in the three hundred pages of the volume the leading points are only touched upon. The author's familiarity with art is unquestionable, and the preparation of his book is evidenced by the fact that he who feels the need of a concise presentation of facts in the history of art, made by one who confines himself to such statements as are indisputable, without undertaking any elaboration of details. The pages are very evenly between the paragraphs, without the thing being given to architecture and about eighty pages to sculpture. As would very naturally be expected, many of the architectural distinctions of style are lost sight of, or at least they do not seem to be preserved with the care one might wish, though the writer bites off very justly the task of style in our modern work when he says that many or most of our buildings do not belong to any style at all, unless it be the "modern," and as modern to most of us, as we are. As to the subject, a radical departure has been made from the order usually followed by writers upon the history of architecture, the modern work being considered first in considerable detail; and it is a change which subsequent writers may follow to advantage. We naturally draw our first ideas of architecture from the examples about us, and it is only after a long training in art that one can aptly appropriate the epithets of pyramid, temple, and Assyrian brick palaces. In fact, analysis is, to most minds, more respectable and satisfactory than synthesis, and the former process of thought, so often adopted that it is almost the only point which must be kept in view when writing a book such as this, which, after all, is more properly intended for the public than for the student, is the production, though the same ideas may be applied to a more detailed art history. Tell a student that St. Patrick's Cathedral is of French architectural extraction and Gothic—or buttressed Gothic, as Mr. Goodyear has it,—by classification of Colleges, is Corinthian and Classic; that William K. Vanderbilt's house is Renaissance and Francis I; and if he never hears another word about architecture, these buildings will be as types to him and he will have a hundredfold more knowledge of the art than if he were to give months to an investigation of the Egyptian hypostyle halls, or an elucidation of the knotty Greek haphazard question. This seems to be exactly the idea which the writer of this history had in view, and the elaboration and slight degree it is sufficient to render the study of architecture interesting from the first page.

The prose treatment of the book is the illustrations, and they are noticeable quite as much for the medium employed, as for the executability in which they are set forth. The two hundred and five process reproductions of photographs which illustrate the text are excellent in idea, and, granting the claim that the worst photograph has some peculiar advantages over the best engraving for the reproduction of works of art, "the illustration of the book is a good one," as regards the regard for the effort to illustrate adequately a history of art in number and choice of objects. As regards the process, it is hoped that in future reproductions the use will be more satisfactory. There are several other methods of reproducing photoprints, and although it would, of course, be quite out of the question in connection with a work so modest in size and in price as this, we can imagine nothing more complete as illustrations to the history of art than a series of three or four hundred of the best gelatine prints made directly from the old works of art.

As a text-book it has a handy volume to carry to Europe with one as a guide to historic art, this book seems to be peculiarly suitable, both by reason of brevity and at the same time, its completeness; and by reason of the categorical manner in which the facts are arranged and set forth. The text is sometimes a trifle dogmatic, but the disposition of the subject is so definite and so well-rounded, vaguey aesthetic study some writers would have it appear, and that the old masters have a precise historic and artistic value which is not measured by individual appreciation. "Personal taste, one's chance acquaintances and surroundings, or the fashion of the hour, are apt to be disturbing elements when we use modern work as the standard of appeal for educational purposes. In dealing with the past, we stand and act as if we were the writers of the criticism is such, and its verdicts are so well-known, that the individual instructor becomes the exponent of these and must be guided by his own rendering and whether the architect or the teacher. It stands in place, not of an individual teacher, but of the criticism of art as determined by its standard authorities. To develop and form an original and independent taste is the object of the learner. To force a firm basis for this depends of essential views and by attention to the most general principles must be the object of the teacher. On the whole the matter of fact is the same.

These last three sentences fitly express the scope and the intent of the book.

**The proposed "standard form" for building contracts.**

We have been requested to examine the form of contract adopted by the National Building and Construction Corporation, the Western Association of Architects and the National Association of Builders, as a "standard form," to which it hoped that all building contracts will, in time, conform. We include the end of the contract, the builder and architect, and the building contractor, with the same general provisions and conditions which eventually would become familiar in the meaning and effect to owners, architects and builders, is a practically one, we have serious doubts as to whether any such scheme is practicable; and we are unscientifically of opinion that this particular attempt will not commend itself to the judgment of the building public. The chief object of this form is in question is the authority given to the architect: he is made the agent of the owner; he is given authority to make alterations and order extras, and to waive the provisions as to time; he is to determine the amount of loss sustained by the owner in case of delay on the contractor's part; also, whether the contractor is in such default as to justify the owner in continuing the work on his own account, and (apparently) to pass upon the sufficiency of evidence that the premises are free from liens. He is also to "direct" the work.

The real parties to this contract would seem to be the contractor and the owner, rather than the contractor and the owner of the premises; the latter having nothing to do but to promptly pay whatever bills may be incurred by the architect, however much in excess of the contract price. The architect will, of course, have any tendency to any extent that he is paid, and the owner has apparently no power to get rid of him. The contract amounts, in short, to an irrevocable power-of-attorney to the architect to build such a house as seems fit, will full power to pledge his employer's credit in payment of the bills.

We doubt if one owner in a thousand would sign a contract like this, if he fully understood its scope and meaning. There may be some special cases in which the owner is, for some reason, willing to give the architect carte blanche in regard to plans and cost; but, as a rule, of course, the wishes and necessities of the owner in respect to the security of a building project. Even if the owner is willing to let the architect build the house at his own discretion as to cost, it would still be wise to insist upon a general power to alter, and for the case must not be forgotten that the real cause of building disputes and the real question as issue between the contractor and the owner is not whether the alterations were, in fact, ordered, but whether a jury will find that they were. As the law stands today, before the contractor can saddle a bill for extras on the owner, he must show either that the owner himself directly ordered the work, or else that so was given by the architect; when it comes to the second step, however, the builder's case generally falls, unless the owner did, in fact, order the extras himself, or expressly authorize the architect to make alterations; and the last step is that the contractor's second and most important step in the builder's case would be unnecessary; he would only have to convince the jury that the architect had approved the alterations; and the main safeguard of the owner against manufactured and fraudulent evidence would be gone.

We think, also, that this extension of the architect's authority

---

would be a serious annoyance and danger to him. Such a provision might lead an architect to conceal, without special consultation with his client, the execution of any work which may have been omitted from the plans and specifications, or to include, to the contrary, any addition, the design, or the cost of which, was no such thing to the client as he was fortunate enough to have the privilege of enlarging the sphere of the architect's authority in the manner proposed. We have been unable to find a single form of contract in use in architects' offices containing such a clause, or anything similar, by which they might protect themselves from the responsibility that such a change would throw upon them.

Moreover, the provision is not a protection for architects, as is the case in the proposed form of contract. It is a provision of the kind of contract, if adopted, would be a protection for architects, as it is the case in the proposed form of contract. It is a provision of the kind of contract, if adopted, would not be a protection for architects, as it is the case in the proposed form of contract.
draw plans, specifications and contracts, and to devote to that purpose, in the interest of his employer, all the knowledge and skill which he possesses. He occupies a position of trust and confidence, being the professional adviser of his client, and his whole and sole duty in the relationship is substantially the same as that between solicitor and client, and it is as much the duty of the one as of the other to draw contracts solely with a view to the protection of his employer.

Architects, in drawing contracts, though generally more competent for that purpose than lawyers, on account of their greater familiarity with building methods, should always bear two things in mind: first, that their duty is to their employer, and to him alone, and in no sense to the contractor; and secondly, that the practical question in building litigation is not whether the work was in fact done properly, but whether a jury will find that it was; nor whether the contractor was in fact told by the architect, as the owner's agent, to make certain alterations, but whether the jury will believe the testimony of the contractor and his workmen that an order was given, or the testimony given by the architect himself. If the architect can certify the progress of the work, he stands, in so far as the execution of that duty is concerned, in a somewhat different position, being bound to consider not the interest of the owner, but the actual facts of the case with truth and impartiality; but in so far as the drawing of the contracts is concerned, he is simply the confidential and professional adviser of the man who employs and pays him.

We are at a loss to understand how the committee of architects appointed by the American Institute and the Western Association could have drafted such an instrument as this, unless these gentlemen agreed in the writer of a recent talk that the architect was a "recognized head of the building trade," employed by the contractor, rather than by the owner, and anxious to make the work of himself, expense for the owner, and litigation for the courts.

PHILADELPHIA CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

A meeting of the Philadelphia Chapter of the American Institute of Architects, held February 13, a committee was appointed to prepare a blank form of contract to be used between the architect and the owner. It is intended in this form to clearly state both the duties and the responsibilities of each party to the contract. Any blank forms of any similar contracts or any information on the subject would be very gladly received by Edward Hurst Brown, 1305 Arch Street, the Secretary of the committee.

MISSOURI STATE ASSOCIATION OF ARCHITECTS.

Special prize competition offered by the Missouri State Association of Architects, the subject being a "Membership Certificate for the Year 1889." The successful competitors were L. H. Seubert, First; H. P. Eames, Second. Mr. T. B. Annon read a very interesting paper on "Construction." Respectfully,

L. H. Seubert, Corresponding Secretary.

WASHINGTON CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

The Washington Chapter of the American Institute of Architects would be pleased to see any of the Institute or the Western Association members who may be visiting Washington during the Inaugural at their rooms, 326 Pennsylvania Ave., W. Street. By calling on or addressing the Secretary, the freedom of the room will be gladly tendered them. One of the regular meetings of the Chapter will be held on the first of the month at 8 p.m., on which date his members will be pleased to meet visiting architects.

GLEN BROWN, Secretary, 326 F Street.

BOSTON ARCHITECTURAL CLUB.

The Boston Architectural Club held its fortnightly conversations Friday evening, February 13, at its rooms, 107 Washington St. The subject for discussion was "Methods and Mediums for Sketching." A few sketches in the various mediums were exhibited, and Mr. W. R. Emerson made some suggestions about architectural drawing. He used his remarks in support of a sketch which he made before the Club. A sketch was first made with the pencil-point, then with pencil used flatwise, treating in masses of light and shade, and afterwards, with the medium which he made an English reed-pen, followed by one with a pen made from a stem of golden-rod, which Mr. Emerson has found to be very nearly as serviceable as the English reed-pen, and much more easily obtained. He then made one of his characteristic sketches with a common wooden toothpick, and finally showed what could be done with a pencil-smooth sketch. His sketches were exceedingly interesting, and were watched by the members of the Club with the closest attention.

The monthly exhibition of the Club will be held from Wednesday, the 20th to the 27th inclusive, and members of the Club will be the sole exhibitors. The list of exhibitors is quite large, including Ross Turner, E. C. Cabot, C. Howard Walker, R. C. Sturgis, F. H. Bacon, and others equally well known. The exhibition is not public, but tickets can be obtained through members of the Club.

GREEK ARCHITECTURE.

PHILADELPHIA, PA., January 12, 1889.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—Permit me to explain more fully than I did in my rather hasty communication of January 25, my position in regard to the question of Grecian architecture.

In the case of the Erechtheum ever had a fixtie is, I think, exceedingly improbable, for if we separate the architrave and cornice enough to insert one of the usual height (or, in fact, if we separate them at all) the proportion of outline is such as to strike the eye very unpleasantly at once, on account of the increase in height of the entablature from less than two-thirds to about one-half of that of the column, which proportion corresponds to those of the other porticos of the building. (These figures are merely approximate; I do not believe the Greek architects to have built their temples as mathematical puzzles for the benefit of modern architects.) The frieze might then have been removed to preserve the correct proportion of parts when the portico was rebuilt in the Caryatid order. Consequently, it is mere supposition to hear of any other opinion, or anything definite upon this peculiar construction.

I shall not intend to bring up the long contested question as to whether the Grecian temples received their chromatic decoration, exteriorly, at the hands of their builders, or at a later time: that they were so decorated in the best period is now, I believe, generally admitted. Neither do I wish to insist upon the ideas which long forbade the acceptance of this truth, and which are held in just contempt by "The Writer of the Article," but the fact that traces of color in crude color have been found upon the temples is not by any means conclusive evidence that the final coloring was of a debased type,—either intrinsically or in comparison with the ancient. That the element of beauty in Classic art is a vital one, although thoroughly opposed to the intrinsic principles of everything associated with the romantic period is, in spite of individual preference, established by long ascendency in times perhaps past. The very greatest human culture that the world has known, and also by its subsequent, frequent resurrections. This being so, why should the writer of the Article,—who desires the excellence of the work but of so much that followed, and who were so successful in form and detail,—fail in the problem of color? Such an assumption I cannot think warranted by the light already thrown upon the subject.

Will "The Writer of the Article" pardon me if I assume that it would have been a stranger insensibility on the part of Phidias, who created the chryselephantine statue of Athena —famous in Greek literature for its beauty and splendor — to have painted those of the gods and heroes without,—several of which are regarded on account of their exquisitely modeling to be the finest works known to modern artists,—like gorgeous harlequins, or to have placed them in juxtaposition to work treated in such a manner?

Very truly,

HERBERT P. KELLY.
The COLUMBIA COLLEGE ARCHITECTURAL COURSE.

CHICAGO, ILL., January 24, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—I desire to ask a few questions apropos of your reply to Mr. Kimball, concerning Columbia College as "the best school of architecture" in America.

By your first statement do you mean to imply that other institutions—notably the one at Boston—have "no corps of instructors of long and wide experience"? If so, I consider the statement unjust, for architecture is so largely a matter of personal instruction that tabulated diplomas and certificates of "experience" count for little in results. What do the results of training show?

Second, is a course of four years' duration, compulsory under-taken, of more benefit in itself than a course of the same length which is voluntary?

I will not question your third statement, not wishing to enter a discussion on rival "equipments."

From the statement that the faculty of the Ecole des Beaux-Arts—acknowledged by all to be the best school for the profession in the world—is of the so-called "narrow-minded and unprogressive" type, is progressiveness, especially in these days of harsam-scum innovation, to be regarded as an unmixed blessing at the start?

Fifth, in consideration of your publication of architects' votes on the merits of buildings in this country, do you think that New York is the acknowledged centre of the highest architectural art in the country? Respectfully,

H. H. Godkins.

We will print our correspondent's questions, while we must decline to answer them. It is not our duty to second-guess our correspondent, and it is not our place to make any statement concerning his inference that, because we made certain absolute statements concerning Columbia College, only the converse of those statements could be true of those institutions which were not mentioned. Our correspondent's amiable esprit de corps has caused him to interpret comparisons which were not made.—Ed. AMERICAN ARCHITECT.
broken marble and sandstone, also two parts of burned porcelain clay, with two parts freshly-slaked lime, still warm. In this way a wash is made that is intensely white, and becomes at the time almost like stone. The four constituents mixed together give the ground color, to which any pigment that can be used with lime is added. It is expressly for the walls or outer surfaces, one day, and the next day frequently covered with water, which makes it waterproof. This wash can be cleansed with water without losing any of its properties, and the color that it gets harder and harder can be even brushed, while its porosity makes it look soft. The wash or calcimine can be used for ordinary purposes, as well as for the finest parlor walls, as the resulting finish is not only equal, but better, to the fresco surface can be prepared with it in the dry way.

Invasion.

Women Iron-Workers. — There are probably a thousand women working in the iron-mills in Pittsburgh, making bolts, nuts, hinges and bars. It is a difficult work, and many of the women working in the bolt-mills, the proprietors decided to try women, and since that time they have been employed very generally in all the iron-work shops. It is a great advantage in some cases, particularly in cases where fine work is to be done, to have a woman's touch. There is also a great advantage in some cases, particularly in cases where fine work is to be done, to have a woman's touch. There is also a great advantage in some cases, particularly in cases where fine work is to be done, to have a woman's touch. There is also a great advantage in some cases, particularly in cases where fine work is to be done, to have a woman's touch. There is also a great advantage in some cases, particularly in cases where fine work is to be done, to have a woman's touch.

Portland, Conn., Sandstone. — Some of the red granite quarried to the cost of this city has been agitated by a report that the famous Portland sandstone or freestone on the Connecticut River, opposite the line of the mason's strike, is this for this reason, because the buildings were getting into the habit of using pressed-brick in its stead. Investigation shows the rumor to be totally without foundation. None of the pressed brick is being used in building on this side of the river, but it is a revival of a similar story which it appears has floated about the Connecticut Valley with greater or less regularity ever since the Portland quarry company, owners of practically all the sandstone quarries in this vicinity, was started. A large sandstone quarry covers an area of over 200 acres, and is practically inexhaustible. It lies in horizontal strata, usually with each stratum in the upper levels varying a trifle from the others in the fitness of things. It is a fact that the one of the three large quarries now worked several areas have been quarried to a depth 200 feet below the surface, and as an experiment some time ago to decide the probable depth of the sandstone, a diamond drill was started down from the bottom of the 200-foot level. It was driven down 612 feet without reaching the bottom of the deposit, making 612 feet in the core. The cores then taken out change material change in the character or quality of the stone. Illustrative of the fact that it is remembered, and the people become frightened because of the extensive quarrying of the stone that was being carried on and passed a law prohibiting people from quarrying the stone for transportation out of the town. — New York Times.

Pittsburgh, Iron. — In the Allegheny district of western Pennsylvania, on the Monongahela, the soil is sandy and will grow little but pines, of which forests have been successfully cultivated. The inhabitants subsist almost exclusively on the produce of their woods, and the only important crops are the various kinds of turpentine. Their pine-trees, and other kinds of timber suited for ship-building, are copious in abundance, and the export is very great. The farmers have the advantage of a large demand for the lumber, and the price is higher in the city than in any other part of the state. The whole value of the pine-trees is immense, and the export must be enormous. The price of pine-trees is about 50 cents per hundred, but they are sold for 60 cents at the nearest market. The lumber is very valuable, and the export is enormous. The price of pine-trees is about 50 cents per hundred, but they are sold for 60 cents at the nearest market. The lumber is very valuable, and the export is enormous. The price of pine-trees is about 50 cents per hundred, but they are sold for 60 cents at the nearest market. The lumber is very valuable, and the export is enormous. The price of pine-trees is about 50 cents per hundred, but they are sold for 60 cents at the nearest market. The lumber is very valuable, and the export is enormous. The price of pine-trees is about 50 cents per hundred, but they are sold for 60 cents at the nearest market. The lumber is very valuable, and the export is enormous.

Steel-Girder. — The substitution of steel for iron in girder manufacture appears to be making steady progress. The Monteur des Inerts Matériaux states that for the large new warehouses in course of erection throughout the country, the girder manufacturers are specified, and that formerly an advantage only obtained in Belgium, the contractors, Halot & Company, Lourain, have had to place the order with the Roth Steel Company, which is now fully established.

Among the notable incidents of the past week in trade and manufactures is the iron trade, as the prices of manufactured iron reach 20,000 tons. — Iron Trade Review.

AMONG the notable incidents of the past week in trade and manufacture is the iron trade, as the prices of manufactured iron reach 20,000 tons. — Iron Trade Review.
The exterior of this house is stained with
CABOT'S CREOSOTE STAIN
for Shingles, Fences, Clapboards Etc.

These Stains are very durable
and give a much more artistic effect
than paint, while they are cheaper,
and very easy to apply.

Our Stains contain no water and
are the only exterior Stains that do
not contain kerosene.

Prices are 40, 60 and 75 cents per Gallon
According to Color.
Send for Samples on Wood, and Circulars.

SAMUEL CABOT,
70 KILBY ST., BOSTON, MASS.
Flemish Towers.
THE GEARED HOIST MACHINE.

The Geared Hoist for passenger or freight elevator service as shown, has several new features; both pissoirs and gears are cut by the most approved methods, securing greater accuracy than has been attempted heretofore in the same class of machinery, and giving a smooth and noiseless motion at a high speed. It is provided with a Centrifugal Governor that acts in case the belts break in descending; has Slack Cable Device that stops the car instantly and applies the brake, keeping the cable taut on the drum when the car is obstructed in its descent. It is also provided with Automatic Drop Forge, Wrought-Iron Stop Device, which absolutely prevents breakage. The machine is right or left hand and can be placed in any position desired as the belts will run at any angle. The pulleys are self-oiling, requiring attention only once in six months. It is manufactured by Morse, Williams & Co., Philadelphia, New York and Boston, who also manufacture Hydraulic, Worm Geared and Hand-Power Elevators. Morse, Williams & Co., Philadelphia, Pa.

A LARGE EAGLE.

The tower of the new City-Hall at Fall River, Mass., is to be surmounted with an immense eagle, nine feet in height with proportionate outstretched wings made of sheet copper artistically hammered into shape and very strongly made from a design furnished by William R. Walker & Son, architects, and manufactured by Thomas W. Jones at 173 Front Street, New York. It is the largest eagle ever made for such a purpose and will be a permanent ornament to the building.

Mr. Jones’s tower ornaments, weather vanes, finials, etc., made from all sorts of curious and unique designs of architects are to be seen from one end of the country to the other, as he uses only copper or brass—which though more expensive than other metals, is far more durable—and gilds only with pure gold leaf. Some work is still defying the elements after twenty-five years of use.

THOMAS W. JONES,
NEW YORK, N. Y.
noted for their quality. The Stettin ("Anchor" brand) Portland Cement, as its name implies, is made near the city of Stettin. It has been in use in the United States since the middle of 1885, and since that time has met with great favor.

1. It possesses the following merits:
   1. It is always uniform.
   2. It is very finely ground.
   3. It is of a good color.
   4. The packages are large and of full weight.
   5. The barrels are lined with thick asphalt paper.
   6. It is cheap, because it will do more work than most other brands, as it will carry more sand.

GEARED WINDING MACHINE.

PORTLAND CEMENT.

The subject of Portland Cement is one of increasing importance, and each year finds the amount imported larger than the preceding year. When this article was first introduced into America, it was almost exclusively English in its manufacture. For some years, this held the preference, but the German manufacturers were steadily improving, and they forced their way to the front until at the present time the German Portland Cements are acknowledged by experts and the principal artificial-stone manufacturers to be the best on the market.

This is especially true in regard to the cements from Stettin which have always been

7. It never fails to give satisfaction.

Last year between 10,000 and 15,000 barrels of this cement were used in St. Augustine, Fla., in the construction of the large hotels and the restoration of the old Spanish Cathedral, etc.

A recent test by the Dock Department of New York, gives the following results:

Fineness. 98½ per cent through a 2,500 mesh sieve.

(The Dock Department only require 90 per cent.)

Tensile Strength. Mixed neat and broken in seven days — 467 pounds per square inch.

(The Dock Department only requires 300 pounds.)

Mixed, one part cement, two parts sand,
and broken in seven days—240 pounds per square inch.

(The Dock Department only require 125 pounds.)

Capt. W. W. Macoy, the engineer in charge of the Testing Department of the Dock Department of this city, says:

"This cement is very finely ground and the tensile strength both neat and gauzed with two parts standard sand at the end of seven days is high.

"The test is therefore a very satisfactory one, as the cement is very finely ground and perfectly reliable."

He also made a twenty-eight day test with the following result:

Tensile Strength. Mixed neat, 575 pounds per square inch.
Mixed, one part cement, two parts sand, 274 pounds per square inch.

Of this he says:

"The twenty-eight day test confirms the good opinion I gave about this cement, based upon the result of the seven day test.

"The tensile strength is very high both with sand and gauzed neat, and taken in connection with the fineness and general satisfactory working, places this cement in the rank of the best Portland Cements in this market."

Do not fail to send for my pamphlet on Portland Cement.

For prices either for immediate delivery or "to arrive" write to

FISHER

WELLS BUILDING, IS BROADWAY, NEW YORK, N. Y.

These centres are all finished before leaving the factory, and painted a lustreless white, to correspond with plaster-finish of ceiling, and are priced in this way. They can, however, be painted and ornamented to suit the taste of purchasers, and to correspond with style and decoration of room where used. These centres are simply screwed to the ceiling after plastering is put on, and can at any time be taken down, cleaned, and replaced without damage to the ceiling or centre-piece.

We present, also, a few designs of sheet-metal interior cornices and ceilings, which we will be pleased to price on application, and which will be found far cheaper than work of corresponding style in any other material. Another, and probably the chief advantage of this class of work is its extreme light weight as compared with stucco, and the fact that it will not crack or fall off, and is not injured by water.

Correspondence solicited. Always state whether work is to be sent by express or freight.

BAKEWELL & MULLINS, 31

SALES, O.

COALITION.

PITTSBURGH, PA., JANUARY 1, 1889.

The business of the Hartman Steel Works, at Beaver Falls, heretofore conducted by the Hartman Steel Company, Limited, has been transferred to Carnegie, Philips & Co., Limited, by whom it will hereafter be controlled.

The works will hereafter be known as the Beaver Falls Mills, operated by Carnegie, Philips & Co., Limited.

The calendar of advertisers are invited to submit to us designs for an attractive calendar, to be issued in January next. The annual issue will be in the form of a pocket calendar, and the work is to be executed on the firm and handsome style, and should be an embodiment of the best commercial art. The work should be in line and proofed for the press, and the designer is invited to select the style of work and page size according to the nature of the work to be performed.

effect is good, and if some of the color were not a little overbright would be very dainty. The Magoon Furniture Company, of Boston, follow a somewhat similar course, though here the decoration, the monthly calendar and the advertisement of the issuing firm have about equal prominence, and the decorations are steel-engravings and not colored prints.

With another class the advertisement is intended to be the thing of importance, and the advertisers send out similar placards at any other season of the year; the calendar attachment seems to be added as an afterthought, as sort of apology and concession to New Year's Day prejudices. At the head of this class, since the calendar is quite inconspicuous, we should place the expensive card issued by Messrs. Samuel H. French & Company, of Philadelphia, and in the same category the even more expensive one issued by Messrs. Merchant & Company of the same city, which, taking all things into consideration, is the most successful advertising placard we have received, though it is not the best calendar. The Gurney Hot-Water Heating Company, who come in the same class, are more successful in some ways than either of the two firms just mentioned; their calendar is for wall service, and the figures are large enough to be read a dozen feet away, while the tone of colors used and the style of letters and decoration makes one quite ready to keep it during the year.

The calendars issued by the Abram Cox Store Company and of the Thorn Shingle & Ornamental Company might almost be included in the class first mentioned—the pyrotechnic class, but they both have enough good points to warrant their being kept.

The ready-made calendar has come to be a regular visitor everywhere in a multitude of forms. It is less expensive, of course, to select a pattern from a stock of ready-made designs for backgrounds and use that rather than have one specially prepared, and it is about as satisfactory, for the multitude of these ready-made backgrounds is so great that one can always find a background of the same design from two or more different advertisers. In this class we should place, at a guess, the calendars sent us by the B. C. Bibb Store Company, of Baltimore; Messrs. Burditt & Williams, of Boston; the Lawrence Cement Company, of New York; Messrs. McKee & Co., of Waterbury, of Boston, and Ketchum & Co., of New Bedford. The backgrounds used by the last three mentioned being excellent specimens of steel-engraving done by the firm of J. A. Lowell & Company, of Boston.

The conclusions we draw from comparing the samples we have received—less than in former years—is that advertisers do not often enough try to select photographs in the position of the recipient. Of the many calendars that may cofee to a given person, he will probably keep two for use, one for the wall with figures large enough to be read from across the room, good in design of decoration and, above all, not glaring of color; the second will be wall-hanging calendars and must have all the attributes of the other, and be, moreover, of such size, shape and form as not to be too much in the way. All others will be thrown away in the course of a few days, and all the excess of money spent in their manufacture, over and above the cost of a single plain circular, is absolutely lost, and worse than lost, it is mispent, since by being paid for advertising in magazines, journals and newspapers, it would have assured the

spender those benefits of constant iteration which is the essence of advertising.

IMPORTANT TO HOUSE-OWNERS.

Among the almost innumerable inventions of modern times, there is no subject that has so engrossed the mind of the American inventor as the subject of window-fastenings; and though hundreds of patents have been issued in this line to as many inventors during the last decade, a comparatively small number of those inventions, when reduced to practice, have not with anything like general approval. There is probably no article in the line of builders' hardware upon the market with so great a variety to select from, and none that meets with such universal disapproval, as the article known as "Centre" sash-fasteners, for the reason that, when applied, they afford neither protection nor convenience, and such a thing as security and ventilation at same time was never dreamed of.

Within the past few months, however, a novel and unique device has been offered upon the market, known as the "Timby" burglar-proof sash-lock and ventilator. This mechanical device is quite novel, if compared to, or rather, contrasted with, the old style of window-fastenings. It is so simple in construction that the casual observer must wonder at its utility and at the same time be convinced of its superiority over all the old-fashioned devices of the kind. It affords a double security for the glass, as it is not openable without keys or without weights or balances, and does not obstruct the attachment of weather-strips or inside-blinds. The descriptive circular of the manufacturer gives full and explicit directions for applying and operating, and a diagram or pattern accompanying each lock, so that no difficulty will be experienced in attaching them to buildings already constructed. In the catalogues from our contemporary, the Manufacturer and Builder, published in New York City: "There seems to be nothing about the construction or operation of this device to render it liable to become disarranged; it should be very durable, and must form a very desirable article for house快来, more generally, and for improving security and convenience than the centre-sash devices in common use. It seems to have much merit, and we commend it to our readers."

Letters patent of the United States were issued to the inventor, Mr. T. F. Timby, under date of March 29, 1887. Preparations for the manufacture of them were begun soon thereafter, and from the first day they were placed upon the market they met with deserved approval. The reputation gained at first remains with the lock, and as time rolls on, and its merits become more widely known, it must meet with that measure of practical application to its intended use as to defy all competition in the line of devices for window-sash fastenings.

At the fifty-seventh exhibition of the American Institute, held in the city of New York in the fall of 1888, this improved window-fastening was exhibited, and met with unqualified approval of thousands of persons who examined it, and among them were many leading architects and builders.

Besides the favorable comment of the public generally, and architects and practical house-builders particularly, more tangible approval followed in the form of numerous orders for the goods. We also see by the published lists of awards made by the American Institute for the year 1888, that the "Timby" burglar-proof sash lock and ventilator received the first prize over all competi-
tors, the award being the beautiful bronze medal of excellence.

This firm is also engaged in the manufacture of another new lock designed expressly for use in windows having a sash bar.

This lock combines all the desirable features of the double-sash lock, viz., automatic action, adjustability, ventilating qualities, etc., but is constructed much heavier in all parts, adapting it to the heaviest sash used in the more modern styles of expensive buildings and dwellings. It will be given widespread use in furnishing these goods in any style and finish to order, or upon specifications to match other trimmings used upon blocks, dwellings, or public buildings.

Many of the leading architects of the cities of New York, Boston, Philadelphia, Washington, Pittsburgh, Cincinnati, Chicago, St. Paul, Minneapolis, Kansas City, and other points have examined and approved this lock. Agencies will be established, and the goods placed on sale in all the principal cities. Dealers in first-class builders' hardware not already supplied will be visited at an early date. When the prices are agreed upon, according to the quality and finish desired, with the new lock so numbered from 1 to 5, the difference in the several grades being apparent only in the style and finish of the face-plates and thumb-nuts, which are made in polished brass, nickle-plate, real bronze highly polished, oxidized-silver, etc.; also a special A of rich gold metal, with a gold and silver finish, very fine, with a buyer's monogram engraved upon the face of the thumb-screw, to order. The inventor of this lock is Mr. T. F. Tinkley, of Brooklyn, N. Y., who has charge of the New York office. The factory is located at Oswego, N. Y., an office has recently been opened in the city of New York, at 142 Chambers Street, Room 3, where models exemplifying the practical workings of the lock may be inspected. There, also, the several parts of the device and samples of the finished locks can be seen, and all desired information will be given.

Samples mounted on a section of window-frame, and distributed to architects and builders throughout the city and vicinity, and will be forwarded to any part of the country upon application. Special attention will be given to order requests, as also to the manufacture of special designs to meet the requirements of architects or others to order.

This novel device will not only find a ready place upon the market, as it seems to meet a want not supplied by any of the sash-lock fastenings in the market; namely, security and ventilation — at the same time covering a field heretofore left vacant, which fact will be appreciated by house-owners.

JENKINS & TINKLEY, COWOO, N. Y.

THE S-TRAP AND THE MCCLELLAN TRAP VENT.

In my contribution to the subject of trap seal protection, I called attention to the fact that Mr. Putnam's experiments demonstrated that an unused vented Trap would lose its seal by evaporation in less than two weeks, and that an unused S-Trap unless it retained its seal for many months. Since all disinterested parties agree that the S-Trap, with fair usage, will rarely or never fail, and that traps of all other forms de fain in proportion to their departure from a uniform calibre, the conclusion is inevitable that, if its seal can be preserved against slippage and evaporation the S-Trap is incomparably better than any other.

Your correspondent asserts that "no automatic air supply has ever been invented so watertight that it will not leak, which will form a reliable protection against siphonage;" but admits that such form of air supply seems to him "to be much more reliable in many ways than the ordinary back-siphon pipe." (The italics are mine.)

The many tests made of the automatic vent preferred to me in my former communication — in this city, under the direction of Dr. William K. Newton, Health Inspector, at the rooms of the New York Master Plumbers' Association, at the New York Trade-Schools, etc., fully established its reliability in preventing siphonage. Mr. Edward Murphy, Secretary of the New York Plumbers' Association of New York, says: "I am free to say that it fulfilled every claim made for it, notwithstanding the tests were made more severe, as regards siphoning, than are ever found in actual practice." In addition to this, I understand that, after careful testing by its experts, the New York Board of Health has been fully and completely satisfied with its use for the exclusion of back-vent pipes.

The question as to the cost and complication is sufficiently answered by Mr. Murphy's further remark that "its advantage in reducing the cost of plumbing, in furnishing an adequate supply of fresh air, and its non-liability to get out of order, are patent facts that further comment would be useless."

My statement that "all so-called anti-siphon traps acquire their non-siphonating quality at the cost of cleanliness," and "have greatly enlarged cavities which gradually fill up with decomposing filter," is met by the assertion that "there are no 'greatly enlarged cavities' in a scientifically designed anti-siphon trap." My remarks were not directed against any special form of trap, but against an unscientific method of preventing loss of seal by siphonage. It is well known to every competent expert that so invented trap has ever been made that will maintain its seal against siphonage to any extent its upward limb is greatly enlarged, and hence that an S-Trap of uniform calibre must be provided with an air supply at or near its crown to prevent siphonage.

More certainly a one-and-one-half inch trap, with a cylindrical chamber of some three inches in diameter, and nearly five inches long, forming a part from its upcast limb to its trap, is a sufficient provision for the foregoing proposition. Nor do I think such a cavity with its sharp angles and extended surface will be found less likely to accumulate fills, with a given water flow, than similar enlargements in other traps.

The advantage to be gained by the use of large outlets as so stated above will be a thorough scouring of the trap and waste-pipe is well known, but shamefully neglected in practice. The statement about the filling up of an ordinary Trap until it gets large enough to carry the little stream its small outlet fixture permitted, simply supports my position that all enlargements form complete, its mouth must be of such size that a matter of time when they will so fill up as to leave a nearly uniform waterway through the trap.

The talk about back-pressure amounts to nothing, if reasonable skill is used in con- structing the trap. If the opening of the fixtures are large enough to allow a proper flush to sear the trap and waste-pipe of all, there will not fill lodgment in the trap, and without their presence loss of seal by capillary action will not occur.

The small quantity of water required to seal a trap, and its readiness with which it is secured by a reasonable flush are not objections, but are among its greatest virtues; while that amount of water required to form the seal of a so-called non-siphoning trap decreases its securing quality and tends to establish a miniature cistern, increasing the evil as, its greater volume of water and non-siphonating quality increases.

The claim that in the case of a kitchen or bath-room trap the line is likely to be cut off to avoid the situation by placing the trap directly above the upcast limb of the trap. This should be avoided by placing the connection beyond the crown of the trap, but sufficiently near it to prevent siphonic action.

Finally, this discussion plainly points to the following conclusions, viz: 1. That the ordinary S-Trap is the simplest and most cleanly ever devised.

2. That it can be employed with absolute certainty, an air-supply must be provided to the waste-pipe at or near the crown of the trap sufficient to meet all demands without disturbing the action of the trap.

3. That while back-vent pipes, when short and direct, furnish air-supply adequate to prevent siphonage, they fail when the lines are indented or very long; besides, the air currents they maintain rapidly decay by evaporation the seals of unused traps.

4. That the back-venting of traps to the roof is costly, complicated and dangerous.

5. That automatic air-supply directly from the room at the point needed is the only uniformly reliable method of preventing siphonage in any situation. — H. Hoonan, in the Statutory News.

NOTES.

The Elgerwood Manufacturing Company, New York, have issued their new catalogue for 1885. It is a credit to this enterprising concern. The book contains fully a hundred excellently executed engravings of their modern traps, sanitary machinery, boilers, etc., and will be forwarded to those making application.

Tus Whittier Machine Company have recently put into the Commonwealth Hotel, Boston, three horizontal steel boilers. They are constructed in the Fall River, Mass., four horizontal steel boilers, each six feet in diameter. Also, have recently put in for Mr. M. Brennan, at the corner of East Washington Avenue, New York City, two hydraulic elevators for passenger service.

ASPHALT PAVING BLOCKS AND TILES

MANUFACTURED BY

THE HASTINGS PAVEMENT CO., 140 Pearl Street, New York, N. Y.


THE MARYLAND PAVEMENT CO., 50 Chambers, Com. Bldg., Baltimore, Md

VOL XXVII. No. 684.
Summary:—
Current Misapprehensions regarding this Journal.—The Al-
bany and Paris style of Public Building and Special Architec-
ture in Boston.—The Tariff on Works of Art.—A New Con-
dition of Competition.—An International Congress of Archi-
sects and City-planners Commencing in Boston.—Some of the
Master-builders.—A Banquet to French-prize-men. 97

Auguste Rodin. IV.

The Lumbermen's Demand for a New Lisp Law. II.

Illustrations:
Main Entrance to City-Hall, Albany, N. Y. House of Mr. B.
F. Willis, Architect, York, Pa.—The Normal Art School,
Boston, Mass.—The Archer Building, Rochester, N. Y.—
Statues of John the Baptist.—Proposed House for C.
Holsey, Esq., Springfield, Mass.—Proposed House for H. E.
Crocker, Esq., Fitchburg, Mass.—Hill Flats, Syracuse, N. Y.

Gutters. 102

Building Law. 102

Society. 105

Communications:
A Personal Explanation.—To Cut a Hip-Rafter.—The Uni-
form Building Contract.—The Willard Architectural Casts.

Trade Surveys. 108

FOR some time our agents, who are constantly brought into
contact with advertisers and material-men, have reported
that misapprehensions were being made concerning this
journal by interested parties. Though disagreeable, we be-
lieved, that, coming from such sources, these false impres-
sions would be set right through the mere passage of time.
But when "one of the most prominent of — architects " ventures
to make (heavily advertised) statements concerning the conduct of this
journal, the matter seems serious enough to notice publicly.
We therefore ask attention for a letter and our answer which
appear in another column.

THE matter of the ceiling in the Albany State-House does
not look any nicer as time goes on. As we said the other
day, any one who really wanted to find out how much the
ceiling was worth need only call in some one who knew about
such matters, and in half a day the true value could be ascer-
tained without compared with the cost to the State. Since
enough, this has been done. After a month or so of apparent
distress and perplexity, diversified with a convulsive attempt to
chastise a newspaper reporter who got tired of waiting for the
official investigation to discover something, a few experts were sent
there who were incantations enough to ascertain the truth in a few
hours, and to report just what they ascertained. The substance of this was, that the true value of the ceiling, as
erected, including a liberal allowance for risk, contingencies and
profit, was not over one hundred and sixty-five thousand dollars.
What has become of the difference between this sum and the
and the two hundred and seventy thousand that the State has
actually paid, or will have to pay, it was not the province of the
experts to determine, and the outside public will probably
never know. Every one, in or out of the New York Legisla-
ture, doubtlessly believes that the tax-payers have been
This is too dangerous a undertaking to be attempted, and
the whole matter will blow over, the New York tax-payer having
long ago made up his mind that it is foreordained that he should pay a great deal for his State-houses, and get very
little. just as the Boston tax-payer has resigned himself to
paying twice as much for his school-houses as other people.
Both of them understand well enough that their money has
been used for corrupt purposes, but to ascertain who got it, and
to bring him to justice, is more trouble than to go to work and
earn enough to make good the amount stolen. Of course, this
way of looking at the matter just suits the people who get the
money, and they grow bolder every day. Some further state-
ments of the experts throw a curious light on the carelessness,
and the deceit of public men, with which the public business
in relation to buildings is carried on. According to the official
accounts, Mr. Smith's bid, of two hundred and seventy thousand
dollars, was the lowest one received for the work as shown by
the drawings and specifications. It seems a little strange that
a contract amounting to so large a sum should have been
bought for with so little spirit that the lowest bidder could
earn a profit of almost a hundred percent per annum.
The Superintendent acknowledged, we believe, that he did not advertise for
offers, but spoke to some contractors that he knew, and invited
them to come in and make a bid. This would be bad enough,
but from the report of the experts it appears that out of the
fifty-one drawings and estimates, there were three of which the
contract was, only six had been made at the time the contract
was awarded, and these three were so vague that no estimate
could, in their opinion, have been made upon them. Whether the
other bids submitted at the same time as Mr. Smith's were,
therefore, fictitious estimates, put in for the purpose of making
him appear the lowest, they do not pretend to say, but they
think it might be interesting to find out. Another curious dis-
covery, which they made by the simple process of counting the
panels shown on the drawings, and the actual amount built, was that while the drawings showed it divided into
seven hundred and sixty-four panels, the actual ceiling was
divided into only three hundred and ninety-six. A saving of
ten thousand dollars was made to the contractor, they think, in the item of iron-work alone, by this change, and after the contract was signed, other building authority, as it appears,
of the Superintendent of Buildings. Another change, by which ten thousand dollars more was put into the pocket of
the contractor, or some one else, was the substitution of paper-
mache for carved oak in the spandrels of the walls. No warrant whatever was issued, except for a<br>---

The Boston School Board is just now reflecting whether
official architecture is any more economical than the article
furnished by private members of the profession. It was
some time ago demonstrated in Boston that the cost of draw-
ings, specifications, contracts and supervision from the City
Architect's office was more than the five per cent on the cost
of the buildings which a private architect would charge; and it
has now occurred to some one to compare the cost of the build-
ings erected under official auspices with that of other struc-
tures built elsewhere. The public accounts show that a certain
school-house recently completed in Boston cost one hundred
and twenty-eight thousand dollars. A similar school-building
has just been finished in a city near Boston for sixty thousand
dollars, and Chelsea had lately put up under a similar spec-
ification for less than sixty thousand. There is no pre-
tense that the Boston school-houses are more sumptuous than
those of its rival towns, and the simple inference is that under
its system Boston pays about twice as much per head for
accommodations for its school-children as other towns do under
the ordinary system. Mr. Capen, of the School Board, ex-
pressed the opinion that the Boston method was a "scheme for
spending the most money for the least work," and most persons
will agree with him, but whether there is any possibility of
getting it changed is another matter.

It must be confessed that the strong point of public
officials does not seem to lie in their appreciation of the wishes and
works of artists, as compared with their annual session of showing off
the confusion and misapprehension existing in Congress on the sub-
ject of works of art, as shown by its discussions on the tariff
affecting them, has just begun, and seems this year to be more
painful than ever. Under the old system every artist residing abroad was
admitted into this country free of duty, while those made by
foreigners were charged with a heavy import. Naturally
enough, this air generalization was soon utilized to cover a
multitude of petty frauds, to the injury of both the artists,
and the public, but the system, we believe, with a certain amount of truth, that some enterprising
metals-dealers, after the law was passed, hired an impudent
American abroad to buy pig-leads, on which there is, or was

March 2, 1889.

Entered at the Post-Office at Boston as second-class matter.

The American Architect and Building News.

Vol. XXV.

Copyright, 1889, by Ticknor & Company, Boston, Mass.

No. 688.
then, a heavy duty, melt it, and cast it in a mould, from which it issued in a rude semblance of a figure of George Washington. When the firm wished to replenish its stock of lead, it notified its "sculptor," and he soon turned out the requisite number. What is the nature of these "works of art" by an American sculptor residing abroad," and passed through the Custom-House free of duty, much to the financial advantage of the firm. It does not seem as if a very astute mind would be required to devise a law which would not be subject to such a ridiculous abuse, but the Senate Tariff Bill, now pending, may possibly be the means of putting a stop to the deception, which seems to include the free introduction of any sort of bronze or other metal statue by an American artist, unless he is prepared to swear that he has "cut, carved, or otherwise wrought it by hand," out of a solid block of the material. If, however, the American artist residing abroad would make himself thus unhappily prevented from sending home any of his bronze statues which he has not himself filed or whittled out of the ingot, he may perhaps gain consolation in another way. Under the proposed bill, the provisions in regard to duty are specified as applicable to "paintings, statues, fountains and other works of art," and prescribing a duty to be paid by the law for each. A statue does not apply to fountains, and, so far as we can see, there is nothing to prevent an ingenuous American from casting lead fountains, instead of statues of the "Pater Patriae," and sending them over here to adorn, temporarily, the back-yard of a dealer, who are consigned to the melting-pot.

On the whole, the Senate Bill, which will probably form the basis of any legislation on the subject for the present, considerably increases the duty on works of art produced by foreigners, while allowing the free importation of those made by Americans; and, as the international copyright question has been the most sensitive, the committee is apparently committed to the absurd position that the works of one kind of art, if produced by foreigners, ought to be discriminated against as rapidly and cheaply as possible, for the public benefit, and that the American producers of that kind of art ought not to ask for protection in their best market; while foreign works in another sort of art are kept out, also for the public benefit, by a high tariff, which is avowedly imposed to foster the interests of American artists of that sort, by enabling them to get a larger price for their works.

Although the number of public functionaries who consider that architects have no rights that anybody is bound to respect grows smaller day by day, there are a few left, even in the older countries, where the position of the profession is much more assured than it is with us. We find in the Belgian journal, L'Emulation, an advertisement, setting forth that the Mayor and Council of a certain town will receive plans for a hospital, or asylum of some sort, up to a certain date. In the lordly style which is so familiar here, but which seems very antiquated abroad, it goes on to say that the author of the plan adopted will be charged with the execution of the work, and will receive as compensation four per cent on the contract-price. It is, however, stipulated that the cost is not to exceed fifteen thousand dollars, complete for occupancy, with "the key in the door"; and that all expenses exceeding ten per cent beyond the contract-price shall be paid by the architect who has the direction and supervision of the work. The editor of L'Emulation mildly observes that this program "seems to us quite complete," and we imagine that the competition will be confined mainly to office-boys and students, Belgium being a place where the value of real architects' services is very well understood. To the profession there, we suppose that this is a reasonable price, and that the city building will seem the most extraordinary part of theprogramme. There is no doubt that it would be binding upon any one who chose to accept the terms by entering the competition, and we should not be very sorry if some indolent youngsters, filled with the confidence of being able to get a pre-ninety large amount of work done for a indefnitely small amount of money, which is characteristic of youth, should bring himself and his family to financial disaster as an example of its force, for the benefit of other persons who might be tempted in the same way. It is not that we object to the principle of an architect guaranteeing the cost of the buildings he designs. On the contrary, there is no more reason for an architect's refusing to make such a contract, if he is paid for it, than for an insurance company refusing to insure the building against fire. What is the nature of the "works of art" by an American sculptor residing abroad, and passed through the Custom-House free of duty, much to the financial advantage of the firm. It does not seem as if a very astute mind would be required to devise a law which would not be subject to such a ridiculous abuse, but the Senate Tariff Bill, now pending, may possibly be the means of putting a stop to the deception, which seems to include the free introduction of any sort of bronze or other metal statue by an American artist, unless he is prepared to swear that he has "cut, carved, or otherwise wrought it by hand," out of a solid block of the material. If, however, the American artist residing abroad would make himself thus unhappily prevented from sending home any of his bronze statues which he has not himself filed or whittled out of the ingot, he may perhaps gain consolation in another way. Under the proposed bill, the provisions in regard to duty are specified as applicable to "paintings, statues, fountains and other works of art," and prescribing a duty to be paid by the law for each. A statue does not apply to fountains, and, so far as we can see, there is nothing to prevent an ingenuous American from casting lead fountains, instead of statues of the "Pater Patriae," and sending them over here to adorn, temporarily, the back-yard of a dealer, who are consigned to the melting-pot.

On the whole, the Senate Bill, which will probably form the basis of any legislation on the subject for the present, considerably increases the duty on works of art produced by foreigners, while allowing the free importation of those made by Americans; and, as the international copyright question has been the most sensitive, the committee is apparently committed to the absurd position that the works of one kind of art, if produced by foreigners, ought to be discriminated against as rapidly and cheaply as possible, for the public benefit, and that the American producers of that kind of art ought not to ask for protection in their best market; while foreign works in another sort of art are kept out, also for the public benefit, by a high tariff, which is avowedly imposed to foster the interests of American artists of that sort, by enabling them to get a larger price for their works.

Although the number of public functionaries who consider that architects have no rights that anybody is bound to respect grows smaller day by day, there are a few left, even in the older countries, where the position of the profession is much more assured than it is with us. We find in the Belgian journal, L'Emulation, an advertisement, setting forth that the Mayor and Council of a certain town will receive plans for a hospital, or asylum of some sort, up to a certain date. In the lordly style which is so familiar here, but which seems very antiquated abroad, it goes on to say that the author of the plan adopted will be charged with the execution of the work, and will receive as compensation four per cent on the contract-price. It is, however, stipulated that the cost is not to exceed fifteen thousand dollars, complete for occupancy, with "the key in the door"; and that all expenses exceeding ten per cent beyond the contract-price shall be paid by the architect who has the direction and supervision of the work. The editor of L'Emulation mildly observes that this program "seems to us quite complete," and we imagine that the competition will be confined mainly to office-boys and students, Belgium being a place where the value of real architects' services is very well understood. To the profession there, we suppose that this is a reasonable price, and that the city building will seem the most extraordinary part of the programme. There is no doubt that it would be binding upon any one who chose to accept the terms by entering the competition, and we should not be very sorry if some indolent youngsters, filled with the confidence of being able to get a pre-ninety large amount of work done for a indefnitely small amount of money, which is characteristic of youth, should bring himself and his family to financial disaster as an example of its force, for the benefit of other persons who might be tempted in the same way. It is not that we object to the principle of an architect guaranteeing the cost of the buildings he designs. On the contrary, there is no more reason for an architect's refusing to make such a contract, if he is paid for it, than for an insurance company refusing to insure the building against fire. What is the nature of the "works of art" by an American sculptor residing abroad, and passed through the Custom-House free of duty, much to the financial advantage of the firm. It does not seem as if a very astute mind would be required to devise a law which would not be subject to such a ridiculous abuse, but the Senate Tariff Bill, now pending, may possibly be the means of putting a stop to the deception, which seems to include the free introduction of any sort of bronze or other metal statue by an American artist, unless he is prepared to swear that he has "cut, carved, or otherwise wrought it by hand," out of a solid block of the material. If, however, the American artist residing abroad would make himself thus unhappily prevented from sending home any of his bronze statues which he has not himself filed or whittled out of the ingot, he may perhaps gain consolation in another way. Under the proposed bill, the provisions in regard to duty are specified as applicable to "paintings, statues, fountains and other works of art," and prescribing a duty to be paid by the law for each. A statue does not apply to fountains, and, so far as we can see, there is nothing to prevent an ingenuous American from casting lead fountains, instead of statues of the "Pater Patriae," and sending them over here to adorn, temporarily, the back-yard of a dealer, who are consigned to the melting-pot.

On the whole, the Senate Bill, which will probably form the basis of any legislation on the subject for the present, considerably increases the duty on works of art produced by foreigners, while allowing the free importation of those made by Americans; and, as the international copyright question has been the most sensitive, the committee is apparently committed to the absurd position that the works of one kind of art, if produced by foreigners, ought to be discriminated against as rapidly and cheaply as possible, for the public benefit, and that the American producers of that kind of art ought not to ask for protection in their best market; while foreign works in another sort of art are kept out, also for the public benefit, by a high tariff, which is avowedly imposed to foster the interests of American artists of that sort, by enabling them to get a larger price for their works.

Although the number of public functionaries who consider that architects have no rights that anybody is bound to respect grows smaller day by day, there are a few left, even in the older countries, where the position of the profession is much more assured than it is with us. We find in the Belgian journal, L'Emulation, an advertisement, setting forth that the Mayor and Council of a certain town will receive plans for a hospital, or asylum of some sort, up to a certain date. In the lordly style which is so familiar here, but which seems very antiquated abroad, it goes on to say that the author of the plan adopted will be charged with the execution of the work, and will receive as compensation four per cent on the contract-price. It is, however, stipulated that the cost is not to exceed fifteen thousand dollars, complete for occupancy, with "the key in the door"; and that all expenses exceeding ten per cent beyond the contract-price shall be paid by the architect who has the direction and supervision of the work. The editor of L'Emulation mildly observes that this program "seems to us quite complete," and we imagine that the competition will be confined mainly to office-boys and students, Belgium being a place where the value of real architects' services is very well understood. To the profession there, we suppose that this is a reasonable price, and that the city building will seem the most extraordinary part of the programme. There is no doubt that it would be binding upon any one who chose to accept the terms by entering the competition, and we should not be very sorry if some indolent youngsters, filled with the confidence of being able to get a pre-ninety large amount of work done for a indefnitely small amount of money, which is characteristic of youth, should bring himself and his family to financial disaster as an example of its force, for the benefit of other persons who might be tempted in the same way. It is not that we object to the principle
SooN aFtER “The Age of Brass” was completed, Rodin made preparations to return to Paris. In answer to the question as to whether he would ever have left Brasséville, if he had been refused further employment, he replied: “Perhaps not. I did not know that I had any talent, though I was working at something more than a trade.”

On arriving at Paris in the early spring of 1877, and finding that he had no studio, he occupied for a short time part of one belonging to an acquaintance, in the Rue Breteuilhers. As he had spent all his money in making his figure, it was again necessary for him to seek employment among the same class of men for whom he had worked before he left Paris. Strangely enough, Belleuse, the first one that he happened to meet, and who immediately offered to give him something to do. The offer was accepted, and for the third time Rodin began to sketch the statues of his old employer, but this time in his own workshop, and as he was not given a fixed time to work, he was able to pass through this kind of unpleasant experiences that had made his early life little less than miserable: he worked for various decorative sculptors.

One would naturally suppose that Rodin’s superior skill would have been to these men a recommendation of unusual character, and that they would have seen in him a working man at least as common as Rodin’s own. Yet it was precisely the contrary. No matter how faithfully he labored, or how much art he produced for them, they were generally dissatisfied, and some of them discharged him. “Not a well-known and successful young sculptor, who worked in the same shop with Rodin on one of these occasions, declares that the latter “was the most learned, skilful, and rapid worker in clay that had ever been seen in this shop.” He made the most beautiful masterpieces, but his employers were ignorant, pretentious and abusive.

Just before the great exhibition of 1878, Rodin was working for a certain decorative sculptor who was especially critical, and for whom he made a number of large heads, destined for the Trocadéro Palace, though eventually they were not used for that purpose. If they were not wholly satisfactory to the employer, he was yet quite willing to sign and exhibit them in the Industrial Art Section of the exhibition, where they gained for him a gold medal. In the same section, Rodin showed his “Broken Nose,” and several other works of decorative sculpture. The heads were afterwards presented by their owner to the Trocadéro Museum, and are now regarded as prized examples, some say masterpieces, of modern French decorative sculpture, though no one knows who really made them.

Rodin had occasionally the surprising good fortune, in spite of the cunning of his employers, to earn as much as twenty dollars in a day, working by the piece, but this could not last long; a workman with such a capacity would soon destroy the trade, and his astonished employer found means to prevent its repetition. He tried his hand again with a well-known jewelry manufacturer, but with less success than before, for the latter would neither accept the sculptor’s model nor pay him for his work. “Yet,” says Rodin, “I thought there was something in what I did, though he could not use any of the men wanted what is known as ‘the sculpture of the School.’”

We will now go back a year to the Salon of 1877, when “The Age of Brass” was on exhibition and Rodin heard that he was suspected of being a reproduction from a mould made over the living model, he went to an eminent sculptor who was connected with the Salon and asked his advice in regard to what was best to be done. As occasion offered, he took the suspicion to have no foundation in fact. “Make some casts and photographs of the model you employed, bring them to the Salon, and we will see,” was the reply. Rodin wrote to a good friend in Brussels to have them made, and at once forwarded them to Paris. When they arrived in a few days, and were ready for examination, but this was all. No attention was paid to them. The statue, as before stated, was carried to the sculptor’s studio, but the sculptor never went to see it.

During these two months Rodin had come in contact, for the first time in his life, with four powerful influences; namely, a friendly government official, in the person of Mr. Turner, artist friends, professional antagonism, and the press. Of the effect of the first three some indication has been given, but the writer is obliged, in this preliminary and hand-written sketch, to put off for a later occasion any consideration of the expression of the last in regard to “The Age of Brass” or of the subsequent exhibitions of the sculptor. The following paragraph, which appeared in C.3.4.6.1. (96), is so far as the writer is informed, the first notice of any length that appeared in a Paris paper concerning this statue. It is from the pen of Mr. Charles Tardieu. An earlier number of the same journal contained an illustration of the figure by a drawing by the sculptor.

“The Age of Brass,” by M. Rodin, has been very much discussed. 1 Age of Brass?: M. Rodin has undertaken the statue of war; only he has, perhaps, neglected to give the statue an explanatory attribute that would have made its intention more clear. However, without this, the tension of the muscles, the expression of the eyes, the gesture of the arms, the proportions of the artist, and the title would have been accepted without objection if the pretension had not arisen of discovering in this work of remarkable truthfulness traces of its having been made from a mould to the living model. We are convinced of this improbability of that being the case, and can bring in favor of the loyalty of the artist the most disinterested and absolute evidence. But, without insisting on the fact, one fact only remains: that it is surprising how well the statue is treated in the lips; it may easily rise above the criticisms now made against it.”

When the Salon closed, a new, and the heaviest, trouble lay on Rodin’s mind. It was the tremendous demand that he could not afford a studio or a workman of integrity. He had never thought of a recompense in bringing his statue to the Salon, but now he wanted justice. Satisfied that it was impossible for him to prove to the public that he was the author of the work, he resolved to substantiate his claim by exhibiting the original from moulds made on the living model. He was so simple-minded that he thought that this was all he need do to convince people that he was perfectly straightforward in his production of a statue; and he never dreamed that both “The Age of Brass” and himself should be chargeable with the responsibility for the reproduction of an army of perpetual fakes; or that prejudice is never convinced of its errors, or such fakes changed into friends. In Paris, at least, every good sculptor thought that this was an impossible task. Selecting the subject of “St. John Preaching,” he began a sketch half the size of what he intended the statue to be, working on it, as had been his habit for the past twenty years, during the mornings before he went to his daily labor, and long into the nights after he had left his employer’s shop.

To the Salon of 1878, Rodin offered, for the second time, “The Broken Nose,” and to the designers of bust, bronze.” Though it was this time accepted, it was very badly placed. The same class of appreciative observers who had discovered “The Age of Brass,” also found this mask, and it was to increase interest in Rodin’s work, which his few admirers, and renewed discussion concerning his merits.

The younger generation of artists, many of them students at the government school of fine arts, saw its fine qualities, and were convinced that nothing greater than a life of a man is he? they asked. No one knew Rodin, and no one saw him. One day, a number of these students were together at the school, talking, as usual, about Rodin, when some one exclaimed, “Let us all go and see him, and let him know, if we are students, that we like his things.” The proposition met with enthusiastic approval and was at once carried into effect. The following account of this visit is given in the language of one of these students, who is now one of the best of the young French sculptors: “The first work of Rodin’s that I saw was his ‘Age of Brass,’ in the Salon of 1877. Among the real artists it had a great success. But the others could see and do nothing of the kind, and were wild over it. When ‘The Broken Nose’ was exhibited we thought that was the most extraordinary example of modelling, of its kind, that had ever been seen in Paris. But Rodin opposed it to the antique. When we went to his studio, Rue des Fourncaux, to our amazement, we found him working on the same kind of commercial art that Belleuse made by the yard, and in which we used to see a great deal of art, though we knew nothing of words. To which he modestly remarked, ‘Yes, I do doing this for Belleuse—to get my bread.’ Our pain was as great as our surprise, to see an artist who had produced such things, obliged to work for such a man as Belleuse; to spend his time and murder his sensibilities on the stuff he was then making. The courage he displayed in consenting to work for such an employer, excited our astonishment beyond measure. But when he showed us the body of the ‘Ogulin,’ we were still more surprised, and hardly knew what to say. It looked like a bit of Michael Angelo, it was so large, life-like, and...
ample in the character of its planes and modelling. We expressed our admiration for his things as well as we could and assured him of our willingness to recommend him to our friends. The Age of Brass." He was much pleased and expressed his gratification. He then showed us some casts taken from his model and asked us to compare them with the statue. Of course, there was no similarity, the differences were very great. We admired it. "The Broek," he said, "we asked him if he would permit us to have copies of it, to which he very willingly assented. I cannot tell you how much I prize my copy of it. It is certainly a study of much interest to us." He turned over the vase, having paid two hundred to his model for posing, he had at last received the justice due him, and had come into relationship with the chief authority of his country; an authority which his countrymen had not forgotten. In the past, when his fame was in its prime, the public was fully satisfied with a small frame of work; for the past was now lifted up, and he began to see that his own way had been true and wise.

His latest experiences were also helping to fill up the years, and which were, in their own time, to bring about other gracious recognitions of his genius. Carrier Belleuse had become Art Director of the Sèvres Porcelain Manufactory, and he asked Rodin to go there and make a number of study casts for him. But Rodin, in the same way, had been provided with a new method, called pâte rapportée, or modelling on the vase after it comes from the mould, and sometimes with a different kind of clay from that of the vase itself is made.

Rodin's method permitted perfect freedom in working, gave full opportunity for variety of decoration and the play of the artist's imagination. The reader may safely anticipate that Rodin was sure to find, even at Sèvres his accustomed fault-finder. He first decorated two vases, with figures, and when they were taken out of the kiln, the administrator of the establishment, Lauth, by name, declared that they would so completely outlive him that he could not permit them. He, perceiving the connection with the factory were so much delighted with them, that he finally accepted one and threw the other away among the objects that had already been condemned.

The next step, like the other examples of work, to an industrial exhibition held in the Palace of Industry. It was there seen, greatly admired and bought by the Art Buying Commission of the Government for four hundred dollars, for the purpose of a permanent exhibition in the Sèvres Porcelain Manufactory Museum. This was a matter of a trifle too far, and the proper influences were brought to bear upon the administrator to the effect that Rodin was not to be permitted to have any more copies of his works. Lauth had the right to discharge Rodin, though he did not dare to do it, yet he was determined to get rid of him in one way or another. Such a disturbing element as Rodin ought and should not be allowed to do his work. It was nothing less than a deplorable state of affairs. But at a moment if he was making the finest things ever seen in the factory, he did not please the administrator thereof, who, strange to say, was not an artist, but a chemist. To accomplish his purpose, Lauth wrote to M. Turquet, that Rodin wished to leave Sèvres, and he was willing that he should go away.

The secretary, who knew very well that it was a fortunate thing for the Government to have such a man as Rodin in its employ, was surprised at this information, and he sent for the artist to come and explain his reasons for desiring to leave. When Rodin told him that the letter was false, and that he had no intention of leaving, but, rather, wished to remain, M. Turquet was delighted with his satisfaction and the great estimation which the Government had placed upon his work, and that he was the only one that was worthy to be considered with Barye and Fremiet."

While Rodin was perfecting his sketch of "St. John," he made a bust of the same subject and from the same model, an Italian, about forty-two years of age, who was named Pagnitelli. The bust was shown in the Salon of 1879, in bronze plaster. Though badly placed, the sculptor received an honorable mention. Both the bust of "St. John" and "The Broken Nose" were quite unnoticed by the newspapers.

In this same year, an honorable reception was given to the art affairs of France. M. Turquet became Under Secretary for Fine Arts in the Government of Jules Ferry being Minister of Public Instruction. M. Turquet had not forgotten his admiration for "The Age of Brass," nor lost interest in art. His first act on his new position for duty was to have the letter sending for Rodin to come to his office, to talk over the subject of the statue, with the ultimate intention of buying it for the State. M. Turquet had no doubt himself concerning its authenticity, but as a public functionary it was necessary for him to conform to the methods usually followed in such matters by the Government, and he requested the State Art Committee to go to Rodin's studio and examine the statue. They did so, expressed their belief that it was a veritable piece of sculpture, assured Rodin of their admiration for his talent, and reported to M. Turquet accordingly.

But in their report, they added the observation that the custom of producing statues with the assistance of casts from nature was very prevalent. Rodin learning of this supplementary addition to the report, and hearing nothing from the Secretary, believed himself lost. "I can throw no hope for him for the first time in his life, warm expressions of professional regard and appreciation, and had dared to hope that fortune might yet smile upon him, yet the help he needed to put him on his feet was Government favor and protection of his art. Having been driven into deep poverty, making the most strenuous exertions to finish his statue of "St. John," and working so hard and incessantly upon it during those months that his health was under constant danger of assistance, after he had left his studio. It was, indeed, a time of sorrow; an overwhelming confirmation of the real name of his Brussels figure, "The Age of Sorrow." Rodin, however, idle, nor was he shaken in his opinion about Rodin. He firmly believed that he had discovered a great artist, deserving of every encouragement. Such an one as the Secretary said it was, for Rodin was a sculptor of the first rank. He, therefore, to satisfy every possible official doubt, sent to Brussels and made the strictest inquiries in regard to the model whose Rodin had employed, and the entire history of the making of the statue. At the same time he requisitioned a number of the best known sculptors in Paris to examine the statue. Their written report, and the result of the Brussels inquiry, satisfied all and every official requirement, and M. Turquet then bought the plaster statue of "St. John" for the sum of three hundred dollars. It was a great event for Rodin. He had now a friend at court, and such a friend as he little imagined. When he received it if he could not do anything by a new method, called pâte rapportée, or modelling on the vase after it comes from the mould, and sometimes with a different kind of clay from that of the vase itself is made.

In 1859, Rodin entered two competitions, one for a monument to commemorate the battle of Sedan, to be placed in the Sedan Republic. Neither was successful. The sketch for the former was much admired by the sculptor's artist friends as possessing extraordinary merit. For the latter he made a large head wearing a helmet. Of it, the journal La France said: "A work of singular originality, but which the jury could not accept. Instead of a
The LUMBERMEN'S DEMAND FOR A NEW LIEN

LAW.—II.

Judge anxiously to be satisfied with the experience how the lumber dealer's ambience... to the sight of the new

Rhode Island.... recently material men had no lien in that State; last year, however, the Legislature passed the

laws, in view of the organized
efforts of the lumber dealers. The lien

had been passed without attracting much notice or discussion, and gave to material men an absolute lien without notice to the owner.

The first case under the new law was that of a school-house in the town of East Providence. The contract seems to have been drawn up in haste, providing for the

work to be begun and completed in the fall of the year, and the lien work progressed; these were made as due. After the

contract was completed and the last installment paid, the committee was heard by the filing of liens to a considerable extent; and the con-
tactor failed, and the town will be obliged to settle the bills.

The case has occasioned considerable comment, and, as predicted in our former article on this subject, the blame seems to fall on the unfortunate architect; the individual members of the committee dis-

claiming all responsibility for the form of the contract. While the architect is probably not legally responsible for the drawing the

contract in such a manner as to render the committee liable to pay twice over for the material; still, his position is not a very enviable one, and it is safe to predict that no more such contracts will go out of his office.

It seems to be generally taken for granted by the Rhode Island press that for the future it will be safe to contract for work on a building contract, and that the bulk of money must be withheld until the time for filing liens has expired.

Turning to Massachusetts, we understand that the Master-Builders' Association of Boston at a meeting held on January 22 voted to oppose the bill which the Lumber Dealers' Association has presented to the State Legislature, giving to material men a lien without that notice to the owner which the law now requires. It is encouraging to find that the leading lumbermen's organization in New England, comprising among its members most of the large material-men doing business in and about Boston, takes a decided stand against the un-
just attempt of a few lumber-dealers to throw the burden of their own improvident business methods upon the owners of real estate.

The opposition of the Master-Builders' Association ought, of itself, to defeat the lumbermen's schemes in the following:

The Chicago Builders' and Traders' Exchange at its fifth annual meeting, held January 21, 1889, resolved with substantial unanimity in favor of the repeal of all lien laws.

The several States and Territories of this country may be divided into two classes according as their respective lien laws do or do not protect the owner in respect to payments made to the contractor before notice from material-men or sub-contractors. The States are found to be: Maine, Massachusetts, South Carolina, West Virginia, Arkansas, Indiana, New Jersey, New Hampshire, Connecticut, New York, Pennsylvania, Ohio, Illinois, Iowa, Michigan, California, Alabama, Kentucky, Texas, North Carolina, Mississippi, Louisiana, Utah, Idaho, Colorado, Wyoming; and probably also Oregon, Arizona and Dakota. In

Rhode Island material men have no lien whatever. In the above-mentioned States provided by which the owner can protect himself against the danger of being compelled to pay twice over for his house without exacting bonds from the contractor or postponing the bulk of the contract payments to the end. Some-
times, as in Maine, the owner may prevent the running of a lien by

*Continued from page 68, No. 683.
giving notice to the material-man; sometimes, as in Massachusetts, South Carolina, and other States, the material-man must himself give notice before delivery. More generally, however, the so-called "sabogation" system obtains, under which any person furnishing labor or material may, at any time, put a lien upon the building; but as payments made by the owner to the contractor prior to the filing of the lien are protected, and the lien holds only the unpaid balance of the contract money. The latter system is undoubtedly the most equitable, as it is the most common; it gives the material-man all he ought to have, viz., the right to be put in the contractor's place in respect to after-accruing payments; and, as the owner can protect himself by taking the simple precaution to make no payments on the contract without preliminary inquiry, in the Registry of Deeds, there is no object for him to hold back his payments to the end of the job, or to exact heavy bonds.

In many of these States and Territories, however, the machinery is extremely cumbersome, and the precautions to be taken are so numerous as to greatly embarrass owners and contractors. Thus the Illinois law of 1887, while theoretically protecting the owner against the contractor's obtaining a lien, is so vague as to be almost impossible to construe. In Kansas, the owner is completely at the mercy of the contractor and material-men unless he gets bonds from the former, or draws his contract in such a manner as to enable him to withhold the great bulk of the contract-money until the last day for the filing of liens has elapsed.

In the District of Columbia and in Wisconsin the statutes are vague enough to render it impossible, in the absence of judicial decision, to determine whether or not the owner is protected as to payments made before notice.

In Pennsylvania, New Jersey, and Virginia the law has recently been changed so as to afford to owners greater protection than they had before. In Florida, Rhode Island, and Tennesse the course of recent legislation has been the other way. In Missouri, it seems that the Kansas City Builders' and Traders' Exchange is endeavoring to procure the adoption of some system which shall relieve owners and contractors from the burden of the lien law as it stands in that State.

On the whole, it cannot be said that the demand for a lien law that will render the owner liable to material-men without protection, except at the expense of the contractor, has made much headway, though it has had for many years the support of the various organizations of lumber-dealers that are scattered over the country. The tendency of legislation and public opinion generally has been in favor of the simplest system that will give to material-men the right to avail themselves of the unpaid instalments of building contracts, without subjecting owners to the risk of paying for their houses twice over, or contractors to the necessity of giving heavy bonds. The general opinion among the contractors themselves is probably hostile to every kind of lien law, at least in so far as material is concerned. The public generally, if not prepared for the total abolition of our lien laws, will certainly oppose the extension of them in any manner that will operate as an outrage on contractors and a swindle on owners.

To give to material-men an absolute lien is to make of them a special favored class in the community, having rights and privileges not open to other kinds of merchants or to the people at large, and inconsistent not only with sound business methods, but with the essential principles of justice. It is class legislation in its most offensive form, enacted for the sole benefit of people who, by their own confession, are incompetent to manage their affairs without the assistance of the State, and selfish enough to wish to shift the burden of injudicious credits on unsuspecting and innocent third parties, whom they have not the honesty to notify beforehand.

It is fortunate that the fate of similar attempts during the past few years leaves little ground to fear that the present attack of the lumber-dealers on our State Legislature will be successful.

This school is a State institution. The building was erected in 1884. Appropriation for its construction was $40,000. It was completed inside of the appropriation. Materials used in construction are brick and brown freestone. The building is so arranged that the staircases, toilet-rooms and coat-rooms occupy the south and west, while the north and east are wholly available for the working purposes of the school.

The Archer Building, Rochester, N. Y. Mr. C. S. Ellis, Architect, Rochester, N. Y.

This building, on North St. Paul St., covers an area 250' x 112' and cost $21,000.

Statutes of John the Baptist, by Auguste Robin and by Donatello.

see article elsewhere in this issue.


Hier Flats, Syracuse, N. Y. Mr. J. M. Elliott, Architect, Syracuse, N. Y.


Gutters.

The humorist who cursed the memory of his "Pilgrim Father" for presuming to settle on a "bleak New England shore" was an architect by profession, and was doubtless more or less stirred by the effect on his fortune, through his work, than by his more immediate physical discomforts.

A region so far removed for the use of Equinox and polar bears as a trying location for builder and householder, and to the daily toil for bread is added the greater toil needed to secure reasonable protection against inclement weather and violent changes of temperature.

In our earlier civilization, when the programme of daily life was simple, "when honest hearts made iron arms, and tender maidens were tough," the minimum of shelter that would now be held insufficient.
ARCHER BUILDING: NORTH ST. PAUL STREET
ROCHESTER, NY
C.S. ELLIS, ARCHITECT

HIER FLATS
JURET CHURCH ON CANAL ST.
Syracuse, NY
SMELLOTT, ARCHITECT
for a respectable horse was thought ample for wife and babies. The "Thanksgiving" family gathering was not only a grand event but so far as possible in the fireplace; and the guests turned themselves, as well as their roasting apples, before the roaring blaze, so as not to be done all on one side. But all this has been improved away. This congregation of men who boasted that they had to kick a snow-drift from the quilt before rising in the morning is fast passing on, and the descendants of the tender maids of Puritan days lack the necessary muscle to enable them to totter the length of a block, and are more affected by a draught than their grandmothers were by a cyclone.

The modern architect, "to the manner born," must follow the changed conditions and patiently endeavor to make his buildings fit for hot-houses in winter, cold-plast refrigerators in summer, and hermetically tight all the year round.

Professional testimony would be somewhat at variance on the relative importance of the different branches of weather protection or neutralization. Insufficient heating, imperfect or excessive ventilation, and leaky roofs, all claim their victims; but perhaps, in these latter times of the picturesque and ornate, the sufferers from leaks may claim a first hearing. In the simple old days, when houses were used principally for sleep or sickness, and "God's canopy" was the most familiar ceiling, and the good wife's worldly possessions were few and simple, and not readily damaged, a few stains of rain on plaster or wood were a pleasant variation from the usual monotony, and there was reason for satisfaction if the water took any other course than down the back of one's neck.

But now one's clients live in briè-à-brève shops and art-museums, surrounded by palace frescos, and they walk on costly rugs, and leaks mean money out of pocket and wounded vanity and vexation of spirit— all which eventually result in going to the verge of desperation the ever-reponsible architect.

Surely, if the man who makes two blades of grass grow where one grows before (a very simple result: time and fertilization) is a public benefactor, the roof doctor, who can so prescribe as to reduce two leaks to one, is entitled to a share of gratitude.

Of the earliest colonial dwelling, the shanty or log-hut, no local examples remain, but they doubtless differed little from similar structures still common to all the wild country of the Southern and Western States. The same style of roof that sheltered Miles Standish answers for Uncle Tom's cabin or Buffalo Bill's ranch. The roof, as tight as practicable, was made steep, in order to shed water rapidly, and, as houses were generally located near streams or springs, every effort was made to convey the water away from the walls. No possible roof was, as a rule, upon a shallow trench in the ground under the eaves, banking the earth against the walls as an additional protection, and connecting the trench by another with the nearest lower ground.

With the rapid advance of civilization, the need arose in some locations for soft water to wash clothes, and the first forms of gutter, conductor and eistrum were devised the two former rough troughs, and the latter a section of a large tree cut out deeper. These were soon replaced by the V-shaped eaves-gutters and spouts, formed of strips of boards nailed together, and leading to a rude barrel or cask — types which may still be found doing their honest work on many a New England farm-house and barn. In their elementary and radical features they have never been improved upon.

When the farm-house gave way in a measure to the more stately colonial mansion, the cornice-members devised for simple use were superseeded by an imitation in thin boards of the stone and brick Renaissance work of the mother-country; but often the formal moldings were supplemented, improved, by a trough-gutter slightly removed from the eaves on iron brackets.

It is a curious coincidence that in a different climate the workers in the parent style were led or driven to the same expedient, as seen in many Italian Renaissance buildings. The foreign and domestic examples are given together in the cut.

There seems, however, to have been no persistent effort made to modify and adapt this sensible makeshift so as to establish a type that should be both serviceable and elegant. Instead of showing improvement, the art of building deteriorated, and the wood-work and sheet-metal gutters of wooden houses were concealed behind cornice moldings, and so located and arranged as most readily to conduct the water into any walls in event of any slight in effect or construction. The common styles of gutter in use for many years past are shown in the following diagram sections; A being the common form, B often known as the New York gutter, and C the shallow gutters formed in metal roofs. There are other modifications, but these fairly represent the larger number.

It is plainly to be seen with all of these forms, that the least carelessness in the fitting of parts by the journeyman or any shrinkage of material may open a course for the rain directly into the walls. It often happens that a leak in the first story can be traced directly to the cornice; and, even if the soaking is not enough to show on inside walls or ceilings, it keeps the outside of walls so damp that the paint is continually peeling from clapboards and finish. But this is not the worst. Any fairly perfect construction should be proof against ordinary leakage of rain or snow, or even of rain or snow driven horizontally by the wind. But, in the climate of New England, we have both the rain and snow in connection with the most extreme and sudden changes of temperature. Almost summer warmth will succeed a sudden cold; and this, again, by a thaw, with floods of rain that back-up through every minute crack and pinhole in a roof. In fact, the inept architect would be astonished to see the smallness of the crevice which has grown in imagination to the dimensions of a considerable conduit.

If most snow drifts heavily upon a roof, and is made still more moist and compact by the warmth of the house, it is liable at any time to form a dam underneath that shall back the water of a thaw or of succeeding rains up against the roof-covering in such a way as to work through any structure not designed, built and maintained with the greatest care.

To employ a new and untested material for covering is as hazardous as to use without modification a style of roof foreign to our climate. Many an architect has come to grief through the eccentricities of the grouped gables, chimney-stacks located at the foot of valleys and other peculiarities of English design; or the flat pitches or tiles and stone-gutters of the south of Europe. Everything in building must be acclimatized and domesticated. A client with a long purse and a love for novelty may be temporarily pleased by a clever importation of style. But, if comfort is lacking in his house, if eaves drip and inside walls stain, and books and pictures suffer from mould and dampness, he soon tires of novel effects and their author, and tries for a more practical investment.

Much can be done to avoid accidents by making roofs as steep as possible—never less than 45° pitch for slate or shingles—by omitting level valleys and flats between pitches, and inclines upwards toward the walls; and by avoiding all unnecessary breaks and projections, and allowing sufficient opportunity for the expansion and contraction of flashings under varying temperatures; and lastly, by employing only the best workmen and materials.

But, with all precautions, it is somewhat unusual for a roof
exposed to the full fury of the elements to stand for twenty years without showing some slight defects.

An ordinary two-story wooden house shrinks in height during the first year of its existence an inch or more, while well-built chimneys settle very little. Consequently there is usually a rupture between the counter-flashing attached to the chimney and the under-flashing and roof-covering, which causes the slates or shingles to stick up, as do the ruffled feathers of a hen, and necessitates repairs of this portion of a roof within a year or two from the time it is completed. Some-thing of this could be prevented by the use of well-seasoned lumber; but well-seasoned lumber is practically a thing of the past.

But even when the design is proper and the construction is sound above the eaves, we have in the ordinary forms of gutter the worst sort of incentive to an ice-dam and consequent leakage. If there is the slightest chink to the flow of water through the leaders or conductors caused by the freezing of the pipes near the ground, or in some part that is cold from absence of sun or special exposure, it at once backs up, freezes in the gutter, and ice begins to accumu-late and work back onto the roof. At the next stage of thaw it melts underneath; and the water, held back by the frozen case, is forced up on the roof to search out its weakest spot, and thence invade the house. The old V-shaped trough, in use on barn and farm-house for two hundred years, furnishes a rough model for the practical remedy of the difficulty, and a trivial exercise of ingenuity and taste will adapt it to modern conditions. The essential points are a gutter so detached and hung as to allow the water to flow over the back, as well as front, in case of any unusual check; and eaves of the skeleton, or open-rafter, form, or, at any rate, eaves sloped upward from the gutter, so that the water will have to run up hill to reach the wall. Such combinations have undoubtedly been employed in more than one instance; but two are here illus-trated that have been used by the writer for more than twelve years with unvarying success; so far as known no leakage having occurred, such as usually follows with the common form.

A represents the skeleton-rafter form, with a trough-gutter hung to every second rafter by a 6" x 1" wrought-iron stirrup screwed to the rafter, before the eaves-boarding is placed, and screwed to underside of gutter.

B represents a modification of the " New York Gutter," so-called, made of boards and lined with sheet-metal. Both are susceptible of meaning variety of treatment, and can be made more or less expensive without the loss of their leading characteristics. If one is not slavishly bound to a Chinese fidelity of imitation, there is no form of domestic building to which these gutters cannot be appropriately applied. Even in the matter of design they have many good points. The shadow thrown by the sloping eaves is black and telling. The light that passes over the gutter and under the eaves makes a bright patch on the wall, that is as effective as that made by a bracketed cornice. The rafter ends and underside of cornice are so much in shade that slight defects in material are obscured, and fairly good spruce-rafter ends and well-planed spruce-boards answer for most purposes. The paint on the underside of such a cornice will outlast three paintings of the rest of the building.

Of the many practical advantages of this form, the fact that it can be readily repaired or replaced is not the least, and of almost equal importance is its reliability and strength as a support for the painters' or other hanging stage.

When the projection of eaves is not great, the trough may be set on wooden or iron brackets secured to the wall; or in very simple constructions the ends of the rafters may be notched and the gutter set on the rafters.

In freezing and thawing weather there is sometimes a drip from this arrangement of cornice, and long icicles often form. But, as the object of such contrivances is to keep the water out of the house, this peculiarity may be quoted in their favor. It is not suited for use on the line of a sidewalk, as city buildings are often located; but in such cases the danger from eaves sloping towards the street is very great in many ways, and they should be prohibited by law.

The sole hope for the establishment of a local and characteristic style of architecture lies in a careful adaptation of features in building that are found, through careful trial, to suit the manners and customs of the people and the requirements of the climate. Bad types of gutter have made trouble enough. If these modifications of ancient examples promise improvement, architects cannot do better than to favor their regular use in some of the many forms that will readily occur to any one giving them full and careful consideration.

JOHN A. FOX.

**HAY HAVE ARCHITECTS A LIEN?**

**BOSTON, February 15, 1889.**

Question. — Will the lien laws of Massachusetts authorize an architect to attach a building for labor on plans and specifications for said building? Is he not a mechanic in the sense of the law?

**Answer.** — The Massachusetts lien law is not restricted in terms to mechanisms; it gives a lien for "labor performed or furnished in the erection, alteration or repair of any building," etc. Similar statutes in other States have been construed to give to an architect who superintends the erection of a building a lien for that work, and, if he has also prepared the plans and specifications under a general contract for the whole, his lien has been held to embrace his entire bill.

This rule has, however, been much criticised by other courts, and we do not think that an architect would be permitted in Massachusetts to maintain a lien.

**MECHANICS' LIENS. — TIME FOR FILING.**

**Question.** — A sub-contractor, say a painter, has to all intents and purposes completed his work and removed his materials. Twenty-eight days after (not having been paid by the contractor) he puts in an appearance with paint-pot and brush and repaints one window, in order to extend the time of expiration of lien to thirty days from that date. Perhaps this one window was intentionally left without one
cost of paint, as called for in the specification. Will the act as above extend the time for filing a lien?

**Answer.**—Whether a claim of lien has been filed within the time allowed by law is a question of fact for the jury. If the last work is merely colorable, done without necessity, and with the sole intention of extending the time for filing a lien, the jury ought to find for the owner. Whether such a case would in fact be held, is, of course, a matter of uncertainty.

**Question.**—A sub-contractor, a mason, for instance, has left the work for twenty-eight days; and on the twenty-ninth appears and claims down and oils the same, having been ordered by the owner and architect to do so, as they were not ready to have it done. Will that extend the lien?

**Answer.**—The whole matter is for the jury, as explained above. No question of law is involved in such cases except when the evidence is so overwhelmingly one way that the court will take the case away from the jury and set the verdict aside. It seems needless, however, to point out that such a condition seldom prevails in lien cases, as the mechanic can almost always produce some evidence in support of his claim upon which the jury is entitled to find for him if it chooses.

### MECHANICS’ LIENS.

**Question.**—Please give me your opinion of the following case in column "A". An architect, e.g., has required a laborer, to work on a building which he is erecting. A pays B his wages for a few months, then fails to pay him his January pay, and at the end of February pays him for work done during that month. Has B a right to lien on building for pay owing January?

**Answer.**—Yours truly.

**A. H. B.**

**Question.**—We think he has. The appropriation of the money to the work for the last month would not, we think, amount as matter of law, to a breach of the trust; that would follow from the failure to pay wages, if any, and, in the absence of strong proof that the acceptance of the money and its appropriation in the manner described was intended by both parties as an abandonment of the lien, the verdict would undoubtedly be for the plaintiff.

### FORM OF NOTICE TO TERMINATE CONTRACT.

**Question.**—What form is proper for an architect’s notice to a contractor who has failed to comply with his directions, and what form is proper when the contractor becomes bankrupt and refuses to pay his workmen?

**Answer.**—No special form is required. The architect had better put his notice in the form of a letter addressed to the contractor, quote the clauses of the contract permitting the termination of the contract, then recite the manner in which the contractor has failed to comply with the contract, and conclude with a simple statement that the owner or architect, as the case may be, has decided to avail himself of the privilege to determine the contract, and do so by this letter. If a special form is required, the letter should contain a statement that unless the terms of the contract (specifying them) are complied with, the contract will be considered as at an end on such and such a day. The architect should take a letterpress copy of his letter, and let the original be delivered to the contractor in the presence of witnesses.

### THE CANTON (OHIO) SCHOOL-HOUSE COMPETITION.

**Canton, Ohio, February 11, 1889.

**Question.**—Enclosed I send you a circular issued by the Board of Education of this city. The advertisement on the first page is a copy of the advertisement as it appeared in the daily papers.

I competed. My design was reported by the building committee as being the best—in fact the only one which complied with the requirements of the circular—but the Board refused to accept, and employed an architect to make drawings who was not a competitor. Am I entitled to anything for my design? Note particularly Section 17 of the requirements.

Yours very truly,

Guy Tilden.

The notice to architects in the newspapers, referred to in the above communication, is as follows:

**Competitive drawings will be received by the Building-committee of the Board of Education of the city of Canton, for the erection of a new building, and a perspective view measuring eight feet in one inch on the near corner. All to be executed with pen and black ink on ordinary white drawing-paper. Said drawings may be accompanied, if desired, by a description or any information that will assist a competent builder in making an approximate estimate.**

**The architect whose drawings are accepted by the Board, as the best of all submitted in this competitive contest, will be awarded the work at a commission of two-and-one-half per cent, and an unadulterated, exact architect will have his drawings returned without any compensation. Any drawings received which do not conform with the foregoing requirements will be returned by the Building-committee.**

**18th. All drawings must be in the hands of the Chairman of the Building Committee before noon of June 30, 1889. Should these two buildings the same plans will be used, both being alike, and that the Board of the city of Canton decide to have one commission of two-and-one-half per cent to the successful architect for the plans and drawings for both school-houses.**

A subsequent communication from Mr. Tilden makes clear that a commission of two-and-one-half per cent was expected to cover drawings and specifications only—a point which the circular itself leaves in some obscurity.

**ENGINEERS’ SOCIETY OF WESTERN PENNSYLVANIA.**

The regular monthly meeting of the Engineers’ Society of Western Pennsylvania was held February 19, in the rooms of the Society in the Penn Building, 237 Grant Street.

A good attendance of members was present and greatly interested in the reading of the two very able papers prepared and read by Prof. John W. Langley, of the Allegheny Observatory, on “International standard for the American division of the watt” and Prof. R. E. Hilbhard on the subject of “Welding metal by electricity,” illustrated by samples.

The attention shown by members manifested their interest in the subject read and discussed. A committee was appointed to consider and report upon the “best methods to construct and maintain Public Highways,” in the State and recommend legislation relative thereto.

The library rooms are open daily and engineers from any part of the country are cordially invited to call, when in Pittsburgh, and make themselves known to the Secretary, Col. S. M. Wickersham. D.
A PERSONAL EXPLANATION.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—The closing sentence of your letter gives me opportunity to say a few additional words, which I regret cannot be said verbally to avoid any misconstruction.

In conversation with architects told me that it cost $50.00 to get a gelatine print into the American Architect, and, while he is a man in whom I have perfect faith, I could not let the matter go without testing it for myself. I do not believe that he has exaggerated the cost, nor that he was guileful. I can only look upon him as a resolute individual, who has seized the conundrum of it from Western men whose position in the profession entitles their opinions consideration. No one can realize all of the not the case of criticism as compared with the difficulty attending the production of such a work, and the best architects in the country are to blame in no small degree for the condition in which we find them. We used to see occasionally a sketch of Mr. Peabody's or one of Stanford White's for Richardson, but they as well as Mr. Hunt, Mr. Post, Mr. Withers and many others are conspicuous by their absence. They have the best of examples across the water in such men as Ernest Guous, Alfred Waterhouse, Norman Shaw, J. L. Pearson, Webb and Bell, etc. It is small pleasure to see the paper filled month after month by men better than myself — there is no influence that can be brought to bear upon them.

I suppose it would be inexpedient but I should like to see a department of anonymous criticism of architectural work, whether it agreed with my conclusions or not; it would stimulate thought and sincere discussion, which is certainly necessary. I shall endeavor to see a column of questions and answers similar to those in the Building News. Some of the Western men thought that the principal architectural journals should have had the complimentary character and it had not hesitate to say so. This is but an individual expression of feeling brought about by your letter so far as the suggestions are concerned, and I am sure will be received as intended.

W.H.R.

The answer which Westermer received from us in reply to a letter which antedates the one above, and intended by him to test the truth of the allegation for himself, must have shaken his belief in the trustworthiness of the testimony of men of position in the profession. Like the boy in the story who lied, this prominent gentleman made a mistake, perhaps in

illness, perhaps only giving utterance to a belief that may be current in the country, which has been caused by a misunderstanding, perhaps the only error in the statement. It would have been more safe, he says, to have given the roof the same pitch without destroying the mass of the roof, to make the pitch at the end of this wing such as the hip at the intersection of the two, the same pitch shall have the same angle with the horizon as the hips of the main roof, and thus give the same apparent pitch to the eye.

The simplest way to solve the matter is by a sample problem as to any other problem of like character, and solve it in the same way.

Suppose the pitch of the main roof is 4 to 5; the plan of the hip

ILLINOIS STATE ASSOCIATION OF ARCHITECTS.

At a regular meeting of the Illinois State Association of Architects which convened the 18th inst. in Chicago, the following resolutions were unanimously adopted:,

‘Whereas: The Illinois State Association of Architects, together with their professional brethren in all parts of this country, feel a deep interest in the course which the United States Government has taken in the formation of its building code, be it resolved that the Association:

‘Whereas: A change of administration in the Government is about to take place, and changes in this branch of the public services may follow; therefore:

Resolved: That the Illinois State Association of Architects hereby respectfully petition the President-elect, and the incoming Secretary of the Treasury to make such changes in the practice of designing and erecting public buildings, as may be necessary, consistent with the methods adopted by independent corporations and private individuals, thereby obtaining a much better grade of buildings at considerably less cost, and be it further resolved:

Resolved: That we distinctly disclaim any intention to reflect upon the incumbent of the office, or on any of his predecessors; believing that their comparative want of success is due to the system under which they were laboring; yet, if a change is made in the office of Supervising Architect, we respectfully request the appointment of some architect whose energy, skill, experience, executive ability and integrity shall be thoroughly established, and who is in sympathy with the desire for reform in the methods of the Government, so far as they relate to the architectural design and administration of its public buildings, as expressed by the resolutions of the Western Association of Architects and the ‘American Institute of Architects.’

In pursuance with the instructions of this Association, we take pleasure in forwarding copies of the above resolutions to you with the request that the subject matter of this communication may be laid before your Society at the earliest available opportunity; and with the hope that you will earnestly cooperate with us in the endeavors of the present methods of government building. Will you kindly distribute surplus copies to the officers of any local architectural Societies or Chapters which we may not have reached in this distribution.

Very truly yours,

WILLIAM W. CLAY, President.
OSBORNE J. PERCY, Secretary.

[With one exception, no man has ever paid any money toward procuring the publication of any design in the American Architect. Oddly enough, the only man who has paid has been Henry A. Hofmann, the men the one who had least reason to expect such treatment. Mr. Rich-ardson declined to allow any of his work to be published save as gelatine plates, and several times during the early years of this journal, when the question of gelatine prints was under consideration, we, in the use, accepted his offer to bear half the expense of printing such plates.—Ed. AMERICAN ARCHITECT.]

COLUMBUS, OHIO, February 6, 1880.

TO THE EDITORS OF THE AMERICAN ARCHITECT.

Dear Sirs,—I enclose the solution of a problem that I frequently come across in my work, thinking that it may be of use to some of your readers. The problem is this: Having in the main roof of a school building a given pitch, but where it is impossible to give the roof the same pitch without destroying the mass of the roof, to make the pitch at the end of this wing such as the hip at the intersection of the two, the pitch shall have the same angle with the horizon as the hips of the main roof, and thus give the same apparent pitch to the eye.

The simplest way to solve the matter is by a sample problem as to any other problem of like character, and solve it in the same way.

Suppose the pitch of the main roof is 4 to 5; the plan of the hip

[Vol. XXV. — No. 688.]
would give the ratio of 4 to 4 between its sides; then by squaring the squares and taking the square root, the length of the hip as it would be shown on a roof plan would be 5.65 and the ratio of this line, the base, to the height of the hip would be as 3.55 to 5.65. This is the slope that the eye, if anything, would suppose that a roof of a pitch gives the proper relative mass to the wing, then a pitch at the end of the wing to give a hip with a ratio of 5 between its base and altitude must be determined.

With one-half pitch the ratio may be 3.55 to 5; then having a ratio of 5.65 to 5 between base and altitude of hips and the same ratio between the base of hip and the side of the triangle forming the plan, the other short side or base of new pitch desired is at once determined to be 2.6-5. This gives a ratio of 2.65 to 5 for the desired pitch for the end of the wing. For a graphical representation lay off 4 A and 4 at right angles, each equal to 4. The hypothesis base or A C, then scales 5.65. Lay off altitude A D at right angles to this as 5. Then revolve triangle A C D around on the point C till A' B' parallels A C D in the proper ratio of 5 to 5, then the point A' becomes the first hip of the form desired. The then desired base will be A' B' which will scale 2.6-5. The plan of the hips of the main roof being A C and the plan of the hip of wing being A' C'.

Very respectfully yours,

CLARENCE O. ABEY.

THE BUILDING CONTRACT.

To the Editors of the American Architect:

New York, February 20, 1889.

Dear Sirs,—In your issue of the 22d inst, you refer to some fragmentary newspaper report which had met your attention on the paper prepared by me and read by Mr. McArthur at the Convention of the National Association of Builders at Philadelphia, and quote what I said in that paper. I do not wish to have that statement misrepresented.

The paper was prepared by me at the request of the President of the Association, Mr. John S. Stevens, of Philadelphia, and upon a subject suggested by him. I presume you will soon be placed in possession of copies of the papers read on the occasion, and then can make such comment as may occur to you with a somewhat clearer understanding of their contents.

The Association here referred to is one which should excite much interest among architects. It brings together at its conventions the principal builders of the United States, who are generally sent in delegations from local societies. Its form and methods correspond with the development of the American Institute of Architects, and it promises to be a great power in regulating and elevating the building trades.

The credit is due mainly to one of your townsmen, Mr. Wm. H. Sayward, the Secretary, for the enterprise and self-sacrificing exertions which have resulted in starting it on its useful and successful course. No one can doubt that it has a mission, and that the fulfillment of that mission will result in much good to all concerned.

With the Association, it is known, originated the idea of having all building contracts drawn out on blanks which are uniform for all work. By consultation and cooperation with the two great national associations of architects such a form was prepared, and, after being adopted by the three societies, it has been distributed for general use. And in regard to this uniform contract form, as might have been expected among architects who have been in the habit of using forms of a dissimilar construction, there are several clauses which do not meet with the approbation of the Association, which makes the architect the agent of the owner, and which was so ably inquired into in an article in your last number.

The conclusion arrived at, however, in that article, that it is neither good policy nor good law to consider the architect as the agent of the owner, I think, from my observation, is not general among those who have examined and have used the form. It certainly is not so among those whose opinion I have heard expressed. A number of a firm of architects who are not engaged extensively in business in this city, in Boston, and all over the country, stated to me that his firm liked the form very much. When I called his attention to the objection that had been made to the clause making the architect the agent of the owner, he said that this was one of its best features about it. In explanation, he said that they had once been prosecuted as principals by a contractor for work ordered by them as architects, and had had considerable difficulty in proving that they were acting simply as agents of the owner. They had been so fortunate as to have had that clause here referred to in their contract-form, there would have been no ground for the suit, and there would have been not even a suspicion of their responsibility in the matter.

A friend has called my attention to the wording of a contract published twenty years ago, that has an instructive bearing upon the subject. He says that the fact that the architect was called the agent as the agent of the owner was held by no less a jurist than the late Theophilus Parsons, LL.D., Professor of Law in Harvard University, who, many years ago, wrote a treatise, to be found in his "Laws of Business," published in 1869, where he entitles "A Full and Minute Building Contract." In this form he has provided that the work shall be done "under the superintendence of Mr. ——— who is hereby appointed superintendent and agent of the party of the second part;" that is, the owner.

In conclusion, it is believed that there is no good reason why uniform contract-blanks may not be used in building operations, and it is only by a comparison of views among those already engaged in study to view that a universal consensus of opinion among architects may be evolved, and the custom be established of using a well-digested and generally-accepted form. Hence these discussions are not without their use.

Very truly yours,

O. P. HATFIELD.

THE WILLARD ARCHITECTURAL COSTS.

New York, New York, February 20, 1889.

To the Editors of the American Architect:

Dear Sirs,—The article headed "New York," in your issue of Saturday last, invites attention to what I conceive to be the truth, that the comparatively slow growth in public recognition of the profession of architecture in America, was in part due to the marked circumstances dominant in a new community, based largely on bourgeois and Puritan conditions, and centring itself mainly on the two platforms of sufficiently sharp trade, and not always over-revealed policies. Thus I have repeatedly urged during the last twenty-five years, while insisting on the greater necessity, ipsa facto, of the profession first recognizing and clarifying itself, and then making use of "collective assertiveness" in its relations with the conscious and the much more frequent unconcerned Philistinism of our environment.

The article is, in a number of other respects, timely, instructive and encouraging, and I share with you the belief that the present paper is likely to prove of service to those in recent years who have been seeking for advanced study in the historical development of architecture.

The recent work of the Institute and the Western Association toward the consolidation of all the architectural organizations in the national territory worthy of professional and fraternal affiliation, will "mark the beginning of the era of the true spirit for existence and the opening of the new era of assured recognition."

I share, too, in your appreciation of the admirable work that has been accomplished by the Architectural League of New York, which, under the leadership of Mr. Russell Sturgis (whose long-volunteer labors did much to help the Metropolitan Museum of Art to its present position), is not likely to relax any of its energy and usefulness; but your correspondent perhaps does not remember that energetic protests were uttered nearly a quarter of a century ago by the Institute against the New York Post-Office and other ill-conducted public competitions; and, moreover, I feel well assured that the League could, in the future, do much more for the practice of all the fine arts, inclusive of and in architecture, if it were to reduce its methods somewhat to the lines suggested in a letter I published last summer to its able ex-President, Mr. John Beverley Robinson.

You also obviously recognize what seems to me indisputable, viz., that the work of the Willard Architectural Commission has already been accomplished as much if not more than fairly anticipated — added much to the encouraging outlook for the profession. Not only will the collection, when completed by the Commission, be a constant source of instruction and delectation to the artist, but it will daily become the invaluable boon to students entering on the practice of architecture. A personal friend, Professor Ware, has, within a few weeks, as a special committee on architectural casts (appointed with the eminent architect, J. Q. A. Ward, and another of the New York sculptors, Rhinelander), supplied valuable assistance to the Commission's agent, Mr. Pierre L. Le Brun, in unpacking the cases so far consigned to the Commission, and in arranging their contents for representation, and I believe this is genuine assistance which your students will reap more directly from the collection than all others put together.

Permit me, however, while cordially recognizing the appreciative spirit in your New York correspondent, to note two or three points in his communication which are somewhat misstated. Obviously, either Professor Ware is misquoted, or he was himself under a
misapprehension (as he very well might be from his quite recent participation in the matter) in the statement that it was the younger Mr. Willard's purpose to be the last to sign. I know that he, and Mr. Willard, were both of the style of ardent and enthusiastic enthusiasts, who, thinking that they possessed the name and reputation as much honored in the profession as they are in antecedents and general relations. I, therefore, with the assurance of my knowledge of the younger, father or son, and simply in the interest of exact justice, speak for both as I do.

I must also say that Mr. Le Brun fils, is not a member of the Commission, and, therefore, in your columns states; but he is one of the best architectural archaeologists in the country, he might, with extreme propriety be so, were it not for the fact that Mr. Willard prefaces his being accompanied, however, on the father's being one of such Chapter members, while the choice and appointment of the other members—Mr. Littel and myself as it turned out—were left to the Chapter. The functions of Mr. Le Brun, the younger, who the willard's selections and purchases "under the direction" of the Commission, is, in selecting and listing architectural objects as alternates for the law, is, perhaps, the most important of them—large models in buildings in their entirety—having been indicated to him near the beginning of the Commission's labors; while, none, the less, large discretion has been left to him in the selection of that of securing balance that is likely to recur, when time is not available for correspondence by mail.

Again, the Commission is not restricted to objects in plaster. The model of the Cathedral Church of Paris—Notre Dame—for being made for the Commission, will, for instance, have the row of kings (which all will remember as running the length of the principal façade in metal); and to give an idea of the scale I may add that the figures are of the size of the heads of the statue of the gallery to the magnificent original hall in the Museum which has been assigned to the Willard collection.

But, when I look back to the first days of the Museum—twenty years ago—and recalling (for a short time, jointly with Mr. S. P. Avery, its first Secretary) the answers from art connoisseurs and collectors who were received in response to requests for financial assistance and loans of art objects, from the Bostonian Society on for its Architectural collections in the museums of Europe—and some of them, more than once, has convinced me that before the end of our fund is reached, we shall already have secured a more valuable assortment of architectural examples than any single collection in Europe. The collection of casts presented to the Museum in its first years by the President of the Institute, Mr. R. H. Hunt, will, moreover, be added to the Architectural collection, interesting not only for its intrinsic art value, but as the first gift to the Museum in this department of fine arts, while President H. G. Marquand's personal contribution of casts of the Erechtheum of the Parthenon already forms the initial enrichment (on the face of the galleries) to the magnificent original hall in the Museum which has been assigned to the Willard collection.
With this material wood-work can be thoroughly protected from fire at a cost of less than one cent per square foot. It can be had in all colors at 30 cents per gallon.

Send for Anti-Pyre circulars and samples.

---

**Samuel Cabot**

70 Kilby St., Boston, Mass.

Also sole manfr. creosote, shingle stains.
Fire-dog, designed by Moreau Freres.

Old English Fire-Bug, thought one in the Bayeux Tapestry Collection of H.E.G. Shaw, M. Batty, R.A.

Curious old Stove, Dudswell, Que. The black snakes under its burner and bell, for Aspersions, being fed from other side.

Chafing-Dish.

Designed by Salemston.

Dog Grate.

Designed by Foster & Nason, Boston.

BUILDERS' HARDWARE. — XX.


THE ARMY, NAVAL, AND MILITARY BUILDINGS OF PUBLIC INFIRMARIES.

THE NEW AIR SYSTEM IN PARIS.

THE LOTS IN ANCIENT ART. — II.

Hot Baths of Ancient Rome.

SOCIAL WELFARE.

Resolutions of Respect to the Late H. M. Blake.

IN MEMORIAM.

COMMUNICATIONS.

Fees on Party-Walls.

NOTES AND CLIPPINGS.

TRADE SURVEYS.

THE annual report of the Supervising Architect, the advance sheets of which have reached us, is an unusually interesting public document. Taken as a whole, it fully confirms the idea which we had derived from the reports of the recent investigation into the conduct of his office, that the present Supervising Architect had incurred the unfavorable criticism of outsiders mainly through the efforts, praiseworthy in a private citizen, but unpublicable in a public official, which he had made to promote expedition and economy in administration. We cannot say that we approve of some of the economies effected, the reduction in the cost of designs and specifications, while involving no practical disadvantage, leaving the serious aesthetic objection of tending to aggravate in the highest degree the commonplace, monotonous and ill-studied character which has been so long the reproach of our official architecture; but the mere existence of the office is a standing defiance to aesthetic considerations, and Colonel Freret is certainly not at fault in endeavoring to administer the business entrusted to him as efficiently as possible, and in something the spirit in which those who founded the office intended that it should be carried on. Aside from this, however, many really useless extravagances have been stopped, and the very tangible saving of three hundred and thirty dollars a day effected in the expenses of the office. Nevertheless, the advantage to the public of real architectural service, as distinguished from routine construction, has not been forgotten, and Colonel Freret proposes that designs for at least some of the public buildings shall hereafter be secured by competition. In regard, also, to the local supervision of the public building work, he strongly urges that the superintendence of such work should be given to properly qualified architects, residing in the locality, who should furnish their own assistants and clerical work, and should be paid by a fixed commission on the cost of the building erected under their care; the commission which he proposes varying from five per cent, where the cost does not exceed two hundred and fifty thousand dollars, to two and a half per cent, where the cost is more than five hundred thousand dollars.

In regard to the matters of procuring sites for buildings, and employing outside assistance in preparing drawings, the Supervising Architect gives explanations which agree with those made before the Investigating Committee, and, it need not be said, could hardly be otherwise than satisfactory to any one familiar with such work. Entering, however, more into detail, he gives some rather curious statistics of the cost to the Government of draughtsmen's work, both within and outside of the office. From these, which are taken from the records of the office, it appears that the amount paid for the services of draughtsmen in the Office in preparing the drawings for the United States Court-house at Lynchburg, Va., a building which cost nearly one hundred and thirty-five thousand dollars, was forty-six hundred and thirty-one dollars, or three and four-tenths per cent on the cost of the building. The draughtsmen's work on the plans for the Court-House at Fort Wayne, which cost the United States thirty-four thousand one hundred and eighty-five dollars, amounted to three per cent, and on the Quincy Court-house, which cost one hundred and eighty thousand dollars, to two and nine-tenths per cent, on the cost. The amounts thus quoted as paid for draughtsmen's services include nothing for tracing, photographic duplication, clerical work, or the salary of the Supervising Architect, or the services of experts, and, of course, nothing for local superintendence; and the cost of the buildings on which the percentage assigned to draughtsmen's work is calculated is the total amount of the appropriations, including all extras of every kind, and the cost of the site. In many cases this was probably as much as that of the building itself, so that the real percentage of cost of draughtsmen's services to that of the buildings was probably nearer four or five per cent than the two and two-tenths per cent which Colonel Freret finds to be the average for a long list of cases, selected at random from the office books, and covering building ranging in cost from six hundred and fifty dollars to thirty thousand dollars. As an illustration of the great expense of making drawings in the Government office, he mentions also that the working-drawings for the heating apparatus alone for seven buildings, made in the years 1882 to 1884, cost the Government two hundred and seventy-two thousand dollars. These facts are brought forward in the present instance to show only the saving which was effected by the letting of contracts to outside architects for the preparation of drawings, which so shocked and grieved the New York Tribune and some other Republican newspapers, but perhaps the new American Institute of Architects may do well to make a note of them, and when the time comes for presenting to Congress that unanswerable appeal, which is some time to be made, in favor of having our public architecture carried on as it is among all other civilized nations, it will find abundant material for supporting its argument in the archives from which Colonel Freret has quoted.

CASE involving several points of interest to builders and architects was decided by the Supreme Court of California recently. A Frenchman named Monnier entered into a contract with a builder named Harding to construct for him a house. The contract provided that the building should be erected under the supervision of a certain architect, and that payments should be made on his certificate; and the firm of Renton, Holmes & Co. undertook to assist the builder by procuring bonds for him, and in other ways giving him financial support. Before the first certificate was given, Renton, Holmes & Co., feeling nervous about their money, obtained from the builder an assignment of his payments under the contract, and notice of the assignment, with a direction to deliver certificates to the assignees, and not to the builder, was given to the architect. At the same time, a man was sent to Monnier with a copy of the assignment, and he read it to him, asking him to sign it. Monnier declined to sign the paper, and told the man that he was a Frenchman and did not read or understand English, and asked him to come again when his clerk was in. Before any further notice was given Harding went to the architect, who gave him a certificate that payment for ten thousand dollars was due, and Harding went with it to Monnier, who paid him the money. Renton, Holmes & Co., after trying unsuccessfully to get him to hand it over to them, sued Monnier for it, on the ground that he had sufficient notice of the assignment, and was bound to keep the money for them. In his notice, they claimed, was given in English, and delivered to him, and, secondly, through the medium of the architect, who, they claimed, was Monnier's agent, so that notice to him was constructively notice to his principal. On this point the court held that under the contract the architect was expressly authorized to see that the building was constructed in a good,
HE reports of the Factory Mutual Insurance Companies for fire, contain the usual amount of interesting matter. As might be expected, the statistics show that the continued investigations of the principles of fire-resisting construction made by the officers of the companies, and their steady influence in getting these principles adopted, have led to a constant decrease in the cost of mill insurance, and to a very great extent on the works, which have escaped since the companies began to try to influence conditions, is estimated at five million dollars. It is fortunate that, as mill-construction is brought more and more into conformity with the rules now laid down, the investigation of the causes and remedies becomes easier and more accurate, so that compliance with the rules stand, they furnish the best means for promoting improvement in them. At present, the observation of mill fires is very accurate and extensive. During 1886, two hundred and ten fires were reported upon, the causes ascertained or inferred, the loss estimated, and all the circumstances of their origin and extinction described so far as they were known. Of the causes of fires in mills, friction or foreign matters in the machinery is by far the most common, fifty-four out of the two hundred and ten fires of the year having been due to this. Next comes spontaneous combustion, which were responsible for forty-three fires, and next hot journals, which caused twenty-four. Four fires during the year were caused by steam-pipes. Of the appliances for putting out such fires, the most efficient by far are the automatic sprinklers, which played an important part in the extinction of nearly all the conflagrations that were finally subdued. Next to the automatic sprinklers, piles of water served the most efficient instruments for the purpose. In very few cases was the loss more than a few hundred dollars, although in two instances cotton, blazing from friction or spontaneous combustion, was thrown by the machinery into bins containing ten to twelve thousand pounds of loose cotton fresh from the bale. In fact, the experience of the previous year showed how much more to be relied upon these simple appliances are than the more ambitious apparatus of steam-pumps, engines and hose. In one case, where both a steam-pump and a rotary-pump had been provided, and were put in operation on the breaking-out of the fire, it was observed that they did not succeed in throwing any water on the first, and, on investigation, it turned out that the valves were turned different ways, so that one pump raised water vigorously into the other, which as vigorously drove it back to its source. On readjusting the valves the water began to go where it was wanted, and by that time the fire had gained serious headway.

Another weak point in the fire-service of many mills was rather unexpectedly brought to the attention of the insurance officials. There seemed to be a question whether the hose provided for the mills was in all cases what it should be, and a special agent was sent to investigate the matter. On testing some nice-looking hose at certain factories, he found that more leaked out of the hose on its way to the nozzle than escaped through the nozzle; and he learned further that "linen" hose could be bought for less than the cost of the flax of which it was made. On making inquiries of dealers as to prices and quality of the hose they sold, he was asked several places whether he wanted the hose for use or to pass the insurance inspector’s examination, the requirements for these two objects being apparently very different in a manufacturer’s eyes. As the hose is sold for about one-fourth the price of a serviceable article, one can see the dealer’s interest in keeping it, but it is disgraceful that where a superintending asks for the best quality, and pays for it, he should have such rubbish pushed off on him. The hose inspection must be, and will probably furnish valuable material for the next report.

THE Society of Swiss Architects and Engineers has adopted a new tariff of charges, somewhat similar in its classification to that which we described not long ago, but shorter. So far as the architect is concerned, the structures with which they deal are divided into three classes. The first class comprises rural buildings, factories, warehouses, workmen’s barracks and simple school-buildings, without attention at artistic treatment. The second class includes dwelling-houses, town-houses, all public establishments, railway-stations and similar buildings; and the third class comprises interior and exterior decorations, furniture, monuments, fountains, and other objects of the kind. For designing and superintending constructions of the first class, architects are paid a commission varying from five per cent, where the cost exceeds one thousand dollars, to three and one-half per cent, where the cost exceeds one hundred thousand dollars. As stable or simple school-buildings costing more than a hundred thousand dollars may be rare, even in Switzerland, this seems to amount practically to a rate of about five per cent for all constructions costing over two thousand dollars, and a higher rate for cheaper ones.

For buildings of the second class, which must include much the largest part of the architect’s work, the commission varies from six per cent, for those costing between two and five thousand dollars, to four and one-half per cent, where the cost exceeds one hundred thousand dollars. This commission, however, does not cover services in regard to the decoration of the house. These come under the third class, for which the commission varies from six per cent, where the cost is more than one thousand dollars, to ten per cent, where it is between two and five thousand dollars. In this case, a commission is desirable a clerk-of-works is to be employed, and paid by the client, and where a clerk-of-works is not employed the client must pay for measuring up work, for verifying the builder’s accounts, and similar service, independent of the architect’s commission. All travelling expenses incurred by the architect in connection with the work whether it be supervision or other service, are to be repaid in full, and in addition to these he is allowed in all cases, beyond his commission, a fixed sum, or

fruit de dépêchement, as compensation for being absent from his office, amounting to four dollars for each half-day, or six dollars for a whole day. For any work for which he is paid less than two thousand dollars, in any class, is to be fixed by special agreement, and where a design made by an architect is given to another to execute, which can only be done by consent of the former, the compensation of the second, for what he is employed to do, must be increased by twenty per cent. The anomaly, common to sibling scales of condition, that is, having more than the fee in one class, less than in another, for example, the commission on a ninety-eight-thousand-dollar building would be larger than on one costing a hundred and four thousand, is got over by providing that in all cases the commission shall be reckoned at the highest figure allotted to the class below, until a point is reached at which the fees, reckoned at the rate proper to the class, shall reach the sum in excess of that figure. Thus the same fee, nine hundred dollars, is charged on all buildings of the first class costing from twenty thousand dollars to twenty-two thousand five hundred. Above this the fee becomes a larger sum, reckoned by the lower scale.

ONE of the most remarkable and satisfactory things about the Paris Exhibition of 1889, which will open in a few weeks, is the precision with which the estimates have been followed in regard to the buildings. We are so accustomed to see the actual cost of buildings of this kind far exceed the estimates that it is surprising, as well as gratifying, to find that the palace for the exhibition of works of art and skilled manual labor, cost seventy-five hundred and eighty-thousand dollars, or less than one per cent, more than the original estimates; the Machinery Hall, which cost fifteen hundred thousand dollars, exceeded the estimates by only four per cent; and the remaining building, the Palace of Diverse Arts, exceeded the estimates by less than two per cent in a total of twelve hundred thousand dollars. The cost of the contingencies, moreover, has been much less than was anticipated, so that the net result, instead of an enormous excess of cost over the estimates, shows a balance of six hundred and fifty thousand dollars which will not be needed.
BUILDERS' HARDWARE.—XX.

ORDINARY LOCK AND LATCH.

One of the cheapest locks in the market, and one which, considering the price, is a very fair article, is manufactured by P. & F. Corbin, Figure 304. Everything about this lock is of cast-iron except the springs. The single lever, shown by dotted lines under the bolt-tail, A, has a small shoulder instead of gauging, and the latch has only one steel spring. It is a lock that offers no real security, but it is worth all it costs, $1.50 per dozen. It works easily, and is so simple in construction that it seems capable of withstanding considerable wear, perhaps more than a better article. Figure 305 is a more expensive, one-lever lock by the same manufacturers, having double springs for the latch. The form of follow, A, and the arrangement of springs in this example is that which has been found to give the best results, generally speaking, and which has been adapted to a great many varieties of locks. When the latch is forced back, upon closing the door, the lower spring alone is compressed, reacting against the plate and posts at B, but when the door-knob is turned in either direction the follow forces back one of the arms of C, compressing the upper spring, while a shoulder on the lower part of C catches on D, which is attached to the latch-bolt, thus bringing both springs into play. This would be termed an easy spring-latch, in that the knob can be turned with equal ease in either direction.

Figure 306 illustrates a lock manufactured by Nimick & Brittan, in which the lever and bolt are essentially the same as in the preceding example, but which has a follow arranged upon a different principle, lugs being cast on the top and bottom so as to bear against the irregular spring-lever A, and the latch-bolt being pinned to an extension of the lever. The follow and lever shown in Figure 307, a lock by J. B. Shannon & Sons, is of much the same description. In both of these, the knob can be turned more easily to the left than to the right by reason of the unequal leverage against the piece A, though the difference in resistance is partially compensated for by making the shoulders on the follow of unequal lengths. The lock shown by the last figure has three levers, and is catalogued as being hand-made. In Figure 306 the latch is reversible so that the lock can answer for either a right or a left hand door.

The "Niles" locks, of which Figure 308 is a type, are all made to be operated by knobs having a follow cast solid onto the spindle. The action of the knob will be referred to later on. The figure shows only the follow, A, which is inserted from the back. The "Niles" locks have the name of wearing very well. The levers are of steel and are pretty well fitted, for a machine-made lock, and the springs are also of steel, the bolt being the only portion of the mechanism for which brass is employed. As in some of the previous examples, the knob turns more easily towards the left than the right. Instead of the irregular, hinged lever, B, a form were adopted similar to that shown in Figure 305, the "Niles" locks would leave little to be desired, and would compare favorably with anything else in the market.

An examination of the figures will show that, except in the very cheapest example, the face-plate of the lock is screwed to the lock-case in such a manner that it can be moved slightly and set at whatever bevel may be desired in order to fit the door. Figure 309 shows a lock of the Ireland Manufacturing Company in which all the parts can be reversed. The latch is

simply drawn out and turned over. The bolt-tail is in two sections and the outer part can be unscrewed and reversed to match the change in bevel. Otherwise this lock is of the ordinary type, Figure 310 shows another lock manufactured by the same company, in which the hand can be changed by turning the latch over.

Figure 311 illustrates a very satisfactory three-lever lock made by the Hopkins & Dickinson Manufacturing Company.

The key-hole in this example is protected by a small rotating catch similar to those described in connection with the store-door locks, intended to aid in securing the levers from being tampered with. Figure 312 is another lock by the same company, in which the latch-springs are of phosphor-bronze, and quite ingeniously, though very simply arranged so as to give an easy spring-latch. The latch is reversible. The lock is shown with a single-lever, but is also made with three, if desired. Both of these locks are excellently finished.

Figure 313 shows a lock in which the latch is operated by a peculiar form of knob having no spindle or follow, but working against the latch mechanism as another lever at A. It had the same disadvantage as the "Niles" locks, that the ordinary form of knob and spindle cannot be used with it. Aside from the latch, this lock presents nothing out of the usual line.

Figure 314 is a type of a make of locks which for simplicity of design, carefulness of execution and for good lasting qualities is hardly excelled by anything in the market, except the best hand-made work. The Yale "Standard" locks, as they are termed, to distinguish them from the ordinary Yale pin locks, are made with steel levers, and brass springs, bolts and follows. They are so perfectly simple as to require no description. The best forms of springs, levers, and follows are used in these locks, so that they seldom fail to give satisfaction.

Excepting Figure 307, all of the foregoing locks are machine-made, the levers being hand-fitted only in the best grades. Figure 315 shows one of Robinson's "cheapest hand-made locks costing $1.25 each, fitted with a single iron lever, bronze or brass being used only for the follow and the bolts. Figure 316 is a better example of Robinson's work, costing $3.50 per lock. In this the levers, as well as the bolts and the follow are of bronze, and the latch is fitted with an anti-friction strike. The interior of a machine-made lock usually is finer looking than that of one made by hand, and as in the latter all the care is concentrated on the adjustment of the mechanism. There is no denying the excellence of the "Robinson" lock, but at least it would be difficult to persuade many Boston builders that they are not the best to be had, and although the locks are much more expensive than the best of the Yale "Standards" or the Hopkins & Dickinson locks, they are used a great deal on all kinds of work. It is a satisfaction to know that this is one corner of this country where careful, conscientious work can command its own price, in the face of the competition which exists in the hardware trade.

(A to be continued.)

AUGUSTE RODIN.— V.

As Rodin had many pleasant memories of Belgium, he was very glad that "The Age of Brass" was sent in October, 1889, to an art exhibition at Ghent, in that country, by M. Turquet. While the sculptor was living in Belgium, he had exhibited in that city his bust of Dr. Thiriau, and had received for it, from J. Roussan, a writer for L'Echo du Parlement, warm and intelligent appreciation.

The authorities of the Ghent exhibition had provided two gold medals to be given to exhibition from other countries, and Rodin was one of them. The statue received an especial consideration from the pen of M. Camille Lemonnier, a distinguished Brussels art-writer. Some mention of it appeared in the "L'Echo du Parlement," and Rodin was expressing at the same time, in the most fatherly manner and familiar terms, his appreciation of the talents of her husband, his firm belief in the certainty of his future success, and the pleasure he enjoyed in performing the duty of bringing this medal, that had been given to the sculptor at the Ghent exhibition for his noble statue "The Age of Brass." "I think," says Rodin, "that this was the loveliest thing that ever happened to me. The gentleman was M. Rodin Jourdain, a former Belgian minister, who, by the way, was succeeded by his son. He spoke as though I had not yet succeeded, but should eventually, by reason of his good wishes and a little more work and patience."

1 All rights reserved. Continued from page 101, No. 668.
In this same year the "St. John" and "The Broken Nose" were sent to an exhibition at Nice. There, also, the sculptor was awarded a gold medal, but under somewhat different conditions than at Ghent. The public at Nice was more satisfied with the results, and the enriched recompense was given must pay for its cost. As Rodin had not then any money to spare for this purpose, he has not yet considered it necessary to purchase a new house.

In the Salon of 1881, Rodin exhibited a plaster statue called "The Creation of Man" and the "St. John" in bronze, and received two votes for the Medal of Honor. In these exhibits, the press, for the most part, was cordially good. If the Medals of Honor were not for some philosophical preoccupation; he wishes to show, in important matter, a life that is uninviting itself little by little; and he has given to his 'St. John' a power of expression as a model of conceptions, and a heavy sleep in order to enter into the sad reality of active life. It is, perhaps, too daring to try to express such complicated things in an art that is above, all entirely material, but when an artist succeeds in expressing anything in any way and with valiant effort like this of M. Rodin's seems to me much more worthy of eulogy than the commonplace compositions that appear every year, such as a mere display of common-sense in a history of unsuccessful antiquity." The "St. John" was much less condemned and much more commended. "Another artist of high value, who receives no justice, is M. Rodin. His "St. John" proves to me that the subject is rare, and the shoulder-blade on the right side is not in its right place, and the action of the legs do not show that he is walking, or that the feet that is in repose, because they are too far apart. But we salute it for its purpose, as it is a work rather square and long, and the conscious effect it produces. It is a magnificent and noble work that our sculptors will no doubt examine with great attention. If not little from it."

In the Autumn of 1880, Rodin was sent to Brussels and the Salon of 1881. He exhibited in the Pigalle a more lively discussion of its merits in that city than there had been in Paris. Condemned for its "vulgar pose, gesture and expression," and praised as "an exceptional piece of modelling; a work of the first rank, one of the most remarkable efforts of present-day sculpture."

In the Salon of 1882, Rodin exhibited two busts, one of the eminent painter, J. P. Laurens, in clay, and the other of Carrier Belleuse, in terra-cotta. With hardly an exception, the critics by storm, nothing being left unsaid in its favor, while the long was cordially admired for its workmanship, and the sculptor occasionally accounted for making a head of such passing interest. The critics seemed to have become aware that a new and different style of man was claiming their attention. The Laurens' bust is a perspective that produced a retrograde, as well as a prospect, effect on all; but it is highly professional. The Laurens, nude shoulders, severe, proud, living, like a poetic work of the strongest epoch. I have respect and a religious love for this expression of life, as the sculptor, after a long struggle, has produced a new poetic model, as far as I can expect from M. Rodin such masterpieces of robust individuality as will make everybody's eyes sparkle, and I count on him to make sure that there is no such thing as modern sculpture outside of an individual power. The young sculptor has a right to expect from M. Rodin such masterpieces of robust individuality as will make everybody's eyes sparkle, and I count on him to make sure that there is no such thing as modern sculpture outside of an individual power.

In the journal, Exposition des Beaux-Arts, M. Philippe Burtly, wrote these observations: "That which M. Dubois seeks in physiognomy, M. Rodin looks for in character. His bust of M. Jean Paul Laurens is a very thrilling work. His manner of rendering form is rare in these times when every one comes from the same school where they were acquired nearly the same disposition not to learn from a close study of nature. There are many defects in taste in this composition. In spite of this, one feels that he faces a resolved artist, capable of giving an idea of the young who, with his face turned left in the face of the imposer of the truth of the spirit of modern times requires. This doctrine, that they call realism, is that of which the sculptor, Mr. Rodin, is the high representatives."
The question of Rodin deserving the Medal of Honor, had become a living one among his admirers, and the subject was canvassed in L'Art, in July, 1883, by Mr. Paul Lerol. He says: "It cannot be said that the question of the medal is the only thing that weighs, and this being true there can be but two competitors possible for the painting and the sculpture; one of them is that of a great sculptor, Mr. Rodin, the sculptor of the portrait of M. J. P. Laurens, which this artist would consider as the greatest masters of all times. There is but one name to give to it, that of masterpiece. Look out for Rodin. He is going a long way." The exhibition in London, Vienna, Pau and Paris. In the first city he sent to the Grosvenor Gallery "The Broken Nose," and the "St. John" to the Royal Academy. His name had already reached London through the press and newspaper, and his name has been mentioned as a good name. The intelligent appreciation of the superior qualities of his work, the principal exception being Mr. Edmond Gosse, the eminent writer and critic, who kindly suggested "the tempered solicitude" with which he would like to have M. Rodin handle the modelling tool. Mr. Gosse disliked the very qualities that the French writers hailed with the liveliest satisfaction, and is the only critic, out of the dozen that have commented on the sculptor, that positively has not an idea of what Rodin did to the sculpture. As a general thing these two exhibits were received in London with the heartiest appreciation.

When the Vienna exhibition took place, Rodin requested the Committee of the French Government to include in the list of sculptors who had sent work to be sold to the State. They were sent to Vienna, but so badly placed, that the newspapers from every country, included in their commendation of the figures a protest against the unworthy treatment they had thus received. In the exhibition in London, the "Triennial Salon, and in it were shown the bronze copies of "The Age of Brass" and the "St. John," for the first time together in that country. Though badly placed, they were noticed, and the most enthusiastic and general praise. The unique qualities of the statues were distinctly noticed, and their author often mentioned in connection with Donatello and Michael Angelo. As a whole, Rodin was set apart squarely and intelligently as representing, with one or two other sculptors, the highest note of French sculpture. For originality of workmanship, living interpretation of nature, and profound and scientific understanding of the human form, he was declared to be the greatest living representative. At the close of this exhibition the "The Age of Brass" was erected in the garden of the Luxembourg. Rodin was now fast becoming a recognized sculptor in art in his native country. The character of his work was affecting serious minds in literature and art. He was making friends among the best people in these professions. A newspaper correspondent, Dr. Danieli, and one of A. Legros, a distinguished French artist and friend of the sculptor, living in London. They were spoken of with the warm accord given to his previous busts. Those of Laurens and those of the "St. John" were shown in the "Petite Asie," and the same admiration that had been given to them in Paris. Besides several exhibitions of his busts, including one of Manon Lescaut and the "Petite Asie," in various places, Rodin, in company with a number of French painters, opened an opera in London at the Egyptian Hall. His list comprised seven works, the plaster statue of "St. John," a figure of "Eve after the fall," half life-size, "The Broken Nose," busts of Laurens, Legros and the "Petite Asie," and a little group in bronze called "The Children's Kiss." By all the London writers these works were regarded as the most striking part of the exhibition, and the point chiefly made was the varied capacity shown by the sculptor. Some thought they would surpass the work of another French sculptor, but the greatest one in the world.

The exhibition was not a pecuniary success, but it served to make Rodin an excellent reputation in England. Of all the young sculptors, I place this one (M. Auguste Rodin) the highest by a great deal. Last year, he exhibited a bronze statue of "St. John, the Precursor," old and thin, savage and nervous, and of an incomparable expression. Rodin's busts of Laurens, nude shoulders, severe, proud, living, like a poetic work of the strongest epoch. I have respect and a religious love for this expression of life, as the sculptor, after a long struggle, has produced a new poetic model, as far as I can expect from M. Rodin such masterpieces of robust individuality as will make everybody's eyes sparkle, and I count on him to make sure that there is no such thing as modern sculpture outside of an individual power. The young sculptor has a right to expect from M. Rodin such masterpieces of robust individuality as will make everybody's eyes sparkle, and I count on him to make sure that there is no such thing as modern sculpture outside of an individual power.
an impression, and been received with more admiration by the most intelligent and liberal representatives of those two classes. The only serious antagonism that the sculptor had encountered was in his own country. That had not diminished, nor was it likely to, for it was based on a natural temperament as strong as that which was seen in Rodin's statues. The history of the Hugo bust is an interesting one. Sometime in 1883, M. Edmond Bazire, one of the editors of the Paris journal, L'Art monument, and an ardent friend of Rodin, and who wished to have him make a bust of the poet, went with him to see Hugo to consult about it and arrange for some sittings. Unfortunately, the latter had just completed giving a wearying number of hours for the same purpose to another sculptor, and he did not feel disposed to begin again. But a member of Hugo's family, who was not pleased with the bust, was very desirous that Rodin should make an attempt in the same way, after his preliminary step he was cordially invited to come to Hugo's house every Sunday evening, dine, and study his subject as best he could.

After a number of these visits the sculptor brought his modelling stand and clay, established himself out-of-the-way, in one corner of the veranda, and began his work, without in any way disturbing or expecting the poet to pose expressly for him. The bust was practically made from memory, the sculptor first looking at Hugo, wherever he might be, and then returning to his clay and working out the result of his observation, losing, of course, much of what he had seen and been impressed with, in going from the subject to his work. It was a difficult and almost endless task, and the bust was only completed about six months before Hugo's death. By many of the poet's friends it was, at first, regarded as a complete failure, but time gradually developed its merits, and those who at first disliked it became its enthusiastic admirers. Rodin made two wax-process bronze copies, giving one to the Hugo family and retaining the other for himself.

To assist him in modelling the bust the sculptor had made many sketches, on paper, of his unwilling sitter from every possible point-of-view. Soon after Hugo's death, an iron merchant of Besancon, commissioned M. Sagot, a Paris dealer in art and rare books, to buy everything that he could find in any way connected with the poet. At this distribution of Rodin's busts had become well known to M. Sagot, he went to the sculptor to get a copy of it, and while there he learned the existence of these drawings. The result was that both bust and drawings, eighty in all, went into the possession of the poet's collector. As fate would have it, in a few years this admirer of the poet met with pecuniary reverses, and the bust, with other objects, was advertised to be sold at auction in the city of Lyons. The Sagot hardened the sale, and to the cost of his pocket, as well as his surprise at the narrow geographical range of familiarity with Hugo's physiognomy, he found that no one knew whom the bust represented, nor saw its merits as an art production. He bought the bust for ten dollars. The drawings have disappeared, and not all of M. Sagot's perseverance and enterprise have been able to find them.

Rodin also made two etchings of Hugo's portrait from these drawings. Several bronze copies of the bust have been sold, and the Paris Society of the Men of Letters has a plaster copy. Not long ago the city of Paris ordered a marble copy.

It is needless to say that Rodin's social and professional relations with Hugo were of the most agreeable description. At his table the sculptor met the most distinguished persons in Paris. Here are some of his observations: "Hugo had the air of a Herencen; bearded to the chin like a tiger, or an owl, he had an immense animal nature. His eyes were especially beautiful, and the most striking thing about him. As a man he was large and agreeable, no personal pride. When he showed pride it was outside of himself. He always had twelve or fourteen guests at his table, and being somewhat deaf he heard little of the conversation, but often in the very midst of it he would break out with some astonishing observation. It was not until two or three years after his death that I really saw the man, the amplitude of his character, and felt the force of his private work and impersonal nature."

T. H. Bartlett.

[To be continued.]

Store building for Mrs. J. F. H. Phillips and Mrs. R. R. Wallace, St. Louis, Mo. Mr. A. F. Rosenheim, Architect, St. Louis, Mo.

The building has a frontage of 70 feet by depth of 85 feet, is 6 stories and basement high, and to be used for department store purposes. The first 2 stories are carried up in Portage Entry and Marquette (Lake Superior) red and brown sandstone alternating, in courses cranked and quarry faced. The upper 4 stories are carried up in brown brick, with brown sandstone for color, and Portage Entry red stone for trimmings. The effect being uncommonly good, and the unusually deep reveals at windows being very effective. The interior construction is what is called show room or mill construction, girders composed of 2 pieces 8" x 16" Georgia pine bolted together at regular intervals and these carry, on wrought-iron struts, cross beams 6" x 12", anchored thoroughly to said girders at intersections. At right angles to these and on top of same is laid a 8" yellow pine tongued-and-grooved flooring, and again on top of this in the opposite direction a 18" maple flooring, the whole making an exceedingly stiff and rigid floor. Iron columns throughout fireproofed and plastered. Plate-glass, hydraulic elevators, electric-lighting, and in short all modern conveniences and appliances. Total cost $100,000. To be completed about May 1, 1889.

Vestibule tower for the Presbyterian Hospital, Madison Ave., New York, N. Y. Messrs. J. C. Cady & Co., Architects, New York, N. Y.

This is one of a series of buildings now erecting for the Presbyterian Hospital. It was recently completed. The tower forms the main exhaust shaft for the system of ventilation, which is connected to all the buildings by means of ducts underground, and when in use will cover an entire block. The rest of this building is used for dispensary purposes, excepting the cellar, which is located the fans and other machinery necessary for driving the ventilating apparatus.

Sketch for stable and billiard-room, Pelham, N. Y. Messrs. Walgrove & Israels, Architects, New York, N. Y.

Building is to be entirely covered with shingles and billiard-room to be finished in yellow pine; to have all improvements and to cost about $3,000.


See article elsewhere in this issue.

Cottage No. 4, Watch-Hill, R. I. Mr. Howard Hoppin, Architect, Providence, R. I.

House for Mrs. Alice Bacon, Lousiville, Ky. Mr. C. J. Clarke, Architect, Louisville, Ky.


The Pop Compressed Air System in Paris.

Every visitor to Paris has noticed the pneumatic clocks which stand in the streets, and in the rooms of the principal hotels and public buildings. When indoors, they attract attention by the absence of the ordinary ticking, which is replaced by an unusual click, occurring every minute. If the mechanism of one of these clocks be investigated, it is found to be exceedingly simple, the principal part being a small cylinder with a piston. This cylinder is connected by a small flexible tube with a network of fixed pipes running through the building, and these are again coupled to a main in the street. Every minute a wave of pressure circulates through the entire system of pipes, and the sounds of all the clocks make an advance. There are an immense number of these clocks in Paris, the total on October 31 of last year being 7,600. Their installation has been greatly facilitated by the fact that the sewers which exist in the city, for the main pipes can be laid in these without breaking the streets. It would be more correct, according to English ideas, to denominate these underground conduits as subways rather than sewers. A few years ago these conduits were kept entirely empty, but now they are used to convey sewage, gas, water, gas, and even water. The notification of time by means of compressed air was begun in 1879 by the Compagnie Générale des Horloges et Forces Pneumatiques. In 1886, the company, which then underwent reconstruction, enlarged its sphere of action, and obtained a concession for forty

Illustration


Sketch for a Memorial Library, Lexington, Ky., by Mr. Willis Folk.
VENTILATING TOWER, PRESBYTERIAN HOSPITAL - NEW YORK, N.Y.
J.C. CARY & CO. ARCHIT'S
DOORWAY TO HOUSE OF JOHN PEABODY, ESQ., MARLBOROUGH STREET, BOSTON.

PEABODY & STEARNS, Architects.
COTTAGE NO. 4.

To be built at WATCH HILL, R.I.

Howard Hoppin, Architect.

Providence, R.I.
21 Rolph St, Toronto.
Residence of Alex. T. A. E.
Knox & Elliot, Architects.
years for the distribution of compressed air for motive-power purposes. An inspection made last year of the air installation at the Kepublique, at 63 horse-power was laid down at Belleville, and the work was pushed on with such energy that there are now 55 kilometres (214 miles) of compressed-air mains in addition to 63 horse-power laid down for the time service. The two trunk mains of the compressed-air service are each 11.8 inches in diameter. The first, which is in operation, starts from the Rue Saint-Fargeau, descends to the Place de la République, and bends northward to join the other trunk mains, which are as far as the Madeleine. The other descends parallel to the first as far as the Rue des Pyrénées, runs to the Place de la Bataille, and joins the line of the Rue Saint-Antoine at 78 Uas, and finally joins the main as far as the Place de la Concorde, where it joins the first in the Rue Royale. This second main is not yet completed. The distribution to the houses is made by pipes varying from 7 to 9 inches in diameter, and are supplied to thirteen sewing-machine factories, to four ice manufacturers, to thirty-nine turners taking about 2 horse-power each, to sixteen printers aggregating 43 horse-power, and to the large forestalling firms, each taking about 70 horse-power in all, and to eighty-six miscellaneous industries.

Paris presents a capital field for the exploitation of such a system as this, since the city is nearly all supplied with only a moderate amount of power. But when the power is derived from a steam-engine the expense is relatively great. The police regulations prevent the building of the engines themselves, but the work can be best carried on, while small engines and boilers are notoriously inefficient, and cost almost as much for attendance as motors of much larger size. Gas-engines offer great advantages to small industries, but when the gas costs 7c. a thousand feet, as it does in Paris, they are not economical. These facts explain the great success of the Compagnie Parisienne de l’Air Comprimé, who have extended their lines into little streets, and are now working on a most florishing position, and is advancing by leaps and bounds. In the interval between October 31 and December 20 of last year there was an increase in the air delivered for power purposes, and for cold-lighting purposes, by 26 per cent, and for horse-power, 15. Financially, the undertaking is in a capital position: we have before us an account of the receipts and expenditure, which, however, we are not at liberty to publish, but which shows that the shareholders will receive a most satisfactory return on their capital.

After several tentative attempts have been made at electric-lighting the Municipal Council of Paris has determined that the time has come to carry out a comprehensive scheme, and in the last days of December a concession was granted to the Pomp Company for an area extending from the Madeleine in the west to the Place de la Bataille in the north, by the river of the Rue de Rivoli in the south to the grand boulevards in the north. This is in many respects the most important section of Paris from an electric-lighting point of view. It is more than two miles long and nearly a mile wide; it is crowded with cafes, restaurants, theaters, and hotels, all of which will, sooner or later, abandon the use of gas. The competition for the concession was keen, the following interests being represented: Rothschild (Maxvol Depeyre), Edione (Compagnie de Edison), Cencier (representing Donon), and Milder (representing a group). The Pomp Company was chosen as presenting the best guaranty of giving satisfaction to the public for electric light and power; they propose to lay down plant immediately, and it being estimated that 150,000 lamps will be required eventually.

It is well known that distribution by compressed air has a very low efficiency unless the air be heated before it is employed in the motors. According to a report by M. Joseph Francois, the air, if employed cold, has an efficiency of 46 per cent; if heated to 206° C. (292° Fahr.) previously to being employed in the motor, it has an efficiency of 54 per cent, which can be increased to 82 per cent, if the air be injected into the motor. The efficiency rises to 87 per cent, as by the following table:

<table>
<thead>
<tr>
<th>Weight of air delivered per unit of horse-power of motors.</th>
<th>Cold Air.</th>
<th>Heated Air.</th>
<th>Heated Air with Injection of Water.</th>
</tr>
</thead>
<tbody>
<tr>
<td>116 lb.</td>
<td>78 lb.</td>
<td>54.6 lb.</td>
<td></td>
</tr>
<tr>
<td>1063 cub. ft.</td>
<td>971 cub. ft.</td>
<td>772 cub. ft.</td>
<td></td>
</tr>
<tr>
<td>68 deg. F.</td>
<td>362 deg. F.</td>
<td>352 deg. F.</td>
<td></td>
</tr>
<tr>
<td>64 per cent.</td>
<td>61 per cent.</td>
<td>57 per cent.</td>
<td></td>
</tr>
</tbody>
</table>

It is stated that these results have been found by experiment, though they appear to be very high; they are about 8 per cent better than those calculated for under similar conditions by the promoters of the Birmingham Compressed-Air Power Company.

By the consumption of 44 lb. of coke and the injection of 6.6 lb. of water per horse-power per hour, the efficiency is raised to 87 per cent, it is said. For practical purposes, M. Francois takes the efficiency at 80 per cent, and on this basis he has made a calculation of the cost of working fifteen air-compressing machines of 400 horse-power (6,000 horse-power in all). He estimates the buildings at £18,000, the land at £14,000, the compressing machinery and boilers at £84,000, the pipes at £24,000, the air engines and fixing at £20,000, and other expenses at £16,000, or £200,000 in all. M. Francois assumes that the installation will be at work sixteen hours a day on an average of the entire year, basing his assumption on the experience of the Compagnie Parisienne de l’Air Comprimé, and on the hypotiesis that secondary batteries will be used in electric-lighting. He puts the coal consumption at 2.2 lb. per hour, equal to £100 a day; wages at £221 per annum and repairs at £81 and salaries at £4, or an aggregate of £144 per day for the compensation of the operators.

The supervision of the motors he estimates at £16, and the management of the company at £20, the total daily expense being:

| Interest and amortisation. | £30 |
| The motors | £20 |
| General expenses | £45 |

With the assumed efficiency of 80 per cent, the customers would receive 4,800 × 15, or 72,000 horse-power per hour, which would cost to supply £246, or about 72d. per hour. If the cost of the coke is reckoned at one shilling per pound, the total expense may be estimated in round figures at one penny, which is an addition of 16 per cent to the cost of the thirty-five per cent already included in the rate.

It is interesting to compare this estimate with that made in 1883 by Messrs. English, Hrnnsen, and Sturgeon for the Birmingham scheme. In the latter case the expense of the plant came to £200,000, as in Paris. The indicated power of the compressing engines was 8,400 horse-power. They were, however, only estimated to work at full power ten hours a day, against sixteen in Paris, so that the fixed expenses per hour were, consequently, greater. However, there was a great saving in the item of coal, which costs 6s. in Birmingham, against 26s. in Paris. Wages and salaries stand for £4,900, repairs and replacements for £3,000 a year. The total sum of the yearly expenditure is £21,000, against £28,000 in Paris, a difference being due to the coal bill. On the other side of the account, it is estimated that the customers will pay for 5,000 horse-power per hour about twelve hours in the week, or for about 5,500 a year during seven days. The average price is put down at £9 a year per horse-power, or about 6d. per hour. Such a sum would pay all the expenses, and would leave £24,000 a year to pay 12 per cent interest per annum for capital.

The two estimates are sufficiently alike to confirm each other in many respects, but the Parisian scheme has a great advantage in the number of hours the machinery is expected to be at work. We may safely assume that a great part of the power will go for electric-lighting, for the manufactures and miscellaneous industries of the city will only absorb a small proportion of it, unless there should be a very great extension in the way of refrigerators and cold stores. We believe that this is an outlet which is expected to develop very largely, and it will offer the additional advantage that it will make the greatest, and, in the beginning, the least artificial light required. The surplus power will be used during the daytime for charging accumulators, and in the evening part of the lighting must be done by batteries charged during the day, and part by current supplied direct from the engine in the evening. In this way both the compressing plant and the dynamo could be kept nearly continuously at work during the winter months.

The scheme is one of very great magnitude, and will be watched with much interest in all parts of the world. — Engineering.

THE LOTUS IN ANCIENT ART. I. THE IONIC CAPITOL AND THE LOTUS.  

I HAVE described the different varieties of lotus known to Egyptian decoration. That this flower was its dominant decorative motive, and that it was thus used as a symbol of immortality and of the resurrection, and as a solar, lunar and generative emblem, 

*Continued from No. 668, page 69.*
sacrificed to all three members of the Egyptian Trinity has been shown from the highest living authorities in Egyptology, as it is also clearly to be gathered from the monuments themselves. The Egyptian adaptations of Egyptian mythology and the cult of Osiris, and of the Osiris, Horus and Isis cult in particular, with its attendant hieroglyphic symbols have been alluded to as matters of current historical information.

In the early Etruscan art, the Cypriote Phoenician art on Egyptian models has been made apparent.

It has also been pointed out that the Cypriote Greek art of all periods so closely followed its early Phoenician models that a separation of the Cypriote art from Cypriote Phoenician motives in pottery or otherwise is frequently or generally impossible.

It has been observed that this Cypriote Greek art represents the first prehistoric stage of the Greek art, or rather its introductory stage, down to a certain period—say in the seventh and eighth centuries B.C., and that it subsequently continued in this introductory stage owing to certain Oriental influences and conservative tendencies in the art of the Greeks of Cyprus long after the Greek art farther west had abandoned its childhood and archaic period.

In the Cypriote lotus motives, whether on pottery or in stone, we are dealing with florally-typical of an early period, however late the individual pieces may be.

It has been shown in the preceding article that the lotus flowers represented on Cypriote vases, not only exhibit exterior scrolls or indelible volutes which are rude imitations of the downward curling calyx-leaves of the natural flower, as also illustrated from nature in that article. Such vase motives are also seen in the details 1–8 included, in the papers No. 8 shown which appear further in the conventional direction apparent in No. 4, as appears in the diminished number of petals. In both cases where the proportions make nearly perfect motives of the flower capitulum, from which the motives are taken, are of such a shape and panelled in such a way that the expansion of the volutes and depression of the petals is clearly apparent together with the decorative motive of the oblong and narrow shape of the panel into which it is compressed. We have, then, in these details 4 and 8, so far as vase decoration is concerned, a palpable approach to the shape which a similar lotus form would assume as an architectural decorative motive under pressure, when due allowance is made for the extra conventional quality belong naturally to stone-carving.

No. 9 is a Cypriote presentation which approaches quite closely the general appearance of the detail 8. It is figured in Colonna-Ceccaldi's "Monuments de Chypre." This work is a posthumous publication of the student whose name is given above, and the introduction and notes to this book are contained in this article and these pages. This little reproduction is not at all to the character of the book itself, as it is a reproduction of an article from the "Joumal Archeologique," with a few similar indelible designs and monotonous patterns. Measurements are given in the book itself, and from the moment when the illustrations are on the capital in the original publication, and it is indexed with the word "Dali," the present name of the ancient city of Chypre. The said indication of locality or derivation is followed by a mark of investigation.

If Colonna-Ceccaldi had lived to edit this capital, he would probably have made a more successful interpretation in detail of the connection between the lotus and the proto-Ionic stiles and capitals of Cyprus than that recorded in my preceding paper, or, at least, he could have pointed out analogies with the Ionic form which are immediately obvious. So far as the lotus flower is concerned, we have seen that he considered the volutes of No. 19 to be conventional representations of curling petals. It has also been remarked that, as an actual matter-of-fact, the petals of the lotus never curl over or downward, and, as the calyx-leaves contrastingly do, it is more probable that the actual natural phenomenon was the starting-point of the conventional representation. Colonna-Ceccaldi had not observed the vase-designs in which these curling calyx-leaves are so

conventional exterior volutes. The entire design may be compared with the vase-designs numbered 1 and 5. Cases of a more conventional proto-Ionic form, in which the volutes also rise from the lower part of the capital in the manner of the conventional ornaments of furniture, as shown on Greek vases. Compare the Ionic of Mochama, Figure 18 of this paper. An analogous conventional Ionic design (Figure 12) is found in an Egyptian ceiling decoration of the eighteenth dynasty (eighteenth century B.C.) taken from the prises of Pise d'Avennes, and may be compared with Mr. Clarke's capital from Neandrea, figured in the paper.

We will now return to the Cypriote vase-design, No. 8, in order to compare it with a conventionalized lotus pattern taken from a stone capital in Salamanca's "Monumentos de Cordoba." This motive is clear that it repeats the elements of 8, but in a more purely Greek and decorative spirit. A still further departure from the original form appears in the decorative motives of 14 and 15, which are taken from Greek vases of Melos (published by Professors Conder and Birch of the Berlin Museum). A similar vase motive has been previously described by Dr. Samuel Birch of the British Museum as "a sort of trefoil lotus." The vase-designs of 15, both of the motives from Cypriote vases in New York and the floral forms between the palmettes in 20 from an Etruscan vase are similar lotus motives and already recognized as such in Greek decoration.

Before beginning the comparison of the proto-Ionic capitals let us finally notice the following conventional lotus patterns, 21 and 22 from Egypto-Phoenician metal-work found in Etruria (Regolini-Galassi tomb) and in the 18th century in Morocco. The motive 16 is a recognized simplification of a lotus motive like 17 (both taken from designs in Rosellini's "Monumenti".

In these last designs we return to a modified conventional form of the exterior spirals or scrolls combined with the central triangle. We will now return to the Cypriote lotus patterns which furnish the starting-point of the argument in order to determine what this central triangle is. In these patterns (1 to 8 inclusive) it is clearly distinct from the petals. It undoubtedly represents the calyx-leaves. In all Egyptian lotuses the petals are represented as the petals of a larger triangle is given in centre calyx-leaves. In No. 17. Although in nature the calyx-leaves all curl downward together, if at all, the absence of perspective and foreshortening methods in ancient decoration and the habit of representing the central calyx-leaves as a larger triangle in lotus motives without the scrolls or spirals, as in 15, 18, 20, would explain this combination. Thus an explanation is reached of the conventional forms 14 and 15 as related to the natural flower. The central triangle is a reminiscence of the central calyxleaf represented erect. In the processes of conventional elimination of minor details the petal triangles have disappeared entirely. Nos. 8 and 15 represent the intermediate conventional step.

If we now approach the proto-Ionic forms in architectural elements, by way of the capitals of the Siphnian temple we have a capital from my first paper at 24, it becomes sufficiently clear that we are dealing here with a conventional form of lotus. The intermediate steps as far as in stone are concerned are all illustrated by 9 and 11.

There are cases of Greek-Ionic design of a comparatively late date, in which the central triangle still remains as reminiscence of the keystone form. In No. 19, a capital from a Grecian-Phoenician relief as late as the third century B.C. (from Conesa's "Periplo," No. 26 is the decoration of a bronze mirror handle found at Olympia ("Olympia" Plate XXII, Vol. IV) dating about 500 B.C. In No. 27, a capital from a Greek vase published by Mr. Clarke in his article already quoted, this triangle has been transformed into a curve just as the central calyx leaf is modified into a curve in No. 9.

The decisive significance of certain proto-Ionic stiles and capitals
from Cyprus for the history of the Ionic capital now becomes apparent in the view of the transitional character of the art of this island—of its geographical location as a connecting point between the Oriental culture and the Greek, and in view of the fact that Cyproite art is also in the grooves of the Oriental Greek stage long after the further development of the Western Greek art. In the case of No. 10 there are positive grounds for not assigning an earlier date than 600 B.C., connected with the style of the scarabaeus which was the central type. But the volutes is undoubtedly a survival of the central calyx-leaf of the lotus. (Not a representation of the ovary as suggested by Colonna-Ceccardi, who modestly states that the lotus ovary is represented by a rosette) The upper inverse scrolls of this stile will be subsequently explained. A stile (probably a tombstone) of related form in the Louvre (29) shows that we are dealing with a type and not with an exception of the solar disk and crescent, familiar emblems of Phoenician worship of the sun and moon, or of gods which personified them, carries us back to the previously noted connection between the lotus and the worship of the sun. A similar association with the solar disk and crescent in the Louvre is stile No. 28. Whether or no we are dealing with a conventional survival of Egyptian emblems which had lost their significance, it is immaterial to inquire. That the association did originally have a significance is fairly proved by No. 11. The head, which appears about the lotus flower, is clearly seen in the original to be one of Hathor (Isis) the Moon-Goddess, where relation to the lotus has been explained.

The origin of the lotus capital had originally a horticultural and sacred significance is probable from the engraved Assyrian cylinder published by Layard, "Culte de Mithra," from which the detail 31 is taken, and from the support of the solar disk on the Sipp Sara tablet.

The Egyptian lotus with the god Horus and the solar disk see the preceding article, and compare the Hittite relief at 32 of this paper, where Ionion capitals support the Egyptian scrolled disk—at feet of the god Horus (Perreaut, as quoted).

The presumptions established by the foregoing comparisons may be summed up as follows: Assyro-Phoenician forms are like the Cyproite in retaining the rudimentary signs of a lotiform origin. As Egyptian-Phoenician influences on Assyrian decorative art are known to have been powerful and manifold, there is no a priori difficulty in admitting that the proto-ionic forms were among them. The Assyro-Phoenician influence, especial in those of Largue, expressly state that Assyrian palaces were imitated from those of the Syrian Hittites.

whose ornamental art, so far as known, has mainly a modified Egyptian style. As all the lotus motives of ancient art are admitted to have been originally Egyptian, the Ionic form is originally Egyptian if it be a lotus motive.

The question may now be asked: If the Ionic form is Egyptian, why do we not find it in Egypt itself that we ever that we do find it. The cut here (33) from Rosellini's "Monument." Vol. II, Pt. XXXI, is the handle of a mirror, to be sure, but it is clearly an imitation of an architectural column and capital, and the Ionion volutes are portions here of a conventional lotus. Cut No. 34 is decisive (reproduced from the foregoing article). It is one of the series published by Pissone d'Avennes from Egyptian wall-paintings, in which originals in metal or by wood, or in the two materials combined, are to be presumed. Belonging to the eighteenth and nineteenth dynasties, these forms antedated any of those known to Assyrian art by a number of centuries. They are not less than seven centuries older than the earliest Assyro-Phoenician forms, and as we know that Assyria was an Egyptian province under the eighteenth dynasty, we are not even under the necessity of assuming a Phoenician intervention as regards the transmission. The lowest member of this capital is a conventional lotus bud. The next is a lotus flower of the form most commonly known to Egyptian art, associated with two lotus buds. Above this we observe that form of the lotus-ionic in capital in which the calyx triangle appears between the calyx volutes, a common Egyptian architectural form, as seen at Fig. 37 of this paper.

The top member of the capital shows an absolutely Ionic form so far as the upper line joining the volutes is concerned. The ornamental detail figured at 32 is another instance of Ionic forms in Egyptian art to which other illustrations can be added. The Hittite relief at Boghaz Kene, in Asia Minor, where proto-Ionic capitals support the winged solar disk, may be also added as an illustration (35). The monument may be Hittite, and the art may be Phoeni- cian, but the winged disk carries us back to Egyptian influence and the association of the lotus with Horus, one of whose forms is the winged disk, is a parallel with the appearance of the solar disk and crescent in Nos. 28 and 30, and with the appearance of the head of Isis Hathor at 11. The date of this Hittite relief is probably not later than the second millennium B.C.

The Egyptian Ionic forms illustrated at 36 and 37 are not essentially remote when we consider the number of Ionic capitals now known in which the spirals rise from the necking. The instance illustrated at 38 is probably Syrian-Phoenician, anterior to the Greek influence in Syria (from a relief at Mashmaka, published in Robet's "History of Ancient Art," p. 42).

The absence of Egyptian lotus-Ionic forms in the existing stone monuments, in contrast with the multitude of capitals like 36 and 37, represented in paintings and reliefs, is undoubtedly explained by the fact that, in Egyptian use, these forms were confined to architecture in wood, with or without metal decoration. It has been abundantly pointed out that the Ionic capital was originally designed for construction in wood (see, for instance, Mr. Clarke's article). The Greeks simply imitated or modified in stone capital of wooden architecture, which have no consequent appearance. The absence of Egyptian stone architectural forms like 33 is thus explained. The lotus-Ionic volutes were not sufficiently solid in aspect for the severe and massive temples of Egyptian stone construction and decoration.

It has been observed in the preceding paper that the Persian explorer, M. Dieulafoy, has suggested an Ionion lotus derivative, and that he has made it his starting-point for a theory of the Egyptian Ionic in which the volutes are conceived to represent petals bending forward and backward, and the intermediate member is supposed to represent the ovary. My reasons for dissenting from this last interpretation will appear later. The reasons for supposing the calyx-leaves, rather than the petals, to have been the initial motive in the Ionic volutes are already apparent. It is certainly to be admitted as a possibility that a form like 37 is a decorative exaggeration of the form 16, which is a simplification of 17. It is clear that the volute of 36 could be easily read the curves of 37. If any one should prefer this theory of the lotiform line, I will only ask that judgment be held in abeyance until the observations on the anthemion and on its peculiar relations to the Ionion capital have been offered.

It is true that Cyproite vase-designs of the second millennium B.C. are not a conclusive link in a chain of proof relating to Egyptian forms which are possibly much earlier as regards the type. We can only insist on the persistence and long-established typical character of all forms in Oriental art; on the continuance in Oriental art of initial conventional forms long after highly remote decorative developments of the same have been reached; on the intimate relations between Egypt and Cyprus; on the rarity of decorated pottery in Egyptian tombs; and on the fact that the study of Egyptian pottery is admittedly the most backward branch of Egyptology. The point that my own observations, the first published, that the forms of Cyproite pottery is an indication that something of the same kind may be almost any day discovered or brought to notice in Egyptian design is as regards the type. In general, and aside from M. Dieulafoy's observations, the significance of the Egyptian Ionic forms has been disregarded even by authors who have published them. As explained in my last paper, all standard authorities have considered the Assyrian Ionic as

HOT BATHS OF ANCIENT ROME.

There is no ancient practice extant in the hot baths of Rome, nor on their method of construction, than those of the baths of Galen, being physicians, naturally only treat of the bath as forming part of a medical treatment in cases of disease. We gather, however, that the baths of the Egyptians, at least those adopted in our Turkish baths; some were gradually from the warm rooms, through the hot, into the laconicum; and some began with the cold and went gradually through the cooler rooms, and in both cases then took the cold bath.

And much of the bathing was done by having buckets of water of different temperatures poured over the bathers. Some were oiled before they began to bathe, some during the process as well, and all were so after it; some, of course, with perfumed oil or unguents. Julius Caesar left 3,000,000 pounds of oil annually to the bathers of Rome. Before the final uction they had been strung and shaved.

In Lucian, who lived in the time of the Antonines, there is a description of a public bath built by Hippias, an architect, and a friend of Lucian. In it there was no month, and the laconicum, but it gives us some notion of the way of bathing, though this bath was probably very insignificant as compared with the vast Roman Thermes.

After you have passed a lofty vestibule, to which you ascend by a flight of steps of an enfilade of rooms, and before you are admitted to the rooms, you are offered a choice of places for your clothes. The middle of this room is exceedingly light, and contains three lavacra of cold water, ornamented with Lacedemonian marble; in the same room are hot rooms, and in one ancient work, of Health and another of Acclapalus. As you go out of the room, through an oblong, vaulted passage, the house grows sensibly warmer, although the heat is far from being disagreeable; this passage leads to a very light chamber on the right hand, where you may be supplied with ungueous; this room, likewise, has a communication with the Palestra, and both sides of the door are covered with Phrygian marble.

The next apartment is the most beautiful of any yet mentioned, being resplendent with Phrygian marble to the ceiling; in it are many conveniences for sitting; it enters an oblong room, and has apartments for walking or taking exercise. On going out you enter a hot passage, long enough for a race, and encircled with Numidian marble walls and painted with a purple color; in it are three warm baths, and in one of them you should not return by the same way you came, but slowly by a shorter way, which brings you to the cold bath through a warm room, gradually decreasing in heat. All these rooms are exceedingly well lighted from the top.

Hippias has wisely constructed the room which contains the cold bath so as to face the north; the other apartments, which require a greater degree of heat, has he exposed to the south, southeast, and west.

Rome had no thermometer, so we cannot tell what the precise heat was, but the water seems to have been hot.

Athenaeus gives the following lines (lib. 1, cap. 32):

"Plague take the bath! I just see the plight in which the thing has left me; it seems I have bade it up, and quite Of strength and nerve bereft me."

"Dead and done with was the god that taught a Man to soak in boiling water."

That stoic philosopher, Seneca, whose business Macanlay describes as being, in reality, declaims in praise of poverty, with two millions out at usury; to meditate epigraphical conceits, to wander in gardens which moved the envy of sovereigns; to rant about liberty while railing on the insolent and pampered freedmen of a tyrant; to praise the divine harmony of water and air, which had just before written a defence of the murder of a mother by her son, was very severe on the heat of the water in the baths, and says: "It is hot enough to boil a mess of them, not to mention the heat produced by windows. Nothing is known as to those cave-dwellers."

Cliff Dwellings in Morocco.—Cliff dwellings are found in great numbers in Morocco while similar habitations have been seen from the time of their first construction. These dwellings in all particulars are like those found in Arizona and New Mexico on this continent of the western hemisphere. The dwellers speak of them as follows: "Until last year the Moors would permit any examination of the cliff dwellings which have long been known to exist some days' journey south of the strange city of Fez. The people who live in these dwellings is almost exactly like some of those in New Mexico and other Territorial states whom we have explored. The dwellings were dug out of the solid rock, and many of them are over two stories high, being feet above the bottom of the valley. The face of the cliff is, in places, perpendicular; and it is believed that the Mohammedans could have reached their dwellings only with the aid of rope-ladders. Some of the dwellings contain three rooms the largest of which are about seventeen by ten feet; the walls of the larger rooms are generally stained by smoke and windows. Nothing is known as to those cave-dwellers."


2. Extract from a lecture before the students of the Royal Academy by Professor Stoclet.

The American Architect and Building News

BOSTON ARCHITECTURAL CLUB.

The Boston Architectural Club held its fortnightly conversations Thursday evening, February 28, at the club-rooms, 6 Hamilton Place, and the subject was possible to be found their being dry; next day he inserted unseen a bowl of water, and shortly afterwards the fire-king burst open the door, half seared to death.

The recesses round the lacunae, i.e., in the thickness of the wall, are paved and lined with white marble slabs, and have seats. One that remains looks like a water-bath, though I saw no exit, but some believe that they were seats, as Count Sturgis, 450 decoration place. As many as I was not so likely to get heat enough in the room; for they must have been hotter, as, in addition to the hanging-floor, the walls were lined with fine-pipes. In Fliny the Younger's letter to Romanus he tells that a night effect, with some effect, was change; and some slaves, was trammed to death by his servants, who "threw him upon the burning pavement of the hot-bath to try if there was any remaining charm ."

Many think that the Roman method of bathing is still adhered to in the East. I can give you my experience of bathing in one of those in Cairo, and I trust that the ancient Roman ones were not so offensive to the sense of smell.

I was first ushered into a vast hall, lit by a lantern, with a raised seat for the bath-keeper and a baldachino over the coffee-stove, with a fountain in the middle of the hall. The whole hall was gorgeously painted, and had towels drying on the die-beams, which the attendants hung up and took down by means of long bamboo poles. A little above the main floor were a series of carpeted compartments, each big enough for one bath. Here I was undressed and were permitted to walk in cloths, while my interpreter folded up my clothes and tied them up in a sheet. I was then led by an attendant across the hall to a dark passage, and a small room, where I undressed, and I was gradually moved from room to room, on a malachite, and of which was hotter than the last, until I was taken into a lighted room, with a central peristyle. In the middle of which was a large marble tank, and with steps running the width of the room. The walls were lined white marble, inlaid with colored ones in patterns; the domed portico of the peristyle were plastered and lit by star-shaped openings, several in each dome, the space between each arch and the wall being open.

Within the marble margin of the bath was a gutter. I was laid down at the side of it, rubbed with a horseshoe glove, and then soaped over and scoured with a sort of artificial sponge, composed of dried grass resembling diminutive bamboo. I was then washed by hot water being poured over me from a large copper cup, and when this was done, rising was the first step, with the legs in the water, which was nearly scalding. I was then led to sit lower and lower, till I was up to my middle; the attendant then went into the bath, caught hold of my hands, and jumped me into the hot water, and put my head under it several times. I was taken back by the passage into another darkish room, where two marble basins, projecting from the wall, were running over with hot and cold water; water was drawn over me from a cup at first hot, afterwards tepid, and at last quite cold, and I was then led back to the place where I undressed. I was then dry-shampooed, and every joint in my body cracked, including my back, with care and sideways.

The Egyptians had their heads shaved, their beards combed, their nails cut, and their feet rasped. After my dry-shampooing I was covered up, laid on a cushion, given a cup of black coffee, and narghile. I felt quite refreshed and ready for dinner, though I had started at 2 a.m. that day, and been up the big Pyramid and into the King and Queen's chamber, and had a long ride back.

As I am now proficient enough about the exercises, and all I can tell you about the method of bathing, I will go back to the plan.

YOUNG MEN'S CHRISTIAN ASSOCIATION, NEW YORK.

THE Library Committee of the Young Men's Christian Association of New York invited, on Washington's Birthday, the architects and students of the architectural schools of the city, to an exhibition of books contained in their library, on architecture and the decorative arts. The exhibit was from 11 to 5, and during those hours several hundred visited the library. Much surprise was expressed at the very rich and valuable collection of the committee, and partial display of the books could be made, as the capacity of the tables was not sufficient for all. The library contains about 800 volumes, in two sections exhibited: 450 in the line of architecture, of which upwards of 80 are folio and quarto volumes, and 118 volumes of folios in the decorative arts.

The collection embraces works on architecture by Pugin, Alberti, Galléch, Guerin, and many other leading architects. Among the number is the complete work of Pugin, with contributions Brinton, Daly, Hickman; and on decoration by Frigiot, Berlot, Anulea, Claessens, Dresser, Duy, Jacobstahl ("La Grammatik der Ornamente") Léonard, Daly, Gerloch, Pugin, Shaw, Adrovet. There is a crop knowledge enough about the exercises, and all I can tell you about the method of bathing, I will go back to the plan.

BOSTON ARCHITECTURAL CLUB.

The Boston Architectural Club held its fortnightly conversations Thursday evening, February 28, at the club-rooms, 6 Hamilton Place. The subject of the evening was "Architectural Travelling in Europe."

Mr. Peabody read notes of his travels in England. Mr. Newton traced the best routes through Spain, indicating where to depart from the usual paths to advantage.

Mr. Andrews described the various changes and influences in the architecture of Athens and Olympia, and pointed out where they are the most clearly distinguished, leaving to the student the choice of the localities appealing to his individual taste.

Mr. Bacon described the more convenient ways of reaching Athens and Olympia, and Mr. Walker dwelt at some length on Italy and what to see there.

The discussion was closed by Mr. Blackall who gave some details of his travels and experiences, etc.

The water-color exhibition by members of the Club closed February 27, and was well attended.

The principal exhibitors were: E. C. Calcutt, F. H. Bacon, C. H. Walker, Ross Turner, R. A. Cram, R. G. Sterlings, and included sketches abroad and many drawings of local interest.

RESOLUTIONS OF RESPECT TO THE LATE H. M. BLAKE.

Whereas, in the ineradicable ways of an all-wise Providence, our Superintendent has been removed from us by sudden death, we, associated with him, desiring to express our deep sympathy with his wife and family in their affliction, do unite in this expression of our warm regard for him, and deeply regret his death.

Words are inadequate to express our sorrow, and language cannot console in this sad bereavement, but we cannot refrain from some expression, and so convey this, our sympathy, as best we can. May He "Who doth all things well" have ever in His keeping the children and children left behind, and raise up many and warm friends who will care for the widow and fatherless.

Therefore, resolved, that a copy of the above resolutions, adopted at a meeting of the employers of the late Howard M. Blake, be forwarded to his family and near relatives, and that they be inserted in the Boston Herald and American Architect.

D. W. Gray.

For the employes of the deceased.

IN MEMORIAM.

JAMES HOWARD SPRUCANE, a young architect of Philadelphia, who recently won a prize in a competition at the Philadelphi a Chapter, A. I. A., died at Denver, Colorado, February 22, in his twenty-third year. He was buried from the residence of his parents, James W. and Fannie C. Sprucane, near Smyrna, Delaware, on Thursday, February 28, at 1 p.m.

FEES ON PARTY-WALLS.

KANSAS CITY, Mo., February 21, 1889.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—If an architect contracts with a client to furnish general specifications, specifications and details for a store building at the usual rate per cent on the cost of the completed building, on one or both sides of which is a party-wall in place, one-half of which is expected will be used and paid for by the client, is it usual and customary to include the value of each half of party-walls in the cost of the completed building in computing the architect's fees when it is not specifically mentioned in the contract? Can you cite any legal decision in which the architect is allowed for the value of party-walls in arriving at the amount of his fees? If you will do me the favor to answer, it may be of interest to others in the profession.

Yours truly,

A. V. B.

[It is usual, so far as we know, to pay architects commission on the portion of the party-wall acquired by their clients; but I do not think there is any recorded decision on the subject.—Eds. American Architect.]

THE CHURCH ORGAN AT LIBAT, RUSSIA.

A correspondent of La Science et la Famille says that the organ to be placed in the church at Libat, Russia, there is an organ which occupies the whole width of the church, about 80 feet, and which has 111 registers, 8,000 pipes, and 14 bellows of large size. It has the organ itself, about 24 feet long, in the middle. The largest pipe is formed of planks 3 inches thick and 31 feet in length, and has a section of 7 square inches and weighs 1,640 pounds. Besides the 111 registers, there are 21 accessory stops that permit of combining various parts of the instrument without having direct recourse to the registers. By this pneumatic control, the people the four harpsichords and obtain surprising results. —Exchange.
Vandalism in Florence. - "Onida," in a second letter to the London Times in regard to recent atrocities perpetrated in Florence under the pretense of improvements, says:

"Every one knows the great hall of the Cinque Cento in the Communal Palace, where of old 1,000 deputies could meet in the name of the Republic. Lonely, in the middle of the court-yard of Vasari there is to be seen, at this present moment a common painted wooden partition, cutting the mighty chamber in two. The old government has altered the designs and programmes of the rival engineers and architects who aspire to attain the eternal infamy of destroying and reconstructing the centre of Florence. The cheap and common wooden boarding, the poor and paltry drawings and perspectives, side by side with the superb frescos under the glorious ceiling and the superb archway, beside the statues of Leo V and X and the Bande Neri, with the white majestic form of Savonarola fronting them, are an apt and curious symbol of the mean and tawdry tastes of modern life, contrasted with the stern and splendid achievements of the past. No juxtaposition of dignity and impudence was ever more distinctly displayed than in this infortunato exhibition of the municipal projects of to-day in the great hall of the Palazzo Vecchio. The most innocent of proportion—nay, even, the smallest spice of that tumor for which our forefathers were so generous, to them which it belongs. The projects for the demolition of Florence should have been exhibited anywhere sooner than at the Palazzo Vecchio, where the very shields on the walls, the very lilies and crosses of stone, seem to cry out against them.

"Once we were lone, and then we fought. Now we are sheep, and we only follow," said an Italian statesman and the day. It is sadly true. The rage for imitation—imitation of all the most trivial and destruc- tive temper of modernity—possesses Italy in the persons of its municipalities. That these cities, as we are beginning to realize in any sense to represent the better part of public feeling is certain; you will probably find that your London Council will not do so either. Election by vote has brought into the councils a political revolution as strong as that the best men stand aloof from submitting to its coarse struggles and its questionings. In your conclusion, to draw your own opinion, that none except Italians born on the soil have a right to treat of Italian matters. Gregorovius has defined its duty (as it was to pose in the past) when universalizing for all our purposes, in which it was his fate to do it. Florence was life (Landor's), because he loved her unspeakably. The city does not now think as does a Florentine, with a Florentine sense of the soil in Savonarola than he would see one in any of the shameless contractors and architects hungering for her ruin, or in the rapacious lawyers and speculators who would break up the Venetian活得 into rubble, and melt down the Perseus into copper money, willingly, if they could.

TUNNELLING THE NORTH AND EAST RIVERS, NEW YORK. — Two years ago Mr. Charles M. Schwab, of Chicago, for a great system of tunnels under New York City and the East and North rivers, connecting the city with the suburban points. Little at- traction has been there to the proposal, but an examination of the plan leaves no reasonable doubt that the city will ratify the proposal. The city hall will extend from the City Hall in New York to Fleetwood Park on the north, under Brooklyn to Cony Island on the east, and under Jersey City to Newark. There will be four tracks. Freight and passengers will be carried. The passengers trains will run at full express speed. Elevators will convey freight and passengers between the main and the laterals, and a bridge will connect the main tunnel with the City Hall in New York. The plan can be carried out without the expenditure of $3,000,000 in capital. The system will be completed in about five years and yield about $2,000,000 annually. The company will be organized under the laws of the state of New York. The company has purchased the property, and the tunnel will be ready for work in about two years. The city of New York will pay $50,000,000 for the right of way and the tunnels, and the company will afterward carry on the work under the direction of the city council.

Circus Water-wheel. - There is a water-wheel in use at Bow- donham, Me., which is probably the only one of its kind in existence. It is used for grinding grain in a village of 150 inhabitants, and at high tide; the spades are wide and set diagonally, like the vanes of a windmill, and the draughts are made by tide-water, running one with the flow, the other with the ebb. With one foot fall of the tide this wheel gives about fifty horse-power. - Commercial Advertiser.

TRADE SURVEY.
The exterior of this house is stained with CABOT'S CREOSOTE STAIN for Shingles, Fences, Clapboards Etc

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply.

Our Stains contain no water and are the only exterior Stains that do not contain kerosene.

PRICES are 40, 60 and 75 cents per Gallon according to Color.

SEND for Samples on Wood, and Circulars.

SAMUEL CABOT,
70 KILBY ST. BOSTON, MASS.
Door-Knocker

from the Ueberbroicher Architektur-Werke

Change II.

KNOCKERS.
MARCH 16, 1889.
Entered at the Post-Office at Boston as second-class matter.

SUMMARY:


BUILDERS' HARDWARE. —XXI.

ILLUSTRATIONS:

House of Dr. W. B. Parker, Marlborough St., Boston, Mass. — A New Work. — The Old Lenox, Va.—Interior of St. Mark's, Venice. — The Mission Church, Santa Barbara, Cal. — An Old California House. — Court of an Athenaeum House at Los Angeles, Cal.

CHAPTERS FROM THE HISTORY OF CARPENTRY AND JOINERY.

COMMUNICATIONS:

Mottos.

NOTES AND CLIPPING.

TRADE SURVEYS.

ACCORDING to the New York Sun, the competition for the New York Episcopal Cathedral will be decided before this paper is in the hands of our readers. We do not think it quite certain of the accuracy of the Sun's information on such subjects, and the account which it gives of the way in which the best designs are to be selected has a rather improbable air, but, as the contest really seems to have closed for the present, we will permit ourselves to make a few remarks upon some of the circumstances that have attended it. In the first place, the "literary bureau" has, to our mind, been altogether too prominent ever since the designs were sent in. Mr. Russell Sturgis' well-meant and interesting description of his idea of a great cathedral, which was published before the drawings were sent in, and thus escapes any imputation of having been circulated "pendente lite," seems to have served as the text, or rather, as the excuse, for a number of others, which, however innocent the intentions of their authors may have been, are certainly open to that reproach. The variety of these incursions seems to have been as admirable as the elegance with which the opinions contained in them were advocated. One author advised the Trustees, in the most earnest manner, that the "Gothic style was dead, never to be revived," an announcement which will, we imagine, be news to a good many architects, as well as to the Trustees, and Mr. Sturgis' another that the Byzantine style was the only one which had any claim to consideration for an important American building. In fact, several people had this idea about the Byzantine style, but their notions varied as to what the style consisted in. One writer was sure that, to be architecturally valuable, the Cathedral should be arranged like a Greek church, forming a cross of four equal arms on plan. This disposition, he thought, was not only more truly Byzantine than any other, but it afforded peculiar facilities for gathering a large congregation about a preacher placed in the centre. It did not escape the penetration of this author that "no good many Episcopalians do not think that the only object of going to church is to hear preaching," but he contrived to head off unfavorable criticism from such persons by explaining that while a few "Ritualists" might not like a church devoted wholly to congregational purposes, they formed only a small and insignificant portion of the Episcopal communion, and, besides, he considered their views were not the views they wanted them. Another essayist, while he thought, like the others, that the Byzantine was the only style admissible, considered that even this would not make the church what it should be unless the design comprised a tower four hundred feet high. A fifth believed that nothing but a round-arched design should be thought of, but it might be either Byzantine or Renaissance, and there were advantages in the Renaissance; while a sixth was sure that the Renaissance, of which he mentioned St. Peter's, at Rome, as a conspicuous example, was the only style that would suit the Bishop of New York. All these confined the treatment of the different parts of the building, and took the different methods of treatment which were extravagantly lauded in one newspaper or another, and it is hardly necessary to say that, to architects, all the arguments and considerations brought forward were purely rubbish. If they had been of any value, the proper time to advance them would have been six months ago, when the competitors were getting their ideas into shape, and a suggestion that was good for anything would have been welcome; but, coming after all the designs had been sent in, and nothing remained but to judge them, some of them, at least, had no air of attempting anything original, or at least, which was very disagreeable. In a shabby, second-rate contest, like that for the Boston State-House, where the gulls of the penny-a-liners reinforced to an amazing degree the pencils of the draughtsmen, such things are, perhaps, to be expected; but even in Boston the services of the newspapers were not called in until after the entries had reached their judgment, and the affair had gone for decision into the hands of the members of the Legislature, who were presumed to be vulnerable to arguments at which an expert would only laugh.

NEW and important question has come up among the trades-unions. For some time the annual transfer of skilled mechanics from this country to England, and vice versa, has been increasing, until it has come to threaten seriously the power of the Union leaders. Some time ago, when the walking-delegates of certain trades saw fit to keep their subjects alive and well, while they drew good salaries for talking nonsense, or worse, a considerable number of the victims of this arrangement quietly slipped across the water, and went to work at their trades where they need not fear being denounced to their Union. The second and very dear point is this: if it be proper that they repeated the experiment, taking others with them, and the Union discipline has, in consequence, now lost its terrors for many of the more enterprising working members. On the other hand, members of foreign trades-unions about the same time discovered the advantage of a reciprocal arrangement of the kind, and it is becoming a very common practice for English, Irish and Scotch stone-cutters, masons, and carpenters to come over to New York in the spring, spend the summer in working at their trades, without asking leave of any one, and go back in the autumn, with their pockets full of American money, to work in England through the winter, when there would be no employment for them here. A reporter of the Philadelphia Call recently made some inquiries about the matter in that city, and found that nearly all the trades were more or less affected by the competition of the foreign workmen. The Union officers were unanimous in the opinion that the "evil" was increasing, and that "heroic remedies" were necessary. What their "heroic remedy" will consist in remains to be seen, but some indication may be found in the resolution which was passed at the Convention of the National Association of Stone-cutters, held the other day, which provided for the members "should not be employed in Europe for more than five years." If such a rule should be enforced, the American workmen would lose the last prospect of escape from the tyranny of delegates which now remains open to them. This, from the Union point of view, would be a great gain, but there seemed to be an idea in the Convention that, if the resolution was passed, the foreign unions would take similar action, and workmen on both sides of the water would be held captive, for fear that they might interfere with each other's monopoly.

THE British Architect publishes a short article on stone-carving, which we hope may be the introduction to a more extended discussion of this very important subject. The writer of the article had, it seems, met a man who had once been a stone-carver, but who had abandoned his profession on account of the difficulties and annoyances connected with it, for which reason he considered that it was a trade not for the weak. According to him, there are plenty of skilful and artistic carvers to be had, but they get such poor pay, and are treated with so little deference, that they have become discouraged, and either leave the business, or, we suppose, console them-selves with the knowledge that they often make fifteen shillings a foot for their labor, and often "drove up in hansom to their work, and worked only three or four days in the week." Then, also, the carvers did not have to use their brains (if they possessed any, which we should say was doubtful in the case of men who went to their work in carriages),
but did all their carving from models, previously prepared by some one else. Unfortunately, through the machinations of architects, the price of carving is now reduced to twelve shillings a foot, and the men who do it are compelled, like the architects themselves, to work six days in the week in order to get a living. This is the reason, we are told, why the work is done so badly. If architects want good carving on their buildings, the way to get it is to make a contract directly with a carver, for a certainty of money, and allow him time to do it in, construct a warm and comfortable enclosure for him, and treat him with great deference and politeness. We hope architects will lay this advice to heart. While it may not be perfectly obvious why the work of a man who devotes his whole week to the practice of his profession, to four days of getting drunk, should be so much superior to that of people who keep steadily at their task, it is plain that men work better who have a reasonable amount of comfort about them, and if the carvers are too fay to get this for themselves, they might as well expect the architect as any one else to provide it for them. As every service on one side, however, implies a corresponding obligation on the other, we hope it is not too much to expect one thing from the persons for whom the architect is to do so much; that, is, that they should know something of business. Supposing, there would be no difficulty in having all necessary facilities provided, and a proper price paid, for anything like such carving as they wish to see on their buildings; but in the great majority of cases English and American architectural carving is simply a disgracement to the building to which it is applied, for the architect's principal object being to get it as quickly, and with as little elaboration to its ugliness, as possible. Even if it is good, the more quickly it is done the better, and the elegant and well-paid leisure which seems to be so dear to the carver, signifies to the architect the ruin of the effectiveness of his carving by sand-papering and smoothing. This is the real reason why architects who care about the carving on their buildings always want it done rapidly. The examples that they have in mind, the medieval and early Renaissance details, were done very quickly and cheaply. Perhaps the most conspicuous of all these illustrations is the Inness, the capitals at the Castle of Chambord, are known to have cost twenty cents apiece, and it is hard to give up the hope that by limiting the time that a good carver is allowed to devote to the work, he may be forced into the brilliant and effective style of the early sculpture. That the hope is a delusive one most experienced architects know. A few carvers can work effectively with a toothed-chisel and a drill, but they are very few, and even their skill is almost always limited to a set of stock forms, outside of which they are helpless. At present, in most little cities, a part of their business, once existed seems to be disappearing, under the influence of the gigantic academies which, by the authority of Rovelli, apparently, do duty for Romanesque detail. To produce such things there is no need of taste, power of design or knowledge of nature, and those aids to architectural sculpture will probably remain dormant until some change in the fashion shall bring them again into activity. When this happens, we hope the change may be a complete one. Before our architecture can take its place as an art worthy of a great people, it must include beautiful and original sculptured detail. This it has never had, and never will have, until a school of architectural sculpture shall be founded, in which shall be taught, not the art of keeping up a genteel appearance, or of dawdling four days out of the seven, but that of composing and representing natural forms, art in which no one has yet reached perfection.

DESCRIPTION of the arrangements for producing and distributing force at the Paris Exhibition is given in Le Moniteur. The arrangement will hardly do harm to the exhibitors of these boilers for the supply of one hundred and twenty thousand pounds of steam per hour, to be used not only in the various engines, large and small, which are to be shown in motion, but for other purposes where steam is required. The main engines, which propel the great lines of counter-shafts from which all the small machines not having motive force in themselves take their power, are thirty-two in number. Two of these are American, one from Sweet, of Syracuse, and one, of a hundred horse-power, from Brown, of Pittsburgh, and these with the power of furnishing the American part of the exhibit of machinery. We venture to say that our countrymen will have no reason to be ashamed of the way in which the service is rendered; but they will not be entirely dependent on these, an arrangement having been made by which a part of the great counter-shafts, although ordinarily independent of the rest, can be coupled by means of a sleeve to the neighboring section on either side, so that the movement is kept up, even though the action of its own propelling-engine is suspended. Power enough is kept in reserve, also, for such a contingency. A contract has been made with the exhibitors of the engines for the regular supply of twenty-six hundred horse-power at the counter-shafts, but the engines are amply able to supply double that quantity if required, and a price has been agreed upon at which extra power may be had from any engine. As steam is supplied to the engines, the cost of the power is, of course, only that of oil and attendance, with a certain amount for wear and tear, and interest on the value of the plant. This seems to have been closely calculated by the owners of the engines, and a uniform contract has been made with all of them, by which they agree to furnish the twenty-six hundred horse-power fixed as the normal requirement, dividing the amount among themselves, in proportion to the capacity of their engines, at eight dollars per horse-power for the one hundred and eighty days that the exhibition is intended to last, and for seven hours each day. If extra power is required, a part of the usual stipulated charge for the engine itself is supplied at six-tenths of a mill per horse-power per hour, and, if the duration of the exhibition should be prolonged, the price of power is to be one mill per horse-power per hour. The counter-shafts are arranged in four lines through the building, their total length being a little over a mile. As with everything else, a contract has been made for the erection and use of these shafts, including supervision and oiling, at something less than thirteen dollars for the intended duration of the exhibition for each metre in length of shaft. If more than seven hours' service per day is required, the charge is doubled for the time at which the increased work is necessary, and for every day of prolongation of the exhibition the price per metre per day of seven hours is to be eight cents. To give suitable facilities for supplying the boilers with water and the engines with steam, and for carrying off the condensed water from the exhausts, if that should be required, a subway has been built, in which run three pipes. One of these, two feet in diameter, carries cold water to the boilers from the Seine; another, of the same diameter, serves as principal steam-main, and the third conveys the condensed water to the central works. The central works, the first, contains a group of smaller pipes, and branches extend to the various engines, the whole length of subway being about a mile.

The foreign papers have a good deal to say about Signor Bottaneto, the winner of the first prize in the competition for the completion of the Cathedral of Milan, and the author of the design adopted for execution. He is, as it seems, a very young man, being only twenty-four or five years old, and it is naturally his immediate triumph that is now in view. A few years ago he was a student at the Higher Technical School at Milan, being maintained there, if we are not mistaken, by the town of Siena, his native place. While at the school he was under the instruction of Professor Beltrami, also one of the favored architects for the Cathedral of Milan, and pupil of the master's ideas. On leaving the school, three years ago, he competed for a travelling-scholarship offered by the town of Siena and won it, and the Cathedral competition being just at that time announced, he resolved to devote his tour to the study of cathedral architecture, with a view to entering the competition. The success of his efforts has made him famous throughout the civilized world, and nothing remains but the execution of the work, which we hope will not be long delayed, to place him among the foremost architects of the century. So early an entrant has his work that of Professor Beltrami, and both of his projects were very much alike, both of them having devoted themselves to the production of an elaborate façade, following the outline of the building behind it, without any addition of towers or screen-work. Professor Beltrami, indeed, placed a detached campanile by the side of his design, but this was rather an independent suggestion than a part of the design.
BUILDERS' HARDWARE.—XX1.

FRONT-DOOR LOCKS.

The greatest amount of care and ingenuity has been expended upon the locks which are used for the front-doors of dwelling-houses, and the largest degree of complication is usually found in these goods. They afford, generally speaking, a greater security against picking than do the locks which are employed for inside-doors.

The conditions of an outside-door lock are that it shall have two sets of mechanisms operated by keys, to move either bolt or latch at will, and shall have the knob-spindle so arranged that the latch can be moved by turning either knob, and that the outside knob can be made immovable, while the inner one is free to move.

Front-doors are usually two inches or more thick, and the lock can consequently be made quite thick, so as to permit of multiplication of the levers, and a stronger mechanism than for inside-doors. A front-door lock should always have an anti-friction strike.

Figure 317 shows a form of front-door lock manufactured by P. & F. Corbin. This is fitted with an anti-friction strike, and has four levers each for the lock and the night-latch. The follow is in two pieces. When the small catch on the face-plate over the latch is shoved to one side, the lever, A, is moved so as to fit in a slot on the side of the outside follow, as shown by the figure, thus holding the follow, and with it the outside-knob and spindle, so they cannot be moved. The night-key operates by first lifting the levers B, and by moving the lever, C, which carries back with it the latch-bolt. Figure 318 is a form of rebated-door lock by the same manu-

facturers. It is inserted here merely to show the manner in which mortise-locks are fitted to a rebated-door.

Figure 319 illustrates a front-door lock manufactured by Russell & Erwin. The levers on the locking-bolt, A, are attached to the bolt, and move with it, not being particularly proof against picking, however. In operating the night-latch, the levers B are pushed to one side until the gatings are on a line to permit the post, C, to pass, the post forming part of a bent lever, the end of which shows at D, which portion acts directly against E, and so draws back the latch. In order to secure the outside knob, the catch on the face-plate is pushed up, throwing the slots on the lever F, F over a shoulder on the outside-follow.

Figure 320 is another front-door lock by the same manufacturers.

Figure 321 is a very excellent lock manufactured by J. B. Shannon & Sons, so arranged that the knob comes between the night-latch and the lock-bolt. It will be noticed that the levers and the posts are notched in the same manner as was explained for some of the dead-bolts. The latch is moved by means of a lever, A, under the upper set of levers, A being attached to the latch-bolt. This is a very secure lock.

Figure 322 shows a variety of the "Niles" front-door lock, which is quite simple in its arrangement. The latch is worked by the lever A.

A very simple but efficient lock is shown by Figure 323.

The latch-key works through a curtain, A, raising the levers until the post, B, and with it the plate C and the latch can be drawn back. This lock is made in the "New York" style, with a single follow, intended to receive the spindle of the inside-knob.

Figures 324 and 325 illustrate two styles of front-door locks by the Hopkins & Dickinson Manufacturing Company. The former is rather a light lock, the latch being strong and heavy, and fitted with five levers to both latch and lock.

Figure 326 shows one of the best of the front-door locks,
the "Standard," by the Yale & Towne Manufacturing Company. There are three steel levers for both the latch and the lock. The night-key pushes the levers B to one side and moves the bent piece A, which forces back the latch-bolt. The tongue, C, which locks the outside-knob, is pushed in or out by the buttons on the face-plate. It is not intended to use this lock with a swivel-spindle, but when the knob is locked by the tongue C, a spindle and cam at D serve to throw back the latch from the inside of the door. The arrangement of the levers B is defective in this lock, in that they will not work should the springs give out. Levers which act by gravity, as well as with springs, would seem to be more suitable.

The lock represented by Figure 327, is one of "Robinson's" best make, being sold, with the corresponding vestibule lock, at $14 per set. It is a hand-made lock, all the mechanism being of brass. In the examples previously considered, there have been two sets of levers to each lock. In this case, however, there is but one, the holes for the night-latch and the dead-lock key being side by side. The shape of the levers will explain the arrangements, two sets of gatings and rackings being cut on each. The dead-lock key acts against the edges at A. B is the post on the bolt-tail, which passes through the gatings in the ordinary manner. The night-key acts against the edges C. The post D is attached to a sliding-plate, working between the levers and the dead-bolt tail. The lever E is pivoted to this plate and also to the lock-case. When the levers are raised so as to allow the post D to enter the ratch-ings, the plate and the lever E are drawn back together at the same time as the latch. The follow is made double, to permit of swivel-spindles, and the outside is locked by the arm F.

The latch has a very easy spring, the follows being stiffened by a spring beneath G. Hall manufactures a front-door lock almost exactly like Figure 327, but with his peculiar anti-friction strike.

(To be continued.)
ARCHITECTURAL SHADES AND SHADOWS.\(^1\) - II.

CHAPTER II. - GEOMETRICAL CONSIDERATIONS.

16. We have already observed that that part of the surface of any opaque body which receives light from the source of light incident upon it is in light; the unlighted part is said to be in shade, and the mathematical line separating the two is called the line of shade. That portion of space lying behind the object, and from which the rays which it emits cross that line, is evidently produced by the intersection of the surface on which it falls (sometimes called the surface of incidence) with the invisible shadow. The latter is, in the case of a sphere, for example, a solid circular cone, whose base is semi-infinite. If the surface of incidence is a plane, its intersection with this cylinder must be bounded by a circle or ellipse, which is therefore always the form of the shadow of a sphere upon a plane (Fig. 12).

17. The form of a cast shadow is evidently that produced by the intersection of the surface on which it falls and the incident light. It is of course apparent that the shadow is always the form of a solid upon a plane of the same size. For example, if a plane be incident on the surface of a solid, the form of the shadow on the plane is evidently the form of the solid. But we shall consider this shadow of a surface to be the form of a solid only in so far as it is the true form of the shadow of a solid, and to the extent of its being the true form of the geometrical solid which may be formed from it. The true shadow of a plane always shows the true form of the plane, but in the case of a solid we must consider that the shadow is formed by the intersection of the incident light with the surface of the solid, and not with the form of the solid.

18. Now if we imagine the body that casts the shadow to be infinitely small—in other words a point—its cylinder of invisible shadow becomes a mere line, and its cast shadow is reduced to a point. The shadow-in-space of a line is a surface whose elements are the invisible shadows of all the points composing the line; its cast shadow is a line composed of the cast shadows of all these points. Returning now to our illuminated sphere, it is easy to perceive that every point of its line of shade casts a shadow which is a point of the outline of shadow of the sphere. This outline of shadow depends therefore wholly upon the line of incidence of its form upon any given plane of incidence, and is true of the shadow-in-space whose surface is composed of the invisible shadows of all the points of the same line of shade. This is very important to note, for it reduces the whole problem of geometrography to the finding of the shadows of lines of shade. No matter how irregular or complicated the surface of an object may be, its form need concern us no further than is necessary for ascertaining the line of shade. When the shadow of this line is found, the problem is solved. Thus the sphere shown in Figure 12, may be disengaged out of all recognition, as in Figure 13, yet if the line of shade is not touched but remains still in the circle, the cast shadow will remain unchanged, a circle or ellipse. The problems of the surface, though constantly in movement, there is no question of the shadows of surfaces or solids, but only of the shadows of lines. Even the problem of finding the shadow of a point is solved by finding the shadows of any two lines passing through it.

20. The line of shade of any solid or surface is a line passing through all the points at which the rays of light are tangent to the surface. Find and draw this line, and you have the solution of a problem of pure descriptive geometry which will be fully discussed later. But in the case of many solids composed of geometric elements it can be at once determined, by observation of the nature of these geometric elements and their relation to the light. Thus the line of shade of a sphere in any position is a great circle perpendicular to the rays of light. The line of shade of a cylinder is composed of the two opposite half-circles of the cylinder and the two rectilinear elements of the cylinder joining them (Fig. 14). So of a parallelepiped, the line of shade is evidently, in most positions, composed of six lines, viz.; two adjacent edges of each base, and the two parallel edges connecting them (Fig. 15). In case of any finite solid, the line of shade must be a continuous and complete figure.

21. The case of plane figures offers some peculiarities worth noticing. We shall at once discard the ray of light, and analyze them as having two sides or faces, and edges of infinitesimal thickness, or in other words, as very thin discs.

a. When such a disc has a normal direction to the light, one face is light, the other dark; the whole edge or perimeter becomes its line of shade, having a cylindrical surface for its invisible shadow and a figure for its cast shadow (Figure 16, A). When it is inclined to the rays of light, a part of its edge is light and the other dark, and the short elements separating these two portions, form part of the line of shade, their shadows being those of straight lines connecting the cast shadows of the two opposite half-perimeters which complete the line of shade (id. B). But in the true plane figure these become mere points, important only as the rays passing through them mark extreme points of the whole shadow.

b. When such a disc is in a plane parallel to the direction of the light (i.e., a plane one of whose elements is parallel to the rays of light) the only light it receives is on its edge, part of which is in light and part in shade, separated from each other both by the elements of the edge where the rays are tangent to it, and by the two faces of the disc, which are in shearing light, and in reality a part of the "line" of shade (id. C). In a real plane figure such an anomaly; these two faces are shadows; the lighted edge, like the shaded edge, becomes a mathematical line, and the short elements that divide them are mere points; hence the whole figure is its own line of shade; the invisible shadow is a plane coinciding with that of the figure itself, and its cast shadow a line or figure lying in that plane; a right line, indeed, where the surface of incidence is a plane. The short elements, or, that divide the light and the dark edge are significant points, their shadows being the extremities of the shadow of the figure.

c. When the figure is irregular, these points of tangency may be numerous, with shadows sometimes falling upon the edge of the figure itself, and sometimes outside of it (id. D). All these considerations are extremely important, as they form the foundation of the "Method of Slicing" to be described in a future chapter, by which the shade and shadow of any geometrical solid may be ascertained.

22. The following maxims resume the preceding considerations:

VII. The invisible shadow of a point is a line, and its cast shadow a point.

a. The invisible shadow of a line or figure is a surface, and its cast shadow a line or figure.

b. The invisible shadow of a right line is a plane, and its cast

---

\(^1\) By A. D. P. Hamlin, Instructor in Architecture in the School of Mines, Columbia College. Continued from page 90, No. 6.

\(^2\) Lunar eclipses are caused by the moon's entering the invisible shadow of the earth, so that the illuminated side of the moon is partly or wholly covered by the earth's vernal shadow. They can only be witnessed by persons on the side of the earth that is on shade. I. e., at night.

\(^3\) A cylindrical surface in geometry is a surface generated by the movement parallel to itself of a right line, not necessarily in a circle, but along a path or directrix which may be any curve. The circular cylinder is only a special form of cylindrical surface.
shadow a right line when cast upon a plane. In all other cases it is a plane figure, lying in the plane determined by the line itself and the rays passing through it; that is, in the plane of invisible shadow.

IX. a. The invisible shadow of a plane figure is a surface, cylindrical or prismatical, and its cast shadow a figure, except when the figure lies in a plane parallel to the light.

b. In this case its invisible shadow is a plane, coinciding with that of the figure. Its cast shadow is a figure lying in the same plane, and, when cast upon a plane, a right line.

e. The shadow of a solid is the shadow of its line of shade.

23. We are now prepared to take up those considerations especially relating to architectural shadows and shadows. Attention has already been called to the precise and conventional treatment in architectural drawings of the phenomena of intensity of light, shade and shadow, as well as of those relations to the direction of the light (4). The former have been treated with some fulness; the direction of the luminous rays remains to be considered.1

24. In accordance with universal practice, the direction of the light in architectural drawings is assumed to be that of a line inclined downward to the right and towards the picture at such an angle that its projections are inclined at 45° to the ground-line (ar, a', Figure 17). This is the direction of one of the diagonals of a cube whose faces are respectively parallel and perpendicular to the planes of projection, and which we shall hereafter frequently refer to as a "principal cube." For in the cube shown, a'a' (Figure 18), which is situated, the projections of the diagonal from the left-hand upper corner ar to the lower right-hand farther corner ce are diagonals of the squares which represent the cube, and, therefore, inclined at 45° to ed, e'd' and GL. But this, as already remarked, is the assumed direction of the light.

25. This angle of 45° is the projection of the real angle made by the ray with either plane of projection, or, in other words, the angle made by the diagonal of a cube with any of its faces, all of which is equally inclined. This is evident from an inspection of the figure, bearing in mind the fact that the angle of inclination of a line to a plane is always measured in a plane normal to the latter.

Now, if we take the side of a square as unity, its diagonal will be measured by \( \sqrt{2} \), (1.4142), and the diagonal of the cube constructed upon this square by \( \sqrt{3} \), (1.732). The angle between this diagonal and either face of the cube will then be the angle whose tangent is \( \frac{\sqrt{2}}{1} \), or \( \arctan 1 \), which is the natural tangent of 45° 15', very nearly. This angle is easily constructed at any point of a line, as C (Figure 20), by the following process: Erect at C a perpendicular of convenient length, CD, and complete the square CDEF. Draw CE and revolve it down upon AB; E becomes E'. Now complete the rectangle CDGE and draw CO; GCE will be the angle required. CE and CE' being respectively equal to the side and diagonal of the square of CD. A pasteboard triangle similar to GCE will, however, save the trouble of geometrically constructing the angle C. 26. The three sides of such a triangle, corresponding respectively to the edges of a cube, the diagonals of its faces and its own diagonal hold, therefore, to each other the simple and easily-remembered relation of \( \sqrt{3} : \sqrt{2} : \sqrt{1} \). When the base (instead of the short side) equals unity, the short side is equal to \( \sqrt{2} \) or \( \sqrt{2} \) and the hypotenuse to \( \sqrt{3} \). When the hypotenuse equals unity, the short side equals \( \sqrt{3} \) or \( \sqrt{2} \) and the base \( \frac{\sqrt{3}}{2} \) or \( \frac{\sqrt{2}}{2} \).

27. Hereafter the angle 35° 15' will in these papers be called the angle \( \theta \). The square constructed upon a given line as its side will be called the square of the line, and its diagonal the diagonal of the line. The latter term will also be used, when necessary, as a measure of length, the diagonal of a line being equal to the line multiplied by \( \sqrt{2} \).

28. The advantages of taking the light at this angle can be indicated here only in part. Chief among them is the fact that the widths of the shadows cast by architectural features become thereby true measures of the amount of relief or projection of these features from the surface of incidence. Consequently, horizontal and vertical architectural members projecting or retracted equally from a vertical wall or other surface, as the jamb and lintel of a door, cast shadows of equal width upon it, which can only happen when the light falls at an angle whose vertical projection is 45°. In all other cases the widths of the shadows are wholly misleading as indications of the amount of relief or projection (Figure 22). The incident advantage derived from the use of the 45° triangle alike for the horizontal and vertical projections of the ray is by no means an unimportant consideration.

We are now fully equipped for the encounter with the problems of architectural seicography. The next chapter will discuss the general method.

Note. Figure I (1) represents in perspective a portion of two planes of projection commonly employed in descriptive geometry. HP is the horizontal, and VP the vertical plane, and their intersection, GL, is the ground-line. Let A and B be two points in space; a and b are their horizontal, and a' and b' their vertical projections. \( \overline{ab} \) and \( \overline{ab'} \) are the projections of the line in space, AB. The lines dropped from a point in space to its projections on either plane are called projecting lines (\( \overline{AD}, \overline{AB}, \overline{BD}, \overline{BD} \)) ; they are normal to these planes, and are themselves projected as lines perpendicular to GL (\( \overline{ac}, \overline{ab}, \overline{bb}, \overline{bb} \)). The projecting-lines of all points in a straight line to a plane of projection collectively form a projecting-plane.

1 In the discussion of this topic and those that follow, the reader is supposed to be familiar with the rudiments of descriptive geometry. Those who desire to refresh their memories in regard to such rudiments as are necessary for understanding these discussions will find them in a note at the end of this chapter, embodied in the form of maxims, for whose demonstration they are referred to the textbooks on the subject.
An old-time California home.
perpendicular to the plane of projection. In descriptive geometry the two planes of projection are represented as opened apart, so to speak, so as to coincide with the plane of the paper, being separated by the line GL, as shown in Fig. I. Lines and points in space are designated by capital letters, their projections by small letters.

1. The two projections of a point are points lying on the same straight line.

2. The projections on either plane of projections of parallel lines are parallel. Conversely, lines whose projections in both planes are respectively parallel are parallel to each other. In Figure II, ab, cd', and ed, cd' or projections of parallel lines, AB and CD'. But EF and GH are not parallel because their vertical projections ef and gh' are not parallel.

3. If a line or plane figure is parallel to a plane of projection, its projection is perpendicular to the plane of projection, and vice versa.

4. If a line is perpendicular to one plane of projection it is parallel to the other. Its projection on the former is a point; on the latter it is a line perpendicular to GL.

5. Every imaginable plane must cut one or both planes of projection in a line or lines called traces. (a) If a plane V is parallel to both planes of projection its traces ds and t are equal and parallel to GL and coincide with the traces of its own plane (see 6). If a plane figure is parallel to one plane of projection but oblique to the other, its projection on the former is a right line coinciding with the corresponding trace of its own plane (6), but its other projection is neither similar nor parallel to the figure. Thus a circle is parallel to VP and oblique to VP has for its horizontal projection the right line ab, while its vertical projection is the ellipse ab'.

(To be continued.)

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSE OF DR. W. B. PARKER, MARLBOROUGH ST., BOSTON, MASS. MESSRS. BARTWELL & RICHARDSON, ARCHITECTS, BOSTON, MASS.

[Galley Print, issued only with the Imperial Edition.]

THE LURAY INN, LURAY, VA. MR. GEORGE T. PEARSON, ARCHITECT, PHILADELPHIA, PA.

This illustration shows the building as recently enlarged.

INTERIOR OF ST. MARK'S, VENICE, AFTER AN Etching by OTTO BACHER.

THE MISSION CHURCH, SANTA BARBARA, CAL. — AN OLD CALIFORNIA HOUSE. — COURT-YARD OF AN ADUOE HOUSE AT LOS ANGELES, CAL. SKETCHED BY MR. J. G. HOWARD, CHELMSFORD, MASS.

No Sunday Opening for the Metropolitan Museum of Fine Art.—The interest that is felt in the proposition to open the Metropolitan Museum of Art to the public on Sundays is not confined to the progressive citizen of New York. People of all descriptions in all parts of the country are equally interested in the matter, and one of them has recently taken a very emphatic course to show how thoroughly he believes the thing ought to be done. In recent conversation with one of the Trustees of the Museum upon the question, Mr. W. T. Walters of Baltimore, was given to understand that the principal reason why the Museum was not opened on Sundays was that it would cost $2,000 a year in addition to the present expenses of maintenance to do so. Mr. Walters upon his return home at once inclosed his check for $10,000 to the Board of Trustees, and wrote an accompanying letter, saying that the contribution was to be used in defraying the cost of keeping the Museum open on Sundays to the general public for five years. The matter was submitted to the consideration of the Board, and after consultation the check was returned, with the statement that the Board could not afford to accept the proposition. They were afraid of alienating strong support from the institution. — *New York Times*.
BETWEEN the decline of the Roman Empire and the tenth century there is a long and dark period, when little peaceful as well as warlike achievements are on record. There is left nothing for us to consider to-night. After this comes the period known as the Middle Ages, which may be roughly described as beginning a little before the First Crusade, and continuing to the Reformations. We have here a time in our own country, and the same is true of the time which followed it— the modern period. England (in the practical, London) will chiefly illustrate this history for us, though we must refer to Continental woodwork also.

There is not much builders' work of any sort except the most sturdily which has come down to us from the time of our Saxon kings, but there is— or was ten years ago—a small ancient timber church at Greatstead, in Essex, near Ongar, of which Sir Gilbert Scott gives a description in his lectures. He says that the foundation stone can be traced back to A.D. 1013, which is more than fifty years anterior to the Norman Conquest. The structure is composed of chest oak trees, grooved and tenoned together by their edges, and let into grooves in horizontal heads and sills. The exterior of the trees was exposed on the outside of the church, the sapwood of which having long since perished, the burrowed and gnarled heart is now seen, presenting a most ancient and interesting appearance. It has been repaired, but I trust that its antiquity has not been compromised.

The Norman Conquest placed this country at the disposal of a race of very energetic and clever invaders, who were builders, sailors and shipbuilders. In every part of England Norman churches and castles, and in the great previous monasteries such as were formerly found in the country, the timber-spires of the monks rose up. It is the Compendium of carpentry which the Norman has left us, and the roofs of these buildings required the skill of the carpenter, and some of the roofs— such, for example, as that over the nave of Peterborough Cathedral— were of not inconsiderable span, and carried a flat wooden ceiling. As Gothic architecture gradually developed, the roofs, timber-spires and floors, and the internal woodwork of churches and other buildings improved; though it must be admitted that, with our present notions and habits, we should have considered the carpenters of those early times clumsy; and it is impossible to deny that some of the earlier roofs of which the framing still remains are unscientific. The most important works of the carpenter are timber roofs. I had the honor of giving a lecture on this subject in 1885, and as many of you may have heard that lecture, and all can consult it in the building journals, I shall make my reference to this branch of the subject very brief, pointing out, however, that the early carpenters used very large timbers, placed very close together, and of oak or chestnut, so that their structure was not easily changed; although, after the appearance of the tie-beam, woodwork was so skillfully managed that the wooden fabric could be easily changed and adapted to the needs of the day.

I had to point out in that lecture how the use of a tie-beam was early abandoned, and a collar substituted as roofs became more steep; how in various ways curved ties, ribs and struts were introduced; and how the whole is called a wall-piece, which, it was always customary to use, was made to project inwards, and was supported by braces and groused by steps which can be traced in a succession of English church-roofs. Still it became that peculiarly English feature, the hammer-beam. The finest specimen of the hammer-beam roof is that over Westminster-Hall, dating from A.D. 1397. The peculiarities of English roof carpentry, when at its best, are well illustrated in this roof. They may be pointed out as the use of the hammer-beam; the use of vertical and horizontal main timbers within the lines of the principal rafters, to the almost total exclusion of raking struts or braces—keeping all horizontal ties high up; the introduction of curved ribs and struts as in so many ways to give an arched form to the majority of the trusses, even in the framework with small bars. In several respects these peculiarities are not those to be met with in modern roofs, but it must not be forgotten that the earlier material was then excellently made and pinned, so that the timbers were far more rigid when framed together than ours.

One can, looking at the saddle roof without feeling that, as a work of fine art executed in carpentry, it is one of the most successful that have come down to us. The roof really is Westminster-Hall, and nowhere have we an example of carpentry so thoroughly architectural.

Among the causes of its success, we must reckon the excellence of the lines of the truss and the regular repetition of truss after truss. Of repetition in the framework is one of the acknowledged sources of architectural effect, but this framework is not only obviously sturdily, but it is full of beauty. The great curved ridges of the old hammer-beams, that very species of masonry known as those hammer-beams—each of these is a striking feature, and its force is intensified by its being repeated again and again down the whole length of the roof, and by the skill with which the openings are framed where the dormer lights occur. In smaller, and perhaps in simpler, roofs, all these sources of beauty may, to some extent, be found, but nowhere else are they so satisfied as in the hammer-beams. The spectator is not, doubt, heightened by the great span of the hall, and the almost colossal scale on which the work has been done.

The hammer-beams all serve to support the rafters of the roof, and for an account of other hammer-beam roofs, especially the singularly beautiful one which spans the Middle Temple hall, I propose to ask you to consider, for a little, timber-built dwelling-houses, a subject of small interest.

In France there still remained till the early part of this century, and may linger yet occasionally, half-timbered houses dating from the sixteenth century. One of these is described and illustrated in Vedel-Dauc's "Dictionary." It is a small three-storied house fronting the street, with side walls of masonry, which are corbelled out just to the level of the first floor. The front wall is formed of large heavy timbers, framed together, and with more or less comparatively narrow spaces that they have filled-in with plastering.

The first floor overhangs the ground-floor, but the second floor is planned over the first. This was the level of the hall. The front of the house is divided into three segments and partly semicircular, and cut out of the solid wood. The timbers are most elaborately mortised and tenoned together, the framing being much like that employed in joinery or shipbuilding than like carpenters' work.

From the thirteenth to the sixteenth century half-timbered work was freely employed in France in house-building, and the timbers are less in size, more numerous in size, and are framed together, and where enriched the moldings are truly worked. In these timber-framed structures we may, if we find, see well carved out the structure which we have described in the timber carpentry in joinery; namely, that wherever the timbers met and were framed together, whether they were halved or were mortised and tenoned, they were (in the English Conquest) to be accurately stopped or made to run out to the face. There is thus as much wood as possible at the shoulders to the mortises and tenons, and the strength is kept for the places where it is most wanted.

It is almost impossible that any one could study that each story overhangs the one below it, and at the top there is either a gable with a finely worked barge-board, or, less frequently, an eaves-gutter and a roof, usually broken by one or more dormer-windows.

In the general treatment there was a tendency for the timbers to be lighter as time went on, otherwise the changes in mode of framing, etc., were not great, except that in later examples you will find more ornamental braces and arches, and the grooves carved in the enriched barge-boards and the doors of doorways and windows, partook always of the character of the moulding and carving in general use at the time.

It is specially characteristic of French timber-built houses that the plates into which the overlapping joints are pinned are almost always beautiful; if not moulded, they are finely carved (where those features occur) have curved timbers, so combined with their barge-boards as to give a distinctly arched appearance to that frontage.

England timber-built houses dating from before the fifteenth century are very scarce; we have some of that century, more of the sixteenth, and still more of the seventeenth; nor did the change in character which we call the Renaissance, very radically affect our timber houses.

Had it not been that they all perished in the Great Fire, we should have, not only, but still many examples of timber buildings in London; as it is, I can only point you to two. The most accessible specimen is on the south side of Holborn, nearly opposite Gray's Inn Road, where the gabled fronts of several houses, modernized, are on the ground-floor, retaining the kind of picturesque which caused this ancient Company of Carpenters to hold at one time the
most important position of any of the London companies that had to do with the construction of this magnificent building. A timber-built house was what is now called half-timbered. It had a low plinth or foundation of masonry. The fabric of its walls consisted of laths or small strips of timber placed close together, reticulated and plastered. The spaces between these timbers were filled with brickwork or more often lathed and plastered. Occasionally they were filled with tiles, and sometimes with woodwork, or even the whole boarded over.

A great many small masonry houses were constructed in this manner in the North of England, where a series of fine old half-timbered houses remaining in Cheshire and Lancashire may serve as a basis for comparison. The dates of the most famous examples belong to the sixteenth century, or are near it. Thus, out of a list of thirty-eight, I find seven to belong to the fifteenth century, the earliest date being 1460, and nine to belong to the seventeenth century, the latest date being 1648, but the remaining twenty-two are sixteenth century. It is astonishing to note how small the difference in date is between so many examples, and how without exception these homely, but very striking, houses are of two short stories only. The upper story usually overhangs, but not in a very marked way. The gables are never of a sharp pitch. The roofs are mostly finished by having a bargeboard, which is usually without finials, pendants, or carving. The walls and gables are constructed of strong timbers, well-framed together and pinned at the joints; the many timbers were arranged in angular spaces between them filled-in with plastering kept quite white, so that the contrast is striking. There seem to be two schemes of arrangement for the timbers, but both occur sometimes in the same building. One is to have the timbers mostly upright, fixed very little more than their own width apart, and with a few horizontal timbers hardly breaking the monotonous surface of the wall; the other is to have the timbers arranged in one course of upright timbers and many horizontal joists, and again the other course of upright timbers and many horizontal joists, so that the timbers are placed alternately. The timbers are, however, often fastened together with drawing, as, and the framing is of moderate dimensions. The panels are always of

Following the plan I have before adopted, let us consider for a moment the carpenter engaged upon these timber-framed houses as an artist and his work. Very few houses, for instance, are more richly and handsomely decorated than those which were built in the fourteenth and fifteenth centuries; but the greater number of picturesque beauty, and the greater number of houses are, perhaps, at their best in the sixteenth century, when the building and framing is of moderate dimensions. The panels are always of
The seasoning is It was believe, make e., cut two-story sincerely louses very the England be combination and Gothic century, more, by squareness of termed, cloth as 130 t. styles, a not generally the work, earlier, the best we at the point, plant are, now examined with the usual point, where are, now examined with the usual. It is, or fully ornamented to tend to be square, as the ornament of a Gothic window, being the squareness of the stone, and being, as generally, all the main lines of the ornament are square, to make the room of a building appear as square as possible. Perhaps no example within reach will give you so good an idea of what was accomplished when Gothic was employed as the ornament of the Bayeux tapestry. The little contrast that exists between the real Abbey and the 'work executed at the time when Gothic architecture was about to give way to the new style, and as florid and ornate as possible. From these considerations, however, of even highly ornamental Gothic joiners' work is decisively dignified, if not severe. The squareness and regularity of the leading lines, the frequency of the panels and the smallness of the moldings all contribute to produce this effect. Much modern joinery has been done from designs made by men who thoroughly understand the old, and, for our purpose, some few are of interest. Sometimes it is called the severe quality of Gothic joinery, I think you may go to the Law Courts, from Mr. Street's designs, where you will see in the wainscot fittings of the courts and other parts the style of the thirteenth century has been well preserved. If we are to have an exact reproduction of the richest joiners' work of the fifteenth century, I would ask you to go to the Houses of Parliament, especially in Westminster Hall. The paneling there is an extent for which only a national work of this sort affords the opportunity. The joiner's work, like that of the carpenter, was affected by the hired of taste at the Renaissance, and was, I think, earlier more completely transformed than the mason's and carpenter's work. It is not an unusual thing to see in an Elizabethan manor-house, where the general forms retain a great deal of Gothic character, paneling in the hall and staircase of thorough Classic design, and possibly a screen in woodwork (such, for example, as the one at Audley End), where imitations of Italian pilasters, columns, arches, and so forth, are executed in wood cheaply enough, and with excellent effect of their kind, but of a character entirely and totally different from that which a screen executed a century earlier, or even fifty years ago. I have seen some good work, indeed, between the roof of the Middle Temple hall and the wooden screen thrown across the lower end of the hall to cut off a corner of the room, and which might call Transitional, the screen almost complete Renaissance.

The best specimens of English joinery after the sixteenth century are those largely indebted to the art of the carver for their effectiveness. St. Paul's Cathedral and both in the stalls and the woollen work of the library, and, though the carving there is a miracle of skill and richness, and certainly combines consistently with the masonry of the stalls, and with the stalls of joiners' work, or as good artistically, as any similar piece of good Gothic stall-work; and I am quite sure that the general run of Renaissance joiners' work is less constructive, less thoroughly designed, and I believe, to most tastes, less pleasing and interesting than the Gothic. Between the medieval and the revived Classic, or, as it might be termed, the imported Italian, there is a great borderland, where work known as Elizabethan, Jacobean or Queen Anne occurs, both in joinery for domestic purposes and in furniture. More than one of the lectures of this course seems likely to touch a little upon this, and it may be a reason, if we can find a way to work this paper as it was given to the economy of material rather than economy of labor.

The other point, the care with which the joiner of the Middle Ages regarded his work, especially when the wood joints come, can hardly have escaped the notice of any practical men in my audience who have examined a piece of old framing, and it affects the design quite as much as the construction.

The modern joiner also is a framemaker in this sense. He is, or, if not both, at least one, and that one usually the one in which the mortise is cut, should be square. Consequently, in such a piece as we are considering, if there are many mortises and chamfers, they are stopped before the point where each rail is framed. In much Gothic paneling, therefore, the sides that enclose each panel are somewhat similar in the shape of the point (the bottom of the rail) is moulded, but the bottom of the panel, i.e., the top edge of the lower rail, is very often ovaled; and the system which we are all familiar with, of moldings round a panel and the smallness of the moldings all contribute to produce this effect; nor was it the practice to plant moldings on as we now often do, or to make use of the projecting moldings, called projection moldings. This is as good a way of checking a pattern from the framework of a modern panel in appearance. The panel also sometimes differed; it was often enriched by carving on it an ornament in relief. This ornament was very often what is known as a 'woodenorum', a design which is generally the groundwork of the panel of the piece of wood—a chapter which is particularly new—of special interest for this hall, and, I sincerely trust, of vital importance to the craft.

By the liberality of one of its members—Mr. Harben, a member of the society, and a gentleman who would encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.

The prizes offered this first year are a first series, and there is a prospect that they will be carried farther in the future if the subscribers and orators of the society are willing to encourage the Company by assisting us to make this movement a success. I appeal to you and to every designer, carver, and high-class workman, who, may have been aware that it is to 130 the British and foreign workmen, and will to encourage us to make the Company's work, and to encourage us to make it a new departure. For this Company it is a privilege, and no small responsibility, to be called to administer this gift through a series of years.
In closing these remarks, and with them this lecture, I have only to express the hope that there shall be a very healthy and active competition for each of these Harbin prizes, and my conviction that to win any of them is likely to do good to the successful competitor by bringing him into notice. The judges will award no prize if they are satisfied with the work, and will not be devious, so far as I can foresee their intentions, to admit or pass anything that is bad or indifferent. In the construction examinations a very high standard will be kept for the last year’s work will be maintained this year; and there is no reason why the same thing should not be done in the adjudication of the art prizes, and every reason why it should be done. To take a prize here will, therefore, be creditable and honor. As to the specimen of work—that is to say, something requiring good joinery and admiring good carving; and, of course, its merits will be judged as a piece of artistic design and draughtsmanship. Last, but not least, there is a prize for beginners in the art of carving in wood.

**The Uniform Building Contract.**

Mr. O. P. Hatfield in a letter published in the American Architect for March 2, suggests that if the architect is made the owner’s agent (as proposed by the “Standard Contract”) there will be no escape from the personal responsibility of the former for work ordered by him. We think that Mr. Hatfield, as well as the framers of the “Standard Contract,” misconceive the true relation of the architect to his client, and overlook the good work done by business principles and professional practice involved in an attempt to give the architect a power of attorney to order what he pleases. In special cases the owner would doubtless be willing to put his architect in as full charge of the work as his own; but ordinarily the idea would be rejected as soon as understood. We are aware of no relation in life where such a power is commonly given by a principal to a person he employs. Even an attorney-at-law has not the same power, or control, by his mere will. But we think that there is no ground for the suggestion that if the architect were the owner’s agent he would himself escape the danger of responsibility; as more fully set forth in the American Architect for February 25, 1889, there is, in our opinion, little room to doubt that the proposed “agency” of the architect would create more trouble than it would cure. Our correspondent invokes the authority of Professor Parsons in support of his views, and cites the limited agency; and quotes a provision from a form said to be contained in his “ Laws of Business.” Making the architect the agent of the owner for the purposes of superintending the work, the agent would have full power to order, and the power to order was expressly given by section three of the “standard form” as what he called “the right.” Moreover, the contract submitted to contain no such contract or any form of building contract whatever. Perhaps Mr. Hatfield’s friend had some English book in mind; English architects very generally insert some such clause in their contracts, though the practice is not purely English, but is rather the introductory chapter of Sir Edmund Beckett’s “Book on Building.”

We agree with Mr. Hatfield that a proper uniform contract blank would be extremely useful.

**The Lumber Dealers’ Demand for a New Lien Law.**

The joint judiciary committee of the Massachusetts Legislature has given the lumber dealers “leave to withdraw.” This ends the matter for this year at least.

**The Final Payment Clause in New York Contracts.**

Saville, N. Y. February 18, 1889.

Question.—Several years ago I had occasion to consult a lawyer in relation to the lien law in this State [New York].

I was advised that it was not necessary to insert the final payment clause until the time had expired in which liens could be filed. The lawyer said that it would be perfectly safe to write contracts for building in such a manner that the lien must be filed within a certain number of days after the work on the contract was finished. He claimed that it was the right of material-men and others who might be entitled to liens to know the terms of a contract (as to payments) under which they were furnishing material or labor and services, and it was possible that they must record liens before the time when payment is due. The substance of his advice was to the effect that so long as the owner made payments when the contract said that they should be made, the contractor was released from all responsibility for liens unless said liens were recorded before the time when the payment became due. From what you say about liens in your law department I infer that the above advice is not reliable, and I would like to know positively whether it is or not. In case the advice is sound of course it is not necessary to keep the contractor waiting three months for his last payment which a large number of contractors say he sometimes has to do, if your local department has been established for the discussion of questions of this nature, and I believe such a department will be of great service to business and construction, as it is sometimes difficult and expensive to get reliable information relating to building laws. Will you give me the law on this lien question without too much trouble? I think it would be useful to many architects, builders, etc., as well as to other firms.

Yours truly,

M. H. Green, Jr.

Answer.—In reply to the above inquiry it may be said with emphasis that it is not safe to pay all the contract money out before the last day for filing liens has elapsed. Wherever the mechanics’ lien attaches irrespective of the state of accounts between the owner and contractor, the danger of paying out all the money while it is still possible that liens may be filed is of course obvious: where, however, it is in New York, where the lien rights are protected as to payments made before the filing of the lien, there is a strong ground for the advice to the contrary; that the lien must not be filed before the three months have expired. But the New York law contains another provision which practically goes far to destroy this protection extended to the owner. Section two provides that if the owner “for the purpose of avoiding the provisions of this Act or in advance of the terms of any contract” pays the contractor, he shall be liable to the material-men to the extent of the monies thus paid. That is if the plaintiff in a lien suit can satisfy the jury that the money was not due from the defendant to the contractor at the time it was paid, the contractor is paid collusively, and the owner will have to pay the money over again. The owner has not only to face the well-understood danger that the jury will find for the less wealthy party to the action, irrespective of the weight of the evidence, but also laborers under the very serious disadvantage of having practically to prove that the contractor was legally entitled to the money at or before the time when it was paid. Now everybody knows that partial payments on a building contract are made in ninety-nine cases in a hundred before they are strictly due according to the terms of the contract. Some little thing has not been done, for the omission of which the owner may, if he choose, refuse to pay the contractor; but in most cases where the work is progressing satisfactorily he is perfectly willing to make the payment. Now in a lien case under the New York law the owner must be able to satisfy a jury that the money was strictly and legally due when it was paid.

It is to guard against the danger of not being able to prove that none of the contract money was paid before it was due, that it is expedient to hold a lien for all risk of its being litigation over, that is, until three months have elapsed since the expiration of the term.

As long as the contract is in being the owner is in favor of the owner as to guard him against the adverse verdict of a jury based on sympathy or a mistaken view of the evidence.

**COPROFANE MOTTOS.**

New York, N. Y., March 7, 1889.

To the Editors of The American Architect:

Dear Sirs,—Would you kindly mention a few pithy and suggestive mottos or maxims, English preferred, suitable for dining-hall and library? Have you any such ever appeared in previous issues of your paper?

Yours respectfully,

Emil Ginsburger.

[As English phrases such as “Let good digestion wait on appetite” are...
tyarded in the last degree we give below some which have not been so bad.

Les famez font des festins, et les saiges les mangent!

And the following is from 'Les Fables':

Majestat artis ingenioso largior, Venter. — Persius

Sic Caverna et Baccho fretus Vennus.

Soror venenatis ossa,

Confinata est de ratione mappis.

A book a is book although there is nothing in it. — Byron

In the spring quarters of the globe, who reads the American book?

Sydney Smith.

Books cannot always please, however good. — Orpheus

Things are never so far out of sight. — Shakespeare.

E. M. AMERICAN ARCHITECT.
The exterior of this house is stained with CABOT'S CREOSOTE STAIN for Shingles, Fences, Clapboards Etc.

These Stains are very durable and give a much more artistic effect than paint. While they are cheaper, and very easy to apply.

Our Stains contain no water and are the only exterior Stains that do not contain kerosene.

Prices are 40, 60 and 75 cents per Gallon according to Color.

Send for Samples on Wood, and Circulars.

SAMUEL CAbot
70 KILBY ST. BOSTON, MASS.
HALF-TIMBERED HOUSES.
MARCH 23, 1889.

Entered at the Post-Office at Boston as second-class matter.

CONTENTS

Summary:
The European Method of Procuring Designs for Public Buildings, the Crushing Strength of Brickwork.—The Albany Assembly-Chamber Ceiling.—Coroner's Verdict on the Hartford Hotel Accident.—The Owings' Building Accident. 

Contents:

III.

Letter from New York.

Letter from Chicago.

Letter from Canada.

Illustrations:

Entrance to the Young Men's Christian Association Building, Albany, N. Y.—Gothic Spires and Towers, Plate 41. — The Age of Friars I, Plates 3 and 4. — Proposed Hotel, Ringsville. — Brompton Oratory, Boston, Mass.—A Fountain, Jativa, Spain. — House at Rochester, N. Y.

Letter from London.

Letter from Paris.

The Governor Gallery.

Architectural Evolution. II.

Building Law.

Societies.

Communication.

Boulder-Walls.

Notes and Clippings.

Trade Surveys.

PROFESSOR EATON, of New Haven, has done the public a service in calling its attention to the advantages of having buildings, particularly public buildings, including monuments regarded as works of artistic impression they will make on the beholder. It is of little use for architects to make representations of that kind, as they are always supposed to do so selfish motives; but the opinion of a layman of position is sure to be received with interest and attention. Professor Eaton describes the early percussions which have been made for securing the best work that German artists are capable of in the memorial which is to be erected to the late Emperor William. As most of our readers know, a preliminary competition has been arranged, in which the choice of site, out of a number of available ones in Berlin, which are specified, is left to the competitor, as well as the method of treatment, whether architectural or sculptural, or both, and nearly all other matters except the scale on which the drawings or models shall be made. This preliminary competition is designed which the artists engaged seem to comprehend best the character and services of the late Emperor, and when that has been decided, a second competition is to settle what design shall be executed. The jury which will decide in both competitions is to be composed of experts, and the result is sure to be in the highest degree interesting and successful. Professor Eaton remarks that as the contest is to be confined to German artists, the French sculptors will lose the opportunity that they might otherwise have had, to gain an artistic triumph over the great rival nation. We are led by no means so sure that the French sculptors would have it easy victory over their antagonists across the Rhine, which is specified, is left to the competitor, as well as the method of treatment, whether architectural or sculptural, or both, and nearly all other matters except the scale on which the drawings or models shall be made. This preliminary competition is designed which the artists engaged seem to comprehend best the character and services of the late Emperor, and when that has been decided, a second competition is to settle what design shall be executed. The jury which will decide in both competitions is to be composed of experts, and the result is sure to be in the highest degree interesting and successful.

In combining sculpture and architecture the French are as yet unapproached, probably for the reason that with them a sculptor is an architect always work together, but for power of expressing sentiment by sculpture there is little to choose between the French and the Germans, when both are at their best. Strange as it may seem, would there be much to choose between either and the best Americans, if the latter had a chance to show what they could do. We say advisedly, that if Americans could be properly taught, encouraged by interest, in technical criticism, in place of the drill that most newspapers pour out over what they call "art," and kept employed on work that would rouse their interest and enthusiasm, they would equal, if they did not surpass, any civilized nation in the variety and elevation of their sentiment, the vividness of their impressions, and their power of expressing them. There is plenty of evidence that we possess already in this country heaven-born geniuses, capable of opening our eyes almost to a new life, if we would only give them an opportunity, but we never seem to find them, and we are never likely to find them until it occurs to some one that there may be a question about the correctness of the ordinary theory, that any one who can read and write is capable of judging of works of art, that the more thickly veiled and half-voiced a man is, the more likely he is to be a great sculptor. When some American shall take it into his head to have the inside or outside of his house adorned, as it would be in the Berlin residence of a German noble, with beautiful and touching sculpture, the beginning will have been made of a new step in American civilization. He would probably not get what he wanted for three or four dozen persons at present in this country who could furnish it; but if he successfully resisted the temptations that would be presented to him, to "let the job out by contract," or to have the work done in paper-mache, or in stamped zinc, or reproduced by a regular Chinese, he would be able to set the discretion to avoid the old stagers from Rome, and the belauded favorites of the society newspapers, who would seek his favor, he would at least put it into the head of some people who loved that sort of work to try to learn to do it well, in the hope of employment, and of making a good living at it, too. Better work in their own houses, and to look for persons to do it for them. By that simple process a demand for "art" would have been created which would find it easy to make an excellent leaf seven feet long could not supply, and sooner or later some one would be found who could do what was wanted, and thus furnish a point of departure for the next step. If the interest has already been general. General Mells, in the Pension Office at Washington, has introduced a terra-cotta frieze, or rather band, of historical subjects, which is not only interesting, but contains some beautiful work; several good pieces of interior sculpture are to be found in New York and Green, Ames, of Massachusetts, has a well-meant band of sculpture around his house in Boston, which, by the way, was put there at his own suggestion. The next thing is for others to do the same, on a smaller scale, if they wish. The size of the sculpture is nothing to its value, and in whatever part of the floor a foot square may find himself famous on account of it, if he will take pains to have it good, and put it where it can be seen. If the present generation did nothing but build rock-faced walls, with one small panel of such sculpture to each house, it would have prepared a sure foundation for the most brilliant architecture that the world has ever seen, and there is no way in which the preparation for such an architecture can be so well made.

PROF. IIA O. BAKER, of the University of Illinois, writes to the Clay-Worker a letter on the crushing-strength of brickwork, which is reprinted below, without any little comment. It seems that at the recent Convention of Brick-makers, one of the members expressed himself as being "provoked" at the "absurd ideas" commonly entertained in regard to the resistance of brickwork to crushing. During the discussion which followed on this same question, another member said that "a brick wall, laid in excellent mortar, two feet thick, and of ordinary brick, will stand its weight two hundred feet high," while a third referred to chimneys that had been built two or three hundred feet high. As these chimneys were, of course, built thick at the bottom and thin at the top, their height affords no indication whatever of the crushing strength upon the base; and the second speaker's impression, that a good brick wall would stand the pressure due to its own weight if built two hundred feet high, is far within the limit accepted by those "absurd" persons, the architects and engineers, who are normally allowed to assume a lower square foot on good brickwork, equivalent to the weight of a column of the same brickwork of uniform dimensions in plan, and about two hundred and sixty-eight feet high. Professor Baker, however, throws the usual data completely aside, and says that in some experiments made by himself brick piers in line-mote have resisted a pressure of one hundred and eight tons per square foot, while piers in Portland cement have stood one hundred and eighty tons per square foot. He asks whether "any one ever heard of brick masonry being crushed by any load brought upon it in an actual structure," and evidently thinks that the ordinary limit for crushing-strength of brickwork is set far too low. In regard to his question, whether any one ever heard of the actual failure of brickwork by crushing under the load brought upon it in a building, we can say at once that we have.

Some years ago a building fell in Denver, Colorado, under cir-
mstances which showed plainly that the failure was due to the
breaking of the safe brick that was supported the front above the first story. It is
true that the bricks, a sample of which was sent to us, were poor,
but the load on the wall, which we computed at the time, was
far less than that which Professor Baker’s testers sustained safely.
How many other cases of the kind there may have been we
cannot say, but our impression is that they have been tolerably
numerous. The former Superintendent of Buildings in New
York, Mr. Esterbrook, would not pass plans which showed
that the possible load on any pier or wall of brick exceeded
fifteen tons per square foot, which is about equivalent to Professor Baker’s result for
crushing, with a factor-of-safety of seven; and as a factor-of-
safety of six is commonly used for members subjected to
a crushing strain in buildings, and is specified by law as the
minimum in some places, we doubt whether, even on Professor
Baker’s results, the usual limit can under ordinary circumstances
be with prudence exceeded.

TIE investigation in regard to the Assembly Chamber
ceiling at Albany has been pressed with more zeal than at
any previous time, and should be exactly upon it, although
nothing will probably be discovered, the principal
actors in the affair have been made temporarily nervous, and
have scattered to parts unknown, taking their books with them.
The immediate cause of this ignominious flight appears to have
been the failure of the attempt to get experts to testify that
there was no ground for the report of the first commission.
One architect did, it is true, testify that he did not think there
was an unreasonable profit in the contract, but he did not say
what he considered an unreasonable profit; and, as another
expert said that the profit was some hundred and thirty-five
thousand, two hundred and seventy-four dollars and a half,
or just one hundred per cent, the contractor probably thought
that there might be persons who would consider that too much,
and that he had better withdraw himself from the public eye until
the unfortunate affair was blown over. Another reason, the
sudden fit of modesty is, perhaps, to be found in the fact that
when his examination before the committee had shown him that
he could neither frighten the committee, nor satisfy their
curiosity, by calm insolence, and that they were likely to take
with the New York press what he calls the “most extraordinary
step” of compelling him to show his books, he, or some one
else for him, made the mistake of having the books tampered
with, by alterations and interpolations, so as to conceal what
he had really done with the money. He forgot that there are
a hundred and fifteen false alarms in an average book for one who can detect a defect or a fraud in a piece
of construction, and the immediate exposure of the alterations
rendered him liable to questions which he preferred to avoid
answering. He seems, however, to have found a worthy suc-
cessor as a witness for the person of the sub-contractor, Mr.
Sullivan, who, when his time-keeper testified that the main beams in the
ceiling, instead of being of iron, as required by the spec-
fications and contract, were of wood, “explained” that “they
were lateral beams,” and “had to be of wood, as iron could not
have been affected by the heat.” It was said of one of the
architects, that “he could not have been used for the lateral beams as
well as any other part of the structure, but we must remember
that the persons principally concerned in the matter, instead of
regarding it from the architect’s standpoint, seem to have looked
only to the most efficient method of doing the worst possible
job for the largest amount of money; and from this point-of-
view the employment of iron would be less successful than that of
wood in places where the latter could be made to hang together.

THE cause of the disaster at Hartford, by which a hotel was
blown up in the middle of the night, and many persons
killed, is now definitely known to have been the fastening
down of the boiler at the Hartford House by one of the
engineers, probably with the knowledge of the other; and
both engineers have been held for trial on a charge of man-
slaughter. Although the building was proved to have been
weak and badly built, the verdict states that there is no
evidence that this contributed to the result, for the explosion
must have been violent enough to destroy any building, how-
ever strong; in which it occurred. It seems from the evidence
that some compound of fuel and powder had been made in a large
vessel placed on the roof of the house late in the evening, and the engineers found that a simple way of over-
coming the difficulty was to keep up a good fire during the
night. Sometimes the fire was too good, and the steam-
pressure ran up so high that the safety-valve blew open. This
stabilized the building; and the ingenious engineers then provided for the new danger by fastening down the safety-valve so that it could not blow open under any circumstances. How effectual their precaution was
the result showed. It would be interesting to know how many
steam-boats have safety-valves tied down, for fear they may blow open and make the owners
Prosecute the number is by no means inconsiderable.

Mr. CHARLES S. FROST, the architect of the Owings
Building, in Chicago, in which some of the floor-arches
fell a few weeks ago, writes to us that the account of
the matter in the daily papers, on which our comments were
based, was entirely erroneous, and that the total damage due to
the accident, which seems to have been caused by the in-
judicious handling of a heavy water-tank in the upper story,
did not exceed four hundred dollars. Mr. Frost adds that this
explanation was given by him personally to the investigating
committee, and their report states that the tank was
blown over by a violent explosion, the result of which was
the inability of the water-distributing system to perform
its function. The tank was on the roof of the building, and
the mechanism in the upper story communicated with it.

We heard an Englishman once inquire how much rent was
asked for a certain house in New York. The house was
tolerably moist, one, on a side street. He was told that the
rent then paid was eight to ten dollars a year. He
explained for having such a small house, considering the
situation, on the corner of a street, it was not
rare to pay five or six hundred dollars. The
landlord was requested to tell him, if possible,
the rent he charged; and the landlord, who
was a gentleman, said that he had heard of this
rent, and doubted whether the house was not
like such a rent, and he doubted whether even that would
fetch so much. To Americans it is a standing wonder how
English houses can be rented so cheaply, considering the fact
that building costs nearly or quite as much in England as here,
and that houses being built on ground-leases for the most part,
the interest on the value of the land, as well as a sinking-fund
for reimbursing the value of the building during the term of
the ground-lease, must be paid by the tenant. The
British Architect gives a description of some new houses now
offered for rent near the River Thames which
were so light and airy that the London
Yorkeremies. The houses in question stand in Bush Hill
Park, a large estate which has recently been improved by
building a number of picturesque houses surrounded
by gardens, in which the old trees on the estate have been
preserved. One of these houses originally
recessed porch with a tiled-floor, a drawing-room sixteen feet long
by thirteen and one-half feet wide, a dining-room fourteen feet
long by the same width as the drawing-room, a square hall,
with two rooky closets, a staircase having an oriel window
on the landing, a kitchen, scullery and coal-house, with two
chambers, bath and water-closet above, a roony garden in
front, and three thousand feet of land in the rear, rents for one
hundred and fifty dollars a year. Others, with larger rooms
and more chambers, and about twice as much land, are rented
for two hundred and fifty dollars, and some of intermediate
quality for two hundred dollars a year.
The American Architect and Building News, 185

MARCH 23, 1889.

EARTHQUAKES. I. — II.

THERE remains to be explained many of the peculiarities of earthquakes accompanied by a stiflial tempest, walls, and mudslides, which I shall call terramovements. These earthquakes are the most frequent, and it is perhaps the observation of these which suggested the theory advocated by Savart and others, with regard to these phenomena. From the farthest antiquity, moreover, atmospheric perturbations accompanying earthquakes have been remarked. It is narrated in the song of Deborah and Barak in the passage where it speaks of the people of Israel in the neighborhood of Sinai: "Descendere ex sepulcris et transire regiones Edom, terra mors est, caligiae ac nubes distillaverunt aqua."

In several psalms we also find analogous descriptions which, although written after the event, seem to be explanatory, and which, if true, might be explained by our theory. For example, the earth becomes a desert, the inhabitants of the land perish, and the whole zone is covered with a mist. It is to be noted that this theory of terrestrial vibrations with the meteorological perturbations which so often accompany the earthquake? Father Galli succeeds in doing this by means of a very ingenious comparison. He receives the wave, for example, as explained by Faraday, and fully confirmed by the experiments of Savart, to wit, that the powder of the lacopod is concentrated in little round balls upon the protruberances rather than along the nodal lines, because it is with these latter, which are called centers of motion, transported by little whirlwinds which are formed where the vibrations are strongest. It is only needful to apply this theory on a much greater scale, to understand how the vibrations of the ground can give birth to the local cyclones which ordinarily accompany earthquakes.

Certain other phenomena, also, have been noted, which seemed to appeal against the vibratory theory, but which the author has succeeded in explaining practically in a sense favorable to his theory. For example, after some earthquakes there have been found statues and even pyramids moved from their place; sometimes even entire buildings have been completely overturned. Now listen to the experiment to which Father Galli had recourse to explain these facts: He took a rope and one of the following: A long string, one end of which is fixed at a point of rest, the other end is released, and the string is observed as it stretches along itself. If released, the string is deflected in the form of a sine curve. Now, if the plane of the oscillating string is moved through a small angle and released, then the string vibrates along a small circle. This is an exact representation of the case of a wave in a liquid, as well as in a solid, such as a rope or a string. In that case, the wave is propagated along a circle, and arrives every time at the same point of the plane where it began. This phenomenon is true for all values of the angle 

In the actual state of things, what is the best means to follow to make habitations more safe in earthquake regions? The conclusions of Father Galli on this point are of capital importance for the study of the relations between architecture and construction, and in a few words are these: Observation has demonstrated that on the ground-floor shocks are not very easily perceptible. Nor is it probable that shocks are essentially vibratory, if the most intense, the most extended and consequently the most dangerous vibrations are those of the superficial layer, it must be inferred that the shock received through the walls is not easily transmitted to the ground which they enclose and that the foundations present a considerable resistance to the passage of the wave. If, then, a house should be entirely surrounded, at a little distance off, by a wall with deep foundations, very solid and well built, this protecting wall would absorb the violence of the shock and would suffer injury in place of the enclosed building. If, moreover, there should be a wall of massive form between this wall and the ground which supports the house, with the effect that the building would be almost entirely protected against vibration. In cities this system would certainly seem to be very expensive, but this would be a consideration which is not applicable to the buildings collected into one group. Besides, the question of expense disappears when it becomes really a question of protecting human life, and rendering it possible to build houses such as those which in these last years have had Andalusian and Liberty theatres. It is a question in short of constructing such harbors as shall shelter human habitations from terrestrial storms, and of protecting them by defensive walls, which always have the same function, an impenetrable barrier to the undulation of the ground, just as we construct harbors to protect our ships against the fury of the seas.

The principle of the stability of buildings laid down by Father Galli makes it impossible for a building to be overthrown; but what difference does that make? We have seen ships perish in port when the riot of the elements had reached such a degree of violence that it exceeded everything that human imagination had been able to foresee; but all the same, this has not afforded a reason for not building harbors for ships.

In any event, there is in this book of Father Galli's several ideas
RECENT EXHIBITIONS AND SALES.—FACILITIES NEW YORK OFFERED TO THE STUDENT. DRAWING CLASSES. READING.

We are at the height of the exhibition season, and nothing short of a daily chronicle would suffice to keep track of the noteworthy examples of painting, sculpture, brick-and-furnishings before our eyes.

The Museum Society’s display was a charming and novel manner this year by a brilliant costume ball. The hall was for the benefit of the Society of Decorative Art, and was a social and educational world—water-colorists offering their works of the Academy, all draped and ready for their own opening. The exhibition was above the average, and especially charming in effect from the drooping of the roses and the light—being chosen by Mr. North, the President of the Museum, who took the Evans price of $2900 for the most meritorious water-color exhibited, was deserving of its distinction.

The exhibitions and sales of the Stebbins collection, with good examples of modern French painters, the Hollis collection, with notable French landscape work, and three or four really good collections can only receive passing mention, though any of their depressions could.

The sale of the late F. C. Darley’s paintings and drawings was a vivid reminder of progress made. The Artists’ Fund was no more and no less interesting in other localities.

The monthly exhibitions of the Union League Club mark a departure that is full of interest. Besides the usual loan of pictures by the members, there was a contribution from their collections of rare specimens of portraits of special types. Last month was devoted, I believe, to sang-de-boeuf glasses, and this month there is a really beautiful exhibition of blue and white. Rare pieces have been loaned by Mr. Wallers of Baltimore, by gentlemen from Washington and Chicago, and Messrs. T. B. Clarke, Charles A. Dana, James A. Garland, and other well-known collectors of this city have contributed. It is really a revelation to such a wealth of rare and exquisitely beautiful examples brought out to illustrate a single small branch of art. Amongst the pictures, Frank Millet’s “Old New Amsterdam” interior pleased me most.

I have been asked to write about facilities New York offers a young and ambitious draughtsman for pursuing his studies after office-hours, and I am somewhat puzzled how to answer. There are and can be but few opportunities for systematic evening study, but there are unlimited opportunities for learning and development. The first thing for a young man ambitious to rise in his profession to do is to create a sympathetic atmosphere about himself, and so train his perceptions as to get the most good out of his surroundings.

When I went to Paris to enter the École des Beaux-Arts, I was somewhat prepared to adapt myself to the conditions there, for I had enthusiastic and appreciative friends who had been there before me. Presently my eyes settled upon a young fellow member of an atelier or studio, one of a group of thirty or forty students under the direction of a well-known architect, a brilliant young man, and then engaged upon one of the buildings I had counted upon this architect, upon the lectures or examinations, or upon the designs required under the programmes for my training, my time would have been wasted; and I say this not in depreciation of the school and its work, but rather for the contrary, to point out how much deeper than the mere courses of study is the real work done there. The students amongst whom I thus found myself, thrown lived in a miniature republic, an independent commune, with a body of traditions and unwritten laws, to which each must give loyal adherence or withdraw. Each member took rank according to his achievements in the common pursuit, and all outside considerations were, as possible, left in the rear, and form for one member to be appreciatively wealthier than another, and titles were not obtruded. One man, I remember, was known as the “Gassoway” on account of his ruffled hair, and it was over a year before I discovered that his real name was an historic one, and

that he was Vicomte. Our schooling disappointed me at first. Indeed, it was not until some time after I had returned to my own country that I fully understood all its advantages. The nomad, upon being introduced and going through a very few formalities, was sent through all the courses named, and protected from violent shocks. H. MERRE.
PROBABLY no one fact shows so plainly the rapid change here from a comparatively small city to a wealthy metropolis as the increasing number of social clubs, together with the rapid increase in the number of bars and ale houses of the older ones. There are now in Chicago fully twenty such associations in a most flourishing condition. Of this number probably one-half have clubhouse that belong to themselves, and during the past month one of the order of these social organizations has opened a new location—reputed the usual formality of a large reception. The building being finished and occupied, one is now able to examine it intelligently and pick out the points that do not appear to be in harmony with the usually accepted ideas of architectural composition.

The new house of the Standard Club is located at the corner of Michigan Boulevard and Twenty-fourth Street, and, according to the daily press, has cost over $100,000, exclusive of land. The two street fronts are faced with Bedford limestone of a greyish tone. This stone, while one of the cheaper stones in its market, is still one of the best. It almost goes without saying that the structure is "new face," for nearly the whole city — or the architectural portion of it, at least — seems to have gone crazy on this kind of work, and nothing is thought of but rough and jagged stone: here, indeed, some monstrosities have been put, but their comparative smallness is the result of the absence of carving (except one minute line near the top where it is scarcely visible) give to the whole building the general rodeo air.

If, as some claim, every building should by its exterior indicate what is its purpose, no one would be surprised if the public at large rarely guessed directly the end and aim that the buildings. A mere commercial-looking construction it is almost impossible to imagine: as for beauty of outline, as well talk of the beauty of outline of a dry-goods box, to which in shape it very nearly compares. But, having such a plain contour, why, at least, all comfort and consolation of a good cornice with its attendant shadow was denied, is something that seems incomprehensible; for in place of some good lines and projections one gets with the monotonous impression of it on the eye, completely clipped off, or else that one has stood the thick Ida of eventually putting on some more stories, without the expense of taking down any useless cornice since the coping stone (the only monuments of the old architecture) is now small, probably the most serious and silliest to the new story. The outline of the house being entirely devoid of artistic form, the effect of the structure could certainly have been greatly improved by some color effect, and an extremely careful study of the shapes and combinations of the openings. The former was certainly not even attempted, for the whole mass of the building (except a few buff terra-cotta panels under the windows) is an even color of the stones, and this idea has been made still more apparent by all the woodwork of the windows being painted the same general color as this facing, so that there is absolutely no relief, only a dead monotonous dull gray, and it is probably the only reason that one can use only one stone, a much happier result could, without question, have been obtained by a more careful study of the method of joining the stonework. Above the first story one can discover no study of the artistic idea, but in the second and third stories the courses of stone are so nearly, if not absolutely, alike as to add monotony to the already monotonous color. Again, the shapes and combinations of the openings are not entirely agreeable to the eye, semicircular and square-leaved windows alternate with each other, in the same story without any apparent reason for such changes, while large and small windows, some extending through two stories and others only one, do not give a harmonious effect to the general exterior.

The main entrance, which is at the side, is one of the best features of the building, being a generous arch with a fine sweep. Unfortunately, the interior of the vestibule was left rock-faced, and, as a natural result, the fitting of the woodwork of the door against this stone, though resulting in an irregular contour line, has not from an artistic point been what any one could call a success. The gas-fixture, both in this vestibule and at the sides of the entrance, are too insignificant and cheap to bear description, and, although the architects probably had nothing to do with their designing, it would certainly have been wise in them to have made arrangements for the one in the vestibule ceiling, so that it would have come in the centre of a panel, rather than in the middle of a moulding, as is now the case. The interior of the house is said to be extremely Shirley, both in color and material, and the decorations are of most serious nature, while, in fact, it was not so, as $500 will more than cover the cost of repairs. It was an accident that might have happened in any building of similar construction where workmen were careless, and not; however, such things happened at the opening of our buildings here without any notice being taken of it either by the daily or professional press, although the damage, certainly in one case, was probably much greater than it looked at first, as it did, on Sunday, the Monday morning papers gave this particular accident all the space possible, in order to "fill up" what is ordinarily the most dry and uninteresting issue of the whole week. Reporters were lifting around until late Sunday night, even routing some architects out of their beds to get their opinions — and they generally got them, though in more forcible than polite language. But, notwithstanding all the talk, probably not by a dozen architects took the trouble to go around to the building the next day to look at the debris.

PROPOSED ONTARIO PROVINCIAL ASSOCIATION OF ARCHITECTS. — THE EFFECTS ON ADJACENT LAND OF HEIGHTENING THE EMBANKMENT AT MONTREAL. — UNFINISHED BOOKS OF QUOTING PIECE OF LAND AT TORONTO AND MONTREAL. — THE TORONTO BOARD OF TRADE COMMISSION.

A VERY decided step has been taken within the last month by the Toronto Architectural Guild towards the establishment of the proposed Ontario Provincial Association of Architects. Draft by-laws have been prepared by an forward architect in the Province, with an invitation to attend a general convention on March 21 to discuss the subject and provide actual and definite means for the object in view. The invitation bears the expression that all the architects in each town or city will meet and go over the by-laws, with a view to expediting matters at the convention, so that from every place coming to the meeting may be prepared for the first extent. The Hamilton architects, so the papers announce, have already met, and are taking the matter up warmly. From Ottawa comes an expression decidedly in favor of the notion, and the promoters of the scheme have every hope of the convention being a great success. Some architects in Queens, of course, cannot share the benefits of an Ontario association, with the Toronto men would go further and get up a Dominion association, but that is quite out of the question. Montreal architects, who are decidedly in the majority, must learn to control their jealousies, and the English and French elements must amalgamate first before any such universal scheme could be promulgated.

A few months ago I saw an account of the works carried out by the Harbor Commissioners of Montreal in deepening the shipping-channel of the River St. Lawrence. Another engineering scheme is having more discussion, probably having a still wider and more important bearing than that. It is proposed to widen the street (Commissioner Street) that runs along face of city, riverwards, to an extent that will give an average width of ninety feet; to raise the present quay and wharves well above the level of the river; to get round the entire shore (as below, and entirely submerged every winter), and do away with the inclined roadways from the street to the quays; to build a parapet-wall to keep on the floods; and to construct an outer wall in the river closing the whole harbor.

Apart from the cost of the question, this great work as a whole cannot be carried out without a very careful investigation of the consequences likely to ensue. The first question is: Where will the water that usually occupies the space it is now proposed to fill up by raising the wharves and quays go to in the winter? As I have before stated, the river-level in the fall is so high that if the water can no longer spread itself out to the northward over the city of Montreal, it is likely to overflow the south shore to an extent far more serious than heretofore, and the villages of Lachine and Longueille will be inundated. There can be no doubt that the benefit of such a scheme would be immense to Montreal, and therefore the villages must, perhaps, go to the wall, but something must be done in the interest of the inhabitants to save them from sudden and overwhelming inundation. One night would
be sufficient to destroy the villages when the ice-dam gives way: the irresistible torrent of water, laden with tons of ice in blocks, would sweep the south shore clean. However, the engineers who have the matter in hand are not likely to do much rushing rash.

With the prospect of an early spring, the building trades are brightening up, and there seems to be every prospect of a considerable amount of work being begun as the frost comes out of the ground. Usually the first of April is the day by which excavating work can be commenced, but, with the short winter and the lack of the usual amount of frost, such work will in all probability be started a fortnight earlier this year. The value of real estate seems to be steadily on the increase. Prices are rising rapidly, and new property has recently been put into the market. New districts, as they are called, are going up very high prices. The rapidity with which Toronto is increasing in area is something astonishing, ordinary suburbs being annexed, and neighboring districts being laid out for building estates north, east, west, and south of Montreal is less favorably situated for such extension, owing to the “mountain” which bounds the city to the north at a distance of only a mile-and-a-half from the river. But the class of choice to which Montreal belongs is so very different from that of Toronto that the two places cannot be compared by the same standard of prosperity. Montreal, with its older foundation, has many disadvantages in the way of old and narrow streets, such as those in Queen’s and Griffintown, and then, as the great port of the Dominion, its quays, wharves, docks and canal-basins, and the accompanying store and ware houses, mills and houses for factory owners, render improvement, except by a vast outlay of capital, difficult and almost impossible. Montreal can only spread itself out practically in one direction; namely, to the west, where Cote St. Antoine is a favorite suburb for private residences. At the other end of the city, in the two cities, that is not easily compared through real-estate reports unless the dimensions of the property sold are given, because in Montreal the price is so much per foot more on the land near the surface, or, in Montreal, the quoted per foot frontage. To speak of seventeen dollars a foot on St. James Street, Montreal, and four hundred dollars a foot on King Street, Toronto, is misleading to the uninitiated.

I note Messrs. James & James’s letter in reference to the criticism on their plans for the Toronto Board of Trade Building in my letter of last month. I will only add, in conclusion of my allusions to the matter, that my remarks were made without any bias in mind against them. I took the plans as they were before me, and made such criticism as they appeared to warrant.

[Contributors are requested to send with their drawings full and exact descriptions of the buildings, including a statement of cost.]

ENTRANCE TO THE YOUNG MEN’S CHRISTIAN ASSOCIATION BUILDING, ALBANY, N. Y. M. E. MESSRS. FULLER & WHEELER, ARCHITECTS, ALBANY, N. Y. (Hello-chrome, issued only with the Imperial Edition.)

Gothic Spires and Towers, Plate 41.—St. James’s, LOUTH, ENGLAND. (Issued only with the Imperial Edition.)

The Age of Francis I., Plates 3 and 4.—The Tourney Field, CHAMBORD; The Guard-Room, CHAMBORD. (Issued only with the Imperial Edition.)

Proposed Hotel, KINGSVILLE, ONT. MESSRS. MASON & RICE, ARCHITECTS, DETROIT, MICH.

Proposed Twelfth Baptist Church, BOSTON, MASS. MR. EUGENE C. FISHER, ARCHITECT, BOSTON, MASS.

A Fountain, JATIVA, SPAIN.

House for Carroll R. Bowen, Esq., ROCHESTER, N. Y. MR. THOMAS NOLAN, ARCHITECT, ROCHESTER, N. Y. [Illustrated.]

The Scholarship Prize-Winners.—The Architecture and Arts Features.—The Admiralty and War Office.—The Monument.

The Exhibition of Students’ Works submitted in competition for the various prizes, medals, etc., of the Royal Institute of British Architects, I think, on the whole hardly equal to that of last year. Some prizes have been more stubbornly fought for, and others have brought out less talent, but this is always the case with these competitions. The “Pugin” student is Mr. C. E. Mallows, who worked, I understand, a good deal with Mr. Penoll, of The Century fame. His drawings indicate a thorough acquaintance with the pencil, and a knowledge which he uses to great advantage of the way to obtain striking contrasts of light and shade; an all-important thing in a certain style of draughtsmanship. He was run very close by several of the competitors. The “Glissell” medal was not awarded. Mr. Lancaster’s charming color studies carried off the “Owen Jones” scholarship. He exhibited the sketches which he made while travelling in Italy last year as “Alcideino” student, and it is a noteworthy fact that success in a minor travelling-stipendium nearly always secures the winner a place in more important competitions, since he is about to spend the time that he uses in working out his studentship in preparing drawings for another. But this by the way, Mr. Lancaster’s drawings are as good as any I have seen in the town for a long while.

The Tate Prize has produced nothing in quality equal to last year’s competitions. Mr. Verity, son of the architect of the “Criterion,” takes the prize for a pure and neat design in Italian Renaissance. The Institute of British Architects Medal for Architectural Design, was won by Nottingham man, Mr. Allen, for drawings of Wollaton Hall, visited by the Architectural Association, last autumn, though Mr. Tromp came in a good second with some excellent drawings of St. John’s College, Oxford. The “Soane” Medalisation has proved the competition this year. Mr. Arthur Sykes was primum inter pares with a well-stroiled and careful design of something new, but with everything very thoughtfully worked out. Mr. George Kenyon, who has studied in the Paris Ecole des Beaux-Arts, submitted a work in which the influence of his alma mater is strongly pronounced. There were one or two Gothic designs, as a warning to others, I suppose. The design of the exhibition was, however, one submitted under the title Espagón. It is one of the most eccentric, extraordinary designs that can be imagined, but as it was protected just the same time, masterly and powerful, and striking in its originality. There is a Moorish feeling about the design, which the author emphasized by a really beautiful perspective drawing, with southern sky and Algarve surroundings. It was quite a hot favorite, a cup about this design. The judges, startled perhaps at its originality, passed it over. When their report, however, came to be read before the Institute, Professor Sir Charles Eastlake, M. A. these prizes, amounting as they do to over £250 per annum, are a great incentive to students to work here in England, and what I may venture to term your spirited action is founding a similar travelling-stipendium for our follow-students across the water has attracted notice here, and been warmly commended, though the breach of your conditions, in opening your competition to students, "male or female, white, red, or black," reads like a dry piece of humor. Nevertheless, let me promise the lucky man (or woman) a hearty welcome to the "oould country," and we won’t grumble even though she be a Paquita.

The latest move of our student body, the Architectural Association, has been hardly what you might term architectural. We have founded a Lyric Club under eminent patronage, and twice a month, under the soothing influence of the fragrant weed, offer up our devotions to the Muses. The Club has had an excellent effect in helping to bind together in the bonds of brotherhood the students at the Association of Architectural Students. What a wonderful body this is, so say it as shouldn’t." With past and present students, we have ever one thousand names on our books. We carry on an illustrated journal and a sketch-book monthly. We have a Cycling Club, two companies in the Volunteers, and now a Lyric Club. We have representatives all over the country to aid the wandering student whilst sketching, and our classes, lectures, etc., are very numerous. Indeed, as you see, we are, excepting the Royal Institute of British Archi-
LAKE FRONT OF PROPOSED HOTEL
AT KINGSVILLE ONT. MASON & RICE ARCH'TS. DETROIT MICH.
pects, the most powerful professional body in the kingdom, and, I am
happy to say, dissatisfaction is felt in no small degree. It is
to a large extent by the Ionic order; and, though many
in times gone by, our relations with the powers that be have been well
frustrated. Forgive this little outbreak of enthusiasm, but it is difficult
to avoid it when one witnesses such a spectacle as this, where there is surely
no time to lose, for it will not be possible to begin the
installations at a seasonable time because of the delays in the execu-
tions of the work—delays arising from several accidents which have
beset the building from the very outset of the enterprise. To
add to the activity displayed and the night-work, we shall get through all
right in a fairly satisfactory way. People were able to convince
ourselves of the value of an enterprise on so large a scale. Repub-
lic on the 13th of January, a visit which produced a very
good effect, since the public being invited were able to take account
of the progress of the interior work, which they had not been able to
inspect from the outside of the enclosure.

And now, before speaking in my next article of the curiosities and
features of the exhibition of 1858, let us glance at its preced-
ences, and the history and subjects in which it comprised. If the
initial exhibition dates the first exhibition? A Greek historian of the second
century (Athenaeus) reports that under Polytem Philometer there was given
a pompous display where this Phaon was caused to be exhibited by the
artisans of Thbes and Memphis every two years in a manner which
produced the world of luxury. If this statement is exact, it would
prove that there is something new under the sun; and that the first
national exhibition does not date from yesterday; but it is allowable
to accord too great confidence to these statements of the ancient
historians; and I only mention the fact by way of curiosity, without
attaching to it any importance.

It is only in the year 1851, that the first national exhibition was
organized, and that the first exhibition was held under the
labeling of an industrial exhibition. It was the writer François Neuchateau,
employed in the Academy, who, on the occasion of one of the public
meets, urged the Greek, to give by the board of the Government, the
people, for the sake of comparison the products of French industry.

This exhibition lasted for thirteen days, and 110 exhibitors took
part. At night the lamps were lighted, and the number of visitors was
very large on the different days. Afterwards the Government organized
exhibitions that took place at several later dates and finally assumed a certain
importance, thanks to the competition of the provinces and the
wealth of the industrial products. It is due to the Government that when the
need made itself felt of comparing the different products of the
nations, and gathering these together in a universal exhibition.
The first of these dates only from 1853, and took place at London.

Each of these years, 1855 was decided by a decree of Napoleon III, dated March 8, 1853.
It was not merely an industrial exhibition like that at London; for
by a second decree, dated June 22, 1854, which declares that the
perfection of the industries is intimately connected with the fine
arts, a section of painting, sculpture, engraving and architecture was
especially organized. A general commission, placed under the pres-
dence of Prince Napoleon, was formed and divided into
commissions, one having charge of Industry and the other of the
Arts. Among the names of the commissioners of Fine Arts we find
the names of Montgelas, celebrated architect of the time; and
Henriquel-Dupont, Mecime and Visconti. The general commission
decided that in the interest of industrial art and the visitors, the
Exhibition should be a place of sale. They decided likewise, and
this was an innovation, that the works should be sold.

This rate varied, according to the day and the season, from twenty
centimes and one franc to five francs on Friday, from the 10th to the
21st of July, and two francs from the 1st to the 9th of November.
All this was complicated enough. The visitors turned into the
treasury in this way a total of 3,902,484 francs for the Department
of Fine Arts, and 2,506,194 francs for the Department of Industries.
The Exhibition took place in the Palais de l'Industrie, which at this
time was connected with the panorama of the Champs Elysées. Be-
sides, it stretched through other galleries fully to the Quai de Billy
and the Avenue Montaigne. Length of the exhibition was 4 months.

THE COMING EXHIBITION.—INTERNATIONAL EXHIBITIONS, THEIR GENESIS AND HISTORY.—THE PRIZE DE RECO-
NNAISSANCE DES ARCHITECTES AMERICAINS.

my next article will very likely be dated off for the time being, as
these cases. These two ways of looking at things are evidently
out at the top of their lungs that it is very possible that on the day of
opening there will be exhibited only unopened packing-cases and
unfinished cases. These two ways of looking at things are evidently
exaggerated. It is time to acknowledge our error and to
to the spirit of pessimism or of opposition, for
there are, it must be acknowledged, many
artistic cases. But if there is no time to lose, for it will not be possible to begin the
installations at a seasonable time because of the delays in the execu-
tion of the work—delays arising from several accidents which have
beset the building from the very outset of the enterprise. To
add to the activity displayed and the night-work, we shall get through all
right in a fairly satisfactory way. People were able to convince
ourselves of the value of an enterprise on such a scale. Repub-
lic on the 13th of January, a visit which produced a very
good effect, since the public being invited were able to take account
of the progress of the interior work, which they had not been able to
inspect from the outside of the enclosure.

And now, before speaking in my next article of the curiosities and
delicacies of the exhibition of 1858, let us glance at its preced-
ences, and the history and subjects in which it comprised. If the
initial exhibition dates the first exhibition? A Greek historian of the second
century (Athenaeus) reports that under Polytem Philometer there was given
a pompous display where this Phaon was caused to be exhibited by the
artisans of Thbes and Memphis every two years in a manner which
produced the world of luxury. If this statement is exact, it would
prove that there is something new under the sun; and that the first
national exhibition does not date from yesterday; but it is allowable
to accord too great confidence to these statements of the ancient
historians; and I only mention the fact by way of curiosity, without
attaching to it any importance. It is only in the year 1851, that the first national exhibition was
organized, and that the first exhibition was held under the
labeling of an industrial exhibition. It was the writer François Neuchateau,
employed in the Academy, who, on the occasion of one of the public
meets, urged the Greek, to give by the board of the Government, the
people, for the sake of comparison the products of French industry.

This exhibition lasted for thirteen days, and 110 exhibitors took
part. At night the lamps were lighted, and the number of visitors was
very large on the different days. Afterwards the Government organized
exhibitions that took place at several later dates and finally assumed a certain
importance, thanks to the competition of the provinces and the
wealth of the industrial products. It is due to the Government that when the
need made itself felt of comparing the different products of the
nations, and gathering these together in a universal exhibition.
The first of these dates only from 1853, and took place at London.

Each of these years, 1855 was decided by a decree of Napoleon III, dated March 8, 1853.
It was not merely an industrial exhibition like that at London; for
by a second decree, dated June 22, 1854, which declares that the
perfection of the industries is intimately connected with the fine
arts, a section of painting, sculpture, engraving and architecture was
especially organized. A general commission, placed under the pres-
dence of Prince Napoleon, was formed and divided into
commissions, one having charge of Industry and the other of the
Arts. Among the names of the commissioners of Fine Arts we find
the names of Montgelas, celebrated architect of the time; and
Henriquel-Dupont, Mecime and Visconti. The general commission
decided that in the interest of industrial art and the visitors, the
Exhibition should be a place of sale. They decided likewise, and
this was an innovation, that the works should be sold.

This rate varied, according to the day and the season, from twenty
centimes and one franc to five francs on Friday, from the 10th to the
21st of July, and two francs from the 1st to the 9th of November.
All this was complicated enough. The visitors turned into the
treasury in this way a total of 3,902,484 francs for the Department
of Fine Arts, and 2,506,194 francs for the Department of Industries.
The Exhibition took place in the Palais de l'Industrie, which at this
time was connected with the panorama of the Champs Elysées. Be-
sides, it stretched through other galleries fully to the Quai de Billy
and the Avenue Montaigne. Length of the exhibition was 4 months.

THE COMING EXHIBITION.—INTERNATIONAL EXHIBITIONS, THEIR GENESIS AND HISTORY.—THE PRIZE DE RECO-
NNAISSANCE DES ARCHITECTES AMERICAINS.

my next article will very likely be dated off for the time being, as
these cases. These two ways of looking at things are evidently
exaggerated. It is time to acknowledge our error and to
the Trocadéro was built, and that there was transformed into gardens, terraces and cascades all of the hillside which extended from the Pont de Jena to the Quarters of Passy and the Arc de Triomphe. In 1878 the exhibitors numbered 52,800. Paris entertained more than 4,000,000 persons, to whom was devoted a whole season of the Exhibition of 1878, a perfect success. The Exhibition itself was closed at night, even the parks and gardens. This year they have, on the other hand, sacrificed the regular buildings of the Exhibition, that is, the inside galleries, to tho scenic beauty and promiscuous beauty of the garden. These assume a great importance, and at night will present a fairy-like aspect. Also in spite of the larger area, which is really occupied, the admission was only twelve francs. On the eighty-four hectares which the enclosure of the Exhibition contains, only twenty-nine will be covered with buildings.

I have already spoken of the general organization and of the direction entrusted to the three directors general, M. Alphand for the works, M. Berger for the exploitation and installation, and M. Grison for the finances. I will add to this the information contained in the third article of the catalogue printed within the above dates. This entry to the Exhibition shall be fixed in the following manner: By day one franc for each person at the hours of general entrance; two francs per person during the hours of the sales; season tickets 100 francs each for the whole duration of the Exhibition; twenty-six francs for subscription-cards delivery to all parts of the kingdom. An entrance ticket will admit you to the Exhibitions.

A weekly bulletin will be published in the official journal, and posted everywhere it may be necessary, which will inform the public of the hours of the various departments and of the departures of the carriages going to the Exhibition. The same method will announce the hours particularly devoted to study and distinguished from the public hours. And now let fine weather and sunlight illumine and enliven the day of opening.

I must not forget before finishing this letter to speak of the first competition which has just been held at the School of Fine Arts for the Prix de Rome. Contes Lindsay and the management may be congratulated on having secured a thorow success in the hands of competent and distinguished collection of magnificent period, many of which have never been exhibited before, and nearly all of high artistic interest. It is worth while the members of the committee of conditions, and the catalogue accompanies by porcekins, galleries, open staircases, etc. Nine contestests took part in the competition, which was extremely interesting. It was, however, rather difficult to avoid the appearance of a funereal monument, as several contestests found to their cost. The prize was awarded to M. Huguet, pupil of M. Blondeel; and "menus" were also awarded to M. Andrevé, pupil of M. Guinard; M. Coster, pupil of M. Gounin; and M. Burière, pupil of M. Andrevé. Here are four artists at any rate who should owe to their American comrades a feeling of gratitude; and you know very well, you fellows ever yonder, that we will always join our good wishes to theirs.

M. BRINCOURT.

THE GROSVENOR GALLERY.

A CENTURY OF BRITISH ART; FROM 1737 TO 1837.

LONDON, January 21, 1889.

TO-DAY this exhibition opens to the public with a second series of pictures at the Grevy Old Master; the last exhibition of the Grosvenor Gallery. This is not a call for anything new, for the majority of the pictures are old, and the artists are old. The pictures are hung with great judgment, and, with a sense of space, each room has a special interest of its own.

Every one knows the two large galleries and the two small ones of the Grosvenor in Bond Street. To begin with, the largest and "West Gallery," where, as usual, most of the pictures are exhibited. Mrs. Jordan's large portrait, by Romney, stands out, sweetly gazing into the rooms from a park, dressed in a simple white muslin, with her hands clasped across her breast, her hair, waving round the face and neck, is surrounded by a soft white cap. It is a happy, delicate young face and slender figure, the expression of beauty of M. Jordan's Life and beauty — before the shadows came, and she was rejected, and forgotten.

Romney was a charming painter of women's faces. He caught their soft witchery and smile, which make his portraits irresistible. Note his many portraits of Lady Hamilton, whom he worked up in every sort of fancy and attitude. It is said that for years he was never completely happy except when she was posing before him.

No. 7 is his Lady Hamilton as "Miranda." She looks like the laughing genius of a storm, with her head thrown back, her red auburn hair waving in disorder, and her bare right arm raised. This lovely creature, who took many hearts, was the daughter of a common housemaid, almost destitute of talent. She first became known to the public through a quack doctor, who exhibited her as the "Goddess of Health." Sir William Hamilton, ambassador at Rome, saw her and strangled by the large buildings. The Exhibition itself was closed at night, even the parks and gardens. This year they have, on the other hand, sacrificed the regular buildings of the Exhibition, that is, the inside galleries, to the scenic beauty and promiscuous beauty of the garden. These assume a great importance, and at night will present a fairy-like aspect. Also in spite of the larger area, which is really occupied, the admission was only twelve francs. On the eighty-four hectares which the enclosure of the Exhibition contains, only twenty-nine will be covered with buildings.

I have already spoken of the general organization and of the direction entrusted to the three directors general, M. Alphand for the works, M. Berger for the exploitation and installation, and M. Grison for the finances. I will add to this the information contained in the third article of the catalogue printed within the above dates. This entry to the Exhibition shall be fixed in the following manner: By day one franc for each person at the hours of general entrance; two francs per person during the hours of the sales; season tickets 100 francs each for the whole duration of the Exhibition; twenty-six francs for subscription-cards delivery to all parts of the kingdom. An entrance ticket will admit you to the Exhibitions.

A weekly bulletin will be published in the official journal, and posted everywhere it may be necessary, which will inform the public of the hours of the various departments and of the departures of the carriages going to the Exhibition. The same method will announce the hours particularly devoted to study and distinguished from the public hours. And now let fine weather and sunlight illumine and enliven the day of opening.

I must not forget before finishing this letter to speak of the first competition which has just been held at the School of Fine Arts for the Prix de Rome. Contes Lindsay and the management may be congratulated on having secured a thorough success in the hands of competent and distinguished collection of magnificent period, many of which have never been exhibited before, and nearly all of high artistic interest. It is worth while the members of the committee of conditions, and, for the catalogue accompanies by porcekins, galleries, open staircases, etc. Nine contestests took part in the competition, which was extremely interesting. It was, however, rather difficult to avoid the appearance of a funereal monument, as several contestests found to their cost. The prize was awarded to M. Huguet, pupil of M. Blondeel; and "menus" were also awarded to M. Andrevé, pupil of M. Guinard; M. Coster, pupil of M. Gounin; and M. Burière, pupil of M. Andrevé. Here are four artists at any rate who should owe to their American comrades a feeling of gratitude; and you know very well, you fellows ever yonder, that we will always join our good wishes to theirs.

M. BRINCOURT.

THE GROSVENOR GALLERY.

A CENTURY OF BRITISH ART; FROM 1737 TO 1837.

LONDON, January 21, 1889.

TO-DAY this exhibition opens to the public with a second series of pictures at the Grevy Old Master; the last exhibition of the Grosvenor Gallery. This is not a call for anything new, for the majority of the pictures are old, and the artists are old. The pictures are hung with great judgment, and, with a sense of space, each room has a special interest of its own.

Every one knows the two large galleries and the two small ones of the Grosvenor in Bond Street. To begin with, the largest and "West Gallery," where, as usual, most of the pictures are exhibited. Mrs. Jordan's large portrait, by Romney, stands out, sweetly gazing into the rooms from a park, dressed in a simple white muslin, with her hands clasped across her breast, her hair, waving round the face and neck, is surrounded by a soft white cap. It is a happy, delicate young face and slender figure, the expression of beauty of M. Jordan's Life and beauty — before the shadows came, and she was rejected, and forgotten.

Romney was a charming painter of women's faces. He caught their soft witchery and smile, which make his portraits irresistible. Note his many portraits of Lady Hamilton, whom he worked up in every sort of fancy and attitude. It is said that for years he was never completely happy except when she was posing before him.
ARCHITECTURAL EVOLUTION.—II.

It is time, however, to notice that important feature which had more to do than any other with the change in the character of architecture. The arch is one of the earliest forms of construction, and is coeval with man himself; it is the only structure that has appeared in all ages and in all parts of the world. Its use is to support a weight, and to carry it to the ground or to another structure. The arch is the basis of all modern construction, and it is the only structure that is truly national, for it is the only one that is national, for it is the only one that can be made to any thing that is national.

The object of the arch is to arrest the downward pressure of a superincumbent weight, that the material beneath may be opened and an opening be formed. But the arch had a higher and more responsible duty to perform—to direct the verticality of the structure and bear the whole of the weight, the arch distributes it. In later days, when radiant lights were employed, an additional function was given to the arch, the purpose of the weight in the structure.

Radiant lights were for centuries unknown, and the arches were formed of stones raised in two piers, each stone as the piers rose, projecting beyond the face of the one below it, in the direction of the other pier, until those projecting stones so nearly met that a single stone closed the intervening space and formed the apex of the arch. The distribution of weight was effected often in a still ruder manner. Two stones placed on end inclined towards each other and touching at the upper ends, have, in many instances and in many ages, done duty for the arch. The Greeks required no arch in the construction of their orders, their columns were set near together that the horizontal cantilevers required no moulding. The Romans, as I have remarked, put their piers so far apart that the heavy cornice running between them must, of necessity, have support; a pier in the centre would not do, for they would never use the arch.

Bringing it out from the obscurity of tombs and merely constructional purposes, they set it in the light of day, constructed it of dressed stone and made it an object of utilitarian usefulness. Hibbert had it been but a piece of "construction," now it was to be "ornamental construction," and was to take its place as a feature in the art. This utilization of the arch as a feature was to alter the whole style of architecture, and this early date may be said to be the dividing line between the distinctive characteristics of Classic and Gothic architecture, and all that preceded the one and followed, and will follow, the other. The horizontality of the one was replaced by the verticality of the other. This revolution was to make way for Christi.

The arch was to take the place of the beam or lintel, and the vault—the lateral continuation of the arch. The form of the flat roof, nor was the vault. I alluded to the functions of the arch—that of arresting the downward pressure of the wall above it, that of distributing it and that of directing it into particular defined channels; but, it was to do something more than this, it was to collect pressures from various points, and then take them into the required channels.

Mr. Ruskin has a very poetic idea as to the origin of the arch. He says in his "Stones of Venice": "Let us suppose that the sun rises at the same moment as it climbs: when it is a quarter up, it will give us the arch c, when it is half up b, and when three-quarters up c. There will be an infinite number of arches between these, but we will take these as sufficient references. With these the central or pure arch, e the high arch, and the rays of the sun would have drawn for us their vassal." He goes on to say, "The central and last group are the most important. The central round, or semi-circle, is the Roman, the Byzantine and Norman Arch." The "Horseshoe round is the Arabic and Moorish Arch and its relative pointed, includes the whole range of Arabic and Lane, or Early English and French Gothic." I mean of course by the relative pointed, the entire group of which the equilateral arch is the representative. I have not sufficient presumption to attempt to overthrow the theories of so great a man as John Ruskin, who has a great insight into the poetry and the spirit of architecture. It is not within the province of this paper to enter into a discussion of the various parts and to whom we all owe the greatest respect. Perhaps there is no one of the present day who could more clearly and more pointedly express the divine origin more clearly, or who has by his lectures and writings done more to instill into the minds of lovers and readers a higher concept of the arts and the teachings of art. It is a matter of small moment to my readers that I have not yet been converted to the theory Mr. Ruskin holds as the origin of the arch. But it is not a matter of the beauty of the Arabic or horseshoe arch. I do not dispute that the idea of the semi-circular arch may have arisen from the rising or setting sun, for the Egyptians were great sun worshippers and there has been a strong influence of the beauty of the curves of the sun. I was in the first instance only used in the roundest form, very occasionally, as if by accident rather than design. Their very method of constructing the arch with horizontal beds may have been the accidental means of the discovery of the pointed, but, when discovered, they made no particular use of it. Had they done so, where would have been the "Classical" architecture?

For many centuries after the Romans brought the arch to light horizontal wood-ceilings were used, and they continued to be used here and there at the same time as vaulted roofs. A dome is the earliest development of the arch for roofing purposes, and it is the roofing problems that resulted in the introduction of the pointed arch. Circular buildings, or even buildings square, on a central plan, such as were Gothic cathedrals, formed a part of a succession of squares were roofed with a succession of domes. The attempt was made to make the one covering to the nave do for "ceiling" and roof, but the height that was sufficient for the interior dome was always found deficient for the exterior, and the stone roof was finally used as a "ceiling" only, while a wooden roof was erected outside this to throw off the water and protect the stone vaulting.

The barrel or tunnel is another method, and a very simple one, of roofing over a nave, and there are many examples extant. It consists of an arch like a tunnel, extending from one end to the other of the church. But I must say something here about the parts of the churches, or else the difficulties to be overcome in the roofing question will not be easily understood. The churches were transformed from basilical to the barrel and the stone buildings were the Roman business buildings. They consisted of nave and aisles—oblong—and one end terminated in a apse. In the apse were the magistrates' seats, and in front of them the altar. Very little change was required to make the building suitable for our purposes. The vault and the roof, the magistrates were removed, and the altar placed nearer the wall they had been against. The apse was raised, and, finally a choir was formed, which was raised about three feet. The rest of the church, became the chancel arrangement of the present day. High up in the nave walls, above the aisle roof, were small windows. There was no triforium, but the space usually occupied by a triforium was used for an ornamental effect. The south fewer and smaller apertures were required for the admission of light than in more northern climates. It was rather an object to build a church, the height of which was not necessary. In the north, more light was demanded. But hitherto the plan of each section or bay of a cathedral had been square, and the spring of the vault-c fault came down very low upon the walls, so that this was not a great advantage for the present. When windows were used the walls were higher, for the dome rested on the top of four arches of equal height. Had the two systems been combined, the greater part of the tunnel vault would have been cut away, and still the difficulties would not have been solved. An attempt was made to obtain the...
required height for the windows by lengthening the bays and introducing a kind of intermediate shaft, which supported a round arch across the nave, on which rested the crown of the vault. But this was contrary to the principle of vaulting, for vaults have to hold themselves up. It was therefore to be expected that this would be improved, and it turned out to be the key to the solution of the difficulty. The intermediate pier was made into an ordinary pier, so that on the nave section became two parts of lengthwise of the church, of the two parallel passages occupying the space of the former square; then, by the introduction of pointed arches over the spaces thus arranged, the object was gained. Evidently, there is a diagram which expresses this perfectly, will quote him: "In spite of all the ingenuity bestowed upon it [this intermediate pier], and in France, in the eleventh century, and beginning of the twelfth centuries, it never produced an entirely satisfactory effect until, at last, the pointed arch and the fan-vaulting were brought into the church. Then it appears not difficult to see how the pointed arch obviated the difficulty: Supposing the great vault to remain circular, two segments of the same, combined with the intersecting vault nearly to the height of the transverse one, or it could be easily carried to the same height as at D. When both were pointed, as at E and F, it was easy to make their relative heights anything the architect chose, without either forcing or interfering with any divisible curve. This means the compartments of the vaults of the central nave were made the same width as those of the side aisles, whatever their span might be,"...

By this arrangement the arches of the vault collected all the weight and conducted it to the four piers, leaving the walls free of weight. They were, therefore, covered with "wall-screen" or "wall-vault," as Mr. Ruskin calls it. To meet the thrust of the vaults, buttresses were built of great strength, but such ingenuity that the bulk of material was reduced, until every particle not actively engaged in the work of thrust was removed. It was found that the addition of ornamental features would, from their disposition take the place, as far as the work to be performed was concerned, of some of the main masses of the buttresses; hence pinnacles were introduced, which, by their weight, assisted in the resistance to the outward thrusting of the vaults. As the wall was little more than a screen, there was no limit to the size of the windows. The whole space between the piers could be removed, except for the necessity of a little lateral support to the piers, without weakening the structure. Large windows, then, being easy to obtain, were speedily executed, and colored glass put into them. The colored glass in the windows partly obviated the necessity for color on the walls, but carving, the decoration that had hitherto been painted on the walls, gave a better play of light and shade. As it was extended, the center of the church was decorated, nothing to do with the support of the roof. The newly-carved wall-space between the walls of the clerestory windows and the top of the nave formed a screen of bays, and was ornamented, and hence pinnacles were introduced, which, by their weight, assisted in the resistance on the side wall covered with a roof. But there was no reason why the wall should not be pierced, rather than the pinnacles, and the nave was thinned in. As the work was carried to the transverse wall, the nave, but this was not found to be a success architecturally or constructionally, and was abandoned, but here piercing was not only desirable, but easily executed, and in effect nothing could have been more beautiful. In some cases the aisle-roof has been raised and windows cut in the outer wall, but wherever this is the case it gives the appearance of a building, and entirely removes the repose gained by this belt of arching round the church, with its dark, mysterious background. There is another form of arch which Mr. Ruskin holds in contempt; namely, the four-centred. The reason for its discovery or evolution was not so much as ornament as ornamentment constructed for its own sake, but rather ornament arising from a desire to decorate the vaults, and in its arrangement principles of construction were sacrificed to its beauty. But it is, perhaps, utterly. The effect produced is certainly beautiful, but it heralded the decline of architecture, and, when the form was made use of for which it was not intended, if only the beautiful features of the impost were destroyed, the result was a regret. The "perpendicular" fan-vaulting is the immediate result of discontent and deviation from perfect truth. When the vaulting problem was solved, the execution of it was correct and perfect. It was not so much as ornament as ornamentment which were the visible characteristics, and that which was visible on the surface pervaded the whole structure. But, not satisfied with the beauty of the form, they looked for other notions to decide us, so to speak, and fall into error, a want of truth, and, therefore, not true art. It grieves me personally to recall that a few years ago I was of the opinion that fan-vaulting was the climax of the art and science, and that I have written up the "perpendicular" as idea, which the matter has given me a different opinion of it, as I have set forth to be the correct state of the case above.

The forms of the ornamentation of architecture are of two kinds, painted and cut, and they are both essential parts of architecture. In the earliest examples of decoration to be seen, and it stands to reason that it should be so. It is far more natural that buildings should be ornamented in color than that they should be plain. Color, or light and shade, exists in everything, and "architecture" is not architecture without it any more than there would be a fire without light. Direct colors can be laid on the wall, the brush. It may be sufficient to use materials of different colors, such as stone and marble in combination or stained-glass, which will then be colored by the waterdiffusion of color through them, or colors may be used more than one color by light and shade and color. A green field does not exhibit a uniform green. It is varied with numerous shades, and dotted with simple wild flowers. The dead level is often still worse, where in the open fields, the precipices face of the cliff, however smooth, shows endless shades and colors as the weather has acted on its composition. A bare rock standing out of it, the recesses which are cut or covered with lichen, which, itself, becomes soil for the plant, and at last even a tree grows upon it. Nature is not satisfied with improving herself, but directly she gets a chance she improves on the works that God has done. Nature is essentially a planner of lines, an architect of masses. It is her office to harmonize with the coloring of Nature. So then love of color is a natural characteristic of man: his surroundings and every association of life has been made colorful. The secondaries evolved from the primaries, the tertiaries from the secondaries, and so on; the chief color of Nature being not a primary, but a second or a tertiary. Egyptians, Egyptians, Egyptians! Egypt was elaborated and decorated with hieroglyphics, as I have said, and at every age buildings have been more or less colored. Between 2000 and 3000 years a. c., the Chaldeans who erected their temples in the marshes, colored every stone and every surface. It was decided, and the paintings were governed by color, and the planes, colored each story with the color dedicated to, or symbolic of them: 1. Saturn, black. 2. Jupiter, orange. 3. Mars, red. 4. Venus, yellow. The color of the walls, the color of the doors, the color of the columns, the color of the roof, the color of the ground. Fragments of colored work, plastered walls, etc., have come down to us from very early times, and in the earliest works of Christian architecture may still be seen the faint remains of such coloring on walls, windows, doors, piers, columns, arches, to be decorated had, of course, a great deal to do with its treatment, and laws must be respected in coloring as in everything else. Plain surfaces need as careful consideration in reference to the whole building as the rounds and hollows of moulded parts; and, if the matter is gone into in detail, it will be found that every color has its proper place. The zigzag is the earliest form of ornamentation, a form which is then considered the better, and still remains a sharp instrument, along the edge of a projection, is the forerunner of all cut ornament. These nicks or indentations widened and lengthened out into a line, and this became a line of a certain width, which was called a frieze. This frieze, or "zigzag," as it was called, was a line which was not only a line of ornament, but a line of lines, the combination of which produced a most beautiful effect. And from that line, or zigzag, to the combination of the two zigzags, and that to the lozenge, the varieties of each and their combinations.

But the true forms of architectural decoration are those whose colors are from Nature, natural plants and foliage, and of these there is a variety to be found in early examples such plants and flowers, which is a characteristic form of Egyptian ornamentation; lotus and palmus belong to Assyrian; almonds, lilies, etc., to Phoenician art. Later we come to the Greeks and find the so-called acanthus leaf, the honeysuckle, lily, bobby and others, until, in the perfection of English Gothic, the leaves of all English plants are introduced into the carving, green as it is evergreen, and as it is not on the branch as it is on the trunk. These carvings are very seldom colored, the true undisguised material, the richness of the carving, the deep undercutting of the leaves so intricate that it is not possible to extract it from other without leaving a void. The zigzag gave rise to the double zigzag, and that to the lozenge, the varieties of each and their combinations.

In the "Grammar of Ornament" we find the following notes, which we should do well to remember, as well as others which I shall not mention. "The first thing that should be done on the application of any kind of ornament is to decide on the development of form, also to assist light and shade." "These objects are best attained by the use of primary colors on small surfaces and in combination, for instance, the primary, the secondary and tertiary colors on the largest masses." "The primary colors should be used on the upper portions of the objects, and the secondaries and tertiaries on the lower." "In using primary colors for the background colors, the objects should be placed in a background of a light color, as these would show best under the white background, and be seen on the dark background, and not under the dark background on the white. The development of statuary is easily traced, from the wooden idol, representing in the rudest form the imagined attributes of a
The only real question in the case is one of fact, viz.: whether the chimney flue in this particular case was such as would commonly be considered in the professional practice intended; and the main interest attaching to the case grows out of the situation the owner has really got the kind of chimney that he ought to have and is simply trying to cut down the architect's fees.

BACK-BAY RESTRICTIONS—PORCHES AND PORTICOS—THE SPIRITUAL TEMPLE.

The case of the Spiritual Temple, which has attracted the attention of architects and the public, has at length been decided by the Supreme Court of the Commonwealth of Massachusetts.

The owners, Mr. and Mrs. Aitkin, have been embroiled in a suit for the sale of a portion of their property, which they had previously bought. The property was situated on the corner of Exeter and Newbury Streets in Boston, and was built from plans of Messrs. Hartwell & Richardson in the year 1883.

The controversy arose under the following clause in the deeds from the Commonwealth, under which both parties to the controversy claimed:

"The front wall thereof on Newbury Street shall be set back 22 feet from said Newbury Street, provided that steps, windows, porticos, and other usual projections appurtenant to said front wall are to be allowed in the reserved space of twenty-two feet, subject to the following limitations; namely, First, that no projection of any kind (other than doors-steps and landstaircases connected therewith, and also cornices at the roof of said building) shall be allowed to extend more than five feet from said front wall into said space; and Second, that the projection of a bay-window at the front, with the foundation wall sustaining the same (such foundation wall being a projection of the front wall) will be allowed unless any horizontal section of such projection would fall within the external plane of the building, but the projection of a bay-window does not extend seven-tenths of a front of the building, nor exceeding eighteen feet in any one case, and whose side line makes an angle of forty-five degrees with the base."
Newbury Street, the Institute of Technology, a number of apartment-houses, hotels and private houses, and the Algonquin Club.

The Boston Architectural Club held its fortnightly conversations Thursday evening, March 14, Mr. Turner, who has been in charge of the water-color classes instituted by the Club, made some informal, but very interesting, remarks on the subject of water-color painting, including a brief summary of the history of its development at various times; its use in modern developments; and the characteristics of the French, English, Spanish, Italian and Dutch schools. The most prominent masters of those various schools were compared and discussed, and, in conclusion, some very practical questions were made as to selection of studies, materials, subjects, etc.

In the open discussion which followed, Mr. Turner gave in detail the steps he would take in making a portrait from nature, as follows:

Illustrating from the possession of the Club—the old Endicott house at Salem, and a large interior of a European church—and he explained how the same ideas could be applied to the making of a portrait of which the architect is called upon to make in ordinary professional practice.

The Club is to hold an exhibition of stained-glass and tile-work, beginning March 20, and there will be contributions made by the leading Boston dealers and manufacturers, and, in addition, there will be exposed a collection of sketches of European glass and tile work.

THE BOSTON ARCHITECTURAL CLUB.

BOSTON-WALLS.

March 9, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sir,—I am about to put up a building of stone picked up from various quarries in the neighborhood. The stone is of great alabaster in the locality and I propose to use this stone for the exterior facing without any tool work whatever and without even as much as toched margin or jointing. The door and window openings will be trimmed with brick.

This style of building has been illustrated by you frequently, but as my reasons have not done any of this work I would like to have some opinion from you as to the practicability and success of the same.

I should imagine that such a wall is plumbed from the inside only, a minimum and maximum being given, within which the outside face should come, as for instance, 2" 3/" and 3 1/2".

Is this right? and how much variation may there be between maximum and minimum? Is it necessary to rough-cut beds and joints?

What sizes and variations of sizes looks best for stone?

The building is, say, 45 feet square, walls 18 feet high above ground. Will the double surface stone or the double surface stone will look better?

If you can favor me with some information in your next issue you will very much obligate,

LICHE.

[Note: this letter is a request for advice on the use of a particular stone and its suitability for the exterior of a building. LICHE is likely referring to a specific type of stone, and the letter seeks expert opinion on its use and appearance.]
The exterior of this house is stained with **Cabot's Creosote Stain** for Shingles, Fences, Clapboards Etc.

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply.

- Our Stains contain no water and are the only exterior Stains that do not contain kerosene.

**Prices:** are 40, 60 and 75 cents per Gallon according to Color.

**Send** for Samples on Wood, and Circulars.

**Samuel Cabot**

70 Kilby St. - Boston - Mass.
Statue of Wm. Penn, in front of City Hospital, Philadelphia, Pa.


Lord Byron, London.

Abraham Pierson, New Haven, Conn. L. Thompson, Sculptor.

Nathan Hale, Hartford, Conn. Karl Gerhardt, Sculptor.
March 30, 1889.

Entered at the Post-Office at Boston as second-class matter.

Summary

Appointments of Mr. James H. Windrim as Supervising Architect of the Treasury Department.—The Office of City Architect in Boston.—Proposed Music-hall for New York.—A West Virginia School-horse Competition.—Major Lydecker and the Washington Aqueduct.—More Particulars concerning the De Beunest Air-ship.—Balloons in Warfare.

Illustrations: Railroad Station, Battle Creek, Mich.—The Bryn Mawr School, Baltimore, Md.—Church of All Saints, Pasadena, Cal.—Competitive Design for a School-house, Yonkers, N. Y.—Church of San Miguel, Jerez de la Frontera, Spain.—The Mohawk Block, Buffalo, N. Y.

Specifications and Contracts: Building Law... Salary... Payment for Unexecuted Plans... Notes and Clippings... Trade Surveys... 148

The public is to be congratulated on the selection of Mr. J. H. Windrim, of Philadelphia, as the new Supervising Architect of the Treasury Department. Mr. Windrim has been long and favorably known in the profession, and the appointment will meet with general commendation among architects. Whether Mr. Windrim himself is to be congratulated, we are not so sure. If it is a necessary part of an American architect's lot to be so moderately favored by fortune that the pittance offered by the Government for such service can attract men so popular and distinguished as Mr. Windrim, the case is one in which we shall be inclined to say that there is no public officer in the United States from whom we should have hope of so much technical skill, administrative ability and honesty. Expectations are high, we are informed, as to his being able to bring to the office a new, a more useful, character. If that is the result, the Government has done Mr. Windrim, and the country, a great service. The position is a new one, and the duties are new and heavy.

The subject of official architecture is one of great importance to the profession, and such influence as architects of repute can exert to have public service of this kind, if it cannot be provided for as it is in other civilized countries, at least cast into the hands of men who command the respect of the profession, is well applied. Next to the Supervising Architect of the Treasury, the official architect in this country who controls the expenditure of the most money is the City Architect of Boston, and if, as is reported, a new appointment is to be made in this case, the members of the profession in Massachusetts owe to their fellow-citizens the duty of pointing out, as no one else can, the errors that have been made in the administration of this part of the public service, and the best way to avoid them in future. It is notorious enough that the management of the public architecture in Boston has at times been a disgrace to the city. Not only, as we mentioned a few weeks ago, have buildings erected under the City Architect cost in some cases nearly or quite twice as much as similar buildings erected in neighboring towns, but evidence has been produced, showing that, so far from saving structures of the best class by this lavish expenditure of money, the city has been defrauded by the undetected, or unopposed, substitution of inferior materials and workmanship for those required by the contracts between the city and certain individuals, whose right to such favors remains to be explained. It is fair to say that in plan and design the Boston public buildings have generally been good, and we do not wish to suggest that the official architects did not try to do their duty in supervising their erection, but the fact remains that the designs and super-

If it is necessary to have professional public officers of this kind at all, about which we are by no means sure, it seems to us that in the assignment of the duties which they are to perform a good lesson might be learned from the example of the other professional officers attached to the United States Government. In every other Department or Bureau the chief official devotes his time, not to devising schemes for the public benefit out of his own head, but to examining these proposed by others, digesting and comparing them, and, if he sees fit, recommending them for execution, and seeing that they are properly carried out. The Attorney-General finds himself much better occupied in examining and criticizing the briefs of the various Government counsel than in writing them himself; the Commissioners of Education can do more good by sending specialists to write on topics of which he perceives the importance, and by disseminating their essays among the public, than by trying to write them all himself; and in the same way, an official architect in a great city like Boston can, we think, be of more useful service, so to speak, the designs for new buildings prepared by different men, who have leisure and skill enough to study them properly, and in seeing that they are carried out exactly according to contract, than in trying to make them, or direct the making of them, himself. In a place like Boston, long experience has shown that certain peculiarities in school-building designs, for example, are suited to the character of the population, and, that, perhaps, it is desirable to fulfill certain conditions of drainage, heating or ventilation. These matters may not be known to architects in general, but by providing for the review of designs for city work by a man familiar with them, all the advantages would be derived from the skill and ingenuity of the ablest men in the profession, working at their best, may be secured in connection with whatever conformity with local tradition may be advisable. In the offices of the Inspectors of Buildings in our large cities a very similar accord of tradition is grown up in men and experience with the Inspectors. Without any interference with architects' freedom of design, within the limits of the law the influence of the Inspectors, in examining and passing upon plans, has tended to promote a uniformity of construction which has been the whole city's advantage and the art of building, while it has greatly facilitated the most important part of their own works, the prevention of gross mistakes in carrying out construction.

Plan for a gigantic music-hall being discussed in New York, and a plot of ground has already been secured on the corner of Seventh Avenue and Fifty-seventh Street, comprising nearly twenty-three thousand square feet. On this is to be erected a structure as perfect as study of the best existing music-halls in the world can make it, and capable of accommodating three or four thousand people. Nearly a million dollars has been promised, and there can hardly be a doubt that the plan will be carried out. New York certainly needs a good music-hall. Steinway's and Chickering's, although good, are too small for the audiences which would often like to occupy them, and the theatres are too excessively built for general use as music-halls, and are not very well adapted to that purpose. The situation of the proposed building is very central, and it seems likely to prove a good investment for its owners.

The Board of Education of Wheeling, West Virginia, recently advertised for plans for a new school-house, and, we are glad to say, by so doing invited Mr. O. P. Phillips, an architect of the city, to write a letter to the Daily Intelligencer, setting forth the unfairness of expecting architects to furnish for nothing the various plans that the Board wanted. If it
was desirable to compare a number of different plans, he said, why should not the Board pay those who could make them for their efforts? To offer a prize for the subject only is the change of employment was, he thought, insulting to them, as putting them on a level with gamblers, and he advised all respectable architects to refrain from having anything to do with the affair. We are much inclined to think that they will follow his advice, that the problem will be as usual in such contests, nothing but a lot of crude, ignorant plans presented to them to make a selection from. Of course, they will not know, unless they have engaged an accomplished architect to advise them, that the great decision, the result of which the authors of them will fill the air with praises of their perfections; but this will not alter the facts of the case, and the result will be, we fear, that one more specimen will be added to the crowd of badly planned, badly built, badly ventilated, louvered, ugly, dark, stiff rooms, in which our children will test the limitations of their sight, their health and their morals, as a sacrifice to the vanity of people in power, too ignorant to know that there is such a thing as scientific school-building, too conceited to listen to any one who knows more about it than themselves, and too mean to follow his advice, if by chance it should be forced upon their attention.

The examination of the Washington Aqueduct shows that the work has been shamefully done, the brick laying being hardly backed up at all, so that in many places a man can walk across it. The reason given for overlooking the brick-laying is that it is estimated that it will cost five hundred and fifty thousand dollars to make it fit for service, and meanwhile, as it would be dangerous to admit the water to it, a temporary pipe is to be laid on the surface of the ground, to convey the water to the reservoir. This is a position which our children are taught is a sacrifice to the vanity of people in power, too ignorant to know that there is such a thing as scientific school-building, too conceited to listen to anyone who knows more about it than themselves, and too mean to follow his advice, if by chance it should be forced upon their attention.

The consequences of a successful issue to the undertaking would be so momentous that they can with difficulty be realized by the first reader, and might end in war. To show how hopeless any military operations would be in a country defended by such weapons, we will suppose that Prince Bismarck, after waiting until Dr. de Bausset has, unknown to him, completed a few of his air-ships, carried out the intention which a good many people in this country are inclined to attribute to him, of picking a quarrel with us on the pretext of a dispute about Samoa. War is declared suddenly, and the war of the Americans against the English. The fleet is met by one or two de Bausset air-ships, which sail away, reach their destination in leisurely manner, drop a five-hundred-pound shell filled with explosive gelatine into the funnel of each, and, having thus annihilated the expedition, proceed to Berlin to treat the remaining portion of the hostile armie in the same way. Of course, it might be that the Germans would have the air-ships first, and the war would be brought to a conclusion by the unconditional surrender of all the principal cities in the United States, under the persuasion of a dynamite-shell held suspended over each; but it would be so easy to turn the tables at a moment's notice by sending up in a balloon, from any of the cities, the things for which the2. was led to suppose. The floating cylinder is to be of rolled steel, one-fourty-four of an inch in thickness, braced against collapse by internal ribs in a way which has been carefully studied out, and is ascertained to give a resistance to the pressure of twice as much.

The weight of the cylinder, with its conical ends, is about seven hundred and fifty feet long, is something like one hundred and fifty tons, and its displacement, supposing only three-fourths of the air in it to be exhausted, will be about two hundred and seventy tons, leaving seven tons available for ascending of one hundred and twenty-six tons. From this, to obtain the net ascensional force available for lifting passengers or freight, must be deducted the weight of the car and of the propelling machinery to be placed upon it. Here, as it seems from the particulars we now possess, was the principal point in which our previous calculations, or rather, estimates, were at fault. Learning that the force was to be derived from accumulated electricity, operating through electric-motors upon accumulators, we estimated the weight of such electric accumulators, motors, and air-pumps, this being the principle of ascertaining the one hundred horse-power mentioned as the amount to be provided, and found that the total, added to a moderate allowance for the weight of the car, would nearly absorb the weight of the ascensional force, leaving what we thought too small a margin for contingencies. However, that instead of the enormously heavy electric-accumulators that we are familiar with, Dr. de Bausset, the inventor of the apparatus, has devised something quite different, which is capable of carrying anything like seventy-five tons of mail-matter or a thousand passengers, at the rate of a hundred miles an hour about the world, the experiment is well worth trying at the public expense; or, if that is objectionable, at the expense of the millionaire, who may be willing to risk a little money for the prospect of a great profit if the experiment should result successfully.
BUILDERS' HARDWARE—XXII.

VESTIBULE-LATCHES.

These are always sold in sets, with a front-door lock, and the levers are so arranged that the same latch-key will open both, the vestibule-lock having no dead-bolt. But, more generally speaking, a vestibule-latch may be considered as any spring-lock having no dead-bolt. When used for a vestibule-door the latch should have swivel-spindles and levers to lock the outside-knob.

Figure 328 is a pattern which P. & F. Corbin list as a front-door lock, but which seems to be more properly a vestibule-latch. The key lifts the levers and moves a plate on which are two posts A and B, one of which must pass the gatings before the other can reach the shoulder on the latch-bolt C, and force it back.

Figure 329 is the vestibule-latch sold with the front-door lock represented by Figure 327. Figure 330 is a Standard knob-latch manufactured by the Yale & Towne Company, which is not, properly speaking, a vestibule-latch, but which is worthy of consideration in this connection. It is provided with triple-springs, thus permitting a very easy action on the part of the striker while giving all necessary strength to resist the turn of the knob. This can be adjusted to either right or left hand doors.

HOTEL-LOCKS.

Hotel-locks are usually made to order, and master-keyed in sets. In a large hotel all the locks on a floor can be opened with one key. In smaller buildings all the room-locks are master-keyed in a single series. The protection afforded by locks which are master-keyed is, of course, less than it would otherwise be, as a master-keyed lock can very easily be picked if the principle of master-keying is understood, and in most cases master-keying benefits no one but the hotel-keeper. Except with the "Yale" and the "Hopkins & Dickinson" cylinder-locks, there has not yet been devised a really satisfactory system of master-keying. The two exceptions will be described in a subsequent chapter.

The simplest and also the cheapest method of master-keying is illustrated by one of "Corbin's" locks, Figure 331. The gathing on the one lever is made so wide as to admit of fifty different positions, in any one of which the bolt-post could pass. The room-key raises the lever so as just to clear the top of the gathing, and the master-key allows the post to clear the bottom of the gathing. A bent wire would serve quite as well for opening the lock as either of the keys. Fortunately for occupants where such locks are used, it is customary to fit hotel-locks with a small bolt, worked from within. Figure 332 is much better. The levers are exactly like those of any ordinary lock, except that there is a shoulder A at the back of each. Beneath the bolt-tail is a fourth lever, with an arm on it, rising so as to catch under the shoulders A. This lever is protected by a ward about the key-hole. The room-key lifts the levers and shorts the bolt without disturbing the fourth lever. The master-key lifts the fourth lever withou touching the others, the shoulders being so sized that the master-key lever will bring the gatings on the locking-levers into line.

Figure 333 shows another form of master-keyed lock by Hopkins & Dickinson. In this instance the regular key and the master-key work from either side of the lock in the same key-hole on the same tumblers and bolts. Still, each has a different set of tumbler-rackings and a different post in the bolt. When the master-key is used the bolt-post for the regular key is thrown down by a patent device, and another post brought up in the second rackings of the tumblers. When the master-key is removed the lock is set in use for the regular key. It is claimed that 1,200 of these locks can be made, all different, each lock with a key of its own which will fit no other, and with master-key to pass all. This is a rather expensive lock, however, and on that account is not used a great deal. The idea is an exceedingly ingenious one.
Figure 334 shows a Hopkins & Dickinson lock, or rather bolt, used for hotel and office doors between connecting rooms. This is intended to be used when it is desired to have the door definitely locked from either side, so that it cannot be unlocked from the other side, and, accordingly, the handles which operate the bolts are placed on opposite sides of the doors. The same company also manufactures a hotel-lock which is so arranged that the locking-bolt can be operated from the inside by a turn-button, instead of a key. When the door is locked from the outside it can at any time be opened from within by turning the button, so that it is impossible for an occupant to be locked in the room.

Figure 335 shows the construction of a Yale "Standard" hotel-lock. In this case the master-key is provided for by a second set of rackings cut in the levers, so that almost any number of variations can be had in a given series of locks, the variation being entirely in the lower set of rackings. The room-key lifts the levers exactly the same distance as the master-key, but as the proportion between the lengths of the bits, and the height of the lever bellies above the lower key-hole is different in each lock, it is easily understood why no two locks can be opened by the same room-key.

[To be continued.]

THE LOTUS IN ANCIENT ART.1—III.

THE LOTUS AND THE PAPYRUS; THE LOTUS AND THE ROSSETTE.

The confusion of the lotus with the papyrus has been assisted by the fact that the papyrus is extinct in Egypt, and, consequently, unknown to the current personal observation of the Egyptologists. As illustrated by the cut herewith (6), borrowed from Perrot's "History of Egyptian Art," the light, feathery nature of the plant has little in it to suggest the solid form of no architectural capital, and although it might be urged that the lotus flower itself has so especially solid outline or construction, we have in this case the religious significance of the flower as explanation, which is wanting in the case of the papyrus. Besides, there are countless cases in which the lotus flower is directly represented in architectural use, and no such case can be proved for the papyrus. The umbelliferous outline of the head of the plant does certainly correspond to the outline of the campaniform capital. Undoubtedly the Egyptians might have taken a suggestion from its outline. As a matter-of-fact, they did not.

The papyrus is grown as a curiosity in some private gardens in Cairo, but it does not in this way come under the observation of travellers. It is generally quoted as growing in a stream near

[Diagrams of lotus and papyrus]

1 Continued from No. 689, page 118.

The confusion of the lotus with the papyrus has been assisted by the fact that the papyrus is extinct in Egypt, and, consequently, unknown to the current personal observation of the Egyptologists. As illustrated by the cut herewith (6), borrowed from Perrot's "History of Egyptian Art," the light, feathery nature of the plant has little in it to suggest the solid form of no architectural capital, and although it might be urged that the lotus flower itself has so especially solid outline or construction, we have in this case the religious significance of the flower as explanation, which is wanting in the case of the papyrus. Besides, there are countless cases in which the lotus flower is directly represented in architectural use, and no such case can be proved for the papyrus. The umbelliferous outline of the head of the plant does certainly correspond to the outline of the campaniform capital. Undoubtedly the Egyptians might have taken a suggestion from its outline. As a matter-of-fact, they did not.

The papyrus is grown as a curiosity in some private gardens in Cairo, but it does not in this way come under the observation of travellers. It is generally quoted as growing in a stream near

[Diagrams of lotus and papyrus]

1 Continued from No. 689, page 118.
As regards the rosette, we may observe in the first place the constant appearance in Egyptian decoration of different details of the lotus in conventional combination. For instance, in the ceiling-borders illustrated by Prisse d'Avennes, we may add to No. 8, in which the seed-pod of the rose-lotus supports an inverted lotus bud, another case in which one bud erects supports another inverted (12). When we add the cases in which a rosette supports the bud (13), and in which a bud supports a rosette (14), the question naturally arises: Are these cases of association?

From the same decorations, we now add the cases in which a lotus flower supports a lotus leaf, and the question again presents itself: Are the cases in which a rosette supports a leaf also cases of lotus association? Such associations, to which we may now add those in which the lotus flower itself supports a rosette (17), become comprehensible when we examine the seed-pods of the white and blue lotus. The cuts herewith, 18 and 19, are taken from the botany plates of the "Description de l'Egypte."

Egyptian design constantly evades representations in perspective by the union of objects seen at the same time, or in the same combination as once in elevation and in plan. We have, therefore, no difficulty in understanding a representation of the top of the seed-pod or ovary as supported by the flower.

Comparison of 18 and 19 with 7 shows that the seed-pod of the rose-lotus has not the rayed top; and in certain decorative combinations, of which 20 is an example, we have probably a section of the top of the seed-pod of the rose-lotus rising above the flower. Figure 21 appears to show a similar combination, possibly the rounded top of the pod rising above the flower. In these cases, the brilliant yellow color of the curved sections correspond to the color of the seed-pod of the rose-lotus.

In a preceding paper the size of the seeds of the rose-lotus has been mentioned as about that of a small silt. The taste is agreeable, not unlike that of a chestnut but not as raw. During a visit to the lily-pens at Bordentown, I was advised by the nurseryman in charge that the boys of New Jersey had already discovered the virtues of the new edible, which is grown in sufficient quantities in a pond near the town to make excursions for this delicacy an object. We know from Herodotus and other ancient authors that the Egyptians used the seeds for food and made bread of them. The same use was made of the seeds of the white and blue lotus which are contained inside the ovaries and have the size of small grains. It appears even that the lotus was sowed as a food crop. All this would make it extremely natural that the Egyptians should have found a decorative motive in the rose form of the stigmas of the white and blue lotus.

The most curious oversight of modern archaeology is its prejudice that the rosette is a distinctive Assyrian form and that the Greek rosette is hence derived. Authors like Longdierger and Charles Chipiez have attributed the decoration of certain vases figured at Karnak to a foreign influence, on the ground that they are ornamented with rosettes, in absolute oblivion of the fact that the rosette is a constantly recurring motive in Egyptian tomb decorations which antedate the earliest known instances of a Babylonian or Assyrian rosette by at least seven hundred years. In that most recent history of ancient art which is supposed to summarize all accepted results up to date M. Perrot treats the rosette off-hand as a distinctively Assyrian ornament. German authorities on Greek vases invariably refer a rosette decoration to Assyrian influence. Orchnenos was recently discovered by Schlichmann, Professor Sayce immediately attributed the rosettes to a Babylonian influence, although the decoration has a thoroughly Egyptian character. The decoration at Orchnemos (undoubtedly of Egyptian style) dating from the prehistoric Greek period (time of the Mycenean jewelry) is illustrated at 22 as a typical case of the constant union in Egyptian decoration of the lotus, the rosette and the spiral. Nos. 23, 24, 25, are illustrations of the frequent appearance of the rosette in Egyptian decoration. All are details from tombs of the eighteenth and nineteenth dynasties, c. c., dating back to a period beginning about 1800 B. C. The earliest instance of an Assyrian or Babylonian rosette appears on the dress of a Babylonian king of the twelfth century B. C. There are no remains of Assyrian ornamental art earlier than the ninth century B. C. Most of the Assyrian rosette decorations belong to the eighth and seventh centuries B. C.

This prejudice in favor of the distinctively Assyrian character of an ornament which is so common in Egypt and which appears there in constant use so much earlier than it appears at all in Assyria can only be explained as follows: In publications of Assyrian monuments the reliefs have been the most constantly illustrated objects and it is on these reliefs that the rosettes constantly appear. In Egyptian publications the architecture and the sculptures have also been the most generally illustrated objects and in Egyptian relief the rosette is almost unknown. It is in the Egyptian tomb-paintings that the rosette is a constant form and these had not been abundantly illustrated until the publication of Prisse d'Avennes in 1879. In the earlier folios of Champollion and Rosellini there are some details by which they are illustrated but they were published at a time when the high antiquity of the eighteenth dynasty was not an axiom of Egyptian chronology. Perhaps the most important explanation is that the history of ancient ornamental art antedating the period of the Greeks has not yet been scientifically founded.

In defining the rosette to be a lotus motive we may return for a moment to the Ionic capital, noting the appearance of the volutes within the lotus volutes in the capitals of the Erechtheum and in the capital from Selinus illustrated at 28 (the demonstration still to be offered for the lotiform derivation of the "egg-and-dart" moulding will considerably assist the general argument as a cumulative point). The appearance of rosettes within the volutes of the Persian-Ionic scrolls (capitals of Persepolis and Susa) is another case in point. We are now prepared to understand the rosettes figured on the Cypriote lotuses, as in Figure 27. Another case in point is...
shown at 28, the detail of a Cypriote vase in the Lawrence-Cesnola collection in England.

The roofs established between the rosemary form and the oval stigmata of the white and blue lotus do not militate against the palatable cases in which a rosemary form is derived from a concentrically arranged series of rayed ovals. The view of the flowers illustrated in plan as it were. These are easily distinguished from the pictures of the oval stigmata by the pointed aspect of the petals.

The angulated terminations of the blue lotus stigmas are blunter. These leaves of the lotus are illustrated among the gold ornaments found by Dr. Schliemann at Mycenae.

In preceding papers notes has been taken of interpretations offered by Mr. H. Dieulafoy and Diersky of the lotus form.

According to the matter herewith presented their views on the subject of the oval, already made sufficiently improbable, would appear to be permanently set aside. Colonna-Caccelli conceived the oval to be represented by a triangle with a perfectly calyx-leaf. Dieulafoy conceived the oval to be represented by a form which was really a bulb inverted.

In the rest of the Assyrían decoration it is to be observed that it generally appears in association with lotus motives which are admitted to be borrowed from Egypt. Its appearance in early Greek vase decoration is invariably with lotus derivatives.

[To be continued.]

SILHOUETTATION

[Contributors are requested to send with their drawings full and a separate descriptions of the buildings, including a statement of cost.]

RAILROAD STATION, BATTLE CREEK, MICH. MESSRS. ROGERS & MACFARLANE, ARCHITECTS, DETROIT, MICH. (Gelatine Print, issued only with the Imperial Edition.)

THE BRIN MAWK SCHOOL, BALTIMORE, MD. MR. HENRY RUTGERS MARSHALL, ARCHITECT, NEW YORK, N. Y.

The building for the Brin Mawk School for Girls which is now being erected on Cathedral Street is intended to accommodate 150 schoolgirls. It will be 90 feet front and 70 feet deep, with 90 feet of space between its roof and its "ground." It will stand in the middle of a block with its front on the street line. The whole block will be surrounded by a high wall and the part not occupied by the building will be used as a play-ground. The building will be thoroughly fireproof throughout. It is planned in compact form to insure facility in management. In order to make the best use of the space it has been found desirable to adopt different levels for the two sides of the building as shown by the section. There will be a gymnasiaum on the south side occupying the height of basement and first story on the north side. On the north side the basement will be used for play-halls, a plunge-bath, dressing-rooms and locker-rooms in connection with the gymnasiaum, while the first story will be occupied by cloak-rooms and reception-rooms. The left room on the north side of the second story will be used as a "silent study room" in which each scholar will have her desk and from which the pupils will go to the recitation-rooms which occupy the remainder of the building. The drawing-room, laboratory and science lecture-room occupying the top floor. All the class-rooms are grouped about the central hall, which is lighted by a skylight in the roof, and by direct sunlight through the south attic room. This hall is faced throughout with English glazed brick. The gymnasium and connecting rooms, the lavatories and the science lecture-room and laboratory are also faced with the glazed brick. In connection with the silent study room there will be a reference-library. Particular study has been made of arrangements which have been suggested as desirable by practical teachers in this country and abroad and a strict attention to these requirements has furnished the elements of the design. The windows in all cases extend from the ceiling level and have sills high above the floor. As to the exterior effect, the building is to be a study in brown. Stone will be used for pilasters and brick in the contrasting shades. The roof will be of dark brown tile. The ornamental effects above the first story are to be produced entirely by the use of the brick of different shades worked into the designs suggested by the sketch. Thus the value of the masses will be retained without risk of such baldness as brick of one color would be likely to give. The high wall around the property it is hoped will give an effective line to the window of class rooms above the top of class rooms in the simplicity of its masses while picturesqueness will be gained by the difference of floor levels and the variation of fenestration which this necessitates. Special care has been given to the heating and ventilation plant. The triangular prism at the peak of the roof is made use of as a horizontal ventilation-shaft which will be closed automatically to windward; the suction from the lee side adding to base to the structure which will thus attain dignity in its height.

SPECIFICATION-WRITING.

As specification-writing is a matter of perennial interest, we need make no apology for copying in extenso from the Journal of Proceedings, R. I. A., the following abstract of a paper on the subject, by Mr. T. M. Rickman, F. S. A., and the discussion it engendered:

Mr. THOMAS M. RICKMAN, F. S. A., was invited, began by stating that the specification was one of the means employed by the architect to carry his design into execution. The design was in his mind. The drawings presented a reproduction of the design in scale projection; they were a representation of the function of the architect's mind. The specification was the translation of the design into technical language, describing the selection of the materials and the construction of the whole. The duty of the writer of the specification was to translate the design from all the materials at his disposal, into another language: from the image in the mind of the architect to a technical description of the work. The true specification should be in course of preparation all the time that the design was being elaborated by the architect. The general description of materials should govern the specifications and the specification in each part should be simultaneous. The writing of a specification should be encouraged as part of a pupil's work during his articles, rather than the common course of education, which left that part of the art altogether to the following period of apprenticeship. It seemed in some cases as if the architect-master of the present day followed the discipline of Pythagoras, who, it was said, collected and arranged the useful, and afterwards instructed them in the meaning of the enigmatical sayings in which he involved much of his doctrine.

Before writing a specification, its purpose should be fully considered. Much might be said as regards the order of treatment adopted, in favor of each of the following courses, the varied influence of which might frequently be traced: (1) Giving directions as to general principles, leaving the details to the common sense and experience of those who have to carry them out; (2) following the order of the quantities, and, in fact, only supplying a running commentary upon them; (3) following the order of the execution of the work; and (4) following the order in which the work would be taken when measured up.

For the practice of specification-writing, perhaps the most important qualification after patience, was decision, the subject, the form in which the writer considered that before writing a specification the mind should be made up as to the meaning and application of the following terms, the terms which there were varying opinions. Uniformity in the use of words, and the avoidance of varied terms meaning the same thing, would also be of great assistance in making a specification intelligible. Allow for, was a term which would not be used: it belonged to a bill of quantities, and should show that the subject was an actual item included, whatever it was. The contract cost at the risk of the contractor. Provide, was intelligible, if applied to quantities of materials and labor; if applied to sums of money, a very ambiguous term, and should be avoided in all cases. Should, if used in place of the usual "provide and fix," increased the clearness of the specification, and avoided some ambiguity. Proper, before the introduction of work in imitation of mediæval structures, had an intelligible meaning, as applied to lodged doors, doors in lead, etc.; it was now safer to fully describe what was intended. Sufficient was a legal term which required breaking down so as to convey the intention of the writer; clear interpretation was the next needed. Terms used to have any definite meaning through the introduction of the terms
CHURCH OF SAN MIGUEL, JEREZ DE LA FRONTERA, SPAIN
ALL SAINTS CHURCH
PASADENA, CAL.

Ernest A. Coxhead
ARCHITECT
LOS ANGELES
The American Architect and Building News. 151

March 30, 1889.

"Best Best," "Double Best," and the like. Prime cost, required explanation as to whether it was to be taken from the list-price without trade allowances, without also discount for cash, and also whether it had to be increased by establishment of 10% for weight, or 15% for such a thing as a trap the fres-air was to be interleaved for. When the window was wished to be close-jointed it should be stated. If the edges of Plate-Glass were to be blacked it should be noted. Custom of the Country should always be considered. The mode of pointing, slating and tilting of all sorts, with bedding and torching appropriate. The selection of stones and the appropriate treatment of each was too large a subject for the author's present attempt.

Among the many things likely to be forgotten might be mentioned: — The possible necessity of driving the planking of foundations as the application depends, 2nd, the liability of misinterpretation of the width of bed of a stone; the amount of labor carried by descriptions such as moulded, stopped, enriched, figured, veneered and the like; the accesses to styles, tape measures, tape descriptions, and the relation of specific sizes to suit the market for the several materials. The objects of a writer of specifications would be the best gained if he first of all had himself the raised knowledge as to judicious expenditure; in the position of the builder, but with an art knowledge which he might not have as to the materials available; and in the position of the clerk-of-works and foreman in having to obtain the workmen intelligent labor.

Discussion.

The Chairman. — There are considerable differences of opinion between architects as to the way in which a specification should be treated. Very few would have dealt with it in the elaborate and very explicit manner which Mr. Kickman submits to you as the proper course. Many would have made a simplified tabular list of the qualities of the materials and the general description of workmanship, in rather vague terms, was sufficient. This was sometimes thought the best way of dealing with the specification, leaving the elaborate drawnings with annotations and specific definitions, and also to obviate the difficulty in conveying the exact meaning to the workmen, and difficulties from omisions continually and frequently arose. With the complete system which Mr. Kickman from his great experience has developed towards more clearness and definiteness, it would arise; but he certainly would place the architect in the position of being not only a many-sided, but a multifrom man, to be thoroughly acquainted with the minute details of every trade in the elaborate manner which Mr. Kickman presents. Mr. Kickman could probably. He would receive great assistance, not only from the specification draughtsman in his office, but also from that now apparently indispensable adjunct to all building works, the quantity surveyor, whose careful revision of the specification during the process of taking out the quantities would supply many of those minute details which the architect had perhaps, in the first instance, overlooked; and the architect himself, there is no doubt, would be of much great indeed to the architect, as in his process of analysis he would necessarily detect essential matters of which the architect himself did not think to include in the specification. In regard to that decision becomes an essential quality, in which sometimes, perhaps, we are occasionally wanting. Unless an architect has cultivated the habit of precision of language he can hardly be expected to make himself intelligible to others in the sense in which he himself understands his words; that decision will be of little value; and it is unfortunately, I think, in the experience of most of us who have had to deal with specifications, is not that engaged with building matters, that such litigation arises too frequently from what I may call the looseness of expression and want of precision — where the intentions are expressed by words which, when read from the necessary precautions, that is, that what is written in a reference or in a court of law, will bear an interpretation entirely different from that from which the architect intended to place upon it. Mr. Kickman's observations upon the term "best," and upon "double best," are also of very great value. Some years ago, when the term "best" began no longer to mean anything but the "worst" it was the ordinary practice to introduce at the head of the specification a declaratory clause, that the commonest material was to be used. The specification is intended to be used in its natural sense, and that no such perversion as "best best" or its equivalents would be entertained. There is another, and that is the whole question of the commonest material as against other tradesmen than the contractor with whom the contract for the main building is placed, and the facilities to be provided for the execution of those works which are necessarily in the nature of incidentals, as such, to be used in the building as a provisional amount, and for which the contractor pays simply on the order from the architect, and concerning which the heartburnings and the differences between the builder and the architect are often exceedingly great, and sometimes lead to considerable litigation. In the present day
that practice of employing special tradesmen has become so general that it is evident that no matter how much or how little the client understands of the subject to which he has made reference, but rather endeavor to determine the specification of such an article as this, as to which, I think, is of the greatest importance. The architect should

Mr. E. T. Hall, Fellow. — Mr. Chairman, I am sure we have all listened with the greatest pleasure to the very able paper which we thoroughly understood Mr. Rickman’s explanation of the peculiarities and advantages of this material. As time is short, I will not refer to the general outlines of the subject to which you have made reference, but rather endeavor to deal with some of the more practical details of the construction of the building, which I think is of the greatest importance. The architect should draw his specification as though no technical person like the quantity surveyor was to follow him, and if he sets himself to work on the design of the building, it is of much more importance to him, of course, demand patience, and also compel the architect to cultivate that quality on which you have laid stress, viz., decision, which is so of great importance. If an architect does not know what he is trying to do, it is impossible that his clerk’s work or builder should know it. Therefore, if he will study the work, analyze the building from the bottom to the top, and describe what is to be done, he will give the quantity surveyor, if one to follow him, much less labor, and he will have the gratification of possessing a knowledge of his building which the clerk of the works and foreman of the builders do not possess. The advantage of effect of this will be the more evident when we consider the erection of the works. Well, Sir, Mr. Rickman has drawn attention to the fact that a specification should describe what is to be done, and not old directing, if the specification is negligently drawn, will be on the part of the client, and that is generally followed by suffering on the part of the architect, who hears of it again. Mr. Rickman says the writing of specifications should be considered as one of a few cases, or cases, where writing of the specification, by which I understood him to mean the original writing of the specification, can hardly be part of the pupils’ work. I think it is necessary to have a great specification, and it is eminently work for the head of the office; but the pupil learns how to do that by setting to copy specifications. With regard to loose expressions in specifications, for such phrases as “provide everything,” it is necessary to have some sort of course there can be no justification whatever. They lead always to trouble, and frequently to those arbitrations which we occasionally hear in cases of considerable object. And yet they are not for, as a term which is very indefinite, and I think his remark was that questions would arise in the mind’s as to how sure were to be calculated under such a direction. There are certain items which virtually are not at all. For example, an architect in London is re-creating a building which is surrounded by old chairs. I think it is a sufficient description for him to say, “allow for the necessary shocking and boarding-in of adjacent building disturbed by removal of the party-wall.” This is a perfectly intelligible description, and it is not a loose description either. Then, Sir, with regard to the trade terms to which attention has been called, I think the architect should have no difficulty, and I think I am not saying anything improper in suggesting, that these originated from the desire of merchants to assist the builder in — I will not say, but the word “will” does not mean “not.” We find that in trade phraseology “best” is not best, but may be a third or fourth-rate article, and that merchants are in the habit of using other terms to indicate something superior to that which is prescribed, to indicate a degree, so to say, that is superior to “best.” With regard to the vexed question of “price cost”: I hope before long the Institute may see its way to have a definition of prime cost, and so prevent the trouble and heartburnings which have arisen. Prime cost can have but one meaning. It means the first cost which the builder pays for the article specified. It can have no other legitimate meaning. To say prime cost refers to prices in any catalogue, with perhaps a discount of 70 or 80 per cent attached to it, is a perversion of terms. I think if it is clearly laid down that prime cost means nothing more nor less than the actual cost of your article, the supply for the trade, no injustice will be done to any man, and that which the architect means will then be clearly expressed and understood.

Then, Sir, with regard to architects’ knowledge of the Employers’ Legislation; I think it is much greater than you state. That is one of the responsibilities which the builder, in making his estimate, should contemplate, of course; but it is not necessary that the architect should be specially conversant with it. In cases where the work is under which the builder, as an employer, comes by an Act of Parliament. As to the question of “reassembling,” I quite agree with your views, and I should venture to press on this Institute a clause in the Constitution of the Branch. I am perfectly certain that words may not be desirable to remove a thing which may have wrongly got into a building, either by accident or design — we will say by accident. You will be surprised — by some other things else has got in. Now, if you are doing your strict duty to the public, you insist upon that being taken out; but possibly, in doing that, you may do almost an irreparable injury to the building. Under your contract, as you normally draw it, you must either take that out, in order to have the specification conformed to, or you must leave it in, in which case you cannot certify that the building is complete according to specification. It would be a very reasonable thing for the architect to do, and I think it is very important. Mr. Rickman, in the case where such a thing happens, the architect’s discretion may be used, leaving him the power to allow the “wrong” thing to remain, and for the reasons such as the reduction in the cost of the building or the owner, the benefit of the difference in value between the article which was specified and that which was put in. Another question comes in with regard to the architect’s decision. A very common instance is that of the temporary architecture and things of that kind, it is almost impossible to get timber which is absolutely without sap. A trifling piece of sap the size of one’s fingers may render a post or beam useless. If it is too small to compete. One who does know that you are reasonable in your interpretation of that will have an advantage over another who does not. Therefore, I think it a sound principle in the contract, applies to the work which is included in that contract. In other words, if you say “provide watching for works,” it applies, and can only apply, to the work which is the subject-matter of the contract. Therefore, I think, a general expression of “watching and lighting” will mean that you are to provide that which will light all the works by day or by night, or as you may specify. As tosegling for old drains, if we knew where the old drains were, we should not use the expression “search for them.” Take the case of an old building in London. If you are pulling down a building two centuries old, you may be positive you will discover an old cesso-pool filled with old timbers and old footings. The old house may be staff of men to take up the floor or to excavate under the old vaults. Indeed, until the old building is pulled down, it might not be safe to work under the old foundations. I think, in such cases, you could say something else; but you could not say that the architect is to provide, as asphalt: the architect must, of course, specify what he wants. If he simply means tar and sand, he should use the expression.

For the purpose, I think, of a general expression of a specification, if expensive asphalts are used, such as Claridge’s or Seyssel, the architect would, as a matter-of-course, say so. Again, Mr. Rickman’s description of stoneware pipes is an exhaustive one; but I think if, instead of saying in the contract a four-inch pipe or whatever it was, he would have said all that was wanted, and he would be as likely to get them perfect. He describes “torching.” I have found there considerable divergence in the trade, and that is why it is to be torched, as understood in many countries — Sussex, for example — is simply pointing the inside of the tiles with mortar, just covering the joint; but the system of torching introduced in other places, and as far as I can see, in the United States, is to fill the whole surface of the tiles flush with the battens. Another thing which is of great importance is with regard to the specification of plumbing. Now, with regard to lead-piping, nothing is more common, and, at the same time, more objectionable, than the possibility of a pipe bursting in a house, or of some apparatus getting out of order; and the thing which is very often omitted from the specification is that the pipes are to be secured at every joint by a proper clip, or stop-cock for shutting off the water in the rising main, by which means you can at any time save a burst of your pipe by having no water on. If you don’t want to have the piping out, the supply-pipe leaves the cistern, by which means, if the apparatus at any particular spot is out of order, you can turn off the stop-cock of that branch and shut off the water in that branch, leaving all the rest of your system to be worked. That is not included.

It is very commonly — if any one water-closet in the house gets out of order, everything else is thrown out of use. Sir, if I may be permitted to do so, I should like to conclude my remarks by moving a vote of thanks to Mr. Rickman for his very able and most instructive paper.

Prof. T. Roger Smith, Fellow. — Mr. Chairman, I think, perhaps, we may be in danger of going a little from the question of the nature of a specification to the question of the nature of things that should be specified. Our friend, Mr. Rickman, has tried to turn our thoughts to the somewhat difficult question of grasping what a specification should contain. I think we must bring in the qualities that go to making of it, but I think there are one or two others that might have been named, and upon which he did not say much at all, that I think would be very important to mention. First of all, there should have patience — it is a work that wants a good deal of patience — and that he should have decision. I am inclined to think that it is equally important that he should have knowledge. A man should be able to get an idea of the things tradesmen are furnishing; what will be expensive or the reverse; what will be inefficient; what will answer his purpose; and then, having got that knowledge, to use it. It is very much abroad indeed when he comes to write a specification. A man, when he is going to write a specification, will often find that he must furnish himself with knowledge, and in many cases he will find he has to do it twice; he then has to see the client, who insists upon that being taken out; but possibly, in doing that, you may do almost an irreparable injury to the building. Under your contract, as you normally draw it, you must either take that out, in order to have the specification conformed to, or you must leave it in, in which case you cannot certify that the building is complete
written comparatively short, describing in general terms the work; but then it must not go into particulars in any part. On the other hand, if a man begins to go into particulars, he ought to go into particulars for every part of his specification. He should, therefore, lay down a system for himself, and adhere to it. One remarkable point struck me during the course of these papers, and has been pointed out by a series of different tradesmen, and the object of the specification was evidently to give each tradesman a description of that part of the work which fell to him. The ordinary specification of a contract may be made up by a series of different tradesmen, and the object then becomes to be fairly complete for each branch; but no doubt this practice took its origin from the ancient custom of the work being done in this manner. If we do this, then we lose the object, for one contractor doing every class of work, and our specifications are made up in one volume, although they still contain a division into trades. There is no other way of carrying an ancient custom and an old plan. Our Chairman pointed out that specifications exist in which one-third, and even one-half, of the contract is amount is introduced in the shape of money-provisions. Now that is simply employed in different tradesmen who have come to the feeling that all the object of allusion to a distinct specification, which may exist or may not exist, but which in many cases does exist, in the nature of a distinct system which has previously obtained from some special tradesmen and it looks to me very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration. When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

Mr. William White, F.S.A., Fellow.—Mr. Chairman, in forming these specifications, it is essential to have contracts to be taken by different tradesmen together, simply because the locality was such as not to justify at that time the existence of a general contractor. I have had contracts carried out by separate contractors, and I have found that the specifications are better based on what he has to do and what he has to do. If, then, a specification is really wanted as a basis of contract more than anything else, then I am inclined to think that the more closely he follows the plan and terminology of the description the better it is likely that it is possible that the architect to carry his contract without any serious extra. If, so, that seems to me to be a point which is not of the estimation of the quantity surveyor, at any rate, to expand their specification unwisely.

Mr. Lacy W. Rider, Fellow. —Mr. Chairman, the Practice Standing Committee have now before them the subjects of general provisions and specifications, and these questions with regard to the cost and estimation of contracts. The one thing which is worth consideration is the manner in which the money-provision is to be construed, and how it is to be paid, and the troubles which might arise as to the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

Mr. Lacy W. Rider, Fellow. —Mr. Chairman, the Practice Standing Committee have now before them the subjects of general provisions and specifications, and these questions with regard to the cost and estimation of contracts. The one thing which is worth consideration is the manner in which the money-provision is to be construed, and how it is to be paid, and the troubles which might arise as to the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.

When you come to look at so large a portion of the work being done practically without description, as is the case, it is very much whether we require the descriptions of which a specification consists for working purposes or for some other purpose; and the thing is to be arrived at, almost better avoided by the architect making a series of distinct contracts for his employer with many of the special tradesmen, and simply making a contract with the general contractor that, in respect of their work, is to provide the necessary scaffolding and the necessary scaffolding. At any rate, it strikes me it is a point which is worth consideration.
out of allowing the quantity-surveyor to write your specifications, and that is, you do not know what is in your contract.

Mr. II. LOVEHOV, Associate.—Mr. Vice-President and Gentlemen, I rise with great pleasure to make a few remarks on Mr. Rickman's able paper, because I consider him to be the head of that branch of the profession to which I have given a considerable part of my time. So fully has each item been dealt with by Mr. Rickman that I need merely touch upon the leading points, taking care before doing so to express great admiration for the concise form in which Mr. Rickman puts his papers together. I am one of those who, referring to what the Late Lord Chief Justice Cockburn was in a legal way, and Canon Libdon in a clerical way. If a written specification is supplied by the architect to the surveyor, the surveyor has a very difficult task to follow the architect's specifications. It is a great advantage to him, as it enables him to compare the specification with the bills, and make them check each other; but by so doing the specification is made into a document which can be moulded, or changed pretty freely in the working of the work in question.

Of the several ways the third way of placing the matter in the specification in order of execution is certainly best, and the architect should then consider in writing the building in its various stages and order the operation as it passes before his mental vision. I agree with Mr. Rickman that “allow for” should not appear in the specification. It is clearly a phrase intended for the bill of quantities. “Provide,” say I, and these words are very clearly explained. The word “provide” to my mind should rarely be used in the quantities. In referring to materials, it is much better to give the architect the quantity, and say “as near as possible,” or “provisional,” after. I have known the word “provide” misunderstood by the contractor. It is not quite certain that the word “allow” would always meet the Architect's view. I have heard of “provisional” specification, and I believe constructors would be likely to assume that to supply the thing did not mean fixing it. I agree with Mr. Rickman that the word “fix” alone does not adequately represent what they mean; and other words being present range of design and work should certainly be careful to specify exactly how these things are to be done. The price cost question has been touched upon by a great number of speakers. It seems to me to be the one thing that specifies, and is not the architect and the builder can never agree when the settlement comes—and I think, as a former speaker stated, the builder wants to get his profit, and the architect tries to make profit towards. I think it should be distinctly laid down that the prime cost means the money actually paid to the merchant by the builder, and then his profit of 10 per cent or 15 per cent should be added to that amount. Local subcontracts should certainly be understood and defined be taken to instruct the contractors to deposit their plans as early as possible—in fact, before they commence the work. That gets over a great many difficulties; it gets over the difficulty with the vestry or the district board of works with regard to drains, and it helps to solve some points of area lights, building line, etc., and difficulties are thus smoothed over by the earlier application to the architect which is always in advance for any large work there is something to show, but with twenty or thirty or more pages of foolsap there is little to show, and the more or less neatly written, I cannot compare with several sheets of elaborately tinted drawings.

Mr. W. H. ATKIN-HURRY, Associate.—I have been very glad indeed, Sir, to hear to-night this particular question of prime cost brought under this discussion, because I think we have experienced the greatest difficulty and embarrassment in dealing with this subject, and I think many others have experienced the same. Local subcontracts are so definitely expressed to-night that the specification is still to be regarded as the work of the architect and not of the surveyor, for I, in my small experience, have had the opportunity of noticing that it has become the custom, amongst a great many, to look upon it as work that is delegating to the surveyor. The architect should have as much control over his specification as he has over his drawings; and I think he should not let the surveyor write them, any more than he should let his clerk describe them to him, from having such a skewer. I ask Mr. Rickman in his reply to define a little what he means by his observations on the word “trapped.”

Mr. W. H. Riggs, A. R. A., Member of Council.—Mr. Chairman and Gentlemen, this is a subject in which everybody who has to practise architecture must take a deep interest, and I am sure we are all extremely obliged to Mr. Rickman for pointing out many things which we have not previously considered. There are two or three considerations with regard to specifications that perhaps do not even come within their scope, but which certainly would be of more value to us than any. We do not know our business could write a very good specification if we had time, and the drawings before us; but it frequently happens that we are pressed for time, and worried as well, and are urged by our employers to finish it. The architect should be paid for his work in a perfunctory way. Architects, too, are very insufficiently paid for doing it properly. There are many great advantages in employing a contractor: there is but one set of plant, and one responsible head; but if you want first-rate work done you would go to the master-tradesmen of each branch, as he takes a pride in the excellence of his work. The principal cause of the difficulties we have in the interpretation of a specification is that, though the architect may be honest and know what he means, and the builder also, yet it by no means follows that the architect has so expressed himself that the surveyor is sure to interpret the work correctly, I think very rarely if the work in question is out of the common way. And how it is to be avoided unless we have more time to devote to it, and an independent interpreter before the tender is made, I do not know. I agree, as far as principles go, and we must not consider the subject both for the architect and the builder. The specification says: “such an article is cost so much, prime cost, the builder's,” and is it not possible—and I think I am right—after the specifications are made, that the subject may be changed, and the subject may be changed, and both, are very properly added to the cost but, to present imposition, the surveyor can always insist on seeing the receipts for what the builder absolutely paid, and make him pay for any additional payment. I always set my face against the discount and the profit as well; this common practice is very unfair and very troublesome work which does not properly appear. There are only two other subjects on which I want to say a word; one is on the subject of moulded bricks. I strongly advise all architects who have anything to do with moulded bricks to insist on a firmer penalty; and as for the other thing, as regards the bind the builder to time, because it may be impossible to carry out the latter condition—the bricks cannot be moulded till the contract is let, and may turn badly in the burning, and the architect will find he has endless trouble and annoyance, and to give full-sized details of every angle brick. I do not know whether “proper” has gone out of fashion, but it appears to me that, if you described it, to me, you will recommend the architect to make the only use of it is for solid door and window frames; and, as far as I understand it, the “proper brick”, the “brick frame” is one which is thoroughly and completely moulded; but if by the word “proper” Sir, you mean that it should come from a proper moulded, or anything of that sort, then you are giving a wrong description, and the builder may justly claim for the extra work.

Mr. F. W. WOODWARD, Associate.—I think the Institute is to be congratulated upon having had brought before it a paper on so important a matter, and I venture to say that there is not a man in the profession who is better able to write upon this subject than Mr. Rickman. The whole thing runs through Mr. Rickman's paper is this: that it is not well, it is not proper, that the writer of the specification should depute to others the elucidation of that which, by a little extra trouble, the full importance of the specification is shown by the use to which it is constantly put from the beginning to the end of the building by the architect and the building foreman. I think a walk through a building shows to the practical eye not only the design of the architect— the realization of the drawings—but those various points to which Mr. Rickman has so well referred—the realization of the specification. I think a specification should mean this: that, supposing the architect died, or should be compelled to be absent from the building during the whole time of its erection, the specification, taken with the drawings, should be sufficient to secure the entire carrying out of the design to the architect's mind. Are you doing this in any further conference whatever. To this end it is obvious that the specification must be written with considerable detail, for the architect owns much more than he is to be held responsible for it. With regard to the use of the word “best,” Mr. Rickman says that, for reasons which he properly adduces, he does not now employ it; but in specifications I use the word in this way: the word “best” is intended to cover the young architect, the architect, when the builder supplies inferior material, to say, “I will get you better,” and thus conform to the terms of the specification. With regard to the provision of scaffold for other tradesmen by the contractor, the architect has no means of noning good after other trades often entails upon the contractor serious and heavy loss. I must express my deep regret that Professor Roger Smith has, in his unwritten, how observations which may lead the journal to undervalue the importance of the specification. As I understand his observations, they point to this; that the architect need not devote so much time to the specification as certainly I and others in the profession have thought necessary. The belief is that, if any such doctrine is put forward, the young architect, with every desire to avoid what he now thinks is drudgery, will insist on his specification. The profession do not have the advantage of his client, to the disadvantage of his building, and certainly to his own detriment as an architect.

Mr. RICKMAN, Mr. Chairman, I have to thank you for the very kind words you have just spoken to me. You have given me the opportunity of noticing the subject, and have spoken to me in a manner which is true, and I am sure we have all here, and in the Committee, have given you the best gratification to you.
I am the friend to whom Mr. Hatfield refers, and, notwithstanding the denial of your legal authority that it contains "no such contract, or any form of building contract," I will say that in "Laws of Business for all the States of the Union, with Forms and Directions for all Transactions," by Theophrastus Parsons, L.L.D., etc., etc., Hartford, Conn., published by S. S. Scronant & Co.; Philadelphia, Pa.; Parmele & Co.; San Francisco, Cal.; H. H. Bancroft & Co., 1869, on page 171, under the title, "Drafing a Building Contract," is found the words: "And under the superintendence of the architect, hereby appointed superintendent and agent of the party of the first part.

These words were quoted substantially by Mr. Hatfield from information derived from this form, and in the course of his argument, I wish to add that Professor Parsons, in the statement preceding Form 23, says: "I now give a very full and minute form, prepared by a skillful lawyer, and in wide use." Yours truly,

ALFRED STONE.

In reply to the above communication, we can only say that the edition of Parsons's "Laws of Business" published in 1869 by Little & Brown, Boston, contains no form of building contract whatever, published by S. S. Scronant & Co., of Hartford, Conn., there is a form, a separate detached form, which contains the clause to which our correspondent refers, but, as pointed out in our issue of March 18, the agency of the architect does not include the authority to order extras. If our correspondent had read a little farther into this form of contract, he would have run across the following:

"It being expressly understood that no extra work of any kind shall be performed, or extra materials furnished, by the said party of the first part (the contractor) unless authorized by the said party of the second part (the owner), nor shall the said party of the second part order extras, except in the case of "skilled labor" and materials, which shall be given by implication even, and to the extent of the original specification, without the consent of the owner in writing. We recommend a careful attention to the other provisions of the "skilled labor" form before adopting the "standard form."

The main objection to the "standard form," we again repeat, is the tendency to give the architect unlimited and irresistible power to order extras. We do not believe that any lawyer in the United States, skilful or unskilful, can be found to sanction such a practice. — Ed.

T-SQUARE CLUB.

At the regular meeting of the T-Square Club held on the 6th inst., at Philadelphia, Pa., action was taken upon the death of J. H. Sprumce, afterwards, after drawings submitted by members (at Mr. Wilson's instance), the appointment of a building committee, who are to proceed with the work for the sum of $1000. The roll was ordered, and the president of the committee was instructed to see that work is done three-fourth inch to the foot, and full-size details were criticised with the following result: First mentioned, Louis Hickson of Philadelphia; second, Frank A. Hayes. The meeting concluded with a collation.

PAYMENT FOR UNEXECUTED PLANS.

Dear Sirs,—Can you refer me to any adjudication cases touching upon an architect's right to be paid for plans and specifications for buildings not carried out? I have found it necessary to sue for such services and beg you to send me references at once.

Very truly yours,

THOMAS

There is no question about the right of an architect to payment for plans and specifications for buildings not carried out, provided he was engaged to make the plans and specifications, and that he did not agree not to ask for any pay unless they were carried into execution. If the architect be suing on jury on these points, it is difficult to see how he can be prevented from obtaining judgment. The proper question is, whether or not the party paying proper compensation will be, depends again on what the jury is satisfied with. Agreement is all that is necessary. If the professional service, he is entitled to damages for being prevented from carrying the plans into execution, in addition to payment for what he actually did. Messrs. Fuller & Wheeler of Atlantic City, and a case decided by this court, were referred to, which was described in this journal some time ago. On the general question, perhaps, Lord v. Norty and Kotts v. Bell, 28 Pick., 58, may be of some use, but the matter really rests upon what the jury, or the referees, may find that the contract was. If they find that the defendant, either expressly or by implication, asked the plaintiff to do work for which the plaintiff did, in a proper and skilful manner, expecting to be paid, and without agreeing to any conditional terms of payment, it will be very strange if they do not award him a fair compensation. As to what condition of the circumstances, the schedule of the American Institute of Architects, which gives the third and one-half cent per page.
A NEW YORK JEWISH ARTS COMMISSION. — One of the last alterations effected by M. Lockroy as Minister of Public Instruction and Fine Arts was in connection with the Department of Fine Arts. For many years all business connected with the arts was conducted by the chairman of the Department. In 1884 an independent committee was appointed, but its powers were limited. M. Lockroy proposed, and the President has now established a commission with an increased responsibility. First, there is a general commission consisting of the chief officers of the Department of Fine Arts, several senators, deput- eputies, and architects; M. Pavin de Chavannes, painter; MM. Chapu and Dalou, sculptors; and MM. Chaplain and Dureteter, engravers. The commission is empowered to decorate of public buildings, will give advice on competitions, and point out works in exhibitions which are worthy to be purchased by the State. By the new arrangement it is anticipated that more unity will be obtained than was possible when commissions were given without any thought of other works. In order that delays may not arise through the difficulty of binding the commission with its representatives who have been nominated, before whom questions will be brought, the members of the commission will be allowed to con- act a commission so constituted than with one made up of officials, whose business, everywhere, is to do difficulties. — The Architect.

CASTINGS FROM BURSSE. — It is said that Sir Richard Wallace has re- fused the offer of some thousands of pounds for a collection that is not a cast of the shield by Benvenuto Cellini, which is one of the treasures of the gallery in Manchester Square. Naturally there is apprehension that it may be sold to France in the course of things. Sir Richard Wallace’s views will be confirmed when he reads how the architect who has charge of the column which marks the site of the Bastille has declined to grant permission for a small statue to be placed on a bronze lion that is sculptured on the west face of the pedestal. It is one of Bury’s, and the commission has been authorized to collect the whole of the collection during the century, which is a part of the international exhibition. The architect says that part of the French custom in the future to refuse permission for numerous recent casts there is nothing to lose their character. He is also uncertain about the chemical action of the plaster, which might remove the pathic character of the ancient. There is an intention, however, to commit a commission to the resolution, which is a condemnation of the action of other architects and conservators who have raised no difficulties about castings. It would be bad news for many museums if the architect’s opinion prevailed. That moulding has not become more dangerous to bronze in Paris than elsewhere is evident from the experience of the past. That the composition of the bronze statue at the base of the statue is a mystery. — The Architect.

THE EFLORESCENCE OF BRICKWORK. — The unsightly efflorescence on walls, due to what is termed “saltpetering,” and noticed generally in dry weather, is due to several causes. Perhaps the only satisfactory explanation is that it is caused by the juxtaposition or antagonists in combination with something in the bricks themselves. It is stated that bricks made from clay containing pyrites are subject to this efflorescence; that the sulphur from the fuel converts the lime or magnesia into sulphates, and that whenever the bricks dry the sulphates evap- orate, leaving behind the crystalline substance of efflorescence. The evil is, therefore, due to the chemical character of the soil, and takes place between the sulphur in the fuel and the magnesia in the clay. The mischievous part of the efflorescence is that it destroys the pointing, and injures the work generally. Remedies are few. The chief object is to stop up the pores with some solution of fatty matter. The lime from the fuel is the most injurious. A combination of particular clay and coal fires employed to make and burn the bricks, and to mix the mortar with animal fat. — Building News.

OLD MONASTERY DOORS. — Derbyshire possesses what are described as the finest pair of old monastic doors in England. The great doors, which are of oak and decorated with coloured glass, which are over two hundred years old, have been well made and the hinges are in good condition. They are in fair condition, the oak bolted together with great clear nails and are carried on a massive stone pier. The date of the building is about 1500-1520. Mr. Fane has lately brought together among the Cole papers the original voluminous charter, with great skill attached, granting the lands of the dimmed priory of Beaurep. — Ex- change.

THE OUTLET OF HOUSING — State. — The following is a statement of the shipments of roofing-slates from different points in the country during the year 1886: Bangor and Pen. Arogo, Penn., 378,800; Brunswick, Me., 114,000; Chairman’s, Penn., 224,500; Peach Bottom, Penn., 23,000; Maine, 28,000; Vermont and New York, 150,000; Virginia, 10,000; making a total of 650,300 square, at an average 360,000 with an average 12.87. — Exchange.

TRADE UNION. — The characteristic of the general markets of the country is dullness. The demand seems to have been anticipated. The lowering of prices and the lowering of prices has just been displaced by a number of individuals. Wage-bills have been reduced 5 per cent. Since the beginning of the year, a number of individuals have been unemployed. A large number of schemes that were to have been pushed this month are delayed, and promoters are disposed to move with unusual caution. What is the actual state of the iron and coal industry? Will the price of production be excessive? Are prices declining? Are opportunities for invest- ment in real estate and other enterprises available? Are a number of schemes for the promotion of business in the country in connection with the price of the month, or are they in connection with the price of the month? Are there stayings out of business? It seems as if the condition of business has been very greatly increased in all departments of activity. Can this increased capacity be profitably employed in what the business world is now a matter of wide and deep. So also in coal, though the bituminous miners’ compact has been effective to preserve the price of coal, we are assured that business is not unemployment. The iron-mill wages will be reduced 12 per cent. In some iron mills wages are down 10 per cent. At the Alabama railroad-shops 4,000 men have been re- duced to nine hours a day, with a half Saturday holiday, and no reduction in pay. The eight-hour agitation is progressing, and employers are observing it with some concern. Railroad building is a case in point. Large structures, valuable engines are in demand in Central and South America; and a leading builder has stated this week that American work in those localities is not being doubled within a few months. Within a short time twenty-one engines have been shipped there. Car-work comes in slowly, but from excellent orders. A considerable portion of the orders will be ready for execution during the next sixty days. Railroad managers are not inclined to contract for large structures, though there is a spirit of the same class. Despite all, the manufacturing enterprise, much new work has been projected since March 1. A road is to be built to parallel the Duluth and Winnipeg, now building. One railroad is under construction. The region is again broken by a road which will soon be heard of. A ninety-five-mile road is to connect Baton Rouge with New Orleans. Prices have been reduced from the Pacific Coast to India. Within thirty days forty roads have been projected, of which, it is estimated, about five miles will be laid. The sensational foreign rumors is one to the effect that the English cabinet will continue in the same manner, hoping that the American railways in Yorkshire, Lincolnshire, Northumberland and Dur- ham will soon be able to carry the imported goods by rail, and that the railways are coming to the front in the Province, passed an important law for it. The Cuban iron-ore developments are very encouraging to the Americans who are extending their control of mineral properties in that island. Natural gas is to be piped to Columbus and other points in the same. The State twenty-five miles distant. Wells have been bored in Kentucky, developing large gas supplies, and schemes to pipe gas are up for consideration. Western mining interests are seeking legislative cooperation to erect dams and to promote the production of manganese. The manganese is to be found in the vicinity of valuable minerals at lower depths. One of the finest oreb- beds in the United States is in the neighborhood of St. Paul. A large bridge is said to average 67 to 72 per cent metallic iron. They are low in ordinary Improved. The ore can be mined at fifty cents, and delivered at Denver. At St. Louis the new companies are more extensive. The profits are high, and the profits are high. Another company is working on a proposition to construct a bridge for brick-paved streets. At Des Moines, a mile and a half have been laid. Glass of all kinds will be in abundant supply. All the factories are working. Real estate speculation is increasing. There are more real properties being bought in large cities, and a great deal of property has been purchased this winter by parties who recognize the value of the real estate in these cities. As facilities for real estate improve, less is demanded of the banks. — The American Architect and Building News, [Vol. XXIV. No. 692. — J. P. PARKHILL & Co., Printers, Boston, New York.]
The exterior of this house is stained with **Cabot's Creosote Stain** for Shingles, Fences, Clapboards, etc.

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply.

Our Stains contain no water and are the only exterior Stains that do not contain kerosene.

**Prices** are 40, 60 and 75 cents per Gallon according to Color.

**Send** for Samples on Wood, and Circulars.

**Samuel Cabot, MFG.**

70 Kilby St., Boston, Mass.
CAPITALS.
THE GURNEY HOT-WATER HEATER.

Below we append cut of the one hundred series of the Gurney Improved Hot-Water Heater, which is the production of years of study and practical experience, combined with theories advanced by the most prominent heating engineers in this country and Canada. The Gurney Hot-Water Heater Company are undoubtedly the pioneers of hot-water heating in this country, and have at all times had uppermost in their minds the ambition to perfection, and for the public good. To be outdone by none, and thus always hold the lead. And to the eye of the practical engineer we think this article and cuts will commend themselves.

In beauty of form, durability of construction, compactness, extent and quality of surface, cheapness, and economy, they have obtained the best results ever secured, and they challenge examination and comment by the engineering talent of the world.

The main considerations to be regarded in a Hot-Water Heater are how to arrange the heating surfaces to obtain the best results and this can only be determined by continued experiments, and the Gurney Hot-Water Heater Company having made in the past several years series of practical experiments, are led to lay down the following essentials for the construction of a satisfactory Hot-Water Heater:

1. The whole arrangement must be such that the least possible resistance is offered to free circulation.
2. The area of heating-surface must be made to approach, so far as practicable, a maximum.
3. The arrangement of the heating surface must be such that,
   (a) A maximum of the heat of the burning fuel is utilized.
   (b) The convection currents shall not impede each other, or coalesce to the formation of eddies.

How far we have met these essentials of a good heater in the construction of our one hundred series of heaters will be best understood by referring to the accompanying cut.

To meet the first essential, we have constructed the heater so that the inlet and exit ports are open from the line of the floor to the top of the heater, as well as around the entire circumference of the cross-sections. All sharp angles and other obstructions to general circulation have been avoided. The second essential is secured by the introduction, in series, of a number of sections, pierced with flues, through which the heated products of combustion require to pass before entering the chimney. The area of heating-surface is thus greatly extended, and essential three (a) met at the same time, since the heated gases (products of combustion) part with their heat as they ascend through the different sections. The essential three (b) we have sought to meet by giving the sections a peculiar shape. The upper and lower plates of each section incline from the ports inwards, giving the outgoing and incoming currents such direction as (in our belief) will most effectually prevent the formation of eddies, and in general, produce currents which may accommodate themselves with the least resistance to the direction of the main currents at the outer jacket.

The Gurney Hot-Water Heater is especially designed and adapted for hot-water heating. It is easy to erect, most economical of fuel, simple to manage, presents the largest heating-surface to the fire, is moderate in cost, and we offer them to our patrons fully guaranteed.

To correspondents living at a distance we would recommend a conference with local agents with a view to obtaining estimates of fitting, and they would be glad to furnish plans which, if adhered to, will result in giving a thoroughly reliable heating apparatus. Correspondents, when soliciting estimates of work, will have the kindness to be as explicit and definite as possible to as to the size of the building to be warmed, its glass surface, construction, location, points of compass, exposure, and conditions generally. A sketch of the building, with its size and height of ceiling, will facilitate matters and enable them to form a correct idea as to size of apparatus needed.

GURNEY HOT-WATER HEATER COMPANY,
BOSTON, MASS.

ASPINALL'S ENAMELS.

For years past many scientific men have endeavored to produce an enamel, that will stand boiling-water, something especially adapted to renovating baths, that have become unsightly, and the success which has crowned the efforts of Aspinall & Co., England, in the production of their various enamels has been hailed with delight by the civilized world. This product is the only real enamel which does stand boiling-water and is made by a secret process known only to themselves. It is not a paint, but is applied as easily and readily as any mixed paint, to iron, tin, wood, or any other substance, however open or porous, and its uses are so manifold as to make it impossible to enumerate them. Old bath-tubs, baskets, tables, chairs, hot-water cans, brackets, boltseats, etc., can be easily and quickly rejuvenated, or ornamented with any color desired, over a hundred different colors or shades being manufactured from chalk white to deepest brown and black. For prices, list of colors, testimonials and further information apply to,

E. ASPINALL,
Sole agents for the United States,
98 AND 100 BEEKMAN STREET, NEW YORK, N. Y.

The Whittier Machine Company have recently constructed for Messrs. Tiffany & Company, Union Square, New York, one hydraulic passenger elevator operated by their Pressure Tank System.
THE "WILLER" SLIDING-BLINDS.

The "Willer" sliding-blinds have been in the market but a few years, but in that short period they have become so generally known amongst architects, builders, and the building public in general that a detailed description of them is here unnecessary. The catalogue shows some twenty different classes, or twenty distinctly different ways of arranging these blinds in the windows. For illustration we select Class E, this class being universally used for buildings of medium cost, on account of its simple construction and moderate price. This class consists of three separate sections of blinds, covering the entire window, and running in a guideway containing three grooves, one for each section of blind, all within the space of the window-opening, no pockets being employed at either the bottom or top of the window.

The other classes in the catalogue show windows fitted with blinds of two, four and six sections, without pockets, and with pockets at either the bottom, top, or both ends of the window.

The "Willer" blinds have rolling slats of a new construction throughout all sections, or lately been fitted with these blinds, the total order for the purpose amounting to nearly $60,000.

As a further proof of the superior quality of these blinds in general, the firm has been awarded the bronze medal at the Late Centennial Exposition, held in Cincinnati, July 23, 1893.

Willer exhibit at the above Exposition, taken from a photograph; also a fac-simile of the medal.

We employ a force of one hundred and fifty men, of whom one hundred and ten are employed exclusively in the manufacture of these blinds. The sales of these blinds for 1888 amount to over $100,000. The blinds are in use in all parts of the country from Maine to California, and Manitoba to Texas. Over $100,000 worth have been sold in Canada alone.

We will send our No. 8 Catalogue of 1888, free of charge, to any architect or builder, etc., upon application. Our new catalogue of 1889-1890 will be issued about May, 1889, and will be the most artistic and complete catalogue of its kind in the country.

We also make a specialty of fine stair-work, of which line a separate catalogue will be issued in the spring.

The firm is represented at present by nearly three hundred sales-agents in all parts of the country. Agents are wanted everywhere, and applications for agency will be considered from parts not yet represented.

Further particulars may be had by addressing the firm, W. S. MILLER, FOURTH AND CEDAR STREETS, MILWAUKEE, WIS.

THE SPRINGFIELD GAS-MACHINE.

The Springfield Gas-Machine has been perfected by an experience of over twenty years. As it has from the first been made of the most durable material and most perfect workmanship, no doubt there are more of these machines in actual operation to-day than of all others combined. Thousands of other machines, which have been made of inferior material and are now out of use, because they have been destroyed by corrosion, often within three or four years after being set up.

Our air-pumps are constructed entirely of copper. Our gas-generators are of heavy galvanized-iron, with every seam not only riveted like a steam-boiler, but massed in solder, so that the cut edges of the iron and the exposed ends of the rivets are completely plated with that metal. They are then covered with boiling tar in several coats. They are divided into shallow evaporating-pan's, furnishing by this means, and by abundant absorbent material, larger evaporating surface in square feet than any other gas-generator made.

We confidently assert that this is the largest and most durable, simple and efficient gas-machine in the world.

The gas made by these machines is usually known as Carbureted Air Gas, being common air impregnated with the carbonaceous vapors of gasolene. It burns with a rich, bright flame, fully equal to coal-gas, and it is conducted through pipes and ornamental fixtures with the same convenience and safety.

The gas is really analogous to coal-gas in its general features — the one being a carbureted air gas, the other a carbureted-hydrogen gas. They are both governed by the same general laws; the particles of each exist in a state of mutual repulsion; if permitted to escape, they alike permeate all the surrounding atmosphere, and are detected with equal readiness by their odor. Air gas possesses an illuminating power of from twenty to thirty candles, equal to the best coal-gas, and much superior to that ordinarily supplied by city gas-companies. It is a remarkably pure gas; contains no poisonous compounds or impurities of any kind; with proper burners, combustion is perfect, without smoke or odor.
Gasolene, the fluid used in making gas by our apparatus, is a light, volatile product of petroleum, analogous to kerosene; chemically considered, it is almost a pure carbon; it is produced in large quantities in the distillation of petroleum, and is a common article of merchandise, readily obtained from almost all refiners or dealers in oil. The supply yearly increases, more than keeping pace with the demand, and is necessarily as inexhaustible as the supply of petroleum.

The Springfield Gas-Machine consists of a gas-generator—a cylinder containing evaporating-pans or chambers—and an automatic air-forcing apparatus.

When the machine is in operation the pump forces a current of air through the gas-generator; here it becomes carburated, thus forming an illuminating gas that is returned through the gas-pipe to the house, and carried by the distributing pipes in the walls and floors of the building to the burners, or it may be conducted from the gas-generator to other houses in any other direction—to stables, out-buildings, or to lamps on the grounds, wherever light is required. This plan of gas-making is automatic.

Gas is generated only as fast as and in such quantities as required for immediate consumption. The process is continuous while the burners are in use, but instantly stops when the lights are extinguished. The Springfield Machine, in this manner, is considered as safe a means of lighting as any that can be adopted; all the gasoline is kept in an air-tight vessel under ground, and removed from the building a safe distance. There is no gas in the air-pump, nor inflammable material in the building, except the gas contained in the distributing pipes.

No fire is used in the process of manufacture. Buildings lighted by the gas are insured at the same rates as though coal gas was used.

We have now several thousand machines in use in every part of the country, lighting all classes of buildings, and in no case has a building been burned.

The cost of the gas depends upon the price of gasoline; this varies from fifteen to twenty cents per gallon. Taking this as a basis, the cost per thousand feet is from eight to ten dollars, six gallons being a liberal estimate of the amount of fluid required to produce light equal to that from a thousand feet of ordinary coal gas.

The economy of lighting by gasolene gas has induced many large consumers of coal-gas to adopt our machine, and with the most gratifying results, the cost of the apparatus being quickly saved in the lessened gas bills.

Gas air is cheaper fuel than coal or wood for cooking and laundry purposes. Send for our illustrated catalogue of gas ovens, ranges, griddles, grills and broilers, laundry-iron heaters, coffee-roasters, instantaneous water-heaters and open, fireplace heaters.

One of the most interesting uses to which gas may be put in promoting domestic comfort is undoubtedly that in connection with the preparation of food. It is a matter of surprise that it has not been more extensively adopted by the general public. Its use for these purposes is of special interest to those having gas-machines, because of the great economy of gas air. The first cost of gas ranges is not half that of good coal ranges, while they will last a lifetime. The exact degree of heat required for any special purpose is at once known, and no more gas is used than is required. On the score of economy, it will be found that gas air is immensely cheaper than coal.

Ordinary open coal grates furnished with a suitable burner, and filled with ragged bits of lava, which, when the gas is lighted, becomes incandescent, perfectly counterfeits a coal fire, and furnishes an economical and abundant heat. Gas air is used as fuel in the mechanical arts for heating light forgings; melting gold, silver, brass, glass, etc., soldering, brazing, bluing; in canneries, and by manufacturers of hollow ware. We invite correspondence on this branch of the subject, and will mail our circular, with numerous references, upon application.

GILBERT & BAIRCH MFG. CO.,
53 Maiden Lane, New York, N. Y.

A RADIATOR WITH ARABESQUE DESIGN.

Our illustration shows the Bundy "Elite" Radiator which has the most beautiful design that has ever been applied to a radiator.

It is of Moorish origin and consists of only lines, curves and angles as the superstitious Moors thought it an unpardonable offence to fashion any artificial object like anything having life. The Koran taught them that the imitated object would immediately die and bring down upon the offender the curse of their God. In this the over-cautious Moors were a little foolish, but at the same time, a study of their architecture shows their skill in designing works of rare beauty.

It is especially appropriate in ironwork where any attempt to imitate life seems out of place, inappropriate and in time, absolutely unbearable.

For this reason the Elite Radiator, which has the Arabesque design in its purest type, is the most beautiful that has ever been applied to a radiator. The appearance of the radiator is such that no one ever grows tired of it and it can be decorated in a multitude of ways to suit the surrounding draperies, etc.

Also, unlike all other sectional radiators on the market, the Bundy Elite Radiator has with it accompanying advantages, and this is why all prominent architects, with rare exceptions, specify the Bundy Elite Radiator, because they know that they can find it from ten to forty per cent less radiation than with any other.

Steam-fitters are also cognizant of this fact and when the matter is left with them for decision as to which radiator to recommend, they are certain to conscientiously serve the best interests of their clients, they will use none other.

It also possesses a great advantage over all other radiators from the fact that the surface consists principally of areas of a parabolic curve, and so all parts of the radiator are constantly surrounded by freely circulating air. Again, all sections are duplicates; legs are detachable and can be placed under any section and if desirable sections can be added to, or taken from, the radiator increasing or diminishing its heating powers at will.

Much more might be said regarding this excellent radiator, but it will suffice to say that we will gladly send our catalogue, which is a valuable encyclopedia on heating, to any one who may request it.

THE A. A. GRIFFING IRON CO.,
72 Communipaw Avenue, Jersey City, N. J.

FIREPROOF BUILDING MATERIALS.

The practicality and efficiency of Hollow Burnt Clay Blocks and Tiles and Porous Terra Cotta Material in the construction and protection of buildings against loss by fire, has been fully and satisfactorily demonstrated, and the security it offers is so palpable, that the best informed architects and builders in the country recommend its use in all structures where life and property is jeopardized.

Since this important feature in buildings has become an established fact—the demand for "Hollow Brick" has increased largely, so much so that within the past year we have been obliged to greatly exceed our former capacity in order to meet the demands put upon us by this important branch of industry. Our works are now the most extensive of the kind in the country.

The advantages we possess for procuring and handling the raw material are unsurpassed, having our own clay beds easy of access within a few feet of our works—situated on the Sources of the streams of earth. Amboy and Woodbridge, N. J., with railroad switches alongside, an extensive water-frontage, and large dock-room, which gives us every facility necessary for shipments to all points reached by rail or water. We are prepared to furnish estimates and execute promptly all contracts intrusted to our care.
The OSTRANDER DOOR-OPENER.

The Ostrander Door-Opener is simple and compact in construction, positive in operation, and withstands wind pressure or other forces, and cannot be jarred open. The movable bolt is a steel drooping screw, and the other parts are of the best wrought-iron and steel. Nothing has been spared in its construction, as our aim is to make this door-opener.

These have been thoroughly tested and in practical operation since patent was applied for.

The movement is a gravity one and it is devoid of any delicate springs or delicate mechanism.

The movement is protected by metal sides to prevent dirt, plaster and chips from interfering with its operation. The whole mechanism is operated by compressed air (Pneumatic) or by electricity with batteries; and orders must state which method is to be used to operate the Door-Opener, and also state if for right-hand or left-hand doors.

W. E. OSTRANDER & CO.,
23, 25 & 27 ANN STREET, NEW YORK.

THE NEW SASH-CORD FASTENER.

The success of house-building and the satisfaction of living in it, when built, depends, very largely, upon the little and unseen contrivances which perfect the working and use of the details. This is no more apparent in the hanging of the window-sash, which too often, is done in such a slipshod and careless manner as to call forth the impression of all who have to do with them. Especially if the sash has to be removed from the frame for cleaning or other purposes.

The Empire Portable Forge Company of Cohoes, N.Y., realizing, from actual experience in building, this deficiency, have put on the market a new sash-cord fastener (an advertisement in another column) which is designed to do away entirely with the difficulties to a cheap and effective way. The illustration here given shows the old method of hanging sash and the new, viz.:

The sharp rib extending over the top of the fastener, through the centre, is by the weight of the sash brought to sink into the frame and thus held from moving.

Reasons why you should use them:

1. It costs less than one-and-one-half cents per sash. Requires no nails or screws. Can be put in or taken out in less than one minute. Prevents the knot from fraying out and getting between the sash and frame. Does not split the sash like nails or screws. Prevents the cord from running back into the weight pocket. The most useful invention for window sash ever put on the market. Every window requires them.

The Empire Sash-Cord Fastener is the most useful little thing ever offered for easily attaching cords to the sash—costing a mere trifle at same time saving much time and patience in hanging the sash and preventing damage to it by the use of nails or screws through the knot, as in the old method, and wearing and binding of the sash and frame by the knot fraying out and becoming jammed between them.

It also prevents losing the cord in the weight-pocket by running backward, and when the sash is to be removed for cleaning or glazing, it can be done so easily and so comfortably that any man building a house will have them, and the work will be much more satisfactory.

The Empire Forge Company call the attention of architects, especially, to this little device and urge them to include the sash-cord fasteners in their specifications.

We will be glad to send a sample of it with cord attached to a block, showing both the old and new methods, on request.

Investigation of this little device, will show it to be a very useful one and destined to have a large sale.

EMPIRE PORTABLE FORGE COMPANY,
COHOES, N. Y.

NOTES.

The Whittehr Machine Company have recently put into the Adams Building on Court Street, this city, two hydraulic passenger elevators, each operated by their Pressure Tank System. Also have constructed for Messrs. R. & O. Goelert for the building corner of Lexington Avenue and 41st Street, a tall elevator for freight and passenger service.

They have recently contracted for Dr. John Waller's, No. 1019 F Street, N. W., Washington, D. C., two upright steel ballers, each and two half feet in diameter.

We understand that the Henry-Bonnard Bronze Co., New York, have contracted to cast in bronze the following statues, on which they are now engaged:

First Episcopal, Portland, Ore.
First Congregational, Williamsport, Mass.
First Baptist, Frankfort, Ky.
Zoeil Ave. Congregational, Cleveland, O.
Second Congregational, Jaffa, Tenn.
Twenty-Second St. Baptist, Louisville, Ky.
First Congregational, Utica, N. Y.
Universalist, Tiffinville, Pa.
Presbyterian, Green, Ind.
First Congregational, Bradford, Me.
First Unitarian, Deerfield, Mass.
First Congregational, New Hope, Minn.
Second Baptist, Lincoln, Nebr.
Second Baptist, Keokuk, Iowa.
First Baptist, Columbia, S. C.
Methodist Episcopal, Princeton, N. J.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches:

First Baptist, Minneapolis, Minn.
First Presbyterian, Detroit, Mich.
Holy Trinity, Hoboken, N. J.
Central Congregational, West Hartford, N. Y.
First Congregational, N. Y. City.
First Congregational, Jaffa, Tenn.

Churches, Baptists:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Congregational:

First Baptist, Portland, Me.
First Baptist, Columbia, S. C.
Methodist Episcopal, Princeton, N. J.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Episcopal:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Presbyterian:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, United:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Methodist:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Congregational:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Presbyterian:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Episcopal:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, United:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Methodistic:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Congregational:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Presbyterian:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Episcopal:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, United:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.

Churches, Methodistic:

First Baptist, Portland, Me.
Methodist Episcopal, S. Bernardo, Cal.
Methodist Episcopal, Ontario, Cal.
A VERY interesting communication is made to the Engineering and Building Record by a firm of architects whom the editor of the Record asserts to be prominent in the profession, quoting two or three forms for schedules of services which have been under consideration by the firm, and asking for advice and criticism to aid the firm in deciding which schedule to adopt definitely for its future business. As might be expected, the question of a clerk-of-works is particularly prominent in the matter, but the firm seem to be in doubt as to the best way of securing his employment. In the first schedule proposed, the charge for all new work costing more than fifty thousand dollars is fixed at five per cent on the cost, and it is stipulated that a clerk-of-works shall be employed and paid by the owner to supervise the execution of the building, under the direction of the architects. In case the owner is unwilling to employ a clerk-of-works, it is stipulated that the architects shall be considered as relieved from all responsibility for defective workmanship, unless it is clearly shown to be due to faults in their drawings, specifications, or general direction of the work. For buildings costing less than ten thousand dollars, the charge is eight per cent on the cost, and the architects agree to employ a clerk-of-works at their own expense, who shall visit the building at least once a day while work is in progress, and they agree to be responsible to the full amount of their commission for the conscientious execution of the work. For buildings costing less than ten thousand dollars the charge is ten per cent, and nothing is said about a clerk-of-works. In the second schedule the architects’ charge is fixed at ten per cent on the cost for dwelling-houses or apartments costing less than ten thousand dollars, a round sum of one thousand dollars for those costing between ten and sixteen and two-thirds thousand dollars, and six per cent for those costing more than the latter sum. For buildings other than dwelling-houses or apartments the charge is five per cent where the cost is over ten thousand dollars.

ARCHITECTS who practise in Boston should take notice that a new regulation went into effect last month, by which the use of the white asbestos-covered “underwriters’ wire” for conveying currents for electric-lighting in buildings is practically prohibited. The Fire Underwriters Union refusing to insure buildings in which it is used for that purpose. As the “underwriters’ wire” is much cheaper than the waterproof wire now required, the change will make an important difference in the cost of wiring buildings for electric-lighting, and architects must see that they are not imposed upon by unscrupulous contractors, who, in their anxiety to underbid each other, are very likely to try to get the architect’s consent to the use of the inferior wire, which has hitherto been the one most commonly employed, and will lay the blame upon him when the underwriters refuse to accept it, and the whole has to be torn out and done over again.

SOME of our readers may remember a description of a building with a tower five hundred and twenty feet high, or something of the kind, which was, according to the daily papers, about to be erected in Brooklyn, N.Y., for an institution which was to undertake the uniform training of young clergymen of all denominations, upon some system which was not explained, but which included the examination of the stars through a telescope in the nature of the transaction. The institution which had undertaken this rather delicate business was said to be the Bibleon, and large sums of money were reported to have been subscribed to support it. A picture of the Bibleon building was even published in some of the papers, which showed the hand of a tolerably practised designer. For the more better informed in regard to ethics, he would have fled from an architect who so far forgot himself as to make such suggestions to him, and would thus have been saved the unpleasant experience which followed; but, like the other people who think that a man who is false to those who trust him will be true to them, he swallowed the bait at once when he was notified that his bid had been accepted, and went to see the architect about signing the contract. The little drama which ensued may be easily divined. After some agreeable conversation the architect mentioned that he had temporarily short of cash and was much obliged for a loan of five hundred dollars. The mansion, unfortunately, only two hundred dollars with him, but the architect said that this would do, and took it, giving in return a note, payable in three months. At the end of the three months the note was not paid, but was renewed, and the architect hurried to the architect for an explanation. He was told that the note had matured unexpectedly, but that if he would call again in a few days it should all be settled. As he had already made a contract for forty million bricks for his work, he could not feel quite easy until the little affair with the architect had been adjusted, and called again at the appointed time, only to find that the office was closed, and its occupant had disappeared. Upon this he concluded that it would be prudent to make some inquiries for himself about the building which it was to have so large a part in erecting, and went to Brooklyn, where he found that no plans for such a structure had been presented for approval at the office of the Inspector of Buildings, and, as we understand, that the site of the proposed institution intercepted a public street. Convinced that he had been defrauded, he set out again to find the architect, and, after a long search, discovered him in an office in New York, and had him arrested. Supposing the mansion’s story to be true, it would be a curious inquiry whether he might not be delared from obtaining legal redress against the architect, through the questionable means of the building, the building which he undertook, added fifty thousand dollars to his bill. A man who enters into a conspiracy with another to betray a trust cannot invoke the aid of the courts to make his companion in crime keep his promises; and, although the lending of the money to the architect was not directly connec-
of morality and public policy very strongly demand its restitution.

THE International Congress of Architects, which we hope some of our readers may be able to attend, will open in the hall of the Trocadéro Palace in Paris, on the seventeenth of June next. The business of the Congress, after the opening addresses, will be divided among committees and sections designated for the purpose, and the ensuing meetings, except the last, will be held in the great lecture-room of the Ecole des Beaux-Arts, called the Hall of the Hémicycle, from the noble fresco of Paul Delaroche which adorns its semi-circular wall; some of the sections being also furnished with consultation-rooms in the building of the Société Savantes, in the Rue des Serpents. The final meeting will again be held in the Trocadéro, on Saturday, June 22, and the same evening a fraternal banquet will take place at the Hôtel Continental.

Any architect may join in the Congress by sending his name previously to the Committee of Organization, or by applying to the Committee on its arrival, and paying a contribution of five dollars, or, if he wishes, of twenty dollars; in consideration of which his name will appear in the printed account of the Proceedings among those of the "Membres Donateurs." Each member properly registered will receive a card of admission, a bronze commemorative medal, and the printed report of the Congress. The organisation of any section may be subscribed to, as an ordinary member of the Congress or a Membre Donateur, and will then be entitled to participate, in the person of a delegate, in the privileges of the Congress. Those members who may wish to address any communication to the Congress may have the subject embodied in the programme, which we have already published, or on any other matter of professional interest, must send notice, with a copy, or at least an abstract of their communication, to the Committee on Organization. If the subject to be treated is one of those mentioned in the programme, the abstract must be received by the thirty-first of March. If it is something not included in the programme, it may be presented at any time before the fifteenth of May.

We imagine that a good many people will be surprised to learn the comparative importance of the exhibits to be shown at the Paris Exhibition, at least as indicated by the energy with which the governments of the countries from which they have come have taken part in the matter. To begin with our own country, the exhibits from the United States will occupy an area of about eighty thousand square feet, which will be mostly devoted to private contributors, but the Government has appropriated two hundred and twenty-five thousand dollars, and will make some sort of official exhibit. Our little neighbor, Mexico, has officially appropriated four hundred and fifty thousand dollars, and has a large building of its own, in which will be shown the productions of what most of us imagine to be a nation of farming Indians. The Argentine Republic, large, but the public which, we venture to say, confounded with Patagonia, has appropriated six hundred and forty thousand dollars, and will fill a space of sixteen thousand square feet with objects which will not consist exclusively of the hides and horns of wild cattle. The Dominions have appropriated two hundred square feet for its official exhibition, and private Chinese merchants have engaged about three thousand. Japan is to have a splendid agricultural exhibit, besides a larger one of manufactured articles than it had in 1878. Portugal and Austria will exhibit, likewise France as Japan, and Monaco, Andorra, and San Marino will be represented. The land is naturally to furnish a large part of the foreign manufactures. Two hundred and fifty thousand square feet were originally appropriated to its exhibit, but the space was almost immediately taken up, and for a long time the English Commissioners had difficulty in finding space to put them. The price of admission has been fixed by the Committee on Finance at two francs for the "hours of study," from eight to ten in the morning; one franc for the hours between ten in the morning and six in the evening; and two francs for the evening. Season-tickets, good for six months, will be twenty dollars.

The French Academy of Medicine has recently been entertained by a long and serious protest, written by one of its members, against the employment in dwelling-houses of the so-called "movable stoves," which have a certain connection with the chimney, by means of a flexible smoke-pipe, but are liable to leak carbonic-oxide gas. Every one knows the poisonous effects of carbonic-oxide, but the introduction of the movable stove has brought them more prominently into notice, by the number of deaths which have already occurred through the use of them. It seems that poisoning by means of these or any other sort of leaky stove may be either rapid or chronic. In cases where the amount of gas inhaled is small, the symptoms may be so insignificant as to pass unnoticed; but the sufferer suffers from loss of appetite, occasional vertigo, and violent headaches, and seems to fall in strength, from no very obvious cause. Where the amount of gas inhaled is considerable the sufferer becomes dizzy, then unconscious; the brain is directly affected, and the symptoms are those of nervous convulsion. If the dose has not been large enough to produce death, the patient lingers through a long and painful convalescence, the effect of the poison on the blood disappearing only by slow degrees. Among us, the movable stove has as yet hardly made its appearance, but we have an apparatus of very similar character, in the shape of the gas stove, whose merits and demerits greatly need investigation at the hands of experts. It may be that the gas-stove, as ordinarily employed, with its outlet pipe pouring all the products of combustion into the room in which it is placed, is an innocent affair, but we should like to know, before the system is approved, we should like to have the public warned against its use.

Some remarkable stories are told of a new steam-turbine, which has come into rather extensive use for driving dynamo-electric machines in England. The inventor is Mr. Parsons, who, we suppose, must be the same with the inventor of the engine with four cylinders, revolving with the shaft, which we described some years ago. If it be the same, his subsequent researches seem to have taken them to the application of the steam-turbine directly to fixed wings on the ship, instead of using the indirect system of cylinders and pistons. As the water-turbine is the most efficient means of utilizing a natural force yet known, it is not strange that many efforts have been made to apply the same principle to steam-motors, which they have hitherto met with little success. Mr. Parsons, however, has avoided the defects of other machines, and has introduced some important improvements. The best of these is perhaps the adaptation of the compound system, each of the more powerful turbine machines securing triple expansion, by using three turbines, in series, the steam expanding from each into the next, while the surfaces are so arranged as to give nearly equal power to each. Moreover, instead of expanding from a certain fixed pressure to another fixed pressure, the wings of the turbines are themselves arranged expansively, so that the pressure of the steam is reduced by the entrance into the turbine to the exhaust. Through this gradation of the pressure, supplemented by an ingenious system of journals, the movement of the engine is made extremely smooth and uniform, even at enormous speeds. In the recent exhibition at Manchester a motor of this kind, connected with a dynamo, was suspended by two wires from the ceiling. There was no swinging or vibration of any kind, and the machine appeared to be quiescent, yet it supplied current for all the incandescent lamps in the machinery hall. The rapidity with which the new engine can be run is almost incredible. The typical Parsons turbine operates at three revolutions a minute, which was considered a very high speed; but the first steam-turbine which preceded it has been furnishing six horse-power, at the rate of eighteen thousand revolutions per minute, almost continually for four years, and is still unfagged by over-work. The machine is held together at such speeds it is difficult to imagine. A few days ago a dynamo in the basement of a store in Chicago, running at the rate of only thirteen hundred revolutions a minute, burst by its own centrifugal force, the engine being seriously hurt by the flying fragments; and a similar apparatus, revolving three thousand times a second, would appear to be a neighbor. This view of the matter, however, does not seem to trouble the expert editor of the Revue Industrielle, who is so much pleased with the new device that he intentionally gives the account of it the place of honor at the head of the first number of the volume for 1889, which, as he says, will probably contain descriptions of an unusual number of interesting mechanical devices.
The people who talk about the "intellectual purity of an appearance" of the marble temples of Greece would do well to read the discussion now going on in *L'Architecture* on the antique polychromy, between M. E. Loviot and M. Pottier. Both these gentlemen are experts in archaeology and architecture, both have directed archaeological explorations in Greece, and the main point of difference between them appears to be, not whether the Greeks applied paint to portions of their temples, but whether they ever left any part of them unpainted; M. Pottier doubting whether they painted the outside steps, while M. Loviot, who himself found the floor of the temple covered with calamine, and powdered with a mixture of white lead and glue covered for 1878, covered with stucco and painted red, believes that if they disliked the appearance of a bare marble floor they would not stop at the steps, but would cover them, as appearances still remaining indicate that they did, with color similar to that of the pavement. In fact, his long experience leads him to the conceiving that in the matter of surface, genuine and coarse stone, no white was ever left visible, in any part of the building, either inside or outside, except where touches of white pigment were used to accentuate small ornament, or in decorative patterns.

The voices of architects continue to occupy a considerable space in the foreign technical papers, as well as in our own. M. Pepin writes in the *Sémaine des Constructeurs*, as only a clever Frenchman can write, giving a list of the virtues, accomplishments and duties expected of a French architect, and comparing it with the remuneration that he receives in return for them, which will excite the sympathy of the profession everywhere. The principles are laid in laying-out streets and squares, and are: that the architect, having made a series of sketches, plans and drawings, should not undertake to attempt to be an architect. If a person not endowed with these requisites enters the profession, he is very likely to spend the rest of his life as a draughtsman in offices, on a small salary, which he has to compete for with cheap foreign draughtsmen; or if he should be so fortunate as to get a little business almost immediately, he will be found, by most of his customers, to be way out of the pay for it. The "trickery and deceit" which, judging from his experience, architects have to encounter, would surprise ordinary people. For example, he had himself been asked, a few days before, by a "down-town merchant," to furnish sketches for laying out his house, and could not accept. He made the sketches, which were rejected, but not until the merchant had had time to steal tracings of them, and he had since learned that ground had been broken for the house, which was to be carried out substantially in accordance with his design. So far as he could see, he had no redress for this base-faced fraud. In another case that he knew of, a wealthy real-estate owner, proposing to erect an office-building in the city, sent out circulars to architects, inviting them to submit full plans and specifications for it, and promising to pay a handsome sum for the ones accepted. The plans were sent in, and after examination, were all returned to their authors as "unusable," for "insufficient" reasons, and as if they had been traced by a clever, but dissipated draughtsman, whom the proprietor had picked up somewhere, and the same artist afterwards combined the designs into a conglomerate structure, which stands at this day in the lower part of New York, as an example of mercantile senseness, and, we might add, of the folly of architects. It does not require a very discerning mind to perceive that if the architects in question had simply shown ordinary prudence, in declining to do any work "on approval," or, if they wished to enter into competition, in waiting until they were offered proper terms, they would not now be suffering from the feeling of having thrown their time and money away for nothing, or from that sharper sting, the consciousness of having made themselves ridiculous in the eyes of their deceiver and his friends, by their childish credulity and lack of common sense. A person who allows himself to be deluded by such proposals may, perhaps, deserve the pity of the humane, but he is not entitled to sympathy. Architects, whose good name he degrades by his folly, while he seriously injures their business by his idiotic competition for work which either he or they might do at a fair price, if he were not always ready to be deluded, on the most transparent pretenses, into doing it for nothing. In the cases which arose, the architects were paid for only one-fourth, and paid not for the whole, on the faith of the commission, where the business was essentially carried on without forming his duties, not only of certifying builders' accounts, but of climbing over roofs, and descending into the drains, wells and other objectionable places which he is called upon to visit.

In return for the display of all these virtues and accomplishments, one would expect to see the architect receive a princely remuneration, which would be guaranteed to him by the unanimous consent of mankind. In France, however, as M. Bérard says, we find, instead of this, the architect placed practically at the mercy of any one who has the heart to try to plunder him. After his work is done, if his client chooses not to pay him, he has nothing for it but to wait, two, three, or five years, until his debtor experiences a change of heart, or some "compromise" is made, by which he submits to be robbed of a part of the money that is due him, for the sake of getting the rest. If this course does not suit him, he has the option of appealing to the courts, where, after distributing fees and dancing attendance upon lawyers, witnesses and judges for two or three years, he has at last the advantage of being excepted from the assaults of what M. Bérard calls his worst enemy, the professional exploiters. His client expressly directed him if he, if he is fortunate, escape without adding a second loss to that which he has already sustained, but can hardly hope for anything more. Outside of these two alternatives, he has no resource whatever, or, rather, as the title of *Le Souvenir de l'Exploitation* may suggest, that the Architects' Protective Association was formed; for he alone, of all business men, is denied the right to cite customs and tariffs in opposition to the whims of judges and jury.

The *New York Tribune* has found an architect in this country, more discontented, if possible, than M. Bérard. According to this gentleman, it is useless for any one who has a large estate to entrust his business to an architect, unless he is prepared to attempt to be an architect. If a person not endowed with these requisites enters the profession, he is very likely to spend the rest of his life as a draughtsman in offices, on a small salary, which he has to compete for with cheap foreign draughtsmen; or if he should be so fortunate as to get a little business almost immediately, he will be found, by most of his customers, to be way out of the pay for it. The "trickery and deceit" which, judging from his experience, architects have to encounter, would surprise ordinary people. For example, he had himself been asked, a few days before, by a "down-town merchant," to furnish sketches for laying out his house, and could not accept. He made the sketches, which were rejected, but not until the merchant had had time to steal tracings of them, and he had since learned that ground had been broken for the house, which was to be carried out substantially in accordance with his design. So far as he could see, he had no redress for this base-faced fraud. In another case that he knew of, a wealthy real-estate owner, proposing to erect an office-building in the city, sent out circulars to architects, inviting them to submit full plans and specifications for it, and promising to pay a handsome sum for the ones accepted. The plans were sent in, and after examination, were all returned to their authors as "unusable," for "insufficient" reasons, and as if they had been traced by a clever, but dissipated draughtsman, whom the proprietor had picked up somewhere, and the same artist afterwards combined the designs into a conglomerate structure, which stands at this day in the lower part of New York, as an example of mercantile senseness, and, we might add, of the folly of architects. It does not require a very discerning mind to perceive that if the architects in question had simply shown ordinary prudence, in declining to do any work "on approval," or, if they wished to enter into competition, in waiting until they were offered proper terms, they would not now be suffering from the feeling of having thrown their time and money away for nothing, or from that sharper sting, the consciousness of having made themselves ridiculous in the eyes of their deceiver and his friends, by their childish credulity and lack of common sense. A person who allows himself to be deluded by such proposals may, perhaps, deserve the pity of the humane, but he is not entitled to sympathy. Architects, whose good name he degrades by his folly, while he seriously injures their business by his idiotic competition for work which either he or they might do at a fair price, if he were not always ready to be deluded, on the most transparent pretenses, into doing it for nothing. In the cases which arose, the architects were paid for only one-fourth, and paid not for the whole, on the faith of the commission, where the business was essentially carried on without forming his duties, not only of certifying builders' accounts, but of climbing over roofs, and descending into the drains, wells and other objectionable places which he is called upon to visit.

In return for the display of all these virtues and accomplishments, one would expect to see the architect receive a princely remuneration, which would be guaranteed to him by the unanimous consent of mankind. In France, however,
THE BOSTON ATHLETIC ASSOCIATION'S BUILDING.

No new building in Boston has attracted so much attention as that recently opened by the Boston Athletic Association, on Exeter Street, and certainly no one reflects more credit on its architects and the building committee, who, in place of being troublesome and practically useless coadjutors, could in this case hardly have been dispensed with, for the requirements which the architects were called upon to satisfy were of a kind that any ordinary architectural training threw no light on, and there were few precedents that could be consulted.

The movement began with a few men who had always taken an interest in outdoor sports, who found that when the open season closed there were practically no means at hand for keeping up that bodily condition which, when once enjoyed, one is willing to do so much to preserve. To be sure, there was a tennis-court here, a gymnasium there, a bath yonder, billiard-rooms in all the club-houses and restaurants everywhere, but all were more or less widely scattered, all subject to separate membership fees and rules, and all more or less unsatisfactory for one reason or another.

A few preliminary meetings made it clear that the movement could have support; the association was incorporated, bonds issued and taken up by interested members who had capital they were willing to invest in this way. This first step taken and a site secured; the next was to procure the necessary plans, and few will deny that a very satisfactory result has been achieved. The fact that some of the rooms are a size too small is a misfortune attendant on the inability to procure a larger lot. Excellent advantage has been taken of the space available, and in compactness, distribution and convenience it is an interesting model to be consulted by those who may have similar buildings to erect in other cities.

From the very start success has been a certainty, and it has been owing to the central idea of uniting under one roof the elements of a social club and an athletic association, since it secured the support and countenance of older men—the more opulent relations of the younger athletes—who would hardly have thought it worth while to subscribe to the support of a mere gymnasium which they were likely to use but rarely, partly through indolence, and partly through an unwillingness to throw their younger fellows how years and disease had softened their tissues and taken from the former manly grace of figure they once so highly esteemed. But thanks to the commingling of the provisions for social and athletic enjoyment these athletes of a former day do not find themselves out-of-place here, and under the pretense of a lounge can get actual profit from their membership by taking such casual exercise as their years and inclination may permit, without feeling obliged to take up the systematic and regular course of...
exercise that membership at an ordinary gymnasium would naturally urge on the really unwilling man of years. A half-hour at the weights in a place like this, with a pleasant dining-room below and ample lounging-rooms and good company around, is a vastly more agreeable thing to contemplate than the same time spent in a bare and ill-smelling gymnasium, when it has to be followed by a chilly walk home, or a still more dangerous ride on the horse-cars. The force of servants and superintendents, and it has wisely been decided to make it practically self-supporting by charging fees for the use of bowling-alley, tennis-court, billiard-tables, Turkish-baths and so on, while the gymnasium proper is free to all. It is here that one whose memories of gymnastic apparatus go back twenty or thirty years to the little, old gymnasium at Harvard opens his eyes and goes about with a mind of respectful inquiry, trying to discover the

real element of success lies just here, and whoever originated the idea of such combination, should be considered the founder of the club.

Although opened only a few weeks ago, it is already the most popular resort in the city — so popular, in fact, that the older clubs which are merely social in character, already feel that the current of favor is setting away from them, and foresee a possibility that their past prosperous financial condition may, in time, be impaired through the greater attractions offered by the new club which already has a waiting-list of several hundred; although, since the opening, the membership has been increased beyond the limit originally fixed.

The plans and illustrations published herewith practically give all the information that can be given, but they can give but an imperfect idea of the homely and homelike air that pervades the building, so different from that which oppresses one in so many club-houses where

whys and wherefores of the intricate apparatus whose very neatness and perfection of workmanship is, at once, an invitation to strip and go to work, and an irritation, as one feels aggravated that these things were not invented two or three decades ago. Clubs and bars and rings can be recognized, but this great array of lifting-weights of different models need explanation, accompanied with demonstration, before it is possible to understand their uses or conceive what set of muscles they are to develop. Many of these are due to the ingenuity of Dr. Sargent, the Superintendent of the Hemoway Gymnasium, at Cambridge, and give evidence of the wisdom of employing in that position a man of intelligence and education, rather than the retired "bruiser," as in the olden time.

In regard to the plan and arrangement of the building, we are obliged to begin contrary to custom, at the top. The tennis and racquet courts being of fixed dimensions regulated the main partition-walls and even the length of the building which just accommodates the tennis court. The building is then divided into three main divisions, one the width of the tennis-court, one the width of the racquet-court, and the third the space left between when these two are taken out. The gymnasium occupies all the space under the tennis-court and this central section, and we find that there is now only one portion of the building which being unoccupied from top to bottom is suitable for a staircase, viz., the space left at the end of the racquet-court, and
here the main one must be. Room is found for the second by taking out a corner of the gymnasia proper and this is of iron, in a brick-wall. So much for the skeleton arrangement; the various floor plans show the result.

We enter on a level from the street on what is practically a mezzanine floor. One flight down carries us to the Turkish baths, with the tank and lounging-room for the bathers and spectators and a flight up takes us to the main social floor; while on the level are the private bowling alleys, which being for ladies’ use as well as members’, are directly at the entrance, the storage-room for cycles, and the barber’s shop.

In all the decoration of the building economy and durability have been the first considerations. In view of the experimental character of the undertaking, the first was a necessity and the latter almost equally so for a club which the founders intended to be permanent.

In the basement then we find extreme simplicity, the walls of the lounging-room and tank of Massachusetts brick are all exposed and the only decoration permitted is a stencilling of strong green over the upper part of the lounging-room walls, which, especially at night is very effective. Five great arches divide this room from the tank, 25' x 39' and holding some 60,000 gallons. Below the water-line this is built of glazed brick, the upper six courses light green and the bottom the same, while the remainder are red. The temperature is maintained at 95° to 100° Fahrenheit.

A graded platform at one end gives any required height for a dive, and a spring-board at the other end gives opportunity for running-dives and somersaults. At the same end a platform under water makes a shallow space 8 feet x 25 for the use of the inexperienced and the children of members, who can here have lessons at stated hours. The water is filtered through a large Elephant filter which makes the otherwise yellow water of Coehuntie clean and colorless, and by the aid of steam-pipes laid about the bottom of the tank is to be kept at a temperature of about 85° to 100° Fahrenheit.

The Turkish-baths proper, following a not unusual plan in the East, are clustered around one central room which is covered by a dome. The four openings are Moorish arches in green, brown and white glazed brick and the walls up to the springs of these arches are of the same material. Above, and up to the spring of the dome a Persian pattern in blue and green is stencilled on the rough plaster, and the dome is relieved by medallions of color, and circular windows filled with stained-glass.

The rooms surrounding are low studded (the half-story only) and are, a room at 140°-150° Fahrenheit, a room at 160°-170° Fahrenheit, a steam-room or Russian-bath, with shower, and a room for massage and the shampoo. Having finished in this last room, the bather takes a cold shower and then plunges into the big tank, while the one who fears the shock returns as he came. Before dressing he can receive a rub down with alcohol, which will prevent his catching cold and will act like a cocktail before dinner.

On the social floor we find the usual club-rooms, with the exception of card-rooms and private dining-rooms—there being absolutely no space for these. What rooms there are, are large: the dining-room seats 85, the billiard-room gives very ample room for 6 tables and could accommodate 8, and the drawing-room, morning-room and library will easily accommodate those who are resting from their exercise or are too lazy to participate in the sports which the building affords. The three last-named rooms are papered in quiet colors, light red being the prevailing tone in the drawing-room, yellow in the morning-room, and dark green with oak and gold in the library.

The furniture is all in keeping with the character of the rooms, and is massive oak or mahogany, covered with soft, red, green, or russet leathers.

The billiard-room, which is in oak, has seats all around and the walls covered with buckram, which, on the natural ground, is stencilled with a good medieval pattern in golden browns, harmonizing with the oak and the buff tones of the beamed-ceiling. This latter is of stucco, and covers the great girders, some of which weigh over seven tons, and which span nearly 40 feet, carrying the gymnasia floor.

The dining-room is in cherry, natural color, as it is the dark room of the building, and the walls are stencilled in green, on a light yellow cartridge paper. Two dumb-waiters run 10' up to the kitchen floor, and the table d’hote meals are served from a hot-table in the china-closet.
Boston Athletic Association
New Club House
Turkish and Swimming Baths etc.
On the second floor, and the mezzanine on a level with the running-track, are the gymnasium and all its baths and dressing-rooms. A special effort has been made to make both these latter as convenient and complete as possible. The members, instead of owning large lockers where they hang their own clothes to be aired or dried as they may, have merely small cupboards, only large enough to receive their clothes when folded. An attendant receives the exercising clothes when taken off, and carries them to a large well-ventilated drying-room, kept at a temperature of 90°. When dry and aired, he folds them and places them in the lockers ready for use. The dressing-rooms accommodate two each, and there the clothes are hung up while exercising; all valuables having been left at the gymnasium office. Besides bath-tubs and bowls, there are a number of private shower-bath-rooms where the bather may take a shower or a douche of any required temperature, or he may go to the general shower-bath-rooms and there receive the benefit of more complicated showers.

On the third floor are the two large courts, which, as they are the same as all other racquet and tennis courts, need no especial description. The walls of one of are of Keene cement, colored red, and of the other, Portland cement painted black, and the floors are an inch of Portland cement, on 4 inches of concrete, on hard-pine planking, which is exposed below as the gymnasium ceiling. They are lighted by skylights half the width of the court, and running nearly the whole length.

The outside speaks for itself. It is of simplest materials, Massachusetts brick, with a sparing use of Andersen pressed-brick, as economy was the one ruling force with the architects. The large spaces to be spanned and the heavy floors of the courts made it necessary to use heavy beam-riders which added considerably to the difficulties of the construction, as they tended to centralize weight at certain points.

**ILLUSTRATIONS**

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

**THE BOSTON ATHLETIC ASSOCIATION BUILDING —THE GYMNASIUM, BOSTON, MASS. MR. J. H. STURGIS [STURGIS & CABOT, SUCCESSORS], ARCHITECT, BOSTON, MASS.**

*[Gelatine Print, issued only with the Imperial Edition.]*

**THE BILLIARD-ROOM IN THE SAME BUILDING.**

*[Gelatine Print, issued only with the Imperial Edition.]*

**BUILDING OF THE BOSTON ATHLETIC ASSOCIATION, BOSTON, MASS. MR. J. H. STURGIS [STURGIS & CABOT, SUCCESSORS], ARCHITECT, BOSTON, MASS.**

For description see elsewhere in this issue.

**TURKISH BATH AND SWIMMING-TANK OF THE BOSTON ATHLETIC ASSOCIATION.**

**PLANS OF THE BUILDING OF THE BOSTON ATHLETIC ASSOCIATION.**

**SKETCH FOR COUNTRY CHURCH, CHAPEL AND PARSONAGE, MONTCLAIR, N. J. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.**

**INTERNATIONAL CONGRESS OF APPLIED MECHANICS.** — There will be held at Paris at the Conservatoire des Arts et Métiers, an International Congress of Applied Mechanics, under the patronage of a Committee of the Conservatoire, consisting of engineers and engineers of renown both from France and from other countries, who will give the work of the Congress the benefit of their influence and the weight of their authority. The President of the Committee on Organization is M. Ex-Insp. Gen. Mines, Mr. J. H. Sturges [Sturges & Cabot, Successors], Architect, Boston, Mass. For description see elsewhere in this issue.

**AMONG THE CAPITALS OF ITALY.**

There is not in the whole range of architecture a more delightful section of study than the one having to do with the evolution of the capital. It is the growth of that chief of ornaments from the time when our savage forefathers bound a cluster of leaves around the summit of the forest column, to the days when cultured Philistias embellished the Parthenon with his inimitable work, is interesting enough; but to follow its course through the fascinating era of the Italian Renaissance reveals a history which is hardly short of romantic. On the glorification of the capital the ornamentalist has bestowed the very flower of his thought, the sculptor the most cunning efforts of his chisel, and even the poet has delighted to hang a few garlands on its volutes. In the days of the old Greeks, its lines, when once evolved by a "master," were looked upon with such veneration that they became as the laws of the Medes and Persians. A definite form of capital was associated with a particular epoch, and to amend or alter it, when used in that association, was considered little short of sacrilege. Even now, after centuries of research, it must be confessed that it is difficult, if indeed possible, to improve upon the capitals devised by the old Grecian architects; for over two thousand years of usage have not succeeded in rendering them at all stale and unprofitable. Philistias and his immediate successors were the artists who, above all others, succeeded in handing down to posterity what Lord Macaulay calls "The stone that breathes and struggles, The brass that seems to speak." Such cunning they who dwell on high Have given to the Greek."

Having hung my chaplet of praise on the capitals of Old Athens, I shall proceed to do what may appear to be inconsistent with the votarial offering; for, paradoxical as it may seem, the main object of these notes — which are the outcome of a personal sketching tour in Italy — is to show that, while the spirit of classic originals can be retained, detail may be infinitely varied, greatly to the benefit of the capital itself, and therefore of architecture and woodwork generally. This statement of purpose will at once suggest that the ruins of the Renaissance form the happy hunting-ground from which I captured the specimens adorning these pages, the most notable of which may be attributed to la Bella Firenze. But before shouting on the banks of the Arno, I propose to pause for a moment by the Tiber, in just about the spot where Walter de Montreal stood when he gazed on Romo. "Though little skilled in the classic memories and associations of the spot, he could not," says Lord Lytton, "but be impressed by the genius which had dwelt amidst the ruins."

1 By J. William Baer, Member of the London County Council.
with the surrounding witnesses of a departed empire; the vast skeletons, as it were, of the dead giantess. Now, thought he, as he gazed around upon the roofless columns and shattered walls everywhere visible, over which the starlight shone gaily and transparent, backed by the frowning and embattled fortresses of Frangipani, half-buried by the dark foliage that sprung up amidst the very fanes and palaces of old — Nature exulting over the fallen art; now, thought he, bookmen would be inspired by the scene with fantastic and dreamy visions of the past. But to me these monuments of high ambition and royal splendor create only images of the future.

In that last phrase we get the motif of these notes. "These monuments" are expressly set out here in the hope that they may "create only images of the future," not only in the matter of capitals, but in a hundred other ways. Some architects and designers may be shocked at the statement; but I venture to assert that the majority of modern capitals are monstrous pieces of plagiarism, and the advent of a new composition of any sort is as rare as the dox. How does this sameness come about? Just in this way: If a capital is wanted, the timid architect or designer hesitates to employ any other than academical examples, and so we get stubborn types repeated ad nauseam. Some of my portly readers may retort, "Is it not better to follow recognized and respected models, than to run the risk of failure by rummaging in fresh fields and pastures new?" Perhaps it is for the man who content to remain on the bottom rung of his profession and suffer splendid mosaics. What a scene to behold; these works of art intermingled with 1,000 bathers! A comparison of the present ruins with what we know must have been the original structure covering thirty thousand square yards, is enough to cause one to "shug like a schoolboy," as Shakespeare puts it. To notice that such precious relics as the one which is here sketched have been carried piecemeal-fashion to every quarter of Rome, and, indeed, Europe, provokes the exclamation of Mark Antony: "What a fall was there, my countrymen!" This superb capital is reverently sketched just as it is, broken and disfigured, without attempting to restore or imagine any of the missing parts. It no longer surmounts one of the grand columns of the Therme, but, when I saw it, was propped up on some lowly brickwork. One of the saddest things about visiting Rome is to see such precious heirlooms as this cropping up in all sorts of commonplace buildings and unexpected corners, having been stolen from their original resting-places, as stones would be taken from a heap. Such vandalism is enough to upset the equilibrium of the outsider, much more the art-worshipping skitier. As Lord Lytton truly says: "So common at that day — the time of Rienzi — were these barbarous appropriations of the precious monuments of art, that the columns and domes of earlier Rome were regarded by all classes but as quarries, from which every man was free to gather the materials, whether for his cattle or his cottage, — a wantonness of outrage far greater than the Gods, to whom a later age would fain have attributed all the disgrace, and which more, perhaps, than even heavier offences, excited the classical indignation of Petrarch."


self-effacement. But the one who desires to impress himself on his work is respectfully invited to accompany me to a few famous buildings in the sunny South, in order to consider on the spot, as it were, some capitals setting forth the versatility of the Renaissance, my hope being that a contemplation of these examples may impart to some the necessary courage and inspiration to go and do likewise.

The object, then, of this architectural excursion is to show how various are the details of which capitals can be composed, and how miserable, in the face of such variety, is the vocation of the mere copiist. Though this inquiry naturally takes the student at once to the period of the Renaissance, it must not be supposed that the ancients were fettered, in the designs for their capitals, to the five orders. As I have hinted, we may first pause for a few minutes at Rome, and there it is at once apparent that the Romans were particularly free in their manipulation of the Greek series of forms. For instance, their composite capital shews the decisive element not to be bound by the academical copy which came from Corinth. And even the composite which the Romans created was further enriched or altered to suit special circumstances. The first sketch to which I draw attention is a beautiful example of this. As a basis we get the genuine composite — the massive Ionic volutes being introduced instead of the somewhat weak tendril-shaped volute — but in the centre a facade, Alberti, Michael Angelo, appears. And why? Because this noble capital was one of those adorning the columns surrounding the baths of Caracalla; and what "finishing touch" could be more appropriate than the figure of the bather preparing for his plunge? How few modern bather-establishments have capitals of similar artistic taste and fitness. Alas! none will compare with the magnificence of the Therme of Caracalla or Antoninusianum, with its numerous statues, which included such treasures as the Farnese Bull, Hercules and Flora at Naples, and

Fig. 1. From the Ducal Palace, Urbino. Fig. 2. From the Cathedral of S. Florio, Citta de Castello.

Happily, this dishonest state of things does not exist now, for the Italian Government jealously guards every such relic of antiquity. Indeed, Young Italy may now sing with Rienzi, though, at present, in not too blatant a strain:—

"The Soul of the Past, again
To its ancient home,
In the hearts of Rome,
Bath come to restere its reign!"

Speaking of those states of Old Rome, some may urge that nearly all the details of the Italian Renaissance can similarly be traced among the remains of the Roman Forum on the Palatine Hill, or among the ruins of the Baths of Caracalla; but one might, with equal reason, contend that the pictures of Michael Angelo showed no advance on those of Cimabue, because the same lines and muscles were portrayed. The capitals in the following series, meagrely as they represent the wealth of a subsequent period, will be sufficient to show how, eventually, the dry bones were clothed afresh with vitality. Some critics imagine that the Renaissance is merely an imitative style because it sought its inspiration in the work of the ancient Greeks and Romans, but such entirely fail to understand the new spirit, which, while awakening men to an appreciation of the romance and beauty of the ancient world, also imparted to them a sense of their own individual freedom of thought and design. The beginnings of this revival are noticeable even before the times of Filippo Brunelleschi (1377-1446), but he was unquestionably the architect who gave the new style "a local habitation and a name." It is a deeply-interesting story, which tells how he sustained defeat, at the hands of Ghiberti, over the celebrated Baptistery gates controversy, and went along with Donatello to try his luck in Rome, and more especially to study specimens of the antique which were then being excavated.
Donatello—or to give his name correctly, Donato di Niccolò di Benci Bardi—that is to say, Brunelleschi claims our attention first, if we were one of the earliest of the masters who re-dressed the Classic after the courageous manner which is shown in capital No. 2. Tourists in Italy are not to be led away by the lines of the land, the great architectural works of Brunelleschi, Bramante, or Michael Angelo, and overlook some of the smaller towns and examples. Such a method of viewing is something like enjoying a grand landscape in its entirety, and foolishly remaining oblivious to the grasses, leaves and flowers which go to make it up. The vast domain of decorative sculpture is full of flowers of thought, whose beauty appeals not only to the architect, but to every student of decorative art. Thus it is that the most delightful lessons can be derived from isolated works in metal, stone, stucco, inlaid (intarsia) or carved wood, which are considered by some as outside the proper range of architecture. How many men who are fairly good in working out the broad lines of a facade, or conceiving a skyline, fail ignominiously in matters of detail?

But to return to Donatello. He was famous for introducing into his work a naturalistic style which, while eringing on the side of harshness, was full of life and character. This capital (Figure 2) from the cathedral of the little town of Prato illustrates this remark perfectly. How he has cropped into this one effort Cupid on Cupid and figure on figure. Why, even the front view of the capital reveals nine figures, large and small, in addition to the bust of the Cupid at the top forming the centrepiece. Just think of it—a nine figures in a single capital! Nowadays we consider ourselves lucky if we get a single good head or mask in such a position, much less a figure. Thus it was that these early Renaissance workers seemed to bubble over, so to speak, with genius. Like the flowering of an exotic, they burst forth with a prodigality which was so bewildering in its brilliancy, and likely to be judged in less prolific times as too profuse. But let those purists who would throw stones at Donatello for his ornateness go to S. Antonio at Padua, or study his reliefs on the two pulpits in S. Lorenzo at Florence. Further, let them reverently study his Peter and Mark in the Museo Nazionale of the same city. The latter is the grand, the former his capital which adorns the cathedral at Prato, a place rich in examples from the artists of the early Renaissance—Donatello, Michelozzo and Andrea della Robbia. I have purposely placed this first because it repre- sentat谢谢你对我的帮助！
they are full of life, and in that respect stand head-and-shoulders above many timid contemporaries. A feature which is distinctly Renaissance in character occurs on these columns, and that is the elaborate decoration of the shafts. In this respect the Italians of the fifteenth and sixteenth centuries made a new departure. Discarding the simplicity of Classic orders, they produced shafts of great beauty, and the two distinct types of treatment which are here shown will reveal the early in which such florid ideas developed. The choir in the Cathedral at Spoleto contains a magnificent canopy in the early Renaissance style which is full of suggestion to the student of this epoch. Two examples will illustrate the character of the work which is to be found in this corner of the sunny South.

One may pick up all sorts of captivating little bits while wandering in the byways of Italy; but, after all, Florence is the centre of most interest to those who care to follow up the subject in hand. Both as regards intellectual and artistic life, the city of the Medici and the Medici in their turn, is the gem of Italy. It was the cradle of the modern idea of the artist. It was the birthplace of Michelangelo, of the greatest of men. Here, in the early sixteenth century, Giotto, the greatest of the Gothic artists, transferred his genius from Padua to Florence, and here the two greatest of the Florentine artists, Donatello and Ghiberti, met to work together. Florence was the cradle of the art of the Renaissance, and here the two greatest of the Italian artists, Leonardo da Vinci and Michelangelo, laboured side by side.

Great art cities of Tuscany succeeded during the Middle Ages in eclipsing even Rome itself. While the Imperial city seemed ever affected by the dead hand of Caesar, its rival on the Arno rose, Phoenician-like, from the ashes of former greatness, and exhibited a vitality which has never been excelled in the world's history. As Leo charmingly puts it, "Here everything breathes the world of generation after generation of ingenious men. Like a water-filly rising on the mirror of the lake, so rests on this lovely ground the still more lovely Florence, with its everlasting works and its inexhaustible riches. From the bold, airy tower of the palace, rising like a slender mast, to Brunelleschi's wondrous dome of the Cathedral; from the old house of the Spin to the Pitti Palace, the most imposing the world has ever seen; from the garden of the Franciscan Convent to the beautiful environs of the Cascine—all are full of incomparable grace. Each street of Florence contains a world of art; the walls of the city are the calyx containing the fairest flowers of the human mind; and this is not the richest gem in the diadem with which the Italian people have adorned the earth."

We will to Florence, then, for the rest of our specimen capitals, and, as in duty bound, first call at the Palazzo Vecchio, to whose "bold airy tower" Leo poetic ally alludes. It was at one time the residence of Cosimo I, but now used as a town-hall and museum, and contains a number of halls decorated by various eminent Italian artists. One of them, perhaps the most famous, is enriched with beautiful marble doorposts by Benedetto da Magano, and sketch No. 8 shows one of them. The same gifted artist executed the intarsias of Dante and Petrarch, which are so generally admired. This example is mainly useful in the present series by way of showing that an episode may be figuratively set out on the face of a capital without detracting from its beauty or disturbing its proportion. Here Cupid is ministering to the wants of Venus, the whole scene being fittingly confined within the limits of a shell. The upper part of the capital, while running much on Classic lines, shows a feeling distinct to its own. Notice the floral terminals of the inside ends of the volutes; how nicely they fill in the interstices. Benedetto da Magano could certainly handle ornament as well as figures.

The tour in search of suggestive capitals may well and pleasantly be brought to a conclusion by considering four specimens from the pencil of that architect in whom the beauty of the Renaissance has so truly been revealed by him. I refer to Jacopo Sansovino, whose life's work was done between the date of the Tintoretto, 1513, and 1556. This architect must not be confused with Andrea Sansovino (1460-1529), the sculptor of the marvelous groups of Christ and the Baptist in the Baptistery at Florence, and other fine works at Rome. Jacopo Sansovino was a Florentine by birth, and had the good fortune to receive his education in that city during one of its most art-inspiring periods. Like most young Italians possessing genius, he had a roving temperament, and so find him working at Rome, and eventually at Venice, which city will owe him a lasting debt of gratitude for the "Stones," which he left there. It was not until I had an opportunity of gazing upon the beautiful facade of the Library of St. Mark's, and the masterly details of the Giants' Staircase at the Doge's Palace, Venice, that I at all understood the wonderful genius of Sansovino, or the part which he occupies in this culminating period of the Renaissance. Bramante's epoch of what may be described as "symmetrical construction" was succeeded by a style in which the chief aim was general effect. Harmony among the individual members began to be neglected, and the eye was arrested by boldness of construction and striking contrasts. As we have tried to make clear in the study of these capitals, new modes of expression were borrowed from antiquity, the axioms of which had formerly been applied in a manner which was unsympathetic. This culminating period had for its exponents Raphael, Baldassare Peruzzi, the younger Antonio de Sangallo, of Rome, Michael San Micheli, of Verona, Michael Angelo, and last, but not least, Jacopo Tatti Sansovino, who was the designer of the four Florentine capitals to which these prefatory notes are intended to draw attention.

The Church of S. Spirito at Florence, where these capitals are to be found, has the fame which comes of being originally designed by Filippo Brunelleschi. It is one of the most attractive churches in the city, mainly on account of the noble proportions of its interior, which is borne by thirty-one Corinthian columns and four pillars.
Tie, to the ornament, there is nothing in the church which is like to that of any building that is known. I will not even adduce those two Sansovino studies. It will be observed that these are all anti- or pilaster capitals, and as such they are likely to be of special service to wood-workers, as well as casters, who have been favored by the phenomenon already noted. While the flat or fluted pilaster is in constant requisition. No. 9 of these S. Spirito studies is chiefly noticeable on account of the masks which finish the corners. Here was a striking departure in such matters. No. 11 is simply a capital for the columns, and the Classic authority that Sansovino had in his mind when he designed it was the Corinthian capital of the temple of Apollo Didymus, at Missol. The idea of placing a vase in the center of this capital is not new, and the design is not very attractive in showing it "on the round," as the article would appear if thus placed.

Sketch No. 10 shows another application of the mask. This time it occupies a central position, and is crowned with a profusion of the "kindly fruits of the earth." The decorative band on which the flowers and the crowning of the whole by the acorn points which shall not be easily forgotten is supplied to the right where the acanthus scrolls at the sides is delightfully artistic. In both these examples Sansovino has deemed it necessary to introduce volutes to finish the top-corners of his capitals, and in the way in which they are pulled out from the moulding is not altogether graceful. In Sketches 11 and 12 he abandons that remnant of the Classic, and boldly uses delightfully modern inventions. The pair of athletes sprouting from the corners give a spirit and contour to the capital which are seldom met with. The decorated band on which the figures stand, with its shells and dolphins, is another feature by the virtue of which it is supplied. The mythic chimerical conception in the center is more queer-looking than captivating, but the whole thing suggests a hundred ways in which the designs of our capital can be refreshing varied. It does not follow that the modern artist need put Florentine artists into his design. Let him, if he so pleases, a couple of cracklecricketers, or footballers, and fill in the interstices with the implements of the play, surrounding the pristine-capital which the players are supposed to have won. Or, if the capital be for a theatrical purpose, let a couple of Harlequins hold the corners, while Colombine graces the centre. Anything to get away from the slavish copyism which is the bane of many architects.

In the last of the Sansovino capitals, the ever-favorable subject, the infant form, is selected for the motif. The graceful pose of the little fellow is shown as if Sibyls by the muses, but the balance of the entire thing, leave nothing to be desired. In the whole range of the figure subjects there is no study more profitable to the student than that of Master Capitol. He will invest many other lifelike combination with a charm which no amount of inanimate ornament can impart.

The summary of the suggestions which these capitals have to make to the student is: "Anything in the world of Nature can be pressed into our service for the design of a capital. " It is an easy matter to find a thousand examples in the work of the ancients, few of the many thousands which adorn the churches and palaces of Italy—-we have figures ranging from the Roman bather at the bath of Caracalla, according to the compartments, to have animals, birds and fishes; leaves, fruit and flowers; masks, armor, and pottery; things as diverse in nature as can be imagined, but all made harmonious and beautiful under the influence of the life-inspiring Renaissance spirit. If we add to Sibyls, or any other, the noble of the Florentine school, if they had spent their lives in merely copying the detail—admirable as it is—of the ancients? Certainly very little. Then let the ornament of each epoch, even if founded on much the same foundation-lines, tell its own tale to the lasting credit of those who, like Sansovino, are determined to speak for themselves in the art which they make their own."

The above is rather a point on which I should like to allude at least before leaving the consideration of these Sansovino capitals, and it has to do with the public more than the student. It is clear, I think, from these examples thus brought, in a fragmentary way, from some two hundred studies, that it is possible to be a master-ornamentist if he can only study on the same lines, and catch a similar spirit, as his Italian predecessors. It will occur to some of my readers, "Why change wooden moulds for a needly art-enthusiast of these times to do any such thing?" It may be admitted at once that, unless he is greatly aided in some way or other, he is, to say the least, heavily handicapped. Then how shall he be assisted in his art-career? Simply in this way: Let any aspiring to the style and title of town or city set about establishing his school of art, amply supplied with the best models. Let it, if it be possible, have a pleasant garden adjoining, with a colonnade, S. Marcellino, running round, so that it may be closed out of the summer-time; and let the alceves and niches be redolent with flowers, and filled with casts of Classical sculpture and statuary. To such a distressing invite a number of picked art-workmen—-young men and women who "mean it" — to gather and revel over precious lines of antiquity, and vie with each other in the classical talent of overshadowing old forms with new beauties. A truly pleasant picture; but who is to pay for it? Let it be paid for out of the rates, and hold any place which will not provide such an art-school up to public proprietor. "What a Quixotic ideal!" the majority of my readers will exclaim. No town-council or rate-payers would hear of it.

Then let us inquire how they managed in old Florence during the days of young Sansovino. Eredivisie dovan told the old Romans. Thanks to the help of that prince among art-patrons, Lorenzo de' Medici, the aspiring Florentine could attend art-gardens expressly set aside for that purpose by the Medici. It was a very different antiquities, the world has ever seen, study and model to his heart's content under proper tutors. By thus surrounding those young men with the remains of the ancient masters, Lorenzo succeeded in educating their brains beyond the forms of common life up to that ideal beauty which alone distinguishes works of art from mere mechanical productions. And best of all, these rare privileges were not confined to those who could afford the luxury of spending time over unproductive art-study—but, will it be believed?—when students were too poor to lose time, Lorenzo de' Medici not only paid them competent stipends while they attended to their studies, but offered considerable monies to prove the incentives of a profession. What better paring town-councillor to say to that? Wise is the modern municipality which takes alarm out of the history of the Medici, and deals in the same large-hearted way with the questions of art and technical training for its people. For in Florence the new generation is so quick from the seed thus judiciously sown by the far-seeing Lorenzo. If only more of our machine-made wealth were spent in paying for parading after the glorious model of Lorenzo de' Medici next to the monastery of S. Marco, we should not give cause to those croakers who are constantly protesting that art died in Italy some centuries ago. Let your young men have the chance, and I believe that if they were but allowed to do more in the schools of Mr. Angelo, we may manage to raise some modern Sansovinos.
processes of manufacture, illustrating the gradual development in its use from the Byzantine mosaics to its perfected application in the Gothic cathedrals, noting the modern and more miscellaneous treatment of the mosaic as a form of art, and giving examples of work in progress.

Mr. J. G. Low was invited to address the Club on the subject of tile-work, but was prevented from being present. Mr. A. E. Streeter, who is associated with him in the Chicago Tile Works, accepted the invitation and gave an interesting account of Mr. Low's early attempts at the manufacture of artistic tiles and pottery, the difficulties which he encountered and some of the methods by which he has increased his output to such a high altitude as to be possible for Prof. Israel S. Morse also spoke upon the subject of tile-work, urging the necessity for more men in this country who would do just what the Lows have done, bringing an artistic training and thorough good taste to bear upon a subject which has never yet received sufficient attention with us.

The Club has reason to congratulate itself at present. The membership is large and constantly growing by the addition of some of the most prominent architects in the city, and almost any hanger in the market will run well if the track is perfect. With the setting of the building, and the shrinkage of wood-work, added to poor workmanship, the double tracks under the window for parlor-doors are very apt to get out of adjustment, and then the best hanger will not work and there is no remedy except to tear off the plastering and reset the track.

After trying one form and another of hanger we concluded that the only sure remedy was to abolish the track altogether. With the Prescott hanger there is no track. The hanger is applied to the jamb and covered by a wide stop. It can be adjusted by taking off the stop and altering the set of the hanger. To be sure this is a more difficult operation than adjusting the set of the ordinary hangers, but when once the Prescott hanger has been adjusted, everything is adjusted, while with the wheel-hangers the fault is most likely to be with the track and no adjustment of the hanger itself will help matters.

Extremely useful therefore with very narrow and high doors which are almost certain to give trouble when hung in the ordinary manner, because the two hangers on the top of the door must be set so close together that a slight inequity in the track will throw the bottom of the door out of adjustment and a sudden pull at the bottom of the door will cause the wheels to jump. With the Prescott hanger the door can never jump no matter how the pressure may be.

Very respectfully, PATTON & FISHER.

THE OWNERSHIP OF DRAWINGS.

SAVANNAH, Ga., March 26, 1889.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—I write to ask an opinion of your law editor in regard to the following case which has just occurred in my practice, and being the first of its kind in my experience, I greatly surprised me.

Mr. M. A., a noted merchant, was in the habit of preparing plans and specifications for a residence, which he was also to superintend. Everything was prepared, and bids received, and the contract awarded last Wednesday. Meantime the form of contract was to be drawn up and the merchant contracted under them. Yesterday evening he came to the office to sign the document, but on reading it over, remarked that it was all right with the exception of one thing. Asking what the objectionable thing was, he replied that he objected to the clause by which it was provided and signed, which read, "And it is further mutually agreed that all drawings and specifications are and remain the property of the architect," and refused to sign unless this was changed, out, or changed to read, "And reserved the property of the architect.

The owners of the house may custom the world over for the architect to retain his drawings, as they were but a means to an end, his tools, as it were, to build the house by. The same with the carpenter. Mr. M. A. was to pay for them and wanted them, had consulted a lawyer, who told him that they, and demanded his rights. I showed him rolls of drawings, the accumulation of ten years' practice, in the office, of works built and paid for, but it was no use, what he paid for was his.

Now I wish to know as a matter-of-law-and-fact, is he right, and what is the Chief's claim to the plan, drawings, or other property of his house?

Very truly yours, J. J.

The owner signs a contract providing that the drawings are to be the property of the architect, he of course cannot claim them. If nothing is stated as to who is to have the plan in the agreement it can probably, as the law now stands, demand them of the architect and get them. The leading case on the subject is the celebrated case where the British Government demanded the plans of the Washington in France from the heirs of Sir Charles Barry. The Barry family fought bravely for property rights, but after long and expensive expenses were defeated by the decision of the highest Court, and the decision has ever since served as a precedent. Among architects it has been universally denounced as unjust, and no architect, by which the clause was included, has ever felt his legal right to the plans. Bellite is composed of dimethyl-benzole and nitrate of ammonia blended together in certain proportions and under special conditions. Bellite will not fuse with water and is better suited for use in fuses and in the case of Mr. Napier, and C., and Mr. Perry F. N. Nursery, C. E., were commenced by exploding 300 pounds of bellite under water, the explosion of spray being projected to a great height. Half a cartridge of bellite was then placed on a coal fire, and was simply roasted away. The corresponding half was exploded by means of a cappled fuse on a piece of three-eighths-inch boiler plate with good effect. An iron weight of 120 pounds was then dropped from a height of 18 feet onto some nailed cartridges, and they were exploded but not burned. Afterwards exploded on a piece of double-headed rail, out of which was cut a short length. In a hole in the earth one pound of bellite was exploded with one-quarter ounce of charge, and the powder was fired, the explosion throwing the bellite cartridges out of the pit in a broken and partially roasted condition. A cartridge of bellite was exploded with a metal lid, and the explosion being merely smashed against the plate. Some comparative experiments made with equal quantities of dynamite and bellite exploded on iron plates showed that bellite was slightly stronger than dynamite, and that it had more of a rending than of a smashing action. As a test of its propelling power a 32-pound ball was projected from a mortar to a distance of 120 feet by a charge of one-half ounce of rifle powder, but with one-quarter ounce of bellite it covered 285 feet in its flight. The final experiment consisted in demolishing a railway. To this end a sixty-foot length of line was laid, with iron rails carried in iron chairs on timber cross-sleepers. A mine containing eight pounds of bellite, placed in the earth at a depth of five feet below the railroad, was exploded, demolishing the railway and forming a crater twelve feet in diameter by some six or seven feet deep. Portions of the rails and iron chairs were blown off, and the track was one of perfect wakere. The experiments fully demonstrated the safety, power, and special action of bellite. —London Times, February 8.
A VERY damaging admission was made by a witness at the recent session of the Ceiling Investigating Committee at Albany. The witness was one of a firm of dealers in glass, and testified that he sold glass to Smith, the contractor, for the ceiling, at three dollars a foot, with an arrangement by which it was to be removed for payment at the rate of six dollars a foot, so that it might appear that Smith actually paid that price for it. In the present case the bill at six dollars seems to have been made out at the request of Smith, after he got into difficulties, with the hope that it might help him to frame a plausible explanation of what he did with all the money that he had been paid; so that perhaps the glass dealers should be reproached with nothing worse than an over-zealous readiness to concoct fibs to help one of their customers out of a scrape; but the same sort of trick is used in other branches of the building trades to an extent which would surprise outsiders. In altogether too many cases the bills, receipts and vouchers presented to architects as evidence for the settlement of accounts are very far from showing what was actually paid for the goods charged on the bills, and none of the architect's duties require more labor and experience on his part than that of finding out what the true net price of materials used in building is. The habit of keeping up "long" prices, as a means of deceiving the inexperienced or unwise, while the goods are really sold at a fraction of the prices marked on the bills, seem to be chargeable mainly to the wholesale dealers. Of course, they do not use the trick against their own customers, all of whom understand it, but the fact remains that it provides those who buy of them with a means of deceiving those to whom they sell again, and the wholesale dealers seem to think that this inducement will bring them customers. Perhaps it does, but they must be of the poorest kind, while the honorable men, who make out their day-work bills with the real prices, ignoring the list prices altogether, find the lists simply a nuisance, they are really worse than that to them, for there is no question that the suspicion entertained by owners, that they are likely to be robbed in some such way, leads them to put many thousands of dollars' worth of work out to contract which would otherwise be done by the day, with much better satisfaction to them and to the mechanics employed. Nothing is more common in architects' offices than to hear inquiries made about the price of certain materials. Some price is mentioned, or looked up in the lists, and the architect is asked whether it is the net or the list price, and if it is the latter, how much discount there is. As the discounts vary according to circumstances, he can rarely tell what will be the exact net price that his client can get the goods for, and the latter concludes by saying that it will be better to put his work out to contract, so as to secure by competition, not so much the lowest price for the labor, as for the materials employed.

The proceedings of the Lydecker court-martial seem likely to be of considerable interest, if not importance to architects. The charge against Major Lydecker is that he failed to do his duty in supervising the construction of the Washington Aqueduct, so that the Government was defrauded out of a large amount of money by the dishonesty of the contractor, and was left with a useless piece of work on its hands. It seems clear that he did not visit the interior of the tunnels very frequently, and the question appears to be whether this circumstance justifies the people concerned in letting the contractor go in peace with his ill-gotten gains, and visiting all the consequence of his rascality on a person of whom the worst that can be said is that he is an architect who "holds himself above suspicion." This is a question which concerns architects very closely, and, as a contribution to the discussion, the testimony before the court-martial of General Newton, for many years charged with the supervision of the most important Government works, is of importance. General Newton testified that the officer appointed to supervise the construction of the tunnels of the construction of the aqueduct tunnel "could never prevent fraud by any possible personal inspection which he might make." "Whether Major Lydecker visited the tunnel more or less often did not affect the question at issue, for he could never have visited it often enough to have prevented frauds if the workmen desired to do defective work, and the sub-inspectors were incompetent or unreliable, for all traces of fraud could be covered up." "In the case of the New York Aqueduct," General Newton said, "although there were a number of inspectors, the cheater had got in, and the discovery of the fraud was quite accidental." He differs from this is from the usual talk on the subject, architects can well appreciate. According to many clients, the principal use of an architect is to enable his employer to put in a "cheater" to build his house, and to hold him responsible for all the cheater's frauds that he does not succeed in preventing; and lawyers are never more eloquent than when they claim the advantage of the "chief of the building profession," is accountable to the owner for all defects in work that he "assumes to supervise."
THE Master Builders' Exchange of Philadelphia has decided to establish a complete set of trade schools, in which shall be taught all the principal branches of the art of building. A school of plumbing has been in operation under the same auspices for about five years, with encouraging success, and the school of radiators has been opened more recently and is being carried out. Although the Exchange has taken great interest in the matter, and will undoubtedly do all that it can to insure success, the real originator and supporter of the enterprise is that unwearyed friend of the American workingman, Colonel R. T. Auchmuty, of New York, who has offered to contribute the necessary funds; a year's expenses of the school for three years, after which it is hoped that it will be self-supporting. Colonel Auchmuty has, it is said, proposed to the Master Builders' Association of Boston to do the same for promoting the establishment of trade schools in that city, and it is altogether likely that his offer will be accepted.

The Eiffel tower in Paris is very nearly finished, and will certainly be completed by the first of May. The painters have for some time been at work decorating it, and the Parisians naturally take great interest in their labors. With the usual French ingenuity in seizing opportunities for exalting the memory of persons whom they wish to honor, the directors of the work diversified the decoration by having the names of distinguished personages of the last century painted in conspicuous places, and two years ago, until it was discovered that some of the most honored names were omitted. The omissions were so glaring that they could not be overlooked, and inquiry was made as to the cause. It then appeared that the names had to be painted in panels of a limited size, none of which would contain a long name, painted in letters large enough to be deeply evident. As the directors were therefore, obliged to restrict the honors to be bestowed in this way to persons whose names were not more than six or seven letters long. Persons who visit the exhibition should, therefore, remember, as they study the names of the illustrious dead on the great tower, that the list does not comprise all the most distinguished ones, but only those with the shortest names.

The Paris Exhibition is to be enlivened by four splendid entertainments, which are to be provided at the joint expense of the State, the city of Paris, and the Exposition funds, at a cost of six hundred thousand dollars. The first of these is to take place on the fifth of May, the one hundred and twentieth anniversary of the meeting of the States-General that became the Constituent Assembly, which is to be celebrated at Versailles with the presence of the King and fifteen hundred guests in the Galerie des Glaces. The second entertainment takes place on the next day in the Exhibition grounds, when the buildings are to be opened for the first time to invited guests with ceremonies appropriate to the inauguration of such an affair. The third is on the fourteenth of July, the anniversary of the taking of the Bastille, when all Paris is to be illuminated. With a splendid spectacle, usual even for the French Fourth-of-July, the Boulevards are to be lighted with strings of lamps, and the Bois de Boulogne and the Forest of Vincennes are to be included in the illuminations. The last affair of the kind is the festival of the inauguration of the monument of the Republic and the Exposition, which is to stand in the Place de la Nation. The date of this is not fixed, except that it is to take place some time in September.

Two new colors are described in various recent technical journals. The first is apparently a reproduction of a color known to the ancients, and made by them with sand and lime, heated with roasted copper. The pigment, on analysis, appears to be a compound silicate of lime and copper. It is now made with exact proportions of the materials, so that the product is uniform, and the process is likely to furnish a material of great value. The color is a bright, greenish blue, so that it will be more available for decoration than French blue or cobalt blue, both of which are of a purplish cast, and do not mix well with other colors, while it appears to be less costly than either of them. A black, which has been made by treating camphor with sulphuric acid. By steeping camphor in strong sulphuric acid a jelly-like mass is formed, of a reddish color. When this is heated it boils, giving off fumes of sulphuric acid, and turns intensely black. By evaporation the unconverted excess of acid and camphor is driven off, and a black mass remains, which seems to have the qualities of Indian ink. Like Indian ink, it can be apparently dissolved in water, and remains suspended for a long time. We hope that some one will pursue the subject of this camphor-black. A pure liquid black is one of the things that science has searched for in vain for many years, and even so near an approach to it as good Indian ink would be a most useful substance.

An architect in Paris has recently been made to feel the weight of professional responsibility in a rather disagreeable way. Being commissioned to take charge of the erection of a house in one of the most elegant streets of the city, he had made his plans and commenced the construction of the building before the grade-lines of the street had been given by the city engineer. His drawings had been made for a high and spacious carriage entrance in a portion of the front where variations could not be seen. In the grade without house existence, but the proprietor, who had a second-hand pair of doors that could be utilized, directed him to make the doorway very small, to fit the dimensions of the doors, and to place the entrance in another part of the front, where changes could be made only with difficulty. The architect followed these directions, instead of protesting against them, as he should have done, and was, moreover, so careless as to allow the door-sills to be set either before the grade-lines had been given, or without properly referring to them. The consequence was that when the house was finished, and the time arrived for laying the sidewalk, it was discovered, with the first-floor rooms and the street below the street, and, moreover, that the sidewalk line would be upon the steps from the top of the carriage-entrance. Naturally, the proprietor, when he found that he could not drive into his house, refused to pay the architect's bill, and the latter summoned him before the Tribunal of the Seine, which decided that the architect had caused a great increase of expense, and, besides the amount of two thousand dollars and costs, or a little more than the balance due him on his own bill. It is characteristic of French jurisprudence in such matters that the fact of the architect's having consented to the adoption of a defective position for the carriage entrance, even at the express request of the proprietor, so far from excusing his fault, was held rather to have aggravated it.

SAINT AUGUSTINE, Florida, is about to be inundated with remarkable architectural innovation by the erection of a Roman, or rather, a Pompeian house, on an immense scale. A small house of the sort was once built by Prince Napoleon in Paris, and King Louis of Bavaria, among his other freaks, constructed one at Aschaffenburg, near Munich, where, under the name of the Pompeianum, it still attracts visitors; but these are small affairs in comparison with this magnificent scheme, under which St. Augustine will possess. Externally, the building is to be quite plain, presenting walls of coquina concrete, colored in the mass, and formed into panels and pilasters. In the middle of the front is a wide door, opening into the vestibulum, from which one turns into the atrium, a room thirty by forty feet, which forms the reception-room of the mansion. The atrium is open to the sky in the middle, and around it are four cubicles, a bibliotheca and an exedra, or conversation-room; while an oratory occupies a small room opening out of the vestibulum, and opens the door to visitors. Beyond the atrium is the peristylum, a room, or rather court, forty feet by fifty-two, open to the sky in the middle, and furnished with a colonnade and a fouss. On one side of this court are the pinaeotheca and the winter triclinium, both of which are also entered from the atrium, and beyond is the summer triclinium, with which is connected a room on one side, and on the other side, where the proprietor is to keep what purport to be his household gods. The house stands on a corner, and, according to the Roman custom, one side is occupied by tabernae, which have no communication with the interior of the house, and are, we suppose, to be routed to the serving-machines agents and grocerines of St. Augustine. In the second storey, which is reached by a separate entrance from a side-street, are a few rooms and a solarium or roof-garden, which will have fountains, treilles, and other suitable ornaments. The furniture is to be copied from objects in the British Museum and the Louvre, and the color is to be that of the Parian and other artists in the purest Pompeian style, and casts of a complete set of statues, such as a Roman-Greek gentlemen of the first century A. D. would be likely to have in his house, will be set up in appropriate positions. The architect is Mr. G. Hornblower, A. R. I. B. A., who, with the consent of the owner, Mr. Franklin W. Smith, of Boston, furnishes the Builder with a plan, description, and two fine perspective drawings.
EQUESTRIAN MONUMENTS. — XIII.

AS ADJUNCTS OF ARCHITECTURE.

The original statue of Louis XII at Blois — the work of Guido Muzzeni, a sculptor of Modena brought from Italy by Charles VIII — bore under it the inscription:

RIC URI NATUS ERAT DEXTRO LUDOVICVS OLYMPO SUMPSIT HONORATA REGIA SCETRA MANO
FELIX QVE TANTI FULSIT LUX NUNCIA REGIS
GALLIA NON ALIO PRINCIPE DIGNA FUT.
Por. Eusns, 1498.

This statue was destroyed in 1789 and was not replaced until in 1845 the government undertook the restoration of the château. The present one is the work of the sculptor Scourr, who based it upon a drawing preserved in the Cabinet des Estampes of the National Library.

A similar statue, probably of Francis I, may have once had a place in the large central opening of the façade of the Château de Galillon, but the only reason for thinking so is a lithograph by Müller, an artist who was somewhat given to embellishing the subjects he depicted. No mention of such a statue can be found in the printed descriptions of the château, nor any other illustration. Whether or no Müller had any authority for introducing this statue the conception, as shown, is both good and unusual, in that it represents the king boldly riding out from the archway, and not aimlessly ambling along the face of the wall.

The photograph of the north porch of St. Maria Maggiore, at Bergamo, is familiar enough, but the amusements excited by the whip-surrounded lions upon whose backs are placed the pillars of the porch, distract attention from the equestrian statue in the upper por. which shows a certain St. Alexander, or, as the figure is often called, Duke Lopas who, also, is shown as riding out from under the canopy. The piece of sculpture is inscribed: "Fitiis Upri di Cimpmio fecit hoc opus, 1655." This porch, which was removed to its present position from the Church of San Alessandro in the lower town, gave Street so much pleasure that, in his "Brick and Marble Architecture," he speaks of it thus: "Such a porch as this northern porch at Bergamo is, indeed, a great treat to an ecclesiologist, teeming as it does with ideas so fresh and new; and, in a small compass, giving so much of the radical points of difference between northern and southern Gothic, and, at the same time, offering so beautiful a study of constructive coloring, that it is impossible to gaze at it.

So far as research can discover, there is not a single instance of the employment in modern times of an equestrian statue as an adjunct of architecture in the way that was adopted with so much success at Blois. The statue of Louis XII there seems as much a part of the architecture, as integral a part of the architect's original conception, as the open staircase itself. While the embrasure over the entrance remained empty pending the restoration of the château, the observer could not but have felt that the central point of interest of the façade was lacking. Having become accustomed to this feature of one of the most elegant pieces of modern architecture, it is doubtful whether a similar employment of equestrian sculpture in connection with another style of architecture would be unquestioningly accepted by the student of art. The figures are sculpture, and the action of the horse is gentle enough not to interfere with the architectural quietude of the man.

A less successful employment of the Louis XII motive may be found at Nancy — less successful because less reproducing in its treatment, and yet not altogether unsuccessful, since the more vivid actions of the horse, which is bestridden by Antoine, Duke of Lorraine, together with the uplifted sword of the rider, bring the composition fairly into harmony with the exuberant flamboyancy of the architectural detail of the central motive of the old Ducal Palace, now converted into the museum of antiquities of Lorraine. Like most of the sculpture now extant on French buildings of an early date, this group, by the sculptor Viuri-Iloco, is but a restoration — though probably not a replica — of an earlier group by Mansuy Grauvain, a sculptor of the early sixteenth century, which had been destroyed by the revolutionary iconoclasts in 1793. The building itself was begun by Duke Raoul, who ruled about 1329, and was finished by René II, while Antoine and Charles III enlarged and embellished it. The central motive, the doorway, was due to Antoine, who finished it in 1512, and it was his figure that was placed there. The building was not restored after the Revolution until 1848, and the present statue was put in place in 1851 where, though all the rest of the building was destroyed by fire in 1871, it still remains.

A less familiar statue of similar character is to be found at the Château de Verger, in Anjou, where Pierre de Bohan rides beneath a projecting canopy. This canopy and the withdrawn curtains held back by little winged genii, stamp this figure as less in place on the outside of a building than the Louis XII and Duke Antoine of Lorraine, and suggest the work of an Italian sculptor, who still retained memories of the treatment of equestrian figures on some of the celebrated tombs of Italy.

While at Nancy, since it may not be visited again, it is well to mention another equestrian statue, a miniature figure of Duke René II (1473-1508), the conqueror of Charles the Bold, which is a reproduction of the leaden original by Lépuy, which is now in the Museum. This little statue surmounts a fountain which stands in the front of the new Church of St. Étore, built, in 1863-75, on the site of an earlier church dating from 1451. The tower and spire here shown are 288 feet high. Besides this little figure which is not exactly in place in this consideration of equestrian sculpture and architecture, there is in the Museum of the Hôtel de Ville a bronze

1 Continued from No. 668, page 42.
equestrian statue of Duke Charles III, by the sculptor Chalgirl, a native of the city; and there is also a statue of the same personage—which may or may not be equestrian—over the doorway of the

There is a minor instance of a treatment somewhat similar to the Blis motif to be found at Vienna in the fountain of St. George, which decorates the palace of Prince Montenuovo, now the Anglo-Austrian Bank: here the group, a St. George and the dragon by Fernkorn, gets its framing in a shallow niche in the face of the wall of the first story, but the sculpture can not in any sense be considered as a part of the architecture.

The only bit of modern equestrian sculpture that can reasonably be brought into the same category with these figures was the also relief by Merci over the guichet of the Louvre, which has already been illustrated, and which the bas-relief, evidently inspired by it, on the new monument erected at Cracow, to Adam Mickiewicz, by Godlewski, sculptor. The figures, may serve to recall. The figures on Strasbourg Cathedral seem to be entirely accidental, and not parts proper of the architectural design.

Wherever else equestrian sculpture is united with the architecture of the building, it is usually in the form of bas-reliefs in such a way as to lie in a sort of niche, ground between decorated construction and constructed decoration, while yet always coming within the province of the architect to control or direct, or else it exists as decoration pure and simple, and the connection of the architect with it has been only to provide the proper pedestals for the detached groups.

It is strange that modern architects should have neglected such a possibility of lending interest to their buildings, although it is not a very obvious means. An equestrian statue with its pedestal is usually in the way in a city, and has either to be set up in a special enclosure of its own stolen from the lawful claim of traffic's needs, or is sent off to find a place in some large park, where few can see it, and where, generally, its sculptural and architectural lines are not in keeping with sylvan surroundings. But if such sculpture should be designed for a place on some important building, where it would be out of the way of traffic, and fitly form the central point of some short vista, it could effect a gain in many ways. It could be erected more economically than a statue standing free on a pedestal of its own, for, practically, only twocent of the figure need be highly finished, since the parts next the back of the niche could be left in the rough, and what would correspond to the work required for the pedestal could be restricted to that which would be needed to finish but a single side of the same. Or, to put the same idea in another form, for the money needed to erect a good statue standing free, a much more elaborate, more satisfying, and less obstructive result could be achieved by designing the next equestrian statue we have to erect in conjunction with some public or semi-public building about to be erected in a place suitable for the fair exhibition of such sculpture. There are projects now afoot in many cities looking to the erection of equestrian monuments to leaders who fell on one side or the other, during our civil war, and the Government might do worse things than, after having taken suitable precautions to prevent the supervising architect of the moment turning the matter into a farce, to offer a wall of the next public building to be erected in such city as a background for such a group of statuary. Perhaps the influence
and advice of an able sculptor who had a stake in the matter might do more to effect a reform in Government architecture than all the expositions that the public and the architectural profession can formulate.

In spite of the short time since it was in evidence and the great number of photographs of the Louvre that must have been taken while it was still in place, it has not been possible to procure any illustration of the "Gingerbread Man," which caused its unfortunate author, the famous Barye, so much mortification. Here was a case where an unfortunate sculptor—not a then well-known one, to be sure—was wantonly sacrificed to the supposed exigencies of the architectural surroundings. When it was decided to place a triumphal relief of Napoleon III over the guichet of the Louvre, Barye, to whom the task was assigned, desired to make the figure in high relief, but the architect, probably M. Lefuel, would not listen to his entreaties, but declared that he could not have the delicate lines of his mouldings and surface enrichment interfered with by a treatment so robust as that which the sculptor desired to adopt. As was, of course, strictly proper, the sculptor had to yield, and the figure was modelled in the flattest of relief and reproduced by the galvanoplastic process by Christophe, with such poor success that it was necessary to plug up many holes and imperfections with lead and wax, which gave to the sculpture the mottled appearance which earned for it the nickname "le bonomme de pain d’épice." But it filled a void, and though laughed at by all, held its place till the fall of the Empire, when it was one of the things that first fell a victim to the iconoclastic rage that, in France, follows political change. Strangely though, it met a kinder fate than some more deserving efforts: thanks to its flatness it was an easy task to conceal it behind a layer of tinted plaster, which served the purpose of the moment and allowed popular rage time to cool, and made it possible at a later day to remove the plague uninjured, and store it away with other displaced royalties and royal belongings in the Governmental bric-a-brac shop, the Garde Meuble.

In this connection may be mentioned two bits of equestrian sculpture of the Bourbon epoch highly by unknown authors, which hold positions in respect to architecture similar to one another: supported on a label over the door of the Loggia del Mercanti—or Exchange—at Ancona, in Italy, stands a little equestrian figure, of animated action, in high relief, while over the doorway of the Convent of St. Francis of Assisi, at Palma, a city on the Baltic, he rode his charger in a full-length equestrian figure.

As one more instance of the many places and ways in which the horse was brought into ecclesiastical sculpture, may be mentioned the relief of St. Martin, as usual depicted his cloak with a beggarman, on the façade of St. Martin, at Laon, France, the church dating from 1110. The church of St. Croix at Bordeaux, published in the American Architect, for December 6, 1884, also contains in a large niche in the façade a group of St. George and the dragon in high relief.

As a type of the horse used as an adjunct, of what may be styled marine sculpture, is the statue of a horse at Chantilly, the Park, at Versailles, may be mentioned. A very admirable type of the many uses to which the horse has been applied, both as a sculptural or as crowning feature of a triumphal arch, or as support of some piece of heraldic sculpture, may be cited in the group which has a place over the entrance to the Imperial Library, at Vienna, whence it looks down upon the equestrian figure of Joseph II, in the Josefsplatz below.

CHARLES-EMILE-Marie Sureau.—Born at Paris, 1796. Died there 1856. Pupil of Cortotiller, who procured the statue of Pope Pius IX, and the statue of "Leda," the statuette of Napoleon, mounted in the Vendôme column: a statue of Charles VII; one of Beethoven; and the figure of "Christ" on the facade of the new Castolin Delavigne, in the cathedral of Perp Lachaise.

FRANZ I.—Born at Cognac, 1494. Succeeded Louis XII, 1515; engaged the Milanes the same year; was a candidate for the imperial crown; in the same year Charles V established a league with England and the Pope against Francis, who was defeated at Pavia, 1525, and taken prisoner; confined in Madrid until 1530; succeeded by his son Charles II, and continued to reign until 1554; promoted science, art and literature; died March, 1557.

DUCHE DE CHALIGNY.—This magnificent castle, erected at the beginning of the sixteenth century, was built by Cardinal Georges d'Amboise, minister of Louis XII, as a maison de plaisance for the architects of Rome, from designs by An- douez de Coreau, the famous architect. It was enriched with sculptures by Jean JUSTE DE TOURS. It was mostly demolished at the Revolution and is now used as a house of detention, having been rebuilt, though greatly altered. A part of the old façade was preserved and has been erected in the courtyard of Ecole des Beaux-Arts in Paris. The fine marble relief of St. George and the Dragon which is now in the Salle de Michel Colombé at the Louvre, was brought from Chaligny. This château was a favorite residence of Louis XIII. Pierre de Rohan.—Pierre, Vicomte de Rohan, Maréchal de Gir, was born in Brittany about 1498. He was made Marshal in 1528, and enjoyed the favor and confidence of Louis XI and Charles II, the latter of whom he accompanied in his Italian expedition. He was appointed by Louis XII preceptor to the young prince, afterwards Francis I, but subsequently fell into disfavor, and was deprived of his dignities. Died 1535.

VILARD-JEANNE.—Born at Saint-Claud (Meurthe). Pupil of Bonnassieux. The museum at Nancy possesses him a bust of the chemist Bracoonet, and a statue of "Christ bound to the column" and "St. Sebastian.

ANTOINE, DUCHE DE LORRAINE.—Born at Bar-le-Duc in 1469. Son of René II. Succeeded his father in 1508. Maintained a neutrality in the war between Charles V and Francis I and reigned mostly in peace. Died in 1544.

MANSUY GAUVARD.—A sculptor who flourished at the beginning of the sixteenth century.

CHALLONT.—There were two sculptors of this name, David and Antoine, apparently brothers, and this statue is sometimes said to be their joint work.

FLORENT DROUIN.—A sculptor of Nancy, who lived in the sixteenth century.


DUCHE DE LORRAINE.—Born at Nancy, 1565. Died 1609. Pupil of his father. He executed medallions in ivory of the Emperor Alexander and the archbishop Charles. In the museum at Nancy are two of Leprin, a French sculptor, which Leprin executed in marble for the monument to that prince in the Church of the Cordeliers.

DUCHE DE LORRAINE.—Born in 1411. Became duke in 1473. His dominions being invaded by Charles the Bold of Burgundy, René, with his allies, defeated Charles at Morat, 1476. The next year he gained another famous victory near Nancy, where the French army wasเช่น ที่มุก in battle. Rene continued to reign until 1480 and was appointed captain-general of that republic; but on the death of Louis XI of France left the service of Venice. He died in 1508.

THE DOMINIC DE MERCANTI. ANOSA.—This building, was designed by Felligno Tibaldi, who lived from 1267 to about 1325.

[To be continued.]
SUGAR IN MORTAR.

ALTHOUGH saccharine matter has been employed in India as an ingredient of mortar from time immemorial, and reference has been made to it by standard authorities, which has attracted considerable attention in England and America during the past two or three years, its effect is not generally known.

Saccharine matter unites with lime, and forms sucrate of lime—a solid which possesses considerable strength, dissolves freely in water, and is acted upon by carbonic acid. All hydraulic cements contain at least 50 per cent of lime compounds; hence, if a saccharine substance be added to mortar, the sugar will unite with the lime and form sucrate of lime. The effect of this compound may be an advantage or a disadvantage, according to attendant conditions. For example, if the mortar is composed of common lime and sand, the sucrate of lime, being stronger than the carbonate, will add to the strength of the mortar: and as the lime will unite with the sugar more rapidly than with the carbonic acid of the air, the sugar will also cause the mortar to set more quickly.

In India, the practice is to add one pound of the coarsest sugar (or its equivalent in syrup) to each gallon of water with which the mortar is mixed. "This amount of sugar adds one-half to the breaking strength of the mortar, and doubles its cohesive strength." It is better to dissolve the sugar in the water than to mix it dry with the lime, since some limes in skaking "burn" the sugar, thereby destroying its strengthening effect, and also blackening the mortar.

The addition of sugar increases the early strength of lime mortar, since the sucrate of lime develops its strength more rapidly than the carbonate. If lime mortar were used in the interior of thick walls, the addition of a saccharine substance would be beneficial, since lime mortar thus placed would never become fully saturated with carbonic acid. The addition of sugar to cement mortar will accelerate or retard the setting of the cement, depending upon: (1) the amount of sugar present (so far as the cement is concerned the sugar is an adulteration); (2) the relative indurating activity of the sucrate and the silicate, and (3) the amount of water used (the cement is hydratable, while the sucrate is non-hydratable, and hence the former will set in the presence of water, while the latter will not). This principle may account for conflicting results obtained from different experiments. For example, one experimenter found that sugar greatly accelerates the setting of Portland cement, causing it to set in a few minutes; on the other hand, most experimenters find that sugar in any proportion retards the setting of Portland cement. All experimenters agree that sugar retards the setting of Rosendale cement.

Sugar added to mortar may increase or decrease the ultimate strength of the mortar, depending upon: (1) the amount of sugar present, and (2) the relative ultimate strength of the compounds formed. For example, with lime mortar, the maximum effect—an addition of 50 per cent to the ultimate tensile strength—is obtained when the weight of the sugar is equal to about 10 per cent of the weight of the lime. With neat Rosendale cement mortar, the maximum effect at the end of three months—an addition of about 20 per cent to the tensile strength—is obtained with about 1/4 per cent of sugar. With neat Portland cement mortar the evidence is conflicting. One experimenter obtained a maximum effect—an addition of 25 cent to the strength—with one per cent of sugar; while another concluded that "sugar was of no great advantage in combination with the best qualities of Portland cement." The last was corroborated by experiments made by the author.

The sucrate of lime, being soluble in the water, will in time be washed out by the rain; therefore the addition of a saccharine substance to mortar is most beneficial in a dry climate; as in India, for the sugar is not permanent when the mortar is exposed to the weather. Owing to these two facts, the use of sugar with cement is not of much practical value. Although sugar aids materially to the strength of lime mortar, the compound is inferior in strength and durability to cement mortar, and costs proportionately more.

It is highly probable that the effects obtained by mixing sugar with mortar can also be obtained by the use of gum-arabic, dextrine, glucose, etc. The use of such materials involves some interesting questions: and a study of this subject by a mason-chemist might lead to valuable results.

IRA O. BAKER, C. E.
DUKE ANTOINE OF LORRAINE, NATIONAL MUSEUM, NANCY, FRANCE.
Portail occidental de l'église St. Martin
SECOND PRIZE—CLAUDE F. BRAGDON.

FIRST PRIZE—W. M. ORCHARD.
ARCHITECTURAL SHADeS AND SHADOWS—III.

THE GENERAL METHOD.

Drawing shadows when the line of shade is known, and surface of incidence is a plane parallel to a plane of projection; difficulty in other cases; "slicing" explained; slicing the cone; finding points of its line of shade and of its shadow; shadow of a cone on a cone; recapitulation; note on surfaces of revolution.

In order to draw the projections of the shadow of an object, we must ascertain the projections of its line of shade. By drawing through a sufficient number of points of this line the projections of rays of light, and finding the intersections of the latter with the surface of incidence, we obtain the projections of points in the line of shade which is then drawn through these points with an accuracy depending upon their number. When the surface of incidence is a plane parallel to the plane of projection, and the line of shade is that of a simple geometrical solid (as in a large part of the cases the draughtsman has to deal with), the problem is much simplified. Thus in Figure 20 we have a parallelepiped whose projections coincide with those of its line of shade (20). Through the extremities of the edges forming this line of shade we draw the projections of rays of light. These intersect the plane of incidence (here supposed parallel to VP) in points whose horizontal projections are, of course, on the horizontal trace of the plane of incidence, and their vertical projections directly above, upon the vertical projections of the corresponding points of the line of shade. The line connecting these points of shadow thus found form the required shadow of the line of shade, that is, of the object (19 and Maxim X), and the problem is solved.

Figure 21 illustrates the application of this process to a plane figure not parallel to either plane of projection, but casting its shadow on one of these planes. Here the line of shade is evidently the line where the horizontal projection of the figure cuts the line of its shadow, as shown in 21. In the same way may be found the shadows of a large number of plane figures and of simple geometrical solids when their shadows are cast upon a plane parallel to a plane of projection. Examples of this kind will be shown in Plate II.

But when the line of shade is not given and the surface of incidence is not parallel to HP or VP, or is not a plane at all, the problem requires some more comprehensive method for its solution, and this is furnished by the general method, sometimes called the "Method of Slicing." This is based upon the principle that when a plane figure is parallel to the direction of the light, or, in other words, has one of its elements of its plane parallel to the luminous rays, the figure becomes its own line of shade (21, 6), its shadow in space a plane, and its cast shadow upon a plane a straight line. The points where rays of light are tangent to its edge, called points of tangency, cast shadows which limit its own cast shadow, and of which a part may fall on its own edge, as in D, Figure 16, and in Figure 22. Now, by cutting any object and the adjacent surfaces into slices by planes parallel to the rays of light, we obtain a number of such figures. The points of shade and shadow on their edges are points in the lines of shade and of shadow of the object. By drawing the projections of the rays tangent to the outlines of these slices we obtain the projections of points in the required lines of shade, the figure itself, and of shadow, which we then draw through these points with an accuracy depending upon their number. This operation is illustrated in Figure 23.

The slices may be cut by any series of planes parallel to the rays of light, i.e., containing one element parallel to them. But it is convenient to have these slices perpendicular to one of the planes of projection, as they are then projected upon that plane at right lines. If the solid is a geometrical figure, the other projection of each slice may be found by assuming points upon its rectilinear projection, and finding their positions upon the surface of the figure in the other projection, these being easily deduced from the geometrical properties of the surface in question.

In the subsequent figures we have assumed a plane normal to VP, and five points are taken upon the vertical projection of the resulting slice (Chap. II, note 9, b). Through these the vertical projections of five elements of the cone are first drawn, and then their horizontal projections, upon which the horizontal projections of the five points are easily found, together with three more similarly situated upon the further side of the cone. These eight points determine quite accurately the outline of the "slice" in horizontal projection, and greater accuracy may be secured simply by multiplying the points assumed in the first instance. This outline is, of course, an ellipse, and upon it the horizontal projections of two points of the line of shade may be determined, as above, by means of tangent rays. Their vertical projections are easily found on the vertical projection of the slice.

In the same process is repeated higher up on the cone, and in C a section is taken lower down, the other two being repeated. The process may be continued as long as new points in the line of shade are required.

It will be observed that some auxiliary means is necessary for finding the horizontal projections of points on the middle elements, numbered 3 in the figure. This is furnished by the radii y', z', o', a', r', s', y, taken at the respective levels of the points situated on these elements, and which show the distance of these points from the axis of the cone. Indeed, the other points might all have been get horizontally by projection by means of radii taken at various levels, as these points would lie upon the horizontal projections of circles as described by these radii (Figure 24, D).

In Figure 25 the secant planes are normal to HP; the horizontal projections of the slices are rectilinear, and their vertical projections hyperbolas. Drawing rays tangent to these hyperbolae in vertical projection we may obtain points in the vertical projection of the line of shade, and their horizontal projection can be easily found on the plane below. The form of the cast-shadow of a plane figure or slice parallel to the light, is determined by the intersection of its invisible shadow (which is, of course, a plane coinciding with that of the figure itself, [21, 5]) by the surface of incidence, and is projected as a straight line when the figure itself is normal to the plane of projection. If the surface of incidence is a geometrical figure or a plane, the other projection of the line of shadow is easily found in the same manner as was that of the line of shade, by consideration of the geometrical properties of the surface in question. Both lines,
rapid. These short-cut rules generally depend upon an analysis of the properties of particular classes of geometric figures and solids occurring most frequently in architecture, and take the form of a categorical statement of the forms of the traces of their shadows on planes and other simple geometrical surfaces, with particular instructions for drawing both projections of the forms thus stated. The application of the general rules to those cases which do not fall under these special rules and conditions.

Note. Surfaces of Revolution. — When a surface of revolution has the axis normal to one plane of projection, as HP, for example, it is projected upon the plane of projection by simply taking the circles cast, by whose centers pass the plane of projection, parallel to the axis. If, however, the axis is normal to one plane of projection and the axis is normal to another plane of projection, as HP, the axis is normal to HP, the circle is cast by whose radii pass the plane of projection, and are parallel to the axis. The other projection of the circles of the surface is easily found from the right line, forming these horizontal elements of the vertical projection of the solid whose lengths equal the diameter of the circle just drawn, and upon them (or the right projection of the assumed plane) are determined. This is virtually what was done in Figures 24, B, with the points on the element figure 3, and again in Figure 24, D. In Figure 27, the points a*, a*, a*, etc., are determined in this way. The symmetry of the figure gives us two points, a*, a*, equally distant from the centre o, and these give us four points in vertical projection, since it is evident that the circle 2 represents two circles in vertical projection (both marked 2* in Figure 27). A few very few points thus suffice to determine quite accurately the outline of the slice in vertical projection. It is frequently convenient to take the points on the circles 1, 3, 5, etc., and allow them to determine the points a*, a*, a*, etc., of intersection with the rectilinear projection of the slice.

Of course, since the axis is perpendicular to HP, the conditions are reversed as to the projections, and the operation is carried on as above by substituting one set of projections for the other.

The student will find it profitable to "slice" with a number of different solids of revolution — toruses, spheres, ellipsoids, etc.

THE BOSTON MUSEUM OF FINE ARTS.


THE Trustees of the Museum of Fine Arts find themselves compelled by the needs of that institution to appeal to the public-spirited citizens of Boston for means to carry it on.

Early in 1887 the growth of the collections had reached such an embarrassment of the building necessary, and a subscription was asked for, and the sum of $200,000 was given by about one hundred persons for this purpose. It was hoped that a part of this money would be paid as a fund to pay the running expenses, but this was found to be impracticable. More room was needed for Japanese collections of the highest value, which generous friends of the Museum offered to place in it. The proper arrangement of the casts of sculpture, and the convenient circulation of the public on both floors of the Museum, required that the building should be carried round the four sides of a central court. This, with the necessary purchase of casts, will absorb the whole of the subscription.

The income of the Museum applicable to its current expenses was, in 1888, $14,183.20; the current expenses were $25,145.13; and it is the hope of the Trustees that there will be enough to meet the expenses and that there may be an increase in the enrolment of the building.

To administer the Museum to the advantage of the public requires an additional income of not less than $15,000 a year. To provide this sum the Trustees ask for fifteen hundred annual subscriptions of $100 each, or five thousand dollars a year. Each subscriber will be entitled to a ticket admitting four persons to the Museum every day on which it is open. The projections of the Museum are such as to receive into the City; it depends wholly upon voluntary contributions. It has been built and filled with precious works of art which give pleasure and instruction to thousands, solely by the liberal gifts of individuals, not many in number, the Trustees, whose number has been increased from eighty to one hundred and thirty. The visitors, the revenue derived from visitors, its annual expenses have been paid in the same way. It rests its claim for help only on the service it renders to the public, and, in appealing to the public for the necessary wider support, the Trustees feel that they may hope for a general and generous response.

Subscriptions may be sent to E. H. Greenleaf, Curator (to whose
order checks may be made payable), at the Museum of Fine Arts. A ticket will be sent to each subscriber upon the receipt of the sum subscribed.


ENGINEERS' CLUB OF PHILADELPHIA.—THE PERSPIRABILITY OF CEMENTS AND MORTARS.

H
t the regular meeting March 16, 1889, Prof. L. M. Haupt pre- sented some notes upon the perspirability of cements and mortars, with a view of bringing out a discussion of this subject. He quoted from the General Report of the United States Engineers on the Washington Aqueduct Tunnel. That report says: "If all of the work could and would be faithfully fulfilled in accordance with the specifications required for lime and facing laid in cement mortar, it would make the tunnel reasonably water-tight; yet it would not prevent all leakage absolutely, and it is difficult to foretell how much water would pass through.

"The head of the water in the tunnel varies for about 75 to 175 feet, and the pressure due to this head from 32 to 76 pounds per square inch. This is an internal pressure, tending to burst the tunnel outward—a suction of force which the tunnel lining is not well adapted to resist. All materials like brick or cement cracks are liable to be developed on the least yielding—which would be almost inevitable if any weak points were left in the filling. But even if it were all filled it must be remembered that both brick and cement are permeable to water. It is well-known that bricks are pervious under very ordinary pressure, and experiments have demonstrated that even the best cement is permeable to water and will allow it to percolate under pressure. Mr. James B. Franks, consulting engineer of the proprietors of Locks and Canals in the Merrimac River, Lowell, Mass., made some recent experiments on the permeability of cements and mortars, a record of which was presented to the American Society of Civil Engineers, May 16, 1888. These experiments showed that about 171 gallons of water per square foot of surface passed through a thickness of nearly 16 inches of cements poured under a pressure of 270 pounds per square inch. A thinner block would, of course, leak more rapidly in inverse proportion to the thickness. If the brick and cement of the tunnel were of the same thickness and leaked at the same rate, considering one pound pressure per inch of open space around the tunnel, it would amount to 5,000,000 of gallons in twenty-four hours.

"Mr. Stauffer's experiments, made in the Dorchester Bay tunnel, served to enlighten the leakage through brickwork. He con- structed a bulkhead of brick laid in cement, 4 feet thick, in a tunnel 10 by 10 feet. He found that under a pressure of 72 pounds per square inch the water percolated through at the rate of 120,000 gallons per day, or 1,360 gallons per square foot. The experience on the Boston Main Drainage Works proved that it was not practicable to build brick masonry that was water-tight under a pressure of 64 pounds per square inch. At the East River, New York, water under 36 feet head was found to percolate through 26 inches of brickwork and 4 feet of concrete.

"The experience of experts made some experiments to test the permeability of brick and cement mortar to water under pressure. Figure 2, plate 8, shows a sketch of the device used in making the tests. A wrought-iron pipe 3 inches in diameter and about 10 feet long has spouts screwed into the cap at the bottom in it a rectangular hole slightly smaller than the end of a brick. A heavy India-rubber gasket, with the same sized open- ing, is placed at the bottom. In the cap on top of the pipe a smaller pipe fitting, which leads from the pump. A pressure-gage is fixed to this pipe so as to indicate the pressure applied. The brick or block of cement to be tested is set upright inside the cylinder, with its open end downward, the upper cap being removed for that purpose. A good potter's clay is then pressed into the open brick until the clay comes up to the brick. The cap is then placed on and the pump applied.

"A good, proper specimen of brick was selected from a pile at the Champlain Avenue shaft, and under a pressure of water amounting to 80 pounds per square inch for one hour passed 23,4 cubic inches of water. The same brick under trial for a second hour passed 23,1 cubic inches of water. The above results are very unfavorable to cements, and reducing to the amount of water passed per square inch of exposed area of surface of the brick, it was found to be 2.8 cubic inches. This is equivalent to 1.75 gallons per square foot of surface per hour; or four times the rate into the face of the tunnel, 57,949 gallons per day of twenty-four hours.

"For another selected brick, in the first hour under 80 pounds pressure, 46.8 cubic inches of water was passed through; and for the same brick in sixteen hours, under the same condition of pressure per square inch, 344.5 cubic inches passed—equivalent to 1.68 gallons per square foot of surface per hour; or for the interior surface of the tunnel, 26,245,520 gallons per day of twenty-four hours.

"Blocks of cement mortar were prepared, in the proportion of cement one part and sand two parts—the materials having been obtained from the stock on land at Champlain Avenue shaft (the same as used in the interior of the tunnel); they were allowed to set for twenty-four hours in the air, and were then placed in water, where they remained for five weeks.

"Of these blocks, one was placed in the testing apparatus, and subjected to a water-pressure of 80 pounds per square inch, passed in a time of two and one-half hours 2,867.8 cubic inches of water—equivalent to 73.6 gallons per square foot of surface per hour; very far beyond the amount of percolation of water through the surface of cement or cement mortar. A second experiment, under 58 pounds pressure per square inch for one and a half hours, gave a percolation of 874.8 cubic inches of water—equivalent to 6.5 gallons per hour per square foot of surface.

"It is to be noticed from the experiments of Mr. Franks that Portland cement mortar having the same proportion of materials as used in the work of the tunnel, did not transmit the water nearly so rapidly. This was owing in a great degree to the cement; but probably partially to the difference in the quality of the sand, as the sand here used was not of the very first quality. The cement bricks presented a appearance of great porosity; and the result was not altogether unexpected.

"It is to be regretted that the time at the disposal of the Board would not allow extensive and conclusive experiments on this subject to be made.

"There was some discussion by Mr. Arthur Marichal and others. Mr. Marichal said that the impermeability of cements is a question of the greatest importance; yet it seems that no steps are taken by manufacturers to improve their products in that direction. The per- meability of the mortar will also affect its impermeability.

"When asked whether it was possible to make cellar walls water-tight by means of cement, Mr. Marichal said that for internal cements, 15i to 20i inches of water are used; 2 feet of mortar, and 4 feet of clay. The probability of the water passing through the mortar is, for instance, generally a couple of feet above the floor. Mr. Marichal answered that some years ago he succeeded in rendering perfectly water-tight, by means of cement, some cellars which were used to contain about six feet of water. He also referred to some experiments he had made in the same discussion of which followed, by Mr. Howard Murphy and others.

"HOWARD MURPHY, Secretary and Treasurer.

"The engineer's society of western Pennsylvania.

"PAPER OF THE evening by Jno. A. Brashcer on "Optical Glass."

"An interesting description of the casting and grinding of the glass, method of purification and annealing, and examination for internal strains of both flint and crown glass. The imperfections of the glass were described as being due to improper annealing, leaving internal strains, which can be detected by polarized light; also to strikes or chords, which are shown by lines running through the glass, which are liable to be formed in both crown and flint glass. Some of these, shown by examining with a lens, which gives a diffused light, and shows them up well in looking toward a bright light beyond. Strips are caused by non-homogeneity in the glass, from unequal density of rays, and from mixture of alumina arising principally from the clay of the pots in which the glass is melted. Strips cause aberra- tions, which are cured, when they exist in small areas, by rubbing the surface down at the location where the stripe exists in that way changing the direction of the light so much as to throw it entirely away from the focal plane of the lens system, thus making it harm- less. An interesting description was given of the method of cutting off the lenses from a block of glass with emery. This is done in fifteen minutes' time.

"The speaker claimed that optical glass could be made in Pittsburgh, and ought to be, that it needed only the skill and cooperation of trained operators, as he had long experience in France.

PAYMENT FOR UNEXECUTED PLANS.

Question.—Can you refer me to any adjudicated cases touching upon an architect's right to be paid for plans and specifications for buildings
not carried out. I have found it necessary to use for pay for such services and beg you to send me references at once.

Very truly yours,

[Signature]

The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.

THE STORY OF A STATE-HOUSE.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—It has recently been announced that the work of carrying out the enlargement of the Maine State Capitol at Augusta, has been awarded to Messrs. Brigham & Spofford, architects, of Boston, and the story of this whole recent agitation as to the location of the capitol building may be of some interest to architects generally.

There had developed throughout a large section of Maine a desire to have Portland make the Capital in place of Augusta. This desire had been steadily expressed for years, and was encouraged by the fact that the city of Portland, being the most accessible from the State at large, being the railroad centre as it is unquestionably—to use a much abused expression—be the most advantageous.

The beauties of its surrounding scenery are great. All these considerations the citizens of Portland actively urged as reasons for locating a capital building at Portland, the time having come when the accommodations afforded by the capitol at Augusta were entirely inadequate to the needs of the legislature.

The question being agitated made alterations to the present capital building, it was felt that now was the time for Portland to make her bid for the honor of being designated the Capital of Maine. Her citizens offered to the State the free gift of an ample lot of land on the famous Western Promenade, supplemented by a sum of $150,000 toward erecting on this lot a new state building.

This interesting design was submitted by the legislature, and, in compliance with the request of the committee, was to be built on the condition that the State would be presented by the legislature a committee of ten, to visit Portland and inspect the city. In anticipation of the arrival of this committee, plans for a capital building were made by those architects who had been specially named by the legislature. These plans were made on a basis of cost not to exceed $600,000, exclusive of furnishings. One of them, specially adapted to the lot on the Western Promenade, could have been built within the sum mentioned, the estimate of $200,000 being made for the building, and $400,000 for the site.

The committee having inspected the city and the designs presented by the Portland men, returned to Augusta and recommended to the legislature the adoption of the scheme of architecture in Portland, rather than the enlargement of the old capitol at Augusta.

A day was set for a public hearing at the State-house, on the subject of transferring the Capital. On the day of this hearing, Portland's people were not able to be present in person, and as a result the charges of honorable ways the claims of their city. Among their implementations of persuasion were the two designs showing what manner of state-house would be recommended by Portland architects. The efforts of the Portland people on this day, coupled with the efforts of the committee of ten advocating removal, so impressed the members of the legislature, that a canvass, made a few days later, showed a majority in both houses in favor of locating a new state-house at Portland.

One day having proved insufficient for the hearing on this important subject now agitating all sections of the State, the hearing was adjourned to Tuesday, with a view to having in mind the objections made to the Portland scheme. It was brought to the attention of the committee that the junior member of the firm of Brigham & Spofford, architects, rendered his first efficient service to the then minority party in the legislature, in keeping the building bill from an absolute death, as one of the architects of the extensive additions to the State Capitol at Boston—work already under way.

Having been thus introduced, Mr. Spofford proceeded to put the people of Maine on guard against the devices of their own architects, by declaring with the air of one having authority, that the designs submitted by Portland men, and there to be seen, would cost each a sum that would exceed $600,000. A request was made that the specific criticism was directed against the more costly of the two designs, he said nothing to prevent the public involving the other with his criticisms against the first. With the service thus suggested, the case was turned against the claims of Portland, with her architects who were schemes to involve the State in reckless expenditure. When the question of removal was put to the vote, it was readily voted down; and the present State Capitol was as readily voted in.

It is not surprising that the members opposed to the plan of removal should desire that some architectural authority be found to place at a very high figure the cost of executing the designs submitted by architects of Portland. It is not surprising that when this authority had been found, and had passed an opinion based on the wishes of the people, the whole argument against the removal of the State House of Augusta, was turned against the claims of Portland, with her architects who were schemes to involve the State in reckless expenditure. When the question of removal was put to the vote, it was readily voted down; and the present State Capitol was as readily voted in.

The Commissioners on enlargement of the State Capitol will give a hearing at the State-house on Wednesday, April 3, 1889, to receive any plans or suggestions as to enlargement which may be offered. Architects and all others interested are invited to appear. For further information, address Secretary of the Commission on Enlargement of the State Capitol, Augusta, Me.
conducted on such a basis. He then presented to the Commissioners terms under which architects might compete with dignity and with justice to themselves. These terms were as follows:

The Commissioners shall institute a competition with the following terms:

All drawings to be submitted under motto or device, in no case the names of authors to be shown upon the drawings, but to be enclosed in a sealed envelope marked with motto or device as the case may be.

A disinterested architect to be selected to assist the Commission in considering plans submitted, and award position in regard to merit.

First Prize—Carrying out the work at the usual rate of commission.

Second Prize—Selling the same at cost of material and labor.

Third Prize—$8,000 as the Commission may decide.

Time for submitting plans shall not be earlier than May 4, 1889.

The architects of Maine did not ask any advantage for themselves. They asked merely that the work be thrown open to the competition of all architects in the country. In this competition the Maine architects were willing to take their chances.

As final result of the conference between the Commission and the architects, there was issued, two days later, this circular:

AUGUSTA, Me., April 3, 1889.

Dear Sir,—At a late meeting of the Commission on Enlargement of the State-House last evening, it was voted:

That the terms relative to a competitive trial for plans proposed by architects, and also approved by the Commission to-day do not meet the approval of this Commission.

It was further voted that the Secretary be instructed to forward a copy of the above vote to each of the aforementioned architects.

C. S. HICHERSON, Secretary.

The Commissioners then awarded to Messrs. Brigham & Spofford, of Boston, without competition, the place of architects for the enlargement of the State Capitol at Augusta.

ALBERT WESLEY CONE.

THE EFFLORESCENCE ON BRICKWORK.

BOSTON, MASS., April 8, 1889.

Dear Sir,—The writer has made some investigations of the "white efflorescence" on brickwork which may be of value to your readers, especially if they will aid him by sending samples obtained from their experience.

Four samples were examined, all from Brookline, and within a narrow space, a few rods in fact, of each other.

Two of these consisted mainly of carbonate of soda. These were from houses built at different times, one some four years ago, and the other more recently.

One, from the house of Mr. R. S. Peabody, architect, was chiefly sulphate of magnesium, and the other chiefly carbonate of lime. In this last case there was a decided possibility that the carbonate of soda is caused by the action of the lime of the mortar acting upon a silicate of soda in the brick, forming caustic soda, which, when it comes to the surface, is transformed into the carbonic acid always contained in the air.

The presence of silicate of soda in a brick is often caused by the use of salt clay, taken near the sea.

Sulphate of magnesia is generally due to the presence of pyrites in the soil from which the bricks are made, changes the sulphate, forming with the magnesia of the lime, a sulphate of magnesia.

The carbonate-oflime sample was upon a very new house, and was merely the leaching of lime from the mortar, carbonated by the atmosphere.

These results all point to the fact that in all cases, so far examined, efflorescence is a combined result of the mortar and the brick.
The writer would suggest that it would be likely to be of interest if the architects would send him samples of efflorescences that they may observe.

Send a quarter ounce or more, if possible, and when practicable a piece of the brick.

A perfectly impervious oil varnish will prevent these salts exuding from the surface, but linseed oil is not suitable alone.

Any samples to the undersigned will be carefully examined, gratis, and may lead to more light on this very interesting subject.

S. E. B. TILSTON.

70 Kilby Street.

HAS THE STATE CAPITOL AT ALBANY SETTLED?

San Francisco, Cal., March 21, 1889.

To the Editors of the American Architect:

Dear Sir,—At various times during the past few years, and since the completion of the State Capitol Building at Albany, N. Y., newspaper paragraphs have hinted at a settlement or cracking of that edifice.

Is this true, and if so what extent? In view of the fact that skilled engineering talent was employed in designing the foundations, and the methods adopted have been published, it would be of value to future constructors to know whether the work was a perfect success or not.

"FOUNDATIONS."

(A στοιχία occasionally punctuated, apparently by newspaper reporters who find time hang heavy on their hands, that the Albany Capitol shows signs of sliding down the hill into the Hudson River. At times the matter has attracted attention enough to call for an investigation, but we believe that no indication whatever has yet been discovered that the ground under the Capitol is settling down more than the settling of a foundation is a matter of daily occurrence. This conclusion is undoubtedly justified, as no foundation can be found that has not been subjected to some form of strain. The conclusion is also exactly verified by facts in the case of the Capitol. It is not probable that the Capitol is moving down the hill into the Hudson River, but it is probable that the hill itself is subsiding.

How TO MAKE A CELLAR WATER-TIGHT.

SALEM, Mass., April 2, 1889.

To the Editors of the American Architect:

Dear Sir,—I am making plans for a heavy brick building to be erected on "made" land near the sea. A cellar is to be made under part of it, the finished bottom of which is 2' 6" below high water mark. Will you please tell me how this cellar can be made water-tight?

Yours truly, "SEAWATER."

[The common way of making such cellars tight is to drive sheet-plain and tile the outside, and to line the cellar bottom with a silicate of soda, grooved and split, set about eighteen inches from the outside of the cellar walls, and to fill in the space between the walls and the piling, to a somewhat below the cellar floor, with a mix of clay and "weeping clay," well-kneed when made to its homogeneity—this keeps the water out tolerably well, until the piles rot; and the bottom of the cellar is covered with concrete, to keep down the water which would otherwise force its way up from the subsoil. According to our experience, however, this will not depend upon the keepers of the cellar, but will be prevented from "weeping" through the walls when there is a pressure outside, and when the hydrostatic pressure is considerable, drops will force their way up through several inches of ordinary concrete. For these reasons, it is usual to provide "boxed" cellars with an outlet-pipe and a check-valve, arranged so that the water will be allowed to collect in a cell below, and be prevented by the check-valve from coming back again. More effectual, but expensive method is to cover the cellar floor with a cellular concrete, made of fibrous asphalted felt, mopped with mastic asphalt. As the pressure of the tide would force in, it must be held in place by lining the walls with brickwork, and making a thick or more, as high as the water is likely to rise outside, and by covering the floor also with thick concrete, or laying the basement with an invected arch of brick, and the superstructure up with concrete. There are two or three contractors in New York who will undertake the latter process, and will guarantee to secure. The clay-boxing is done by contractors in almost all seacoast cities.—Kos. AMERICAN ARCHITECT.]

STATISTICS THAT HAVE INTEREST.

A German statistician says: The rate at present in all languages spoken to the globe, whose religious convictions are divided between 1,000 different confessions of faith. The number of males is nearly equal to that of the females. The present population of the earth is 342,000,000. One-fourth of the population of the earth dies before attaining the seventeenth year. Of 1,000 persons only one reaches the age of 100 years, and not to be born six of them reach 60. In one year 5,000,000, of whom 35,214,000 die every year; 96,480 every day; 4,026 every hour; 67 every minute, and 1 a fraction every second; on the average, a man born to 37,500 years; 100,000 every year; 4,200 every hour; 70 every minute; and a fraction every second. Married people live longer than the unmarried, and married people who lead an active and increasingly longer life than the civilized nations longer than the uncivilized. Tall persons enjoy a greater longevity than small ones. Women have a more favorable chance of life before reaching their fiftieth year than men, but a less favorable one after that period. The proportion of married persons to single ones is as 1 to 1.000. Persons born in Spring have a more robust constitution than those born at other seasons. Births and deaths occur more frequently at night than in the day time. It may finally be added that only one fourth of the inhabitants of the globe grow up to carry arms or perform military service. — Paris American Register.

EARTHQUAKE-PROOF HOUSES.—As foundations for a building, there are two types: In one, which is the European method of building, the structure is firmly attached to the ground by beds of concrete, brick and stone. In the other, which is illustrated in the Japanese system of architecture, the structure rests on a framework of wood and boulders. As an indication of the relative value of these two forms of building, it may be mentioned that in Yokohama, in 1889, many of the European buildings were destroyed, while only a few in the Japanese style of construction in the portion of the town there was no evidence of disturbance. The houses, like the foundations, are also of two types. In the European house built with a stand alone, and with the usual large windows, brick and stone, and San Francisco, and for which in America patents have been granted, we have a building of brick and cement found together with the frame, which has been made firm and under a frame of stone, a building from time to time is jerked backwards and forwards by the moving earth, to which it is secured by the firmest of foundations, is expected to resist the sudden applied and varying stresses to which it is exposed by the strength of its parts. This type of structure may be compared to a steel box, and, if its construction involves any principle, should be to that of strength, the proportion of strength and weight. In Caracas, which are low, slightly pyramidal, have flat roofs, and which are bound along their faces with iron, belong to this order. These so-called earthquake-proof buildings, with the exception of their chimneys, have certainly satisfactorily withstanded small earthquakes in Japan. As to how they would withstand a disturbance like that of Minchumata which yet proved fatal. Unfortunately, these structures are very

CREATION IN PARIS. — Everything is being done in Paris to induce the French to have the day's work done. A new machine has been constructed, according to the plans of M. Gueluard, a municipal councillor. This furnace is entirely of brick, and its partition-walls are composed of their most solid material. The walls are of metallic tubes through which gas is let in by force, having been pumped into the furnace by means of compressed air. The temperature, which is raised to 2,000°, is maintained at a certain point, and the metal obtained have been satisfactorily convincing. In thirty-five minutes an entire sheep, weighing fifty kilos and placed in a wooden box, was reduced to ashes without the slightest smoke or smell. — New Y. Com.

mercial Advertiser.

TRADE SURVEY.

Fortunately for both employers and workmen, a truce, practically speaking, has been declared for the season and no general disturbance of the existing friendly relations is to be feared. In some quarters the workmen declared as a general strike, but just real and serious, more are bent upon making their organization compact than to organize strikes or allow them. It is safe to go farther and say that the leaders are more conservative than they have ever been and for several reasons, one of which is that the latest one, viz., they are coming to recognize that no strikes do not avail so much after all. Another reason is, that more of the control of labor organizations is passing into American hands, and the employers have not hesitated to let it be known that there can be no question of a general strike in the States. Employers and trade associations are determined to contend against American labor organizations, and in the spirit of a general eight-hour movement next year. Lines are being drawn, the employers, in fact, are showing a determination to resist a reduction and the American following. In Great Britain the movement for a general eight-hour movement, and promises to be the pivotal question which will decide the selection of a score of men to be at a much later time. In Paris, where the unionism has grown rapidly in this one, it has been rather a matter of places instead of men, that the workmen of Great Britain. Eight-hour laws have been enacted in several States and they remain a dead letter. That a mere or general movement of the kind is to be checked by this law is, at least, a useful check to eight hours in a great railroad shop. This week the employers of 1,500 men reduced all labor to eight hours in order to retain them in employment. This course will probably bring to all who can conveniently do so and long enough before the date fixed in the movement that there will be no observed connection between the policy and the movement. The fact is the old labor leaders have suffered so frequently from which the employers are less one, but from leading new movements. Conservation is apparent in speeches, acts, and management.

The improving industrial conditions in Great Britain and on the Continent will check the immigration movement from this country, and decrease the immigration from the United States. The employers, and the movement for a reduction of hours of labor, but facts and conditions will bring the selection of a score of men to be on the committee and the union is not, neither worse nor better. Last week the Eastern mill-masters slaughter themselves, and but once every year, at lowest 5 per cent less, and this week a favorable vote was made on it. The Eastern manufacturers have failed to renew their combination, but, as a rule, the twenty sickly and unhealthy when they have been the greatest production, and waiting for the good time coming, when there will be more of workmen doing the same production, and they will have not effected a general combination, owing to the unwillingness of some of the smaller and widely-scattered concerns to come in. Architects in Western cities have started since the first of the month on a great deal of new work for public buildings, and a number of city architects have emigrated into small Western towns, where their practical services are in demand. The demand for nearly all kinds of materials is now very active; bricks, particularly, are wanted fully as much as they can be delivered in all markets. Lumber is increasing in activity in all markets. Poplar remains under the control of Southern manufacturers. Yellow pine is strong and in demand. In all States, and the railroads are making up their lines and clearing everything at large. Hemlock holds its own, and spruce, for the reason above given, is in much demand, and much more of the average. There is much improvement in the crop and the prices. Hemlock holds its own, and spruce, for the reason above given, is in much demand, and much more of the average. There is much improvement in the crop and the prices. Hemlock holds its own, and spruce, for the reason above given, is in much demand, and much more of the average. There is much improvement in the crop and the prices.

The volume of business, the country through all, is increasing. Prices keep low, and this is advantageous to the masses, although occasion will occasion some complaints among manufacturers and employers of values. The increasing interest given to the creation, or rather extension, of an American mercantile empire, has been the subject of much more and more attention to securing our share of the commerce of the world. The merchant princes of America are being trained to think of the markets of the world than is usually supposed, and our commercial competitors, who know our capabilities even better than we do ourselves, are thinking of the transtic and commercial enterprise to head as off as possible.

S. J. PARKKILL & CO., Printers, Boston.
The exterior of this house is stained with
GABOT’S CREOSOTE STAIN
for Shingles, Fences, Clapboards Etc

These Stains are very durable
and give a much more artistic effect
than paint, while they are cheaper,
and very easy to apply.

Our Stains contain no water and
are the only exterior Stains that do
not contain kerosene.

PRICES are 40, 60 and 75 cents per Gallon
According to Color.
SEND for Samples on Wood, and Circulars.

SAMUEL CABOT
70 KILBY ST. BOSTON. MASS
MEXICAN SKETCHES.
APRIL 20, 1889.

Entered at the Post-Office at Boston as second-class matter.

SUMMARY:
The Lowell City-hall Competition.—The New York Cathedral Competition.—Death of Samuel C. Hall, Author and Editor.—The Late Felix Langlais, Architect.—The Verticality of the Eiffel Tower.—Royalties on the Sale of Views of the Eiffel Tower.—A Simple Test for Arsenic in Wall-paper.—The Manufacture of Plaster-of-Paris.—Flanged Boiler-Tubes.—Glazing with old Negatives.

BUILDERS' HARDWARE.—XXIII. 183

THE SEPULCHRE OF AMENEMHAT III. 185

ILLUSTRATIONS:

LETTER FROM BOSTON. 186
LETTER FROM LONDON. 187
LETTER FROM CANADA. 188
EQUESTRIAN MONUMENTS.—XIV. 189
NOTES AND CLIPPINGs. 191
TRADE SURVEYS. 192

It is a good thing for young architects to have their attention called occasionally to the history of the lives of the more prominent men in the profession, so that they can distinguish for themselves the qualities and habits which lead to the various sorts of success in architecture, and which form the object of men's ambition. Among the many biographies of the kind which, after the French custom, are published in the professional journals, one of the most interesting is that of Felix Langlais, contributed to L'Architecte L'Amerique.

Among the wealthy and influential people, with his own prudence, brought him fortune, and he died a rich man, but much more than that, he died happy in family affection, in the respect and esteem of his associates, and in his charitable, as well as professional occupations, that no one thought about his success in accumulating money. Next to his work...
THE Eiffel tower continues to be the hero, so to speak, of various adventures. According to Le Génie Civil, which is its official biographer, a story was circulated not long ago in Paris to the effect that it had begun to lean. The outline of this tale is as follows: it is said that the roundness of the strongest of the two verticals observed, and that the rumor spread rapidly, until it came to be asserted that the tower would soon resemble the leaning tower of Pisa, to which it was constantly compared. There was no reason whatever to suppose that any movement had taken place, but the public solicitude became serious enough to make it advisable to have the matter tested, and two engineers were sent with theolletes to make a careful survey. As there are no vertical arrises in the tower, the method of observation employed was to trace the intersection of two vertical planes made at right angles to the central axis of the tower, and bisecting each face. This was done, and the two theoretical planes were found to divide the faces of the tower with almost perfect symmetry, showing that the shaft was not inclined in any way from the vertical. On three of the sides the curvature was found to be exactly as designed, while the fourth side showed a hollow amounting to about one inch of deviation from the intended line.

Another affair the tower is the aggressor, instead of being the victim of outside makes. It seems that the structure is helpless to be a work of art, like a picture or a statue, and to be, therefore, entitled to the benefits of the statutes for the protection of artistic property. Whatever rights of this kind may attach to it have been assigned to a M. Jalouzot, who has undertaken to defend his acquisition by claiming that all persons who sell photographs, models, pictures, or representations of any kind of the tower must pay him an impost of twenty per cent on the price. As pictures and photograph for any nothing of models, large and small, in gold, brass, bronze and may other minerals, are sold all over Paris, the royalty would amount to a very substantial sum, and some of the dealers interested in the question, at the whole question of the right of the structure to the preservation of what pictures and poems is now before the tribunal, and the result will be awaited with some curiosity.

THE Sanitary News quotes from the British Medical Journal a description of a simple rough test for arsenic in wall-papers. No apparatus is required beyond a glass-dash, which is to be turned down until it burns entirely blue. A strip of the paper to be tested is then to give an inoffensive, weak hydrazine with water, it will feel harsh to the touch, so as an architect, and as referee in building cases, which were often the cause of the greatest public concern, the principal interest was in the improvement of the condition of the working classes, particularly in a moral sense. He was himself a deeply religious man, and, as one means for helping the poor to a better moral state, he engaged actively in the work of the Association for securing the observance of Sunday as a day of rest.

MARIETTE gives, in La Semaine des Constructeurs, an account of the manufacture of plaster-of-Paris at the quarries near Paris which has a certain value for our architects, who, although they do not employ that material so freely as their brethren across the Atlantic, at least like to know how to tell whether it is of good quality or not. According to him, the best way to try whether plaster-of-Paris, as delivered at a building, is properly burned, is to handle it. If it is underburnt, and therefore likely to give an inoffensive, weak hydrazine with water, it will feel harsh to the touch, no

matter how finely ground it may be. If it is overburnt, it will also feel gritty, but if the burning has been continued just long enough, it will not be unmeaning to the touch, and will leave a white spot on the water. It will surprise many people to learn that the calcination of gypsum may be, and often is, effected at a temperature below the boiling point of water. In fact, the proper temperature for calcination lies between one hundred and sixty-five and two hundred and fifty degrees Fahrenheit, so that the process is rather one of drying than of real calcination. It is, however, effected by burning, a fire being kindled at the bottom of a heap of gypsum blocks, and pushed sufficiently to heat the nearest blocks to redness. These are then very much of the same kind, and are underburnt, but all are ground together, and if the burning has been judiciously managed, the entire product is good. In Paris, the plaster used in building is rather coarsely ground, and is considered stronger in that condition, but plaster for finishing work, as well as that shipped to a distance, is ground very fine, and sifted through a silk bolting-cloth. Among us, plaster is an expensive material, found only in the Maritime Provinces and in the far West, and is used mainly for finishing, and after cementing mortar or tiles, but there is a good deal of room for improvement in the manufacture of the American plaster, and architects should not hesitate to demand the best results that the material is capable of furnishing.

An improvement has recently been introduced into the design of boilers which promises to effect an important economy in the production of steam. An article in Le Génie Civil, by M. Lisbonne, a retired director of naval constructions, describes some experiments made with a boiler provided with tubes having ribs, or flanges, on the inside, so as to present a larger surface for absorbing the heat of the fire. The projection of the flanges is about one-quarter of the diameter of the tubes, and eight of them are spaced at equal distances around the boiler, the invention of M. Jean Sarre, of Gisors, are now drawn by the French machinery, and are of strong and easily cleaned. The first experiments with them were made on a steamer on the Rhone. A host with copper flanges of the tubes of the boiler was carefully watched, and it was found that the combustion of one pound of coal would evaporate seven pounds of water, while the temperature of the smoke was as issued from the boiler was six hundred and eighty Fahrenheit. The tubes were then taken out and replaced with M. Lisbonne, and the evaporation immediately rose to nine and one-third times the quantity of water as before assumed, and the temperature of the escaping gases fell to four hundred and sixty degrees. These results would seem to indicate an economy of about one-sixth in consumption of coal, and some other experiments, in which the quantity of coal consumed was measured, showed that the results are as one pound per cent in coal. At the naval arsenal in Brest some further tests were then made by officers of the Government, with the result that with natural draught the economy of coal effected by using the flanged tubes in place of smooth ones was, with a given quantity of water evaporated, fourteen per cent, while with forced draught the economy was eighteen per cent.

THE American Florist describes a piece of glazing-work which appears to be quite novel, and certainly commends itself to persons who may be in search of original effects in decoration. A florist in Connecticut, having occasion to put the glass into his greenhouse, he had thought himself that he might save a little money by using for the glass of the positive plane that had already seen service of some sort, instead of buying new. He therefore applied to a photographer of the neighborhood, and made a contract with him for some thousands of old negatives of salt paper, to be used for his purpose. The negatives were delivered, and their new proprieprer fixed them, forming, as it were, one large glass, arranging them in groups, according to their subjects and other circumstances. The pictures of old gentlemen and ladies he placed by themselves, where they could keep guard together over a certain portion of his plants. Next came the middle-aged persons, flowers in a Tulip-nich, and lastly the children, smiling in groups in a sunny corner. For the amorous views a special place was reserved, and the pictures of young persons taken hand-in-hand were collected over a heliotrope-bed, which would be confidently expected, attain remarkable luxuriances under their influence.
BUILDERS' HARDWARE. — XXIII.

CYLINDER LOCKS.

The broad and general principle which distinguishes the ordinary lever-lock from the style of lock manufactured under the Yale patents, is that in the latter the mechanism upon which the key directly operates is entirely distinct from the lock itself, being enclosed in a cylinder or escutcheon. The function of the key consists simply in so arranging certain movable parts or sub-actions, that the mechanism is free to rotate, and by its movement, to operate on the locking-bolt. This variety of lock is by no means without a prototype, as we have already seen in the case of the "Egyptian," the "Bramah," and the "Cotterill" locks; but in its application it has been simplified and reduced to a marketable form chiefly in this country, and can be fairly claimed as a product of American ingenuity.

Linus Yale invented the lock which bears his name, about thirty years ago. His original patents covered substantially only the use of a flat key to operate a locking mechanism, a series of vertical pins of unequal length being lifted by means of certain ricks or irregularities on the upper edge of the key, so that the ends of the pins were brought on a line. Within recent years an important change has been made in the construction of the Yale escutcheon. The slot through which the key reaches the pins is now cut in sharp corrugations, the key being corrugated longitudinally so as to exactly fit the slot. By this simple device, the "Yale" locks have been rendered practically proof against any but the most expert lock-pickers. The external appearance of the "Yale" lock is presumably familiar to every one, but the internal construction will require some explanation.

Figure 336 shows a cross and a longitudinal section through a typical Yale escutcheon, together with the exposed face of the same. It will readily be seen that the action of the mechanism is very simple. There are two barrels or cylinders, one rotating within the other, but eccentric with it. The key is withdrawn the lower cylinder is held from rotating by means of five sets of round pins which are fitted in vertical grooves extended partially through the two cylinders, and pressed constantly downward by five bar springs. In each groove are two pins of unequal lengths, one over the other. When the proper key is inserted, all the pins are raised simultaneously, but to varying heights, so that the joints between the upper and the lower pins are brought exactly on a line with each other. It is evident that as the inner cylinder, categorically designated as the plug, is exactly fitted to the bore in the shell, an almost imperceptible variation in the height to which any one of the pins is raised, will prevent the plug from turning: whence it follows that an immense number of locks can be made with this mechanism without duplication. From this result the unrivalled capacity of the "Yale" lock for permutations, with its proportionate safety against any accidental interchange of keys.

It will be seen that in this lock the key acts only as an adjuster of the pins. Motion is communicated to the locking-bolt of the lock simply by means of a hub on the back of the rotating plug, or, in the case of a rim-lock, by a flat key extending from the plug through the door. Some of the opponents of this system consider that in it, too much is demanded of the key, but when the locks are otherwise as nicely arranged and evenly balanced as the "Yale & Towne" goods are usually found to be, the amount of twisting strain required to move the bolt is really not a great deal. In no well-made lock should there be any tendency on the part of thekey to jam, much less in such a device as this, wherein there are no strong lever-springs to work against.

It will easily be appreciated that this device has almost revolutionized the lock-trade in this country. Not only has it opened the way for many valuable inventions of a similar nature, but it has stimulated the perfecting of the ordinary lever-locks, and was instrumental in the abandonment of the old style of heavy door-keys, so that one's pockets are no longer burdened with such keys as were thought indispensable forty years ago.

The advantages claimed for the Yale lock are as follows:

First, a key of the smallest size and most convenient form.

Second, immense capacity for changes or permutations, so that more thousands of changes are possible than an equal number of digits with the old systems.

Third, great safety against picking.

Fourth, uniformity of size of the key for locks of all kinds and for all purposes.

Fifth, protection against accidental interchange of keys by reason of the great capacity of the lock for permutations.

In regard to the third point claimed, it must be remembered, however, that with all its security the Yale lock does not offer an exception to the general rule that any lock can be picked which is operated by a key. Still, very few persons have the nicety of touch necessary to raise the pins by means of fine instruments inserted through the key-hole, and bring them exactly to the position necessary for moving the plug. There are experts who claim to be able to open any "Yale" lock which has been made, but for all practical purposes, a lock of this sort affords absolute security, as the time required to pick it renders it very unlikely that any thieft would be so indiscreet as even to make the attempt.

It will be understood that the zig-zag corrugations extend entirely through the length of the plug. In a measure, this feature prevents any duplicate key from being made by persons not authorized to do so, as it requires very heavy and specially made machinery to produce one of these keys, and unless the corrugations exactly correspond with the lock, the key cannot enter. The plugs are cut by a peculiar form of hand-saw specially designed by the manufacturers; and altogether it seems as if every precaution had been thought of which could render the lock more inviolable.

Like a great many other successful inventions, the Yale locks are remarkable for their simplicity. The whole of the mechanism being practically combined in the escutcheon, there is no necessity for a complicated system of levers or springs in the lock proper, and there remains very little to get out of order. The older plugs, made with a straight slot, would allow a certain amount of vertical play to the key, so that it would rock in the cut and would not allow of exactly lifting the pins, besides which the slot permitted the lock to be picked with comparative ease. This is entirely obviated by the corrugated slot, as already explained. It will be noticed also that the lock is not in any way dependent upon the springs, as the pins would act by gravity, even should the springs give out entirely.

It would seem almost an impossibility to master-key a series of Yale locks, and yet it is accomplished in two different ways. The first is to fit each lock with a separate master-escutcheon, practically making a double lock, though both sets of escutcheons act on the same locking-bolt. By this method a million locks could be master-keyed in a single series, if desired. The second way is to use three pins in each slot.
instead of two, the lengths of the pins being so adjusted that, throughout the series, the upper joints can be brought on a line by the master-key, while the lower joinings are all different, and fitted to the individual room-keys. This method necessitates a larger and more cumbersome plug and cylinder, and is seldom used.

Yale locks are manufactured in all styles and for all purposes, but the escutcheon is always arranged in exactly the same manner, whether intended to operate a night-latch or a desk-lock. The variations consist mainly of differences in the form of the latch or of the lock. A single example will be sufficient to illustrate the whole. Figure 337 represents one of the most perfected forms of Yale front-door lock. $C$ and $B$ are the two escutcheons, each with a cam, $R$, attached to the back of the plug. $M$ and $N$ are two levers hinged to the bolt-tail. $L, P$ is a bolt lever, hinged to a flange of the bolt-tail, and catching under an bolt on the bolt of the latch. The dead-bolt can be operated from either side, the cams first depressing the levers so as to pass the post, $S$, and then shooting out the bolt in the same manner as with an ordinary key. When the dead-bolt is unlocked the end of the lever $F$ takes the position shown by the figure. If the cam $K$ is then turned to the left, it so acts on the lever as to cause it to draw back the latch, $G$. Consequently a single key serves both to unlock the dead-bolt and to draw back the latch.

The "Yale" lock has, of course, won for itself a host of imitators in the hardware trade. The closest approach to the "Yale" system is embodied in an escutcheon lock manufactured by P. & F. Corbin. Figure 338 illustrates this. The internal arrangement is exactly the same as in the "Yale" lock, so far as relates to the pins, etc., but the plugs are cut with square-edged, instead of zig-zag slots. These slots, also, are not carried entirely through the plug, but extend only through a thin face-plate, behind which is a wide slot exactly like that of the original "Yale" locks. This seems like an imitation of, but in no wise an improvement on the original, and is considered by the Yale & Towne Manufacturing Company as an infringement on their patents.

Figure 339 illustrates the "Foster" lock, manufactured by A. G. Newman, a very ingeniously devised lock, which is harder to pick than the "Yale," and, as put on the market, shows the greatest of care in workmanship and finish. The cross-section of the escutcheon shows the internal construction. The outer shell, $A$, is fixed to the lock-case. The plug, $B$, is hollow, and fitted with ten slides $C$, which work through slots in the side of the plug and catch in slots, $E, E$, cut in the shell, so that the plug cannot rotate until the slides are withdrawn. Half of the slides protrude from the plug towards the right and half towards the left; each slide being fitted with a small brass spring, $D$. The key is cut with an irregular cleft, and the slides are cut out, with a cross-piece near the centre. The cross-pieces, and the sinuosities of the cleft in the key are so mutually spaced that when the key is inserted all of the slides are drawn in and the end no longer protrude but are flush with the surface of the plug, which is then free to rotate. It is believed that this lock is unique of its kind, and, though in outward appearance much like a Yale lock, it is decidedly original in every other respect.

A form of cylinder-lock has recently been put on the market by the Hopkins & Dickinson Manufacturing Company, which partakes somewhat of the nature of the old "Bramah" lock, previously described. Figure 340 illustrates the external appearance as well as the internal construction of the escutcheon or cylinder, whose functions are the same as in the Yale lock. The shell, $A$, is secured to the lock-case so as to be removable. The plug, $B$, rotates inside of this, being held in place by screws, $C$, turned through the outer shell. Inside of the plug are five slides, $D$, working in a closely fitted groove, with a separate spring to each slide. The springs are on opposite sides, in separate slots, so that there is no chance for the slides to rock. The key is flat, with five notches on the end corresponding to the five slides. It is inserted through a straight slot in a capping-piece, $E$, and bears against the bottom of slots in the centre of the slides. At the back of the plug is a flat piece of metal, known as a fence, $F$, working up and down in grooves, with a hole through the centre sufficiently large to allow the ends of the slides to protrude by it. The top of each slide has one notch in it the same width as the thickness of the fence, at varying distances from the key-hole, besides one or more false notches of lesser depth. The plug is extended with an arm, $G$, by which the lock-bolt is operated.

The mechanism operates as follows: The fence is in the plane of an eccentric groove or ward cut on the back of the shell, as shown by the figure. This eccentric groove is so treated with reference to the centre of rotation of the cylinder that when the plug is turned, the longer arm of the fence is forced to one side, the amount of eccentricity being sufficient to firmly wedge and hold the plug, in case the fence should not be free to move laterally. When the key is inserted, a shoulder on it first presses back a pin, $H$, which works in a slot so as to hold the plug and the shell together so as to prevent accidental rotation. The cuts on the end of the key then force back the slides in such ratio that all the deep notches are
brought exactly on a line with the plane of the fence. The key is then turned, rotating the plug, bringing the fence to bear against the wall of the eccentric groove, and forcing it down into the notches of the slides, these notches being of sufficient depth to allow the fence to entirely follow in the eccentric groove. The arm, C, can thus operate on the lock-lever.

The shallow notches on the slides are intended as a safeguard against picking. By turning the plug with a knife blade, the fence can be brought to bear against the slides. Slight inequalities in the width of the slides cannot be avoided, and the widest slide will bind most firmly against the fence, so that by depressing the slides successively with a fine pin, one might in time be able to catch all the notches over the fence, and so undo the lock, were it not for the false notches which are so confusing that it is extremely difficult, and for most persons, impossible to pick the lock.

Many improvements have been made in the mechanism of this lock during the past six months, and the most thorough study and care has been given to perfect it in every way. The first samples put on the market were deficient in many respects, but the lock as now offered to the trade is about as perfect in every way as anything of the kind which has thus far come before the public. It has excelled everything except the Yale locks, and indeed there is little that can be said of the "Yale" which does not apply with equal force to the Hopkins & Dickinson cylinder-lock. It is well-made, compact, not liable to get out of order, easily repaired and practically burglar-proof.

Figure 341 illustrates an adaptation of this escutcheon to a front-door lock. The works are ingeniously arranged so that the key will operate both the dead-bolt and the latch, while at the same time the dead-bolt can be shot back by a turn-button and spindle from the inside of the door. The illustration is too clear to require any detailed description. This kind of escutcheon or cylinder can, of course, be applied to any form of lock, though thus far it has been used by the manufacturers only in connection with front-door and office-door locks.

The patents to a very interesting cylinder-lock are controlled by the Yale & Towne Manufacturing Company. The structures of these locks, Figure 342, is so peculiar in its workings that even after taking it apart it is hard to follow the movements it makes in unlocking. The outer cylinder is secured to the lock-case and to the door, so as to be immovable. Inside of it rotates the plug, a section of which is needed to carry a slide-holder, A, which is free to move in and out. Inserted in the face of the holder is a pin, B, projecting sufficiently to catch in a groove which is cut out from the inner surface of the outer cylinder-barrel, the groove following a waved line, so that when the plug is rotated, the slide-holder is first drawn away from the key-hole, then back, then away again.

The slides are flat pieces of steel, one-twelfth inch wide at the ends nearest the key-hole and one-sixth inch at the other, and are each notched on one edge, at varying distances from the end. There is also a sliding-post which passes through the plug behind the slides, which is a little beyond the inner end of the plug, so that one end of the post must project through a short slot in the outer cylinder-barrel. The key, when inserted in the plug, sets the slides by means of the nicks on the end, bringing the slots exactly on a line. The plug being then turned and the slide-holder moved from contact with the key, the notches remaining set on a line. After performing a quarter revolution with the plug, the projecting end of the sliding-post encounters an obstacle tending to force it out on the opposite side of the plug, and the notches on the slides being on a line, a fence on the sliding-post slips into the notches, and the plug can continue to rotate before a complete revolution is effected, the slides encounter a fixed obstacle which forces them back to their original position, the alignment of the notches being destroyed. The connection between the plug and the bolt of the lock is the same as in all the cylinder-locks.

A little reflection will convince one how futile would be any attempts at picking this lock. The key simply sets the slides and acts as a lever to rotate the plug. The slides are all pointed on the ends towards the key, and a very slight experience is sufficient to show that the lock cannot be picked at all. Indeed, this is the worst thing about it from a commercial point of view, as few people care to have a door-lock so improbable that the door has to be broken in every time the key is lost.

There are several other styles of cylinder-locks, in which the key operates on levers instead of the slides, which have much the same appearance as the Yale locks. None of these, however, present any striking peculiarities, and are being used more for cabinet work than for doors, they hardly came within the scope of this discussion.

(To be continued.)

THE SEPULCHRE OF AMENEMHAT III.

ABOUT a month ago was reprinted in the columns of the London Times an account of the discovery of the Hawara Pyramid in the Fayyum by Mr. Petrie, the well-known explorer. News now comes from the same source that Mr. Petrie has succeeded not only in cutting an entrance into the sepulchral chamber of Amenemhat III, but in searching every accessible part of the structure. He has thus turned every fallen block, and cleaned away the sand and mud accumulated during many centuries. The lost secrets of the pyramid are, in fact, been brought to light.

In the sepulchral chamber had been found two empty sarcophagi. The smaller of these Mr. Petrie at first conjectured to have been made for the King's son and successor, Amenemhat IV, or possibly for the King's daughter, Sebaknefretu, who succeeded her brother, Amenemhat IV, and who finally ruled in the twelfth dynasty. But it now proves, says the London Times, to have been made for another daughter, Princess Ptauhenu, who probably died about the same time as her father, or, at all events, previous to the closing of his pyramid. This Princess is new to history; her name, Ptauhenu, or "the perfection of Ptothu," being composed on the same lines as that of her surviving sister, Sebaknefretu, or "the perfections of Sebak." A large alabaster vessel, four inches in length, cut from the bone of half a trussed duck, and engraved with a hieroglyphic inscription
signifying "the royal daughter, Ptahnefru," was found in one of the passages a day or two after the opening of the pyramid, and with it two similar vessels, smaller and quite plain.

Two days later, as the work of clearance went on, a superb alabaster table of offerings, surrounded by the broken fragments of nine more alabaster duck vases, was unearthed from beneath the rubbish in a chamber adjoining the Funerary chamber-room.

This beautiful work of ancient art is described by Mr. Petrie as "a rectangular block measuring 26 inches in length, by 17 in breadth, and about one inch thick, in which are ordered round masses of food and drink for the "Ka" of the royal daughter Ptahnefru; the incised surface being carried on in relief with 116 representations of miniature various bowls, cups, plates, leaves, cakes, birds, fruits, and the like. Each object has its name engraved beside or above it, thus giving a list of between 70 and 80 varieties of wines, poultry, cakes, etc., and playing us in picture mosaic the complete rendering of a royal feast circa n. c. 2800. Oddly enough, the ducks, geese, and other birds shown in this interesting list are represented without legs, probably for economy of space. Mr. Petrie says:

"There is a flake off one corner of the block, but it is otherwise as perfect as the day when it was first engraved. It is a lovely monument, new in its details, and new as to the Princess whom it commemorates. It also shows that Ptahnefru must have been the daughter of Amenemhat III, and sister of Sebaknefru. We had a hard job to get it out of the pyramid, as it weighed 490 pounds, and had to be handled with the greatest care.

"The mummies of the great Pharaoh and his daughter were buried to ashes by the original spoilers of the pyramid, who shall say how many centuries ago? Mr. Petrie carefully cleared out the two sarcophagi with his own hands (both being under water), and found at the bottom of each nothing but a deposit of charcoal mixed with grains of quartz and a quantity of scales of mica. The charcoal showed that the wooden mummy cases and their occupants had been burned, but the quartz grains and mica scales puzzled his correspondent. The discovery of a fine lapis-lazuli inlay, carved in the form of a false beard of the kind represented on the chins of gods and Pharaohs, explained the mystery a day or two later. It showed that these beautiful mummy cases had been decorated with mosaic ornamentation in fine stones, which, when calcined, would have produced precisely the residuum found in the charcoal.

The scattered fragments of some six or eight alabaster bowls and vases were also recovered from this chamber. The main feature of the upper chamber is the two sarcophagi of the royal princess, each contained within a wooden chest, complete the brief list of objects discovered inside this pyramid, which has cost the explorer so much time and labor to open.

The sepulchral chamber of Amenemhat III proves to have had no door and no entrance. The largest sarcophages must have been placed in position and the smaller one constructed before the whole of the roofing-slates were laid on, the exit having been closed when the temporary rafter was fixed by dropping the last slat into its place. As these slats weigh from forty to fiftiess each, the security of the dead might well be deemed eternal. The presence of the Roman amphora shows, however, that the passage from the labyrinth was open in the time of the Cressa; and it is possible that the pyramid may have remained inviolate up to that period.

How many centuries have elapsed between the ral of the last plunderer and the systematic siege carried on by Mr. Petrie that is beyond the reach of conjecture; but it may safely be predicted that the last resting-place of the Labyrinth Pharaoh is not likely to be invaded by many future travellers. Its last treasures being removed, the spoiler will not longer be tempt. Its problem being solved, it offers no enterprise to the man of science. Neither will it long remain accessible to the more tourist. The passage from the labyrinth is blocked, and the path will be found by the last tenant, and Mr. Petrie's tunnel, which was never very safe, and is now very dangerous, will shortly close in, if it has not done so already.

In the meanwhile, Mr. Petrie, whose appetite for pyramids seems to grow by what it feeds on, has removed to Illob, there to attack another of these stupendous royal sepulchres, according to old tradition and modern report, has never yet been opened.

"Spanish Cedar."—A tall man walking down Chestnut Street, laughingly responded to the inquiry of a friend as to what he was doing: "Sawing Spanish cedar boards in West Virginia for cigar-box makers." To the remark that no Spanish cedar grew in West Virginia he replied: "And not enough anywhere else for the demand. We saw up poplar, burr-oak, hickory, and black walnut, and we find trees with cedar extract that gives the boxes proper color and odor." The logs are sawn with ribbon-saws that make little sawdust to waste. Nearly all boxes used by American cigar-makers are made from this wood. — Philadelphia Inquirer.
Saint Mary's Minster.
Somersetshire.
Nicholas Spradling.

Saint Mary's, Swineshead.

Lincolnshire.

The economy somewhat public certain City-hall over 187 speech, New existing Calvert, less Baltimore we large attributed number Paul once also "1888, public brownstone As ruled the absence about was about real estate in Baltimore: "Sales have fallen off and prices ruled as low as in 1887, much of the depression is attributed to the absence of public works, the public, in the absence of manufacturing and the large abatement of home capital — the number of new buildings (shows) a falling off of over 1,000, compared with 1887." The force of these remarks is somewhat modified by the fact that they proceed from a town to which many persons, agreeing with our esteemed contemporary Life, have failed to attribute certain Kip-Van-Wrinkle characteristics; also by the fact that during the truth in which they appeared, the grain exports of Baltimore are said to have exceeded those of New York and Philadelphia combined, a state of affairs so alarming, that an investigating committee was at once sent to see "what was the matter." If relieved them to discover that the facts were undeniable, and that nothing whatever was the matter.

Certain incongruities in the results to be expected from these data may be observed in the comparison of any and all description of what the single dwelling-house really means, and by the careless interchange of the"multa" for the "multum." A Baltimore dwelling may house comfortably only a half-dozen people, a New York one a hundred or more, the one may cost a thousand dollars, the other a hundred thousand. The same comparison holds good for other cities, as illustrated by the fact that from one of the tables quoted above, under the head of number of existing dwellings in 1888, Philadelphia is represented by 146,412, and New York by only 76,864. Truly digits are doubtful, and if we may be permitted a not unceased form of speech, although they may not absolutely lie about the whole town as of the whole truth about all that lies in them. Baltimore certainly continues to hold her own in her hackneyed reputation as the "city of homes," and in the increase of the small individual dwelling-house, tending, among those showing the hand of an architect, to grow to a smaller than formerly; we have not, however, seen any of really satisfactory interior design, or indeed without decidedly objectionable features in the colonades, where the width of the lot was less than sixteen or eighteen feet. As to the facades, on the other hand, here and there some intelligent and simple designs stand out conspicuously amid the vast amount of the ordinary builder's foolish conglomera- tions. Notably a group of quiet white marble fronts on Townsend Street near Charles, and from the same office there is a good bit of simple design, of brownstone and brick, in a single house on St. Paul, and another on the lying across the street from the former, with details probably designed originally for stone.

Two items of City-hall news have lately excited more or less public interest and comment and give a certain insight into methods of municipal government. The block of ground in the very heart of the city, bounded by Calvert, Fayette, St. Paul and Lexington Streets has for many years been occupied over a large part of its area by various court buildings, the most important of which are the old City-house proper in brick, and of colonial design, and the South and severe and massive looking granite Record Office, now old and in many respects inadequate to be sure, but, standing isolated within the same enclosure upon abruply rising ground separated from each other by the open streets, and not to mention some architectural merit, a group of certain monumental effect and solidity, and the interest of local historic association. For the future, however, an extensive and very extensive scale a most excellent treatment is strongly suggested by the surroundings, rising westward as it does from Battle Monument Square to the east of which about the same area is almost entirely covered by the City-hall and the new Post-office, so that here is possible a very large and effective architectural scheme (in spite of details in the new buildings) extending over four blocks, east and west with the movement. The principle to be adopted for the future improvement should be only additional and more extensive Malone of the old buildings, no less careful consideration and treatment would be required to obtain a harmonious and successful result.

For many years past various indefinite suggestions have been occasionally mentioned for this improvement, but the public were not aware of any actual steps being taken in the matter until a few weeks ago, when the following piece of news appeared in some of the daily papers, accompanied by a ghostly-looking sketch of the proposed building.

Building Inspector J. Theodore Oster has completed designs for the new Courthouse, accepted for which work the contract for the loan is set aside, and will submit them to the City Council and the Supreme Bench this week. Mr. Oster has designed an ornate and commodious structure which is in all modern conveniences, and, it is claimed, with sufficient room to accommodate the present and initial machinery of Baltimore for half a century to come: a little architectural ornamentation will give the metamorphosed and re- created structure a handsome and original appearance. The project was completed by Mr. Oster have been much admired and will probably be adopted with little change. We will add to this the fact that, without showing it in any way Mr. Oster's ability as a building inspector, he has never been known in that the structural design, a matter.

As soon as the matter became generally known and a subject of public comment, one of the more progressive and liberal-minded members of our city council, Mr. Calvert, interjected a comment that to this body to effect — that a transaction of such importance to a city should be carried out only with the most careful consideration for the best practical results and architectural effects; that an unpaid commission of five citizens (naming them), well known for their intelligenze and public spirit, should be appointed to carefully consider the whole matter and be empowered to obtain preliminary sketches from architects, with a certain sum — ludicrously small — appropriated for that purpose. This resolution was simply "referred to the committee on ways and means." A numerously signed paper from conspicuous citizens, including nearly every architect in town, was also presented to the City Council, covering about the same ground, and protesting against summary proceedings in such an important matter. The mayor himself is said to have stated that what is to be voted at the next meeting is a temporary and patched-up building, only partially freighted, which he believed to have been purchased in about a year, while the greater scheme for entirely new buildings would cost $2,500,000, and would require an enabling act from the legislature. It is in this way that stage this stage the matter quietly went to sleep, or into secret session, and nothing has been heard of it for several weeks.

Another very recent transaction is also something of an illustration of method of City Government. Upon one of the principal up-town avenues, a main thoroughfare, and one of the widest streets of the city, the property owners extending along two blocks had given an additional fifty feet of their lots to the width of the street, had left the central space curbed and plotted in parkings, and presented the whole to the city. This has become one of the most desirable and attractive locations for residences, and is being rapidly built up as such. A public liability firm designed to establish itself on one of the lots opposite this parking. An option, up to a certain date, was obtained on the property from the owner, and the required legal notice published in one of the least important of the daily papers. This being finally discovered, a general protest immediately was a hearing was given before the special committee to whom the matter was referred, when every property owner represented most emphatically and unanimously, with strong reasons opposed the permit, with one exception, and that was the man who was selling the property. A protest, signed by a large majority of property-holders in the immediate neighborhood was also sent to the City Council itself. In the face of this very general opposition based upon most evident grounds, the permit for the erection of the building was given, and the work upon it is now in progress, but the special influence of both direct and indirect by those in authority in order to obtain the desired end, were not unknown, it is said, to those interested in the matter, and their own line of justifiable opposition was quite powerless against them.


We would have thought that the recent troubles of the Metropolitan Board of Works would have been sufficiently suffi- cient to render the last few days of their chequered life in some sort of sober repectability, but it has been de- creed otherwise. Bearing in mind the fact that it must dissolve and give place to the new London County Council on April 1, yet, on March 30, almost within a fortnight of its dissolution, in the face of the strongly expressed opinions of the President of the Local Government Board and the Chairman of the London County Council, it actually entered
into a contract for a tunnel under the Thames at Blackwall, costing some hundreds of thousands of pounds, and some fifty thousand pounds in excess of the official estimate. This reckless expenditure of public money, by a body whose life could be counted by days, was really scandalous and very exasperating to the public. Fortunately the contract is now void, and it has incidented nothing further than the usual official rejoinder that the Government has no funds at its disposal. The homeless condition of the National Portrait Gallery, a very valuable collection of portraits, ought to move to pity some of the stone-hearted keepers of the public purse, but it does not; and unless there is a fire, or some other extraordinary occurrence, this gallery will doubtless go on without a home. This is only a specimen of the contemptuous manner in which matters architectural are treated in the metropolits of England.

A most curious dispute is proceeding between Lord Grimthorpe, theAbstract. A most curious dispute is proceeding between Lord Grimthorpe, the quondam Sir Edmund Beckett, Q. C., author of a Book of Building, and general self-appointed adviser to the profession generally, as to whether the Rev. Edmund Hitchie, Rector of St. Alban's, and Richard Harris, Clerk of the Works, shall repair the Lady Chapel at St. Alban's Abbey. The noble lord, as you know, obtained a faculty some years ago for restoring the Abbey generally, and if he himself is not able to do anything to the building except himself, as the sympathies of the profession are entirely with Mr. Gihis, and to rescue any part of the once noble old abbey from the hands of a wealthy architectural charlatan like say Lord Grimthorpe, the latter may do anything to the building except himself. As the sympathies of the profession are entirely with Mr. Gihis, and to rescue any part of the once noble old abbey from the hands of a wealthy architectural charlatan like say Lord Grimthorpe, the latter may do anything to the building except himself.

While, however, these two amateur restorers are fighting over St. Alban's Abbey, the restorations at Peterborough Cathedral, which you remember, were obliged to be done to save the building from ruin, have come to a complete standstill for want of funds. This is a great pity, for Peterborough is one of our chefs d'oeuvre. Still, it is far better for the restorations to be carried on slowly in a reverent manner, than to be done by an irresponsible spirit, than to be abandoned to the unhappy fate of St. Alban's.

Competitive Design For Christ Church
New York - R.A. Robertson - Arch't
The American Architect and Building News, 1899

April 20, 1899.

The buildings and the sums expended upon them, and closing his report, stated that under an agreement with the Ontario School of Practical Science, on which he desires to found a chair of architecture; and a report of the meeting he convened last December to ascertain the feelings of the students on the subject of the institution, which is to be devoted to classes in applied chemistry, applied mechanics and architecture.

The Mayor of Montreal has received from Mr. Saxon Snell the plan for the proposed great Royal Victoria Hospital, in that city, the free gift of Sir George. The plan would charge an additional Knt., a short description of the general arrangements may be of interest: it is a very large group of buildings estimated to cost $5,500,000, including accommodation for 1,000 patients, at a certain price for a small house, the client remarked that he did not see why he should pay more than $1,750, and that amount was the highest figure ever asked, and he is now a client in the case. The general plan consists of a central group of four buildings—the nurses' apartments; the clinical department; a building with the consulting theatres and operating theatres; and an infectious building with the central block are built in a central block, with each other by galleries at every floor level; on the left, three buildings, and on the right, two; each four stories high. Staircases connecting the different parts are all well finished to the severing connection between the wards themselves. Accommodation is provided for surgical patients, 96 beds; for medical, 180; for convalescent patients, 55 beds, Verandas are attached to every ward, and all the arrangements are of the very best order. In securing the services of Mr. Saxon Snell whose "forte" is hospitals, the city has taken the wisest possible course, and they will have the assurance of an entire and devoted management, the meeting was one of the most orderly of its kind that has ever been held. Mr. Langton, of Ottawa, acting as Secretary, and the President of the board, Mr. Sir George A., took a deep interest in the discussions and decided on the conduct of their business, and disposed of themselves by quietly slipping out, but not, as they hoped, unobserved.

The Architectural Guild of Toronto invited all the visiting architects, as well as the rest of the architects of Toronto, to dine with them in the Guild Hall. The President, Mr. Sir George A., Mr. Durand, of London; Third Vice-President, Mr. Balfour, of Hamilton; Directors: Mr. Belcher, of Peterborough; Mr. Burke, of Thunder Bay; Mr. Kirk, of Sarnia; Mr. Berry, of St. Catharines; Mr. McCauley, of Ottawa; Treasurer, D. B. Dick, of Toronto; Secretary, H. S. Hendess, of Toronto.

The Architectural Guild of Toronto invited all the visiting architects, as well as the rest of the architects of Toronto, to dine with them in the Guild Hall. The President, Mr. Sir George A., Mr. Durand, of London; Third Vice-President, Mr. Balfour, of Hamilton; Directors: Mr. Belcher, of Peterborough; Mr. Burke, of Thunder Bay; Mr. Kirk, of Sarnia; Mr. Berry, of St. Catharines; Mr. McCauley, of Ottawa; Treasurer, D. B. Dick, of Toronto; Secretary, H. S. Hendess, of Toronto.

The Architectural Guild of Toronto invited all the visiting architects, as well as the rest of the architects of Toronto, to dine with them in the Guild Hall. The President, Mr. Sir George A., Mr. Durand, of London; Third Vice-President, Mr. Balfour, of Hamilton; Directors: Mr. Belcher, of Peterborough; Mr. Burke, of Thunder Bay; Mr. Kirk, of Sarnia; Mr. Berry, of St. Catharines; Mr. McCauley, of Ottawa; Treasurer, D. B. Dick, of Toronto; Secretary, H. S. Hendess, of Toronto.
attendants brought in and presented to each guest a valuable gift: "At one time it was a matter of sixty most beautiful horses with trappings of silk and silver; at another plate, hawks, hounds, horse-gear, fine saddles, a collected suite of armor fashioned with crests, surcoats embroidered with pearls, betls, precious jewels set in gold, and great quantities of cloth of gold and crimson stuff for making raiment. Such was the profusion of this banquet, that remained unopened the tabling for two thousand men." And a similar feast was held shortly after in honor of the marriage of his son Gian to Isabelle of France.

The architectural monuments of the Renaissance were frequently in keeping for such a man as Sigismondo Pandolfo Malatesta, whose family nickname — "Evil head" — fitted him better than it did some others of his race, to which his name was given on account of a quick succession of wife and daughter, and attempt the chastity of his son as mere incidents in his career, while he satisfied the demands of his higher nature by building the Church of San Francesco at Milan, or held long discussions on philosophy and art with the learned letters knighted to his court; while Gian Galeazzo Visconti, who killed his own uncle that he might rule undisputed, built the Certosa at Pavia and the Cathedral at Milan.

It was a singular epoch, an age of tyrants — not successful, but many contemporaneous; an age of warfare, of love, of passion and intrigue ending in sudden and violent death; an age of distrust and self-seeking, when the day was everything, and the question was, what the sword openly unsheathed could not. It was an age of barbarism and yet of magnificence, for, though the leaders were conscious of a lack of foundation, the age was already one which a less turbulent prince held the succession, and then the practitioners of peaceful vocations had their day, and gathered wealth at his hand, and, although it all the while continued to be a nation of people clung to peaceful pursuits. So the life of the times was everywhere anarchy and terrorism, and it was possible for the tyrant, at length satiated with conquest, revenge and bloodshed, to seek and find close at hand a band of men high-spirited and ready to advance to any extremity in defense of their civilization. The great cities of the North grew and expanded as fast as those coarser tyrants, like Ezzelino da Romano, were extirpated. This was what had been lived in Classic times, would have to-day taken with all men a reputation which would put Nero's to the blush, for he had none of Nero's virtues. He was simply callous to all human instincts; his one pleasure was to wring a human being with his hands, or to make a man of the commonest and dirtiest vocation, as the executioner, in some strange and disgusting way, give him the power to make it serve the ends of his own gratification.

In Padua alone he had eight prisons, holding more than ten thousand victims, and from them he would one day pull out, so to say, a few bodies about which some curious persons who had casually dropped in to the place would be interested in the discovery. But those bodies were usually in the presence of this monstrous tyrant, one of whose most atrocious acts was his treatment of the inhabitants of Friola, whom, when put together, age or sex, he put beyond the pale of future usefulness by putting out their eyes, and cutting off their noses, arms and legs. The mutilation of his victims was one of his most ordinary practices, and it was at that time the habit of the beggars throughout Italy to excite sympathy by attributing to their own servile exertions the real collectivities to the cruelty of the Veronese tyrant. The death of this monster was typical of his life: overcome at length by a natural and wholesome fermentation among the people, three men captured sorely wounded, he undid the dressings of his wounds and tore them open, so that he might escape the doom his victims had in store for him...
was one of these condottieri to whom English romancers, at least, have given a most satisfactory character for unblemished honesty and manly virtue. He is pictured as one of those rough diamonds who, while first of all a soldier, still preserved amid the temptations of a roving life many of the kindly simple virtues of the typical knight. This character was probably not disbelieved, and he was held in such esteem in his temporarily adopted country that, although he was not honored by the erection of an equestrian monument, the walls of the Cathedral of Santa Maria del Fiore, at Florence, bear a large mural fresco of the doughty Englishman painted by Paolo Uccello. Born in the County of Norfolk, son of a good knight and brod a tailor, he early abandoned the needle and shears for a nobler cutting instrument, and served under Edward III in the wars in France, and was knighted by the King himself. After the disbanding of the army, Hawkwood joined one of the roving bands of freebooters or White Companions, and entered in service of the Marquis of Monteferrat. In the war between the two cities, he appears as commander of the Pisan forces, and for the next thirty years he was the leading condottiere of his time, serving now the Visconti, now the Guelphs, with rapturous gratitude toward its deliverer. Nothing within the gift of the city seemed to promise an adequate expression of the honor that might be bestowed, and day after day the wisest counsellors of the city sat in vain debate as to what the need should be. At length a veritable inspiration seized one man, and it was cried out: "Let us kill him, and then worship him as our patron saint!" All agreed that the solution was found, and we may fancy with what pagan festivities the unfortunate savior of the city was induced into immortality. Those who know how common a thing it was for a hired leader who had done such a service to a beleaguered city to take advantage of the uproar to seize the reins of government for his own use and profit may suspect that the inspired counsellor was a practical joker of rather a grim sort.

Hallam says: "The name of Sir John Hawkwood is worthy to be remembered as that of the first distinguished commander who had appeared in Europe since the destruction of the Roman Empire. . . . Every contemporary Italian historian speaks with admiration of his skilful tactics in battle, his stratagems, his well-conducted retreats. . . . Hawkwood was not only the greatest, but the last of the foreign condottieri, or captains of mercenary bands."

The Cathedral at Florence contains a companion painting of another condottiere of a later day, Niccolo Peruzzi da Doviza, who, captured by the Milanese, died in captivity in 1434, but the grateful Republic esteemed him no less worthy than Hawkwood of an equestrian portrait, and caused one to be painted by Andrea del Castagno. The monumental portrait of Hawkwood is interesting, because he is shown in the half-civile garb probably worn on occasions of state, rather than in the full armor of the military commander of the period; the painter by this selection throwing away one of those costly aids which so often spoil the effect of the statues of the full-armed knight. There are no more popular "eights" in Europe than the great galleries of armor at Madrid, Paris, London, Berlin, and elsewhere, and nowhere is one more likely to find that one feels in examining the stuffed figures of knights and horses in full armor, to be found in these galleries, must be counted the pleasure of looking at an armament statue simply because that is shown to us.

FZRRER’S "Ancient Funeral Mementos," Annual 1872, says, speaking of Hawkwood, "The Italian writers, both Historians and Poets, recount his worthies acts with full enthusiasm. But for aught I know (and I may, in words) it may suffice to adduce the rest these four verses of Julius Ferrarius:

"The glorious prime of Englishman, then of Italian bold,
O Hawkwood, in yon gallant mood,
That hast, in time, service done,
The noble, vain, inlay'd reward."
conditions come to explode with a force far greater than gunpowder. This is because the iron substance is being heated by парфорс, explosions like that of the "Westfield," which took place with only twenty-five pounds of ordnance, was succeeded. To solve the cause for the recent Pittsburgh explosion, which came just as the whistle was sounded and the steam turned off for an hour given to a meal. The natural gases that are evolved are considerable, and the explosion is caused by the water, which is divided up in smaller masses, ought, as far as possible, to be used in buildings where an explosion will cause great risk to life. At the present time, the "case" boiler offers greater risk where care is taken. When one reflects that the United States has 7,500,000 horse-power, scattered among 100,000 to 100,000 stationary boilers, and that in 1857, 1,414 of these exploded, 40 per cent in swallows, the risk is seen to be small. The Pittsburgh explosion recurred July 27, when 14 boilers in a "latticework" of twenty-explosed at midnight, killing twelve and wounding thirty persons. A prolonged inquiry into this disaster will throw light on the becoming rare occurrence of these explosions, and on the fact that the service, failed to make the cause clear, and the conclusion reached was that it was probably due to the explosion of the Bannister furnaces made in steam, which combined in some explosive proportion with the products of coal combustion. As in the Pittsburgh explosion the disaster occurred at the hour when work was stopped for a meal, it affected boilers which could by no possibility have all had low water at once, and no one can read the reports made on it without feeling, as we said at opening, that there is still much to be learned about some boiler explosions. —*Philadelphia Press.*

**Brick for Street Paving.** —A Detroit contractor who had occasion to purchase brick for street paving in Detroit, recently reported, only 184 of these exploded, 40 per cent in swallows, the risk is seen to be small. The Pittsburgh explosion recurred July 27, when 14 boilers in a "latticework" of twenty-explosed at midnight, killing twelve and wounding thirty persons. A prolonged inquiry into this disaster will throw light on the becoming rare occurrence of these explosions, and on the fact that the service, failed to make the cause clear, and the conclusion reached was that it was probably due to the explosion of the Bannister furnaces made in steam, which combined in some explosive proportion with the products of coal combustion. As in the Pittsburgh explosion the disaster occurred at the hour when work was stopped for a meal, it affected boilers which could by no possibility have all had low water at once, and no one can read the reports made on it without feeling, as we said at opening, that there is still much to be learned about some boiler explosions. —*Philadelphia Press.*

**New Brick for Street Paving.** —A Detroit contractor who had occasion to purchase brick for street paving in Detroit, recently reported, only 184 of these exploded, 40 per cent in swallows, the risk is seen to be small. The Pittsburgh explosion recurred July 27, when 14 boilers in a "latticework" of twenty-explosed at midnight, killing twelve and wounding thirty persons. A prolonged inquiry into this disaster will throw light on the becoming rare occurrence of these explosions, and on the fact that the service, failed to make the cause clear, and the conclusion reached was that it was probably due to the explosion of the Bannister furnaces made in steam, which combined in some explosive proportion with the products of coal combustion. As in the Pittsburgh explosion the disaster occurred at the hour when work was stopped for a meal, it affected boilers which could by no possibility have all had low water at once, and no one can read the reports made on it without feeling, as we said at opening, that there is still much to be learned about some boiler explosions. —*Philadelphia Press.*

**Brick for Street Paving.** —A Detroit contractor who had occasion to purchase brick for street paving in Detroit, recently reported, only 184 of these exploded, 40 per cent in swallows, the risk is seen to be small. The Pittsburgh explosion recurred July 27, when 14 boilers in a "latticework" of twenty-explosed at midnight, killing twelve and wounding thirty persons. A prolonged inquiry into this disaster will throw light on the becoming rare occurrence of these explosions, and on the fact that the service, failed to make the cause clear, and the conclusion reached was that it was probably due to the explosion of the Bannister furnaces made in steam, which combined in some explosive proportion with the products of coal combustion. As in the Pittsburgh explosion the disaster occurred at the hour when work was stopped for a meal, it affected boilers which could by no possibility have all had low water at once, and no one can read the reports made on it without feeling, as we said at opening, that there is still much to be learned about some boiler explosions. —*Philadelphia Press.*
The exterior of this house is stained with Cabot's Creosote Stain for Shingles, Fences, Clapboards Etc.

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply.

Our Stains contain no water and are the only exterior Stains that do not contain kerosene.

Prices are 40, 60 and 75 cents per Gallon according to Color.

Send for Samples on Wood, and Circulars.

Samuel Cabot
70 Kilby St., Boston, Mass.
GURNEY
HOT WATER HEATER.

More extensively used and with better results than any other Hot Water Heater, Conclusively demonstrating that
HORIZONTAL HEATING SURFACE is infinitely more effective than Vertical surface.

Gold Medal Boston, 1887.
- - - Highest Award New York, 1887,
- - - Highest Award Toronto, 1887.

SPECIAL SILVER MEDAL FOR EXTRAORDINARY MERIT, NEW YORK, 1888.

For Full Particulars, see Catalogue Gratis.

GURNEY HOT WATER HEATER CO.,
237 Franklin St., Boston, Mass.

New York Office, 88 John St.

Selling Agencies:
San Francisco, J. J. Lowton, 438 Fulton St.
Detroit, Y. B. Chase, 136 Larned Street. West
Portland, Or., William Gardiner & Co., 136 Third St.

Detroit Heating & Lighting Co's
HOT WATER HEATER
(BOLTON'S PATENT)
For Heating Public and Private Buildings by Hot Water Circulation.

THE COMBINATION
GAS MACHINE
For Lighting all kinds of Buildings and for Furnish-

ing Fuel Gas for Manufacturing Purposes.

IDEAL GAS STOVES.
WEBER STRAIGHT WAY VALVES.

DETROIT HEATING & LIGHTING CO.

FISCHER'S
Wrought Steel Family
and Hotel Ranges.

CHEAPER & BETTER than the old style stoves. Guaranteed to wear like cast iron alone.
The Wm. C. Fischer Mfg. Co.
CINCINNATI, OHIO, U. S. A.

U. S. MAIL CHUTES
Enable you to mail letters without leaving the floor on which your office is located.
NOW IN ALL FIRST-CLASS BUILDINGS.

CATLER MFG. CO., ROCHESTER, N. Y.

ASAHEL WHEELER'S
IVORY
WHITE
PAINT
Is now the popular desideratum for interior painting, and is non-poisonous.

145 Milk Street, - BOSTON.

ARCHITECTURAL BOOKS.
DRAWING INSTRUMENTS.

1889 Catalogues Free. Address
WM. T. COMSTOCK,
23 Warren St., New York.

A WONDERFUL BOILER

THE "Perfect" Hot-Water Boiler
Having Unprecedented Power.

QUICK HEATER, ECONOMICAL IN FUEL.

FOR HARD OR SOFT COAL OR GAS.

Hundreds in use giving perfect satisfac-

tion. Send for Testimonial List.

RICHARDSON & BOYTON, CO.,
232 & 234 Water St., N. Y.
54 Lake St., Chicago.

Decennial Index of Illustrations
IN THE
American Architect and Building News.

1876 to 1885. 1 vol. 8vo. . . . $2.00

A carefull-made topical index to the thou-

sands of illustrations printed in "The Ameri-
can Architects" for the past ten years, with

the architects and costs of the buildings illus-

trated. These include Sketches, Etchings, Gen-
eral Views; Towers and Spires; Monuments,

Statues, and Tombs; Interiors and Furniture;

Entrances and Gateways; Educational, Mer-
cantile, and Public Buildings; Churches and

Parish-buildings; Dwellings; Club-Houses;

Theatres, Stables, and Farm-Buildings; Ho-
tels, Museums, Libraries, and Town-Halls.

TICKNOR & COMPANY.
Holland, the door furniture is something like that in England, but the Dutch still make use of the oval and egg-shaped knobs which our ancestors copied or imported from them, and we have of late copied again from our ancestors. Mr. Blashill said nothing about what is perhaps the most striking peculiarity of the Dutch doors, the way in which many of them are made to open in two sections, divided by a transverse joint in the middle of the height of the door. This fashion, which is still very common in Holland, is preserved in many houses about New York, and must have a curious history, which we commend to the attention of some amateur of Knickerbocker archaeology. The Italian doors retain a peculiarity of which the origin is more obvious, in the shape of a grated opening, which is almost always found in the outside doors of houses, at a convenient height for inspecting a caller before opening the door to let him in. Considering the sort of callers that a man was liable to have in Rome or Florence three or four hundred years ago, it is not strange that some such facilities for reconnoitring visitors should have become fashionable. The most interesting doors of which Mr. Blashill spoke, considered artistically, were perhaps the Moorish ones. These are framed like ours, but with the panels at the framing, so as to give the surface, on which stamped leather is often placed, and secured by brass arabesques, nailed over the whole. What a pretty suggestion this would be for one of our modern houses, we need hardly point out, and many ways will occur to architects which a somewhat similar treatment might be carried out in other materials.

THERE is gratifying to learn that so enterprising a town as Kansas City is "waking-up to its art needs," to use the expression of Mr. Tom Blashill, who we find one of the youthful teachers of the school of drawing, in which the architects and builders of the city appear to have interested themselves so far as to found prizes, to be awarded to the most deserving pupils. We are glad to wish the utmost success to the new school, and to see it have as its object the building up of the care of architects, and of builders also, if, as appears to be the case, the builders of Kansas City are exceptionally interested in fine art. The same writer, however, considers that it is desirable to have more pictures immediately imported "from the East" into the town, which is not quite the same thing as having its citizens make them for themselves. It thinks that if a demand for pictures were to manifest itself, it would soon be supplied, which is unquestionably true, the "Eastern artists," or at least some of them, having facilities for supplying such a demand as that which we are hearing from the Kansas City journalist. Not only can the artists in question furnish modern paintings in oil, of assorted subjects, at the moderate price of one to two dollars each, but, if report does not belie them, they can fit out the future "galleries" which are to adorn the metropolis of the Mississippi Valley with choice Rembrandts, Raphael's, and Titians at about the same figure. These pictures, by the way, are really painted in oil, either on canvas or a tolerably good imitation of it, by what is called the factory system, each canvas passing by turns through the hands of the "sky-man," the "tree-man," the "foreground-man," and so on, until it arrives at the end, a picture complete in every respect except that which makes a picture valuable. The productions of these factories are said to be extensively sold in the West, and a worse fate could hardly befall Kansas City than to be known as a good market for them.

THE affair of the addition to the Boston State-house, which at one time seemed likely to lead to unpleasant rivalries between the architects concerned, as well as to undignified controversies in the newspapers, appears to have been happily settled by the appointment of a consulting architect, who, in conjunction with the architects to whom the first prize was awarded, is to prepare a modified design, which is to be carried into execution. In this way the contractor observes that many of the original architects, that the execution of the work should always be given to the author of the design placed first, and at the same time satisfies the popular demand that "a first-class architect," i.e., one who would have nothing to do with the competition, should be concerned in the work. It will be observed that no one, so far as we know, has ever said anything against the skill or
ability of the winners of the first prize, but the fact that they were willing to compete at all on the terms offered, and still more the fact that they should have done so after the almost unanimous withdrawal of the members of the profession in Massachusetts, appears to have created a presumption in the minds of the Massachusetts public, as, in fact, it generally does in such cases, that they must in some way be inferior to those who have been invited to compete on a home basis. Although we consider the whole scheme of placing the most costly and important part of the State-house in a separate building, at a lower level, and across a street, over and under which communication is obtained by means of tunnels and bridges, to be a most mistaken one, and the reason given for it, that it would allow for the future additions of inch boards covered with tin, to be little short of absurd, the time has gone by for discussing that point, and we hope that the legislature will see that the disposition which its supreme wisdom has adopted is carried out as promptly and energetically, and with as complete an absence of unnecessary squabbles and scandals, as possible.

SIGNOR MELANI writes to La Construction Moderne an extremely interesting letter about the history of the Campanile at Florence, from which it appears that our textbooks on the subject ought to be immediately revised, and an immense amount of esthetic rubbish expropriated from the sentimental literature of architecture. To sum up in a word, Signor Melani assures us, not on his own authority, but on that of certain persons who cannot be disbelieved, that Giotto's Campanile was principally built by somebody else, and from designs which Giotto never dreamed of; while the Cathedral of Florence itself, instead of being the immortal work of Arnolfo, was the result of the successive labors of half-a-dozen architects, one, at least, of whom had quite as much to do with its design as Arnolfo. To begin with the Campanile, the records of Florence show without question that Giotto's work upon it when it had reached a height of about twenty feet from the ground. At this height the principal part of the spire had been completed, including the gable, the balustrades, and the small oddities that have been recorded. The spire was pointed to the word, which was copied by Giotto himself. At this point Giotto was succeeded by Andrea Pisanu, an artist almost as renowned as his predecessor. Where Pisanu's work ended is not quite certain, but a picture which is preserved in Florence, in the "Uffizi del Bigallo," indicates that it stopped at the height of the first large windows. This suggestion is confirmed by the fact that a writer contemporary with Giotto and his successors, speaking of the work that Pisanu did on the tower, mentions that his employment was terminated on the discovery that he had made a change in the design of a sort which Giotto would probably not have approved. With this charge in mind, the writer, Pucci, the writer in question, does not explain, but Signor Melani points out that there are in the tower, at the height of the first story windows, some small pilasters placed in the line of the niches, which occur nowhere else, and are of an unpleasant effect. Whatever may have been the exact point at which Pisanu was discharged, it is certain that he was succeeded by Francesco Talenti, who carried the building through to completion, and there is plenty of evidence that he treated the design of the upper part as he liked, without interference from any one. The usual romance about the construction of the Campanile fails that Giotto, before it was begun, made a model of it at a large scale in wood, on which every stone was marked and colored in imitation of the piece of marble which was to be used in that place. It is quite possible that the model was made according to the story, but it is certain that it was not followed. Not only does the internal evidence of the building, which plainly shows three styles of treatment, furnish to an architect, convincing proof that it was not built in accordance with one design, but the familiar tradition in Florence, that it was intended to have a spire, indicates that a complete change in design had been the original conception. The exact character of the original design of Giotto is not described by any contemporary writer, but Signor Melani has discovered in the Uffizi dell' opera, or archives of construction, of the Cathedral of Siena, a drawing on parchment, of the fourteenth century, representing a tower, the lower portion of which is absolutely identical with that at Florence. At the line of the mosaic of little squares begins a variation between the drawing and the actual tower, which continues to the summit. In the drawing, the octagonal corner-buttresses, which, in the actual tower, are simply carried up and crowned with the same corone as the wall between them, were adopted as an architectural curiosity, and a few years ago the upper story is made octagonal, and, rising between the buttress-pinnacles, carries a high octagonal spire, with gabled windows on the faces corresponding with the faces of the square beneath. This arrangement is familiar enough in North- america. It is the so-called Gothic spire, and was set on their churches at Florence. Of course, there is no certainty that the Siena drawing is the work of Giotto, although Signor Melani, from the resemblance of the details shown in it to those employed by Giotto in the backgrounds of some of his pictures, believes strongly to the contrary. It is, but more serious than that it is at least represents the Florentine campanile as it was first set up by Giotto, and that the variations of the present tower from the drawing show the design of Pisanu, and, after him, of Talenti, who, it must be remembered, did not complete the tower until 1358, when Giotto had been dead twenty-one years, and his model, if it ever existed, probably long been forgotten. Even if it had not been forgotten, moreover, it would probably have been thrown aside to make way for the devices of Talenti, who, though now almost unknown to fame, must have been a great man in his day—much too great a man, in fact, to subserve merely to curiously train the ability of an artist of the preceding generation. Investigations into the records of the Cathedral of Florence show that the same Talenti was in 1357, while his work on the campanile was still in progress, commissioned to modify the design of the nave of the cathedral in the same spirit, and in the following year he gave the designs for the decoration of the base and the stones of the exterior of the nave wall nearest to the façade, which have since been erroneously attributed to Giotto and Arnolfo.

GREAT many cat stories are just now circulating through the technical press. Fire and Water has two, illustrating the occasional connection of cats with conflagrations. According to the first, an Englishman, a few weeks ago, saw a cat on the roof of his house, and, after the British manner, thought it would be good sport for him to get a gun and shoot it. He got the gun and tried to shoot it, but the shot missed their mark, and pussy escaped to a neighbor's yard. Meanwhile, the blazing wood had set the roof on fire, and the house was burned to the ground. Another lover of sport, in North Carolina, shut himself up with his cat in his store, and amused himself by throwing lighted fire-crackers at her. This distraction lasted, with great satisfaction to one of the parties, until a misdirected cracker landed in an open powder-keg, and the store, with its contents, were scattered over the surrounding country. The hilarious proprietor was blown under the counter, and was subsequently extracted from the debris, not so much injured as he deserved to be. The third story that we have to record possesses a somewhat local character. A lady in Liverpool, who had a pet cat, of which she was very fond, was seen by some neighbors to take the cat into the yard and cut off its tail by a blow from a hatchet. The neighbors, although she appeared just as kind to the cat after the amputation as before, saw fit to complain to the police, and the amateur surgeon was arrested. The defense was that the removal of the tail was necessary to save the cat's life. Every cat, the woman explained, has a worm in its tail, which occasionally takes a fancy to crawl up through the tail and back to the cat's head, where it provokes a great deal of discomfort. The commencement of this pilgrimage on the part of the worm may be detected from the actions of the cat, which begins to run after its tail. In this stage of the disease, if the tail is cut off, the worm is removed with it, and the symptoms disappear, but unless this precaution is taken a fatal termination is inevitable. Although most of the lady's neighbors confirmed her theory, the judge unfeelingly replied that cruelty is not excusable because based on superstition, and fined her ten dollars and costs. With a few more judges of this sort, England would be a dangerous place to practice medicine in, for the cat- society has much too much confidence in some of the methods of healing which are applied to human beings. Although the worm-theory is new to us, it is certain that cats are often troubled with a disease which shows itself by an inflammation and swelling at the end of the tail. The patient whirls round and round, endeavoring to scratch and bite its tail, and appears seriously out of health. Under these conditions, it is a matter of very general belief, if not of experience, that the removal of the inflamed tip of the tail effects a cure.
Dial-Locks are used almost exclusively for safe and vault work, and so cannot be included under the general topic of Builders’ Hardware. But, representing, as they do, the highest degree of perfection in the line of locks, a brief statement of the principles upon which they are constructed and worked, may not be out of place.

The external appearance of a dial-lock is familiar to every one, consisting of a rotating disk, graduated around the circumference either with letters or with numbers. To operate the lock, the knob attached to the dial-disk is turned a certain number of times to one side then to the other, etc., stopping each time on a certain number or letter, until the combination is set, when a single turn of the knob draws back the bolt. The internal arrangement consists of a series of flat, circular disks or tumblers, which rotate freely on the spindle of the dial-knob. In the edge of each tumbler is a notch, and the innermost tumbler is made with a dog which catches the tooth of a lever attached to the bolt. This inner tumbler is made fast to the spindle. On each face of each of the tumblers is a small peg, all the pegs being placed at the same distance from the centre of rotation; so that when the spindle is turned, the peg on the first tumbler strikes against the peg on the second tumbler, causing the latter to rotate, and in turn to start the third, and so on, so that with a four-tumbler lock, turning the spindle four times to the left moves the fourth tumbler to any desired number; turning next three times to the right adjusts the third tumbler, but does not disturb the adjustment of the fourth; then turning twice to the right adjusts the second, but does not disturb the other tumblers. When the slots in all the tumblers are brought to a line, a bar drops into them, permitting the bolt-lever to catch in the teeth of the first or locking-tumbler, when a single revolution will draw back the bolt. A single lock will illustrate the subject sufficiently for our purpose. Figure 343 shows the works of one form of safe-lock, used by the Damon Safe and Lock Works; and though this is a cheap lock, it embodies all the essential principles of every combination lock. This lock is susceptible of 75,000 different combinations, but some bank-locks afford as many as 184,000,000 changes.

There is absolutely no way to pick such a lock as this, except by “ringing the changes,” that is to say, by making successively all the possible combinations, until the right one is found.

Combination locks cost from five dollars for the cheapest kind, to several hundred dollars for the most perfect styles of time locks.

Miscellaneous Locks.

In addition to the regular lines of lever and cylinder locks, there are several forms which may be considered in this connection.

Tubular Locks.

Some cheap styles of lock are manufactured of such form that all the mortising can be done with an auger, being essentially the same in principle as the mortise-door-bolts described in a previous chapter and illustrated by Figure 36. Figure 344 shows the construction of the “Hollenbeck Tubular lock.” It is too simple and cheap to afford any very great degree of security as compared with an ordinary three-lever lock, but for some cases it would answer very well, as it saves seventy-five per cent of the labor ordinarily necessary to fit a common lock to a door. It is held firmly in place by the lugs at top and bottom, so it cannot work loose. Hollenbeck also manufactures a tubular latch on essentially the same principle. Several other firms have tubular locks listed in their catalogues, but they are too much alike and too simple to require further illustration.

Electric Locks. — It is often desirable to have a lock which can be operated by any one at a distance from the door.

In apartment-houses, clubs, etc., it is well to fit the front-door with a lock so connected with an electric battery that when a knob is pressed in an upper story a catch in the lock is drawn by the action of an electro-magnet, permitting the lock or latch to be moved.

Any form of lever-lock might be adapted to this purpose, but there are a few forms of specially designed electric locks which are more commonly used. Properly speaking these are all electric-latches, as none of them have a locking bolt. Figure 345 illustrates “Thaxter’s” electric lock. The pressure of a button closes the circuit through the electro-magnets, A. These act on the bent lever so as to release the arm, B, from its catch on F.

The spring at C draws back E and D from the latch, and follow, E. The outside knob can then be turned and the door opened. When the latch is drawn back by closing the door, it carries with it the arm F, which resets itself so that the bolt D catches in the follow and locks the door. The latch is also fitted with a set of levers, so it can be operated by a key, independently of the knob. “Fuller’s” electric lock, Figure 346, is a triple simpler. The magnets draw the armature A away from the cam, B, permitting the knob to be turned. When the door is closed the latch lifts the bent arm, C, and forces back the armature under B.

The “Thaxter” and the “Fuller” locks are the ones most commonly employed in and around Boston, though there are several other makes in the market, most of which are, however, asserted to be infringements of the patents.

Sliding-door Locks. — Figures 347 and 348 illustrate two types of sliding-door latch and lock. The locking mechanism used for this purpose is usually quite cheap in its construction, as a finely fitted lock is seldom required for sliding-doors. Indeed in many cases no lock at all is necessary. The bolt is curved and hooks down into the face-plate on the opposite door or on the jamb.

The door-pull is either in the form of a hinged-lever, as in Figure 347, or a straight pull reinforced by a concealed spring, as in Figure 348. Both pulls can be pushed.
in flush with the face-plate. In some localities it is thought desirable to use knobs on the sliding-doors, one set of knobs having all the latest improvements of the Yale system, and being practically unpickable. Figures 349 and 350 illustrate two good types from the great variety of locks used for wardrobes and small closet doors. The first shoots a bolt up and down and is a fair, two-lever lock. The second shoots a double bolt horizontally. Both are gained into the inner face of the door.

The Corbin Cabinet Lock Company has recently put on the market a very ingenious change lock, intended specially for post-office boxes. It is somewhat upon the principle of the Day & Newman lock previously described. Figure 351 shows the lock with the face-plate removed. Each lock can be locked by any one of a series of keys which can be extended in number almost indefinitely, all the keys being different in the arrangement and spacings of the notchings. But the bolt can be unlocked only by the key which was last used in locking it, so that the key can be changed as often as desired. In case the key is lost, an arrangement at the back of the lock permits the post-master to open the box and throw back the bolt, when a new key can be used, without in any way changing the lock, and the key which was lost would not then work the lock at all. Furthermore, the bolt is so arranged that it will turn back only sufficiently to permit the box to be opened, but not enough to allow the key to be withdrawn, unless the bolt is forced back by external pressure. The working is as follows: The upper levers are pivoted so as to permit of a rotary as well as a longitudinal motion. The second set of levers moves only laterally. The opposite edges of both sets of levers are notched, the width of the notches corresponding to the difference between the notches on the keys. Suppose the bolt to be unlocked: when the key is turned, the lower levers are first pushed to one side varying distances, corresponding to the notches of the key, and the upper levers are then drawn down and away from the post. As the key continues to revolve the levers interlock and the lower ones are forced sidewise by the springs, carrying with them the pivoted upper levers, which rotate so that the slot in each lever no longer comes opposite the post. At the same time, the bolt is shot out. It is evident that the action would be the same, no matter what key were used, only the sets of levers would not interlock in exactly the same relation. It is also evident that the only key which will rotate the upper levers so as to bring each slot opposite the post and permit the key, in turning, to draw back the bolt, is the key which last made the combination between the two sets of levers.

This lock hardly comes within the scope of builders' hardware, but it is too ingenious to pass unnoticed. The Corbin Cabinet Lock Company also makes a change lock for drawers, operating on much the same principle.

Padlocks.—The subject of padlocks is one which might be illustrated indefinitely, as there are quite as many different varieties as have been noted in regard to lever-locks, though with a few exceptions all padlocks are on essentially the same principle, consisting simply of spring-levers and a shooting-bolt, operated by a key in the same manner as an ordinary door-lock. Padlocks are now used but little about a house, as mortise or rim locks are usually more convenient, and at the same cost, are more secure. Only a few of the market forms will therefore be considered.

Figure 352 illustrates the internal arrangement of a very secure padlock manufactured by A. E. Dietz, the key, notched levers, etc., being somewhat similar to those in the Dietz.
store-door previously illustrated. Figure 353 is a form made by nearly all the leading lock-manufacturers. The key is inserted at the bottom of the padlock and rotates a set of levers which catch in the slots on both of the arms of the hasp. One arm is swivelled into the padlock case. Figures 354 and 355 are two other well-known padlocks, the former being used a great deal for government work and the latter having the hasp, staple and lock in one piece. The more common makes of padlocks are too well-known to require illustration.

LATCHES.

The ordinary door-latches have already been described in connection with the locks, but there remains quite a variety of latches which are made without any locking appliances, being intended simply to hold the door in position. Figure 356 shows the commonest form of latch used for elevator-doors, consisting simply of a bent lever, the lower arm of which is counterbalanced so that the lock will drop by gravity and remain closed until drawn back by pressure on the upper arm. Figure 357 is a very simple rim sliding-door latch; and Figure 358 is a very good rim door-catch which is self-acting, the hook being released by raising the lever A, either directly or by aid of the spindle, B, from the outside of the door; while it is locked from within or without, the slide C being moved so that A cannot be raised. Figure 359 represents one of a great variety of styles of thumb-latch, a very simple, old-fashioned form which is very suitable for some cases. Figures 360 and 361 are cheaper forms of thumb-latches, intended to be used only on screen-doors. Each of these styles has a lever B of some sort, A, which serves to lock the latch. All of these patterns act by gravity. Figure 362 shows a spring-catch which is released by lifting or pulling out the handle on one side or by depressing the thumb-latch on the other, the latch being locked by the swing-lever A.

For French windows and cupboard-doors or for light screen-doors, one of the styles represented by Figures 363, 364 and 365 are employed. Figure 364 can be locked, and it and Figure 365 work with a spring.

PRICES OF LOCKS.

It has not been deemed advisable to publish in this connection any summary of the market prices of the locks which have been illustrated and described, as, without such an acquaintance with the subject as can come only by examination and comparison of the actual samples, any prices which might be given would be misleading, and would often be unfair criteria of comparison. The real value of a lock depends so largely upon the care with which the levers are fitted, and the care taken with such details differs so much with the various manufacturers that the price ought to be the last thing to be considered in selecting the locks for a house. A good lock by a thoroughly reliable firm can always be matched by a lock sold for considerably less money, which has the outward appearance of being exactly as reliable, and yet which is totally inferior.

Surely the difference between good and bad workmanship could not be fairly illustrated by even the best of drawings, and it would never be wise to select merely from a trade catalogue. The only approximation which can be presented here is that previously given in the classification of locks by prices. It is of course very general, and consequently somewhat vague, and liable to exceptions; but it was prepared in conjunction with one of the largest hardware dealers in the country, and is sufficiently exact to serve as a guide to the general prices which should be paid, bearing always in mind that the wisest plan is to select only from the work of the best manufacturers and then only by samples.

The seventy-five or more locks which have been illustrated and described must be considered as types rather than as an exhaustive selection. A simple, three-lever lock is common property and several manufacturers whose names have not been mentioned in this connection turn out locks which are quite as good or better than those which have been selected for illustration. The difference would be entirely in the fitting or the finish, neither of which can be shown by the illustrations. All that can be hoped for is that this chapter may serve as a summary to guide in the general selection of the goods.

[To be continued.]

WHY THE ROYAL ACADEMY EXHIBITS NO WATER-COLORS.—It appears that the directors of the British National Gallery are not responsible, after all, for the fact that all water-color paintings are relegated to the basement, where very few persons ever dream of looking for them, that they are precluded by the terms of the Government grant from either acquiring water-colors or exhibiting them with the works in oil. An effort will be made to amend this condition of affairs. —N. Y. Evening Post.
The new building, which is to occupy the lot at the intersection of Grove and Salisbury Streets, facing Lincoln Square, is to be built of brick with brownstone trimmings, and is to be 87 feet, four inches, by 134 feet, seven inches, with basement floors of 140 feet. It is 1885, and the whole house will be for the use of the infantry companies. Each floor will contain two company rooms, 26 by 37 feet, the commissioned officers' rooms occupying the projecting bays at the front, while the rooms for the non-commissioned officers open from the rear. Each company will be provided with all the necessary rooms for uniforms, guns, dressing, etc., on the same floor. The fourth floor is occupied by a kitchen, 15 by 17 feet, and a 44-foot, four-inch, by 140-foot, one-story, rear building will be supported by iron arch trusses rising from the floor, which will be entirely unobstructed by pillars or partitions, thus affording an excellent place for drill. A small section, 16 feet wide, will be shut off from the rear end of the shed as a gun park for the artillery. This section is separated from the main hall by gates, which may be raised up out of the way. The entrance to the drill-shed will be in the center of the facade, the Salisbury side, and the rear corners of the shed will be battlemented and furnished with loop-holes, commanding the sides and rear of the building in case of need. The floors throughout the building will be of hard wood, and the finish will be generally in oak.

HOUSE OF C. J. PAGE, ESQ., WESTLAND AVENUE, BOSTON, MASS.

This house, which was completed last autumn, is built of common brick and has a Flemish bond, with a red mortar; with masonry arches and of pressed-brick laid in red mortar. The diaper pattern across the second story is formed by using the same two materials: dark pressed brick and a light pressed-brick in white mortar. The columns in the arched windows of first story are of Georgia marble. The balconies, lamps, standards, etc., are of wrought-iron. The interior is elaborately finished in hard woods; the sixty upstairs rooms works a quarter four feet, and the oak ceiling and, has an arched brick fireplace-bay, in which are placed oak settles. The parlor is finished in mahogany, with carved pilasters or caps in brick. The hall is wainscoted eight feet high, and is finished in cream-white. The roof is a large studio.

GRACE CHURCH CATHEDRAL AND GUILD-HALL, TOPEKA, KANSAS.

Mr. H. M. CONDON, ARCHITECT, NEW YORK, N. Y.

The Guild-Hall is built, costing about $25,000. The Cathedral it is hoped to commence in a short time and carry out in its completeness. Mr. Seymour Davis, of Topeka, was employed as superintendence of construction of the Guild-Hall, but the local papers have mistakenly given him credit as being the architect.

VIEWS IN VERONA, ITALY.

See article on “Italian Cities” elsewhere in this issue.

HOUSE OF BEERHART E. TAYLOR, ESQ., NEWTON, MASS.

R. RAND & TAYLOR, ARCHITECTS, BOSTON, MASS.

A BIRD'S EYE VIEW IN CALIFORNIA.—M. R. Rose, of the Capital Iron Works of this city, has bored a well on R. D. Stephen's place, near Mayhew Station, which is the largest in this section of the State. It is thirty-two inches in diameter and 120 feet in depth. It is not only the largest bored well in the State, but it furnishes more water than any other. In fact, it is an inexhaustible reservoir that cannot be lowered. A hammering machine works a 24-inch, forged-iron, single piston, which throws over 32,000,000 gallons per day,—more than our City Water Works pumps in a whole week, and what would measure in a ditch, or canal over 1,000 miles in length. So strong is the supply that this immense volume does not in the least lower the source of supply, and the water is as clear and pure as any obtainable.—Sacramento (Cal.) Record-Union.

Auguste Rodin. — VI.

It was in this year, 1884, that Rodin began a bust of Rochefort. From the very beginning things did not go well with the Red Republican. As the work went on, it became more and more dissatisfied, and finally would not give any more sittings. His explanation of his experience at the sculptor's studio is amusing. He says: "I went to the studio in the morning, sat down ready for Rodin to begin. Then he would look at me for an hour and a half or two, and turn to his work. He told me that for the same length of time, put a bullet of clay carefully on it, and by that time its energy would be ready for me, and that for the same length of time, put a bullet of clay carefully on it, and by that time its energy would be ready for me, and Rodin was never done." The sculptor, on his part, was equally dissatisfied with his sitter's impatience and total lack of appreciation, and, at last, became disgusted, but the busts had told their little story in the production of a great work of characterization. Though not completed it was cast in plaster, and declared to be, by Rochefort's assistant editors and critics, one of the most astonishing pieces of individualization. Plaster copies are now in the possession of several of the editors of Rochefort's papers, and especially,—The Bulletin.

As time went on and Rodin's reputation increased, Rochefort experienced an awakened interest in the formerly despised bust of "bulletin" construction, and he indicated a willingness to resume the sittings he had before refused. It was too late. When he had looked Rochefort through and through by the hour, and had sent his cranium and visage into posterity as a powerful image in sculpture, had its sense of what was due to it and to art. The bullet process was not resumed.

In the early spring of 1885, Rodin was invited by a committee of the city of Calais to make a sketch for a monument to commemorate the heroic partitizens of Empire-street and his five companions, who offered themselves as sacrifices to the demands of Edward III, the conqueror of the city in 1347. The original intention of the committee was a single statue of the principal personage, but Rodin included in his design three figures, St. Pierre being the chief figure. Of the several sketches sent into the competition, none of which had more than one figure, that of Rodin was accepted in the autumn of the same year. The superiory of the sculptor's sketch was commented upon by the Calais newspapers, and references made to the merits of his former work as a guaranty of a successful result. The receipt of this important commission led a newsman to ask Rodin, "What, sir, are your plans?" Mr. Rodin, who was then a pupil of Laurens, named Isaac, told his master that his native city, Calais, proposed to erect a monument to these six men who went out to save their city from the arms of the English fleet, and that he would return a sculpture of their heads and with ropes on their necks, and asked him if he knew of a French sculptor that he could recommend as worthy to be invited by the committee to make a sketch. "Certainly," quickly answered Rodin, "but Rodin is the sculptor.

Rodin's last exhibition at the Salon was in 1885, when he sent a bronze bust of M. Antonin Proust, a former Minister of Fine Arts. If such were possible, it was spoken of with more enthusiasm than the busts of Hugo and Daudet. The correspondences of nearly every important newspaper in Europe had some amusing word to say of this bust, some of them entering into quite a dissertation on its artistic merits, an analysis of the genius of its author, and the probable effect upon French art of such a powerful worker in clay. In modern times, they declared, no one had ascended to so high a plane in bust sculpture. Among the many who saw him and talked with him, his master, the brilliant sculptor, was not commented upon. A few observations on this point, by Roger Marx, are as follows: "If one were obliged to judge the present condition of French sculpture from the works of the students at the Villa Medici (the French School of Fine Arts in Rome), we should now see at the School of Fine Arts, one would be led to conceive a sad opinion of French artists. But it would be an error to believe that noble art, elevated art, imagined art, and any art whatever, without knowing any rule or following any conventionalism. These men represent the grand art of to-day—as grand art as there is—and you can study it in the first work you see treated with a free hand."

*All rights reserved. Continued from page 114, No. 660.*
CLAY SKETCHES FOR THE CALAIS MONUMENT.

AUGUSTE ROOD, Sculptor.
under such conditions as are absolutely necessary, to our way of thinking, for the conception and execution of a veritable work of art really worthy of the name.

In the summer of this year, 1885, the commission for the statue of Bastien-Lepage, which was proposed to be erected to his memory in his native town, was given to Rodin to execute, and it came about, says the latter, in this way: "The first time I saw Lepage was several years ago, at a club that met in the Rue Veron, called the French Cottages. He was talking very loud and a good deal, his hair was brushed down over his forehead, and he made considerable noise generally. I said to myself: Who is this young chap who makes such an uproar? Hereon cannot be a friend of mine. Some time after this he came to my studio, expressed his admiration for my work, and after he returned home he sent me a very charming letter, full of appreciation of what he had seen, and assuring me that he would get some of his friends to buy my things. In a little while he came again and bought a marble copy of the figure of 'Sorrow,' which he placed in his studio as the only piece of sculpture there. We, of course, became the best of friends, and, after he died, the committee who had charge of the erection of the statue, and knew of our friendship, gave the commission to me. I made him painting in the open air, because he was the strongest living representative of that way of working. It will be a little larger than life. Lepage was a follower of Manet, with a little touch of the School. He had a great tenacity for nature, and was very sincere. He understood Manet better than any one, or as very few did. I did not understand him until Lepage led me to one of his pictures to show me how good they were. But I was not converted, though I found them droll. Afterwards, I became a great admirer of Manet. I am glad that was a great artist. He has made a tremendous impression upon French art, a great leader for those who came after him. Even prominent artists, who despised him when living, and won't commend him now, show in their pictures that they are willing to copy him. Some of the men who paint in the same style that Manet did, and especially Monet, are stronger than he was. The latter is a very great artist, one of the deepest seers into the mysteries and secrets of nature that we have ever had. Sometimes Manet was a little thin, though always in the right direction. Poor Manet! though such a reviving power, he is quite forgotten. You never hear his name mentioned."

It was also during this year that M. Tarquet placed to Rodin's credit the sum of seven thousand dollars for the purpose of paying for the casting of the door in bronze by the wax process; and the first well-paid commission that Rodin had ever received came this year from the Baron Alphonse de Rothschild.

Rodin's exhibits at the Salons of 1883-4 and 5 had awakened so much interest among art-writers that when that of 1886 came round, and nothing from his hand was seen, there was expressed a general regret. Allusions were made in regard to the superiority of French sculpture over the painting, to such men as Aubé, Dauzé and Rodin as its best representatives, and to the fact that the latter had not been justly treated in any respect by the art authorities of the Salon. In regard to the last allusion, it was prophesied that although it was a disgrace to art to quarrel over such a man, there was complete consolation in the belief that the great statues of the Calais Monument and the surprising compositions for the great door, upon which he was then engaged, and which would be shown to the public in a short time, would forever set at rest the criticisms which had begun on his first arrival in Paris with "The Age of Brass."

The fifth International Exhibition of Painting and Sculpture at the galleries of Georges Petit, in the Rue de Seize, was open at the same time as the Salon of 1886. Rodin had been invited to contribute, and he sent his bust of Dauzé and Beauforat and a number of small plaster sketches of figures belonging to his door. The appearance of these sketches was the signal for a more general and analytical examination of the sculptor's work, and for a renewed declaration of his superiority. At the close of a long article in the journal Le Voleur, Roger Marx, said: "When this door is completed, perhaps in 1889 for the great exhibition, we shall see what a master of the true French line Rodin is, and what he can do, one whom the sculptors keep at a distance—from fear or jealousy—and who will dominate them all by the incomparable strength of his talent, strange, original, and most distinguished lovers of art. But it was not until the next year, at the same place, that Rodin took the entire Paris world of art by storm—critics, amateurs, and the most distinguished lovers of art. Even the sober and age-regarding Gazette des Beaux Arts placed its pen of admiring servitude upon the now successful artist, by publishing the following article from the pen of Alfred de Lontelat: "Sculpture has for a representative, in the Rue de Seize, an artist of the first order who is rarely seen at the Salon, and whose fame has not yet passed the limits of the members of his profession and of the amateurs whose curiosity is strongly aroused. It is impossible in a few lines to analyse a talent so original and powerful as that of M. Rodin. All that we can say, is, that there will be a lively up- roar in our world of art when the great door that he is making for the Museum of Decorative Arts, and his group of the 'Men of Calais', are shown to the public. In the meantime we advise every one to go and see the plasters on exhibition, and in the galleries of Georges Petit, comprising fragments of those great works, and some finished pieces, the bust of Madam Rolli, and a group in bronze that Hoolow would have called the 'Kiss.' The value of these works strikes the eyes at once; one feels that they are the emanations of the brain of an artist haunted by grand and original thoughts, and in whose hands the finest fancies take a new and imposing movement. Happily, M. Rodin is not without his faults, and he has found a place for his exhibition that agrees with his temperament, for he is also a seeker, a revolutionary, if you will, who in sculpture aspires to deliver us from the Greeks and Romans. Let us salute this man of creations and with him the best of fortune."

Rodin's contributions to this exhibition were three of the statues, in plaster, for the Calais Monument, a sketch of the Lepage station, a marble bust of Madam Rolli, a group in bronze belonging to Baron Rothschild, two groups in marble, a statue called "The Source," and a number of figures and groups, in plaster, belonging to the door. The articles concerning this exhibition of Rodin's works embraced the whole gamut of praise, appreciation and encouragement; of cut- ting inscriptions to the Salon—filled with academical nihilities—and of bitter references to the shamful struggle that such an artist had had to pass through to get a foothold, even in beautiful Paris, and the surprise that the governing art authorities of the State had not discovered him long ago and filled his hands with the execution of great monuments. To some of the figures belonging to the door, that were...
in the exhibition of the previous year, an occasional allusion was made in regard to the unusual freedom of their composition and action, and the slightest hint was given that too susceptible minds might not look at them with as chaste a feeling as the sculptor intended to convey.

The same point was alluded to in reference to several works in the present exhibition. After paying his admiring respects to the busts of Auguste Rodin and Sylvain, Armand Seguy, the director of the Musée d'Art Moderne, says: "Then comes a series of works in plaster and marble that are evidently not intended to be used in the education of young girls." After describing a figure of Eve, belonging to M. Auguste Vaquerie, which, although round, is, beyond comparison, beautiful, he continues: "We now approach the Baudelairean series that begins with a magnificent plaster group, representing a vigorous man who has lived too much, with almost the same gathering and results as the fluttered, enervated and submissive woman. I cannot describe the trembling passion that is shown in this double movement of victory and defeat, with what fury this savage idyl is treated, the sharp and sensual pleasure foreordained for theólnor, and all the delights of human life for the enervated and submissive woman. I cannot describe the trembling passion that is shown in this double movement of victory and defeat, with what fury this savage idyl is treated, the sharp and sensual pleasure foreordained for the

What melancholy in this other figure of despair on the plinth, of which I read these lines: 'How many flowers exhaust themselves in perfumed regret like a sweet secret in the depths of solitude.'

"It is an Arlinea weeping for her absent lover? Rather a Sappho before being conquered by the virtuous love of Phoön. All this is but the threshold of the temple into which M. Rodin conducts us to the presence of the living gods of the flesh that are encircled by death and the goddess of immortality. Here I close all description. Never has physical love been treated with such truthful impetuosity, in such a sentiment of violence and despair. For there is a grand foundation of unsatis'fied desire and melancholy in these entwined bodies that stirrest with a reeking fume of wild kisses, kisses that burn rather than refresh the lips. The august fraternity and the mysterious parentage of Love and Death are proclaimed, without ceasing, in those strange images, in which a noble sentiment has given a relative chasteness. For the beautiful is always chaste to a certain degree, as Debret has said in an infinitely more picturesque language. In fact, all those little groups are incomparably beautiful. M. Rodin has himself to a greater artist than ever, and that is the essential thing, in spite of the shocking effect that sentimental miseries will experience as they wander through this labyrinth of plasters.

The chief object among the sketches belonging to the door was a group which the sculptor called "Francesca and Paolo," but which others variously named "The Lovers" and "Love." It was made in the studio of Rodin earlier that year and appreciated as "la Charmante" and published in La Justice —too long to reproduce at this time. A catalogue description of the group would read like this: A young girl sitting in the lap of her lover, arms of both entwined around the bodies and necks of each, kissing as only lovers can kiss — both figures nude. To proclaim such a group would be deemed vulgar, to same ones, a beautiful and chastel expression of the sentiment. The placing of the figures is, on the other hand, greatly barbarous, not because nude, the fact that it was a great piece of sculpture was almost entirely overlooked. Octave Mirbeau closed a brilliant article on the subject of these figures with: "Ah! what wither melancholy, and what love!" Still another group, more vividly or surprisingly dramatic, represented a female head of hell, or a syren of desperately sensual character, crouching through space carrying a bewildered lover upon her back. From the point-of-view of audacity of movement, nobility of line, dramatic force, living and human personality, the statues belonging to the Calais Monument were declared, by all writers, to be simply masterpieces. "No sculptor of modern times," they said, "has approached M. Rodin." "For richness of imagination, learned grace, robustness and power in the use of clay, and splendid truth in the representation of flesh, he has no equal." Say what you will, the world must recognize this grand artist.

In 1886, M. René Goblet, the Minister of Fine Arts, delegated Rodin, and his friend Laurens, to go to Bourges to act as the sole judges in awarding the recompenses at an art exhibition. There had been provided for their disposal a list of honorable mentions, and a Medal of Honor for each department of sculpture and painting. Now the good mayor of the city, who belonged to a noble family, had in his possession a work by Bourges, a name which the clan of professor of which was his personal favorite. As naturally water runs down hill, so did the mayor fancy that to the director of the school of sculpture and of the Department of Fine Arts would be the choice of the youthful and the bestiaries of the city. No other, indeed, is thus the district where the approval be entrusted? Both were doomed to disappointment, and their mortification cannot be described when they learned that the medal was given, as an answer to the unknown sculptor, who, as a poor marble cutter, had sent to the exhibition a statue of "Louis II," and some busts and bas-reliefs.

In honor of the expected distinction of his protégé, the mayor had prepared a sumptuous dinner for the evening of the day when the prizes were given, and to which the distinguished judges from Paris were invited, in company with the chief notables of the city. But the above unexpected and sorrowful event cast a very chill of death over the art professor and destroyed the joy of the gueens' official. But being a man of parts and undissembled courage, the mayor boldly and vigorously argued the art representatives of the State to reconsider their decision, but all without success. Neither rich viands, cheering wines nor official apology could move the hearts of Rodin and Laurens. Neither did this new disappointment deprive the host of all his wits, for he now asked them to explain why they gave the medal to the desired sculptor. To which Rodin answered, "Because he has the best things in the exhibition, yet you don't even know him or care to recognize him." And he added: "When you make another exhibition do it, first, for the benefit of your citizens, for their encouragement, then if you have not enough things and wish to send to Paris for more, get the best, and not the poorest, as you have now done. You ought to be proud to have a young man in your city who can show such a statue as the 'Louis II,' and the busts and bas-reliefs." This was a pretty severe lesson for the good mayor, but he bore it well, agreed with its good sense, and promised to follow Rodin's advice in the future.

Balfour, was the name of the young sculptor. He afterwards came to Paris, got mixed up in politics and attempted to kill a member of the French Legislature. He came originally from the same place, and, because he revered in the terms of that personage and was, by man, considered crazy. So, incidentally, Rodin and Laurens encouraged a mad man.

T. H. Bartlett.

(To be continued.)

THE LOTUS IN ANCIENT ART--IV. THE LOTUS AND THE PALMETTE.

1. THE object of my last paper was two-fold—to eliminate the supposed papyrus from the list of Egyptian decorative motives, and to add to them the rosette as a picture of the ovary stigma of the white and blue lotus, how propose to explain the origin of the Egyptian lotus palmette. This will be found subsequently to bear on the development of the Assyrian palmette and of the Greek antherakon. The matter already offered on the subject of the Egyptian Ionia will explain such voluted lotus forms as are seen in 1 and 2.

There may also be understood as lotuses, and as regards the exterior volutes, from the form 3. No. 1 is a voluted lotta supporting a seed of the rose lotus (from the "Description d'Egypte," V, Plate 80). No. 2 is a voluted lotus supporting an inverted bud (from Prisse d'Avennes)—cases analogous to those illustrated in the last paper.

No. 3 from Prisse d'Avennes, then appears as a voluted lotus supporting the ovary stigma, a case analogous to the lotus flowers and buds supporting rosettes previously illustrated. No. 5, an Egyptian palmette of the eighteenth century a. c. (Prisse d'Avennes), one of the commonest motives of Egyptian decoration, is thus explained as a lotus palmette in which only a portion of the rosette (ovary stigma) appears in plan, the rest being concealed by the flower.

In Egyptian-Phoenician decoration No. 6 is a common and related lotus palmette, differing only by the absence of volutes. The detail shown in this case is a shield found at Amathus, in Cyprus. No. 7 is seen to be either an abbreviated and conventional outline of 6, or within an inverted bud as placed in illustration 8. The pyrogle of the palmette may represent a portion of the top of the seed-pod of the rose.
The geographical position of the Phenicians on the Syrian coast, midway between Assyria and Egypt, made them the natural mediators between the civilizations of the two countries.

Objects of Egyptian style are found in great number among the Assyrian remains, and the influences of Egyptian ornament on the Assyrian art are universally admitted.

Among these ornaments of admitted Egyptian origin are the Assyrian lotus motives, to which I have referred in the preceding article, and which the outlines of the Assyrian palmettes have an undeniable resemblance to the form of the palm-tree, as represented on Assyrian reliefs (see illustrations in the first paper on the Ionic capital), but there are absolutely no traces of a decorative development by which the ornamental palmette form was evolved from the natural palm-tree. Above all there are no cases in which the palm-tree itself is used as an ornament, while the instances to be quoted for the natural lotus form are simply innumerable. Symbolical use of the palm can probably not be shown to have been frequent much earlier than the Christian era. There are one or two rare instances of palm-trees on the Assyrian or cylinder seals, but these are cases in which the natural aspect of the tree is fairly represented. The palm-tree proper appears in the Assyrian sculptured reliefs purely as part of the natural scenery, and never as an ornamental detail.

On the other hand, the resemblance of the Assyrian palmette to certain forms of the Egyptian lotus palmette is so close that a derivation of the one from the other appears absolutely certain.

The Egyptian sacred tree is a palm, and the Assyrian palmette is a palm, the Ionian palmette, however, is derived from the palmette of the lotus capital, the Egyptian lotus motive, and this latter motive is derived from the lotus capital, the Egyptian sacred tree.

The Assyrian “Sacred Tree” combination of palmettes offers a new argument in favor of the lotiform character of the Assyrian palmette. The two typical forms of the Assyrian “Sacred Tree” are shown at 21 and 22.

I am advised by a competent Assyriologist, Prof. A. L. Frothingham, Jr., of Princeton College, that the cuneiform texts offer no information as to the name or origin of the “Sacred Tree,” and that it does not appear in the earlier Chaldaean period. This is also apparent from what has been said as to the late appearance of the palm-tree form in the Tigris-Euphrates valley. So many Chaldaean scholars have been found, that they furnish fair negative evidence as to the appearance of the “Sacred Tree” of palmettes in earlier times than the ninth century B.C.

It is clear, however, from the monuments that the “Sacred Tree” of palmettes is connected with the worship of the sun, as the winged solar disk frequently appears above it and the attendant worshippers (see the plates of Layard). The relations of the lotus to the solar cult of Egypt have already been explained (first article on the Ionic capital), and the same relations appear in the art of the Phenicians. Figure 23 represents a Phenician relief from the neighborhood of Carthage, in which the solar disk and crescent appear with the lotus. We have found an illustration of the lotiform significance of the Ionic capital in the support of the solar disk in the Sippura tablet.
The indicated is a connecting lotuses represented on the Ionic stile supporting the crescent and the solar disk (Figure 31, second article on the Ionic stile) in the appearance of the solar disk and crescent on Ionic stiles and capitals of Cyprus (Figures 10 and 36 of the same article); in the Ionic capitals supporting the winged solar disk at Bogazar Kerv (Brittle relief, Figure 33, same article); and in the lotus-Ionic stile, with head of Isis (moon-goddess, Figure 11 of the same article). Finally, Assyrian seals and cylinders are extant in which the lotus flower itself is represented before the worshipper of the winged disk or of the crescent-moon.

To these indications that the "Sacred Tree" of Assyria is a phase of the same associations between the lotus and the worship of the sun which are otherwise proven to exist for Assyrian, Phoenician and Egyptian art, still others may be added. Worshippers of the "Sacred Tree" held branches represented at 25, 26, 27, 28 — details taken from plates in Layard. These branches represent ceremonial or symbolic insignia, probably in metal, borne by the worshippers or priests. No. 25 is a branch of lotus flowers with rosettes (ovary stigmas) at their base. No. 26 represents a branch of lotuses with rosettes and lotus buds. No. 27 is a branch of lotus rosettes; 28 is a branch of lotus palmettes.

The association with another argument may be added. An object frequently held by the divinity facing the "Sacred Tree" has been generally interpreted as a fir-cone. This interpretation has been suggested by a purely external resemblance, and there are absolutely no symbolic or ornamental forms which would explain the use of such an attribute. No coniferous fir-trees are represented in the Assyrian reliefs, according to a recent article in the Babylonian Record. The lack of authority for this interpretation, and its want of meaning, have lately prompted the suggestion in the Babylonian Record that a citron is indicated.

No. 29 is a detail of the bud-shaped object held by the divinity facing the Sacred Tree.

An obvious interpretation of this supposed fir-cone is suggested by the treatment of the lotus bud in Assyrian relief. No. 30 is a detail from the lotus decoration of an Assyrian slab in the Metropolitan Museum of Art. Examination of the Assyrian lotus patterns, as published by the various compilations of the history of art, or by Owen Jones, will show that this treatment of the lotus bud is general in the Assyrian reliefs.

The bud-like form of the rosette and its resemblance to a tulp have been noticed by botanists, and are apparent to any one examining the plant. (The buds of the blue and white lotus have a more elongated form.) The sketch herewith at 31 was taken from nature in the Illy-ponds at Bombelier, N. J., by Professor Frothingham. The naturalistic tendencies of Assyrian art are well known, and the hatched lines of the Assyrian reliefs may be safely supposed to imitate the appearance of the natural bud, as represented at 31. Professor Frothingham's interest in my theory, shown by his sketch, may be regarded as an indication that it is not repugnant to the present known facts of Assyrian science. There are Assyrian tile decorations in which the winged divinity holds the bud-shaped object facing a rosette, another case of lotus association according to the views presented in my last paper.

It may be urged, in the next place, that the different forms of the "Sacred Tree" are brought under a common explanation as to origin by the theory proposed. That certain "Sacred Trees" should represent combinations of fir-cones, as in 22, and that others should represent combinations of buds, is an unexplained and inexplicable state of affairs. Still more incongruous would be the association so commonly seen in Assyrian decoration, and represented at 22. Why fir-cones should stand for Chigir Tree, is a point easy to understand. That lotus buds should spring from a lotus-palmette is easily understood. The representation of lotus buds in the branch figured at 26 appears to be a conclusive point, and it may be observed that a similar treatment of the lotus bud is occasionally found in Egyptian design.

It thus appears that the derivation of the Assyrian palmette from the Egyptian lotus-palmette is rendered probable by the close resemblance of the forms, by the precedence of the Egyptian motive in point of time, by the known direct relations of Egypt to Assyria under the eighteenth dynasty as a conquering power, by the dependences of the Assyroites on Egyptian-Phoenician influences in ornament, and by the various considerations which substitute a relation of the lotus to solar worship, known to exist at once in Egypt, Phoenicia, and Assyria for an interpretation of the "Sacred Tree" without authority and without probability.

The sacred character of the lotus "tree" is illustrated by a series of ivory plaques in the British Museum which were probably lustral decorations of furniture, possibly of a throne. One of these is shown at No. 33, an adorer before a lotus, which rises from the conventional form of lotus volutes and triangle explained in the matter relating to the Ionic capital. The Egyptian style of this ivory plaque, which is probably of Phoenician manufacture, speaks for itself. It is from this series of Egyptianizing ivory plaques that the details are taken on which Mr. Clarke relied for his connecting link between the form of the Chigir capital and the form of the Assyrian palmette. A connecting link between these two forms of lotus-palmette is undoubtedly is.

It is clear that we are dealing with a motive analogous to 35. This motive is an Egyptian variant of designs like 8 and 12, and is taken from the metal designs of the Regeulini-Galasi tomb. Thus the Ionic capital, took its place among the forms of the lotus-ionic, and is seen to be simply a variant of that aspect of the Corinthian feature. The Corinthian prototype, Proto-Ionic already dealt with, in which the triangle between volutes is the distinguishing feature. One more of these latter motives is shown at 36, also from one of the Egyptianizing ivory plaques of Ninveh in the British Museum, in order to exhibit the contrast and unity of derivation which can be shown to exist within the limits of the lotus motive for the various forms of the Proto-Ionic capital.

The development of the Greek anthemion will be found to bear also a position in this way. The first prototype is seen in the Chigir capital. It is a composite element which, being in Ionia, is Herculean. A reactive and secondary influence of the Assyrian palmette on the Greek anthemion may be readily conceded, but its supposed original relations with Assyrian art will be found to be unsubstantiated, and its connection with the Egyptian lotus-palmette will be demonstrated beyond peradventure.

W. H. Goodyear.

[To be continued.]
On the road to Milan and Venice, the most interesting city that is encountered, from the point-of-view of history and of art, is Verona, sitting on the banks of the River Adige, which separates it into two unequal parts, the smallest of which is called Veronetta. The bridges serve to connect these two fragments of land with its ancient towers and crested walls garnished with loopholes, pre-empts a monumental and severe aspect which at first sight recalls the physiognomy of towns of the Middle Ages. Through the mixture of sumptuousness and more austere aspect, we understand why it was the seat of the power of the Scaliger family, the most illustrious, and perhaps the most powerful of the Republics of the Lombard League. Atterto has been justly called the Augustus of the Middle Ages, since he was the head of a veritable literary court, at which Dante, the grand Italian poet, and all the other illustrious men of that age rendezvoused. Today Verona is not of its vast extent, so little proportioned to the reduced number of its population, contributes to impress upon it a painful air of desertion and irrecoverable decadence. The streets of the unworldly town and the squares are so vast that, as resident Des Brosses said, there could be built in them entire villages.

The origin of this city is very obscure, but it is the most reasonable tradition that the inhabitants are descendants of the Etruscans, which population had its cradle in a group of grand and fertile mountains, whose silhouette shows itself a short distance beyond Padua, on the banks of the Bochignione. About the second century it was already a city of some note, and when it fell under the power of the Romans it did not long delay in acquiring municipal dignity. In 556 it became the capital of the Lombard Duchy, and under the successors of Charlemagne it was the capital of the Lombard Kingdom. From this time dates the commencement of its real splendor. After having formed a part of the Lombard League against Barbarossa, it fell under the power of the Scaligers, whose vicissitudes were largely identical with those of the Scaliger family. Atterto, its most celebrated poet, was the capital of the Scaliger family during the three centuries that they reigned, from 1286 to 1387. The Scaliger family, who were the most illustrious in history of the Scaliger family, was an important place in the history of art. Roman domination left here visible traces in some of the monuments religiously preserved, especially the arena, which is assuredly one of the finest remnants of antiquity. Later Verona found itself at the point of junction of Byzantine and Gothic art, whose coming gave birth to the Lombard style which from the foot of the Alps spread throughout the whole of Italy between the eleventh and the twelfth centuries. The Lombard art was the transformation which Italian genius impressed upon it in proportion as it penetrated farther into the depths of a nation always rebellious, in matters of art, against foreign influence. Renaissance assumed the form of an art essentially national in its characteristics, Verona lost much of its importance; but it had a sufficiently large tribute to the artistic progress of the nation and especially to architecture, for besides Falconetti, who is one of the most distinguished architects of the sixteenth century, it also saw the birth of Fra Giocondo, who built the bridge of Noire Dame at Paris, and Michel San-Michele, who died in 1569, whose brilliant career we will trace later on, and who disputes with the famous Palladio of Vicenza the title of the Viru, or the monumental aspect. The Austrian domination, entirely repressive and retaliatory in its nature, prevented this interesting city from following the social progress realized in other civilized countries. Under the Austrian despot the people was forced to vegetate in fear, without initiative, without exercise, and so long as the oppression to which it was subjected endured, it underwent a period of arrest, at which period a large part of the city was to be in the same condition as at the moment of its entrainment.

The history of the arts and especially of architecture gained, for it is due to this stagnation of Italian genius, a great measure of Italian style, when it is in the original and characteristic physiognomy which they had in former times, and which now is rapidly beginning to disappear. Rome, for example, is becoming more and more little unmistakable, and the race of which its municipal authorities are animated, and which is inspired, it must be confessed, by a very praiseworthy desire to beauty and renew, is exercised, nevertheless, in such a vehement and lucid manner that the grand old Italian cities where a need is felt is making good lost time and effecting the stamp of varied picturesque which the mighty ages of art have impressed upon it.

Fade outside these great currents of modern life, Verona has in many ways partly escaped this mournful municipal sickness, and its homes still preserve in part the souvenirs and at the same time graceous proportions which they had in former times. The three streets which descend from the houses, whose brown color is relieved by the sparkle of the pots of flowers which garnish them. The marble pillars, the flower-beds, and the light wind which makes the foliage of the maple still embellished with fresco, degraded by age and bond weather, and the magnificent tombs of the Scaligers, which are to be found right in mid-street, all recall to the imagination those agitated times when civil discord and feudal quarrels shook the soil of Italy with human blood; when the cares of cultivated men were divided between love and war, and the patrician went out by night with a rope-ladder in order to take his pleasure in the pleasures of the baths at the feet of the lady of his thoughts. Involuntarily I think of the terrifying hatreds of the Capulets and Montagues, who divided Verona into two factions always armed one against the other in this city as in the other cities of the Middle Ages. This was described by Shakespeare in the subject of his immortal drama. The fame of Romeo and Juliet still lingers persistently amongst the Veronese, and the young girls cannot be more unfortunate from the fear of the thoughtless. It is on this account that in Verona there be somewhat on his guard against local legends, which popular faith, jointed with a spirit of speculation, has invented and fixed tenaciously on certain monuments or buildings, and people have always associated with them the name of a poet or a king. Juliet is well it, also, to apply this feeling of distrust wherever one travels in Italy to almost all the monumental relics which the rapacity of local showmen has nearly succeeded in uniting with the fame and reputations of localities, and to this one attribute. It is in Florence, near the cathedral, the stone upon which Dante used to sit and dream before his exile; and at Ferrara a guide conducts the traveller into the houses of the Scaliger family, as one of the houses of his visit to Shakespeare the subject of his immortal drama. The fame of Romeo and Juliet still lingers persistently amongst the Veronese, and the young girls cannot be more unfortunate from the fear of the thoughtless. It is on this account that in Verona there be somewhat on his guard against local legends, which popular faith, jointed with a spirit of speculation, has invented and fixed tenaciously on certain monuments or buildings, and people have always associated with them the name of a poet or a king. Juliet is well it, also, to apply this feeling of distrust wherever one travels in Italy to almost all the monumental relics which the rapacity of local showmen has nearly succeeded in uniting with the fame and reputations of localities, and to this one attribute. It is in Florence, near the cathedral, the stone upon which Dante used to sit and dream before his exile; and at Ferrara a guide conducts the traveller into the houses of the Scaliger family, as one of the houses of his visit to Shakespeare the subject of his immortal drama. The fame of Romeo and Juliet still lingers persistently amongst the Veronese, and the young girls cannot be more unfortunate from the fear of the thoughtless. It is on this account that in Verona there be somewhat on his guard against local legends, which popular faith, jointed with a spirit of speculation, has invented and fixed tenaciously on certain monuments or buildings, and people have always associated with them the name of a poet or a king. Juliet is well it, also, to apply this feeling of distrust wherever one travels in Italy to almost all the monumental relics which the rapacity of local showmen has nearly succeeded in uniting with the fame and reputations of localities, and to this one attribute. It is in Florence, near the cathedral, the stone upon which Dante used to sit and dream before his exile; and at Ferrara a guide conducts the traveller into the houses of the Scaliger family, as one of the houses of his visit to Shakespeare the subject of his immortal drama. The fame of Romeo and Juliet still lingers persistently amongst the Veronese, and the young girls cannot be more unfortunate from the fear of the thoughtless. It is on this account that in Verona there be somewhat on his guard against local legends, which popular faith, jointed with a spirit of speculation, has invented and fixed tenaciously on certain monuments or buildings, and people have always associated with them the name of a poet or a king. Juliet is well it, also, to apply this feeling of distrust wherever one travels in Italy to almost all the monumental relics which the rapacity of local showmen has nearly succeeded in uniting with the fame and reputations of localities, and to this one attribute. It is in Florence, near the cathedral, the stone upon which Dante used to sit and dream before his exile; and at Ferrara a guide conducts the traveller into the houses of the Scaliger family, as one of the houses of his visit to Shakespeare the subject of his immortal drama. The fame of Romeo and Juliet still lingers persistently amongst the Veronese, and the young girls cannot be more unfortunate from the fear of the thoughtless. It is on this account that in Verona there be somewhat on his guard against local legends, which popular faith, jointed with a spirit of speculation, has invented and fixed tenaciously on certain monuments or buildings, and people have always associated with them the name of a poet or a king. Juliet is well it, also, to apply this feeling of distrust wherever one travels in Italy to almost all the monumental relics which the rapacity of local showmen has nearly succeeded in uniting with the fame and reputations of localities, and to this one attribute. It is in Florence, near the cathedral, the stone upon which Dante used to sit and dream before his exile; and at Ferrara a guide conducts the traveller into the houses of the Scaliger family, as one of the houses of his visit to Shakespeare the subject of his immortal drama.
very common to the princes of that time, forced for the most part to display, not their virtues, but the level of the brutal and villainous passions of their contemporaries.

Mastino I, founder of the dynasty, was killed in 1277. After his death his son Paolo, his brother Albert, who had inherited the fortune, died a natural death in 1301. Three of his children, Bartolomeo, Albino and Can Grande, ruled in succession. Bartolomeo remained three years in power, and it was under his reign that Dante first came to Verona. He also died in bed—a rare thing in that family. Albino ruled only under the direction of his brother. He was frail and sickly by nature, and after the death of Bartolomeo he governed himself. Finally Can Grande succeeded him, found himself at odds with the two sons of Albino and with another of his nephews, who disputed the throne with him. He finally gave up the struggle for the crown, having many other intentions of passing the sceptre to the hands of his natural son, because he had no legitimate children, he was pontifical by Can singoria, his second brother, who desired to rule after him, and who, to enjoy in peace the fruits of his crime, caused to be imprisoned at Peschiera and finally strangled his brother Pietro, who would have been able in his turn to dispute the throne. In spite of this double failure, Can singoria was in the main a virtuous prince. He avoided war, and did everything in his power to agrandize the power and prosperity of Verona. It was the fashion of the times; each one wished to be an Augustus or a Marcus Aurelius, but he also wished to be the Augustus or the Marcus of the eligible means, even if they were criminal.

The two natural sons of Can singoria, Bartolomeo and Antonio, were the last fruits borne by this dynasty, which, having its birth in crime, perished in blood. Antonio, in order to rule undisputed, cut the throat of his brother Bartolomeo, who was himself dethroned in 1387, and died by poison a year afterwards.

The first one to whom the Middle Ages in Italy reawed alters and erected monuments. In the tombs of the Scaligers there have been successively deposited the ashes of nine members of this dynasty of the Aviti. These tombs are not enclosed by a very beautiful wrought-iron screen; but the most interesting for those who study history and architecture is that of Can Grande, which dominates the others, and has a truly monumental air. It is a sepulchre built after the then accepted proper form, and which has been sensibly from that which at almost the same time flourished in central Italy and especially in Tuscany. In his masterly study on Donatello, D. E. Muntz very carefully and justly characterizes the difference between these two schools; and it is from him that I borrow this definition. He very justly remarks that of the two principal types of funerary monuments obtained in Italy during the Middle Ages one is the manseum planted against the wall, which consists only of a facade more or less richly decorated, and of which Tuscany can claim the invention. Armando di Carlo, a Florentine sculptor, has found a kind of monument in the last years of the fourteenth century in the tomb of the Cardinal de Brayus. The other is a manseum isolated on all sides and containing under a kind of baldacchino a sarcophagus with the cofnicate figures of the deceased and another statue of a same person, most frequently on horseback. This original conception finds its most eloquent expression in the tombs of the Scaligers, but it has been revealed in the tombs of the Aviti in Milan, and King Louis XII of France introduced it in the tomb which he caused to be erected at St. Denis.

At the top of the tomb of Can singoria stands the equestrian figure of Can singoria himself, whose image is also introduced on the majority below.

While the Royal Society. — Mr. Whistler and the Royal Society of British Artists have been fighting, it would appear, about a lion in a picture which has been purchased by a rich man, his name engraved on the marble board, and appended a butterfly, more suo, as its emblem. According to the president of the Society, the design was made in 1856, while Mr. Whistler, according to the presiding officer, was the subject of the lion and effaced the butterfly. The Times has been publishing quite a lively correspondence on the subject, but, ultimately, the Society decided in favour of the lion. So, the Society has painted a fresh notice board, and had they sold the old one...

ELASTIC SANDSTONE.—What is known as "Sialsolite," or elastic sandstone, is found in California, Georgia, and other localities in the United States, and a whole mountain of it, it is stated, exists in South Carolina. In the neighborhood of Charleston, it is said, a large distance away from the source of supply, it is nearly always to be met with in regions producing the diamond, and is the reputed matrix of that gem. A piece of this elastic sandstone, 10 inches long, 1 inch thick, and 1 inch wide, was found in the Mining and Scientific Press (San Francisco), which is as flexible as a piece of India-rubber. Another piece, 13 inches long, 2-1/2 inches thick, and 3 inches wide, was found at the United States War Department, Washington, and said to possess equal flexibility, but being, without doubt, a genuine stone. No practical use has yet been made of the substance, and its elastic foundations for machinery, to prevent vibration, such as are now being introduced in America. At any rate, it is a geological curiosity. — The Builder.

TRADE ELICIDE.

Advises recently received from quite a number of manufacturing and mining companies state that it is very inconvenient to engage in trouble with wage-workers during the season. In some quarters fees are expressed, but they are not well founded. There is a disposition among manufacturers to endeavor to strike if advantage offers; but at the same time there is a feeling among both leaders and the membership that this is a question which cannot be decided. It is true that the most important movement on foot is pushed by the Amalgamated Iron and Steel-workers to shut down the rolling-mills of the country for two months during the summer, but the subscription, as the struggle closely adapted itself to this annual suspension, and feels no bad effects. The iron-workers do not own the ore, and have no power of position to resist them who would undoubtedly do so. As it is, their organization is powerful enough to exist for a long time. The iron-workers probably have the matter in their own way. It is scarcely probable this movement will affect the other industries, although it is well known that in a good many branches of trade workmen would welcome a few months' suspension during the summer, especially those who are able to afford it. In the building trades there is no such demand. A careful search among artisans, in which there is the most danger to be apprehended, shows that the arrangements made for the early spring will be continued throughout the season. There is no sign of any difficulty, and the fact that the prices of material fell last week made next spring to reduce the hours of labor. Many of the leaders among the wage-earners who have not yet declared their intentions have recently expressed their willingness to give it their sanction. A trial will probably be made. The better industrial conditions in foreign markets have not as yet apparently reduced the outflow of labor, as much of it comes from agricultural regions where ordinary industrial conditions do not induce movements. It is feared that the high cost of living during the summer, if it does not affect all, will at least few diminishes will come from the larger cities and towns of Great Britain and the Continent. There is in general more employment and better pay. The workmen prefer to remain at home where there is work for them, as the fact is becoming more and more apparent to them that the apparent advantages of higher wages are more or less counterbalanced by the cost of living. The duties which has existed in the industries engaged in iron-making still prevail. As a matter of fact, the recent advance in wages has been, as all are anxiously awaiting the word "Go." It may not be given for some time to come. Perhaps never was there moreacon, but the object is to continue the movement throughout the season. If the wages were kept down, there are many arguments that the miners and the enterprise of the country are only awaiting a favorable opportunity. Meanwhile, reports from building centers, where, it is said, that house-building was never more active than it is so far. Very large contracts have recently been closed for lumber in lumber centres in Albany and other places. The graft in lumber trade is great activity. A kind of fund speculation is in progress there, and it has been reported recently by the brokers and others that the fat would fill the mills and factories of the countries becom- with this button on— they would have made money by the trans-
The exterior of this house is stained with **Cabot's Creosote Stain** for Shingles, Fences, Clapboards Etc.

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply. Our Stains contain no water and are the only exterior Stains that do not contain kerosene.

**Prices** are 40, 60 and 75 cents per Gallon according to Color.

**Send** for Samples on Wood, and Circulars.

**Samuel Cabot**

70 Kilby St., Boston, Mass.
From the Church of St. Denis.

From Revol, "Architecture Romane.

Column found in the Hall of the Louvre.

Capital, Old Chapel, Hotel Dieu, Paris.

CAPITALS.
The Sturtevant System of Heating and Ventilating.

The necessity of mechanical ventilation in all cases where positive action is required is becoming more and more keenly felt every day. Particularly in this vicinity, has the discussion of the new Suffolk County Court-House and the condition of our public school-buildings brought the subject into prominence.

The only accepted and economic means of mechanically ventilating is the fan. If, in conjunction with the fan and ventilating system, the heating system can also be operated, there is not only a marked saving in expense, but a combined system is formed which heats and ventilates with the maximum of efficiency. It has been the common practice among many architects and contractors to purchase the fan of one party, the heater of another, the engine of another, and so on. To meet the requirements, and, at the same time, reduce the cost to a minimum, this house has for years manufactured what is known as the Sturtevant Steam Hot-Blast Apparatus. This line of manufacture was started nearly a quarter of a century ago, and since that time over five thousand of these apparatuses have been sold. They are now to be found in use in buildings of all classes, from the machine-shop and foundry to the largest and finest public buildings, theatres, etc.

Radical changes have very recently been made in the entire apparatus, and it is now presented in the improved form, as shown in the accompanying cuts. The small cut represents the apparatus complete. It consists in its several parts of a steel pipe steam-heater (shown in larger scale herewith), a fan, and an engine. The heater is constructed upon a series of cast-iron sectional bases, into which are screwed vertical rows of steel pipe, connected at the top by cross-pipes. The course of the steam is clearly shown, the steam inlet and drip being in the same header connecting with the series of sections. The fan is specially designed for handling large volumes of air at a minimum expenditure of power. It is lightly but strongly built of steel plate, and stiffly braced. The engine is of the best type, embodying the results of years of experience in fan-propulsion, and is capable of continuous running at high speed. When or fouls to the various rooms. The admission of warm air to these rooms is regulated by registers or by dampers in the flues. The peculiar advantages of this system consist in the much reduced amount of heating-surface required, the positive and absolute ventilation and heating of the apartments, the removal of all the steam-pipes from the rooms, and the placing of the control of the entire system in the hands of a single person.

It is adaptable to all classes of buildings, and this house is prepared to put in complete ventilating and heating plants, comprising boilers, engine, heating and ventilating apparatus, return water apparatus, flues, registers, etc. A very complete and comprehensive description of this system is contained in a large eighty-page, illustrated "Treatise on Ventilation and Heating" issued by this house. A copy will be mailed upon application.

R. P. STURTEVANT,
BOSTON, MASS.

Rubber Goods.

The New York Belting and Packing Company, New York, enjoy the reputation of making the finest mechanical rubber goods in the world, and also the rare faculty of knowing just how to let the public become aware of it, through liberal and judicious advertising and capable, energetic representatives. Their latest lucky stroke is in having secured as their Southeastern agents the Atlanta Rubber Company, of Atlanta, Ga., who conduct the only jobbing business in rubber goods in the entire Southeast. This firm will carry at Atlanta a very large stock and complete assortment of the New York Belting and Packing Company's vulcanized rubber goods, from which orders can be filled without an hour's delay—a fact of interest to everyone who handles or sells mechanical rubber goods in the Southeast. During their existence of some six years they have built up an excellent name for square-dealing, careful and prompt attention to orders and business courtesy. The New York Belting and
Packing Company is to be congratulated in securing their services, as the New South is fast developing its manufactures, and will constantly demand more and better supplies of all kinds, and no one is in a better position to advance their interests in this territory, than these new agents.

NEW YORK BELTING AND PACKING CO.,
12 FIFTH AVENUE, NEW YORK.

TIMBY'S LATEST AUTOMATIC LOCK.
FOR SINGLE-SASH WINDOWS AND DUMB-WAITER DOORS.

In response to numerous calls from architects and builders, as well as private individuals that contemplate erecting dwellings or business blocks during the coming season whose plans specifically call for single-sash windows, this lock has been specially designed and placed upon the market.

There are many reasons why the heavy oak or other hard-wood single sash, are being substituted for soft-wood double sash for windows in many of the costly blocks, and residences now in process of construction in different parts of the country. Everything considered the single sash makes a very handsome and desirable window and the number used is rapidly increasing. But the question of a suitable locking device for such sash has been a puzzler. From amongst all the "centre sash facts" in the market, and their name is legion, not one can be selected that can be applied to a single-sash window, or a lifting dumb-waiter door. It must be admitted that for all practical purposes, a window should be locked, as that a door should be, and while it is important that the lock used should be strong, and substantial, it is of the highest importance that it should be automatic in its action, locking the sash securely when closed, and just as securely when open for ventilation, or other purposes.

The "Timby" Single Sash Automatic Lock, accomplishes all that can be desired in this direction. It is a mortise lock, entirely novel in construction, extremely simple in all its parts, applicable to any window, perfectly automatic in its action and when set in the stile of the frame, and the sash adjusted in position, as it is in the house, that remains in sight is the operating device. The accompanying illustration represents a section of window frame with the lock applied to the left-hand stile.

The positive automatic action of the bolt, makes it simply impossible to raise a sash from the outside two or four inches, when the door has been left slightly open by the carelessness of servants, or others for purposes of ventilation. If by the accumulation of ice or snow under a sash it cannot be perfectly closed, and the bolt does not enter the socket in the sash, should a person from without attempt to raise it, the bolt would automatically return to the lowest point, and prevent the possibility of raising the sash farther.

The sockets in the edge of the sash are provided with heavy metal plates, or bearings, secured in proper position at different points by screws. The heavy bolt of the lock is projected automatically into the same, thus locking the sash at different points of adjustment.

Particular attention is invited to the great strength of all the component parts of this lock. Its wonderful simplicity, and ready adjustability to any window, the bolt being of sufficient strength to withstand more than a thousand pounds pressure. The mechanism of the operating device is novel in the extreme; externally, the appearance is simply that of a thumb-nut, resting upon a plate beneath.

Suspended from the extreme inner top of the thumb-nut is an adjustable lever extending downward within the walls of the nut, and far enough below the plane of the face-plate to admit of an adjustable connection with the extended arm of the lock proper. The rocking or semi-rotary motion of the bolt arm, sufficient to withdraw the bolt from the socket, and thereby release the sash is produced by sliding the thumb-nut downward, which, having a leverage of nearly two inches, the greatest possible ease of operation is assured. This new lock is a recent invention of Mr. T. F. Timby, N. Y., but it is a separate and distinct invention from the burglar-proof sash-lock and ventilator.

Three different sizes of this new lock is manufactured.
1. No. 1, being for the heaviest hard-wood single sash.
2. No. 2, for medium weight.
3. No. 3, for dumb-waiter doors and ordinary single or double sash windows.

Descriptive circulars and price list of this new lock may be had by addressing the manufacturer,

1. G. JENNINGS,
OWNED, NEW YORK,
or T. F. TIMBY, MANAGER OF THE NEW YORK CITY OFFICE,
102 CHAMBERS STREET, NEW YORK CITY.

ELECTRIC TIME SYSTEM FOR PUBLIC BUILDINGS.

Architects are without doubt aware of the growing demand for a good system of Electric Time for Public Buildings and Factories.

The "Warner" system, supplied by the Standard Electric Time Company, of New Haven, Conn., meets this demand in a most satisfactory manner and has attained an enviable reputation for good and reliable service wherever it has been used.

A close examination of the system will show that it is an excellent substitute for the ordinary clock, and can be used on any building or in any part of a factory. The clock is placed in a central point, and is controlled by means of a switch-board, which is placed in a convenient position, either on the wall, or on a central pillar. The switch-board is a simple construction and shows the condition of the battery at a glance and a small indicator clock which always shows the condition of the secondary clocks throughout the circuit. An alarm-bell is also attached which gives immediate warning in case the service fails from any cause, whether failure of the battery or breaking of the circuit wire.

When it is desired to introduce a regulator as the master-clock this company furnishes a fine self-winding regulator with the switch-board system inclosed in its case. This way no care is necessary except to replenish the batteries once in eight to eighteen months, as the alarm-bell will call attention to it in case anything goes wrong.

This system of time is used by the N. Y., N. H., & R. R. Co., and many others, and has never failed to give complete satisfaction. In cost it will compare favorably with any electric clocks ever offered to the public and is considerably less than any other system capable of giving even fairly good service.

THE STANDARD ELECTRIC TIME CO.,
NEW HAVEN, CONN.

REMOVAL.

Or about May 1, 1889, I shall remove my business to 66 BEKEMAN STREET, a much more commodious and desirable place than that which I now occupy.

I desire to thank my friends and customers for their past favors and take pleasure in stating that it is my desire to give every facility to my new place of business. As a housekeeper I shall take pleasure in giving personal attention to all work entrusted to my care, and in my new place shall be able to show the different sanitary appliances which I have now manufactured and make an especial advantage of for the sake of the public.

After June I shall be able to show all the standard closets of first quality in the market, and be able to keep on hand a full line of plumbing fixtures. All material sold and all work done by me will be guaranteed.

LEONARD D. HOSFORD,
66 BEKEMAN STREET, NEW YORK.

NOTES.

The Whittier Machine Company have recently put into the building of Messrs. George C. Goodwin & Co., on Hanover Street, Boston, a belt elevator for freight service.

All Saints' Church, Richmond, Va., from plans by M. J. Dinnock, architect, has recently been completed and dedicated. The building of this church has been entirely decorated and furnished by Messrs. J. & R. Lamb, of New York. The work includes all the glass windows, the color decoration of the walls, and all the chancel furniture in carved oak. The result obtained is very consistent and harmonious.

Messrs. Somers, Lindeman & Co. have taken the position of incorporating their Liquid-Filler, or "Lin-" as a demand that they are willing to sell it to responsible parties, subject to their approval. It obviates the necessity of rubbing off—a very expensive task. It is an excellent substitute for white shellac. It can be used on the lightest wood without dis-coloring it; it is entirely transparent; hence does not cover up the finest figures of the wood; it effectually prevents suction or absorption. One coat of Liquid-Filler and one coat of varnish will make an excellent finish, presenting sufficient body on which to rub.

The attention of manufacturers, importers and dealers in building materials and appliances is invited to the advertisement below, the "Lin" is a guarantee that they are willing to sell it to responsible parties, subject to their approval. It obviates the necessity of rubbing off—an expensive task. It is an excellent substitute for white shellac. It can be used on the lightest wood without discoloring it; it is entirely transparent; hence does not cover up the finest figures of the wood; it effectually prevents suction or absorption. One coat of Liquid-Filler and one coat of varnish will make an excellent finish, presenting sufficient body on which to rub. The attention of manufacturers, importers and dealers in building materials and appliances is invited to the advertisement below, the "Lin" is a guarantee that they are willing to sell it to responsible parties, subject to their approval. It obviates the necessity of rubbing off—an expensive task. It is an excellent substitute for white shellac. It can be used on the lightest wood without discoloring it; it is entirely transparent; hence does not cover up the finest figures of the wood; it effectually prevents suction or absorption. One coat of Liquid-Filler and one coat of varnish will make an excellent finish, presenting sufficient body on which to rub.
THE SANITAS MANUFACTURING COMPANY.

SANITAS SINK AND FLUSH-POT.

This new device has successfully solved the problem of the disposal of kitchen and pantry waste-water.

It is absolutely automatic in its action, and to this feature is largely due its great success. It is so constructed that it must always do its work correctly and completely, and it cannot be made to do otherwise, even by the greatest ignorance or neglect on the part of the user. It operates on the principle of the intermittent automatic flush-tank, keeps the waste-pipes clean and obviates the necessity of using a grease-trap. It is provided with an accessible seal-retaining trap constructed on the principle of the Sanitas Trap, and is altogether the only complete sanitary kitchen-sink ever offered to the public.

One of the most difficult problems in sanitary plumbing is the disposal of kitchen-waste. The fatty substances dissolved in the hot water of dish-washing are in ordinary kitchen-sinks discharged into the waste-pipes, where they quickly congeal and clog them. To overcome this difficulty innumerable devices have been invented, but hitherto without success.

Large pot-traps have been used under the sink with the view to collecting the grease before it entered the main waste-pipes. But these traps require constant attention to remove the accumulating filth at suitable intervals, and as there is nothing in their mechanism to remind the servant when they require emptying, and as the emptying is an extremely offensive operation owing to the putrid condition of the contents of the trap, the work is neglected and the waste-pipes become obstructed as much as if no pot-trap existed. Moreover, the trap must, on account of its weight, be placed on or below the floor, leaving a considerable length of pipe between it and the sink outlet to be clogged.

Large grease-traps have been used, but they are open to the same serious objections as the pot-traps, and utterly fail to solve the problem.

Flush-pots, with ordinary outlet-plugs, have been tried. But as the outlets must necessarily be operated by the persons who use the sink, it is found that sooner or later they are improperly used, and then greater objections than ever result.

Any simple plug-outlet in kitchen-sinks offers a tempting waste receptacle for solid refuse which an ignorant servant is certain to scrape into it to avoid the trouble of their proper removal; and even with the greatest care there is nothing to prevent the accidental passage of solid matters sufficient to clog the trap through this outlet, particularly where the strainer is movable, and in practice this is what is found to occur.

It was for the purpose of avoiding these objections that the Sanitas Kitchen-Sink was invented.

It has been assumed at the outset as an indispensible condition in the design of the apparatus, that absolutely nothing should be dependent upon the intelligence and care of the servant, and that by no possibility could the waste-passages become clogged either by accident or by design. In short, that the operation should be entirely automatic, and that the form of the outlet should be such that no solid refuse could possibly gain access to it.

These results have been obtained in the Sanitas Sink as follows:

The general form of sink and flush-pot, designed by the well-known sanitary engineer, William Paul Gerhard, has been adopted as a basis. It consists of the combination of a square flush-pot, with an ordinary kitchen-sink, in such a manner as to provide a sink of the ordinary appearance and form alone, but having a deep portion or flush-pot at the end. This deep portion is partly covered with a strainer, and the waste-water is discharged through a stand-pipe overflow and outlet-plug, preferably the "Sanitas" waste.

Mr. Gerhard's sink is an improvement on Colonel George E. Waring, Jr.'s. flush-pot, in being more convenient in form and arrangement, and hence less liable to improper usage than the latter. But neither possesses the all-important requisite of automatic action.

It remained for Mr. William E. Hoyt to suggest the use of an automatic discharge in connection with the Gerhard Sink and for Mr. J. P. Putnam to embody the suggestion in practical form in the Sanitas Sink. Thus the Sanitas Kitchen-Sink is the creation of four competent sanitarians, and its construction and operation are worthy of its parentage.

Figure 1 represents a perspective view. Figure 2 a plan and Figure 3 a section of the Sanitas Kitchen-Sink. The Flush-Pot of Gerhard is retained except that the upper or horizontal strainer covers the entire pot and is hinged to one end of the sink so that it may be opened when it is desired to use the deep part of the sink. Instead of a siphon discharge being used, and a vertical strainer is interposed between the flush-pot and its siphon. The short arm of the siphon is trapped with a seal-retaining trap of the Sanitas-trap principle just behind the vertical strainer. This strainer slides upwards in a groove to give access to the trap when desired, but closes again automatically by its own weight as soon as released. Clean-out openings are provided at the trap and wier chamber and give access to every part of the waste system. No bones and solid refuse can be scraped into the discharge outlet and dropped into the waste-pipe, because this pipe ascends instead of descends at the outlet and should the trap be clogged, it will simply cause the water to cease to flow until the obstruction is removed, which can easily be done by simply raising the lower strainer and lifting out the obstruction by hand.

The operation of the Sanitas Kitchen-Sink and Flush-Pot is as follows: The sink is used in the ordinary manner until the flush pot fills to the height of the siphon overflow. When this point has been reached the next discharge of a quart or two of water from the washing-pan charges the siphon and causes the entire contents of the flush pot to rush out through the waste passages filling them full bore and scouring them from end to end. The solid matter and lumps of grease will be left on the bottom of the flush-pot and must be removed by the servant in the proper manner, inasmuch as they cannot possibly be removed in any other manner.

Thus by the use of the Sanitas Sink and Flush-Pot all the great annoyances, expenses and dangers arising from the discharge of refuse are completely avoided. Moreover, the Sanitas Sink is in most cases much more economical than any other. The Sanitas Flush-Pot is entirely constructed of iron, and is of simple form. The additional cost of the actual flushing apparatus over that of an ordinary kitchen sink is trifling. But the sink contains its own trap and the cost of trapping is avoided rendering the sink really no more expensive than an ordinary sink and trap. The Sanitas sink trap is also antiphosphonic and hence requires no back-venting and hence the use of the Sanitas Sink and Flush-Pot is considerably cheaper than that of any ordinary sink.

The Sanitas Flush-Pot is designed for use
The following advertisers acceptably carried out contracts on the Boston Athletic Association Building.

**Torrey, Bright & Capen,**

**Importers and Dealers in**

**Fine Carpets and Oriental Rugs.**

348 and 350 Washington St.,

BOSTON.

**A. H. Davenport,**

96 Washington St., Boston.

932 Broadway, New York.

**Furniture and Wood Work**

**Made to Order.**

**Rare Stuffs for Drapery and Coverings.**

---

**E. B. Badger & Son,**

**Coppersmiths**

And Manufacturers of

**Metal Cornices,**

**Windows, Skylights, Etc.**

Metal Work on Athletic Building done by E. B. Badger & Son.

---

**William Lumb & Co.,**

**Plumbers**

15 Province St., and 9 Chapman Pl.,

BOSTON.

---

Either with ordinary iron, soapstone, wooden, or any other form of sink, and is sold either alone or in combination with an iron sink body especially cut out to receive the flush-pot, as shown in the figures already referred to.

**Direction for Setting.**

The Sanitas Kitchen-Sink and Flush-Pot are set just as any sink, except that no trap is needed, a seal-retaining trap of the best and most scientific form being constructed in the apparatus itself. This trap has the very great advantage of being directly accessible from the flush-pot of the sink without the removal of so much as a screw. The trap, moreover, being anti-siphonic, requires no venting, and this expense may be avoided. The trap may be vented, however, if desired, like any other trap, in which case the vent-pipe should be taken from the lead waste-pipe just beyond the weir chamber, or at the bend of the floor, as is usual in back-venting kitchen-sink traps. But such trap-venting decreases the rapidity of the discharge of waste-water and its consequent flushing effect as much as thirty per cent, and it is to be condemned as an expensive and useless complication.

The discharge-pipe below the siphon should have as quick a fall and as much of a fall as
G. W. & F. SMITH IRON CO.,
Building Iron Work
Office, 411 Federal St.,
BOSTON.

JOHN Y. MAINLAND,
Carpenter & Builder
164 Devonshire Street,
BOSTON, MASS.

JAMES M. RILEY,
Formerly H. Riley & Son, Established in 1841.
Slate, Metal and Composition Roofer.
Personal Attention given to Repairs, etc.
Office: 164 Devonshire St., Boston.
Master Builders' Association.

WALTER McCREEARY.
JOHN D. NOYES.

McCREEARY & NOYES,
House, Sign and Decorative
Painters & Glaziers
Hard Wood Finishing and Polishing.
9 Lime Street, Off River, Boston, Mass.
Residence, Fairview Street, Roslindale.

A PAMPHLET has recently been issued under the title of "Additional Designs for Iron Greenhouses, Palm-Houses and Conservatories, taken from photographs of work recently erected by Plenty's Horticultural and Skylight Works, of 144 Pearl Street, New York."

In looking over it one would be struck with the grace and proportion obtained by the very simple lines of construction, and by the subordinate part which the buildings play in the exhibit of plants, so that it is easy to realize the fact, often commented upon, of the extreme lightness and airiness of buildings of this construction, which throws no shadow and conveys the impression of unobstructed sunlight.

The growth and increasing wealth of the country is creating a demand for permanent greenhouses and horticultural structures, and by those who have experienced the constant annoyance of continually repainting and re-putting wooden greenhouses, the system of
EUREKA SHEATHING - LATH
The Best Article in the Market.
Saves Mortar, Labor and Money.
Combined Sheathing and Lathing is now well known and is meeting with great favor, both from architects and the public. Manufacturing Rights for sale.

Wm. M. DWIGHT & CO., DETROIT, Mich.

IMPROVED IRON-
CELLAR WINDOW FRAME and SASH.
13 Sires. Secure and Durable. Send for Price List.
THE McLAGAN FOUNDRY CO.,
NEW HAVEN, CONN.

CLIMAX METALLIC CASEMENT CO.,
MANUFACTURERS OF
WINDOW FRAMES, TRANSOMS, SKYLIGHTS, ETC.
In Wrought-Iron, Bronze, and Copper.
No. 19 Province Street,
BOSTON, MASS.

NOTES.
The Manhattan Brass Company, First Avenue, Twenty-seventh to Twenty-eighth Streets, New York, whose advertisement appears on page 3, are making a specialty of interior brass decorations of a superior quality for theaters, banks, offices, churches, foundries, railroads and grill-work of all patterns. They have just completed the railings and grill-work throughout Proctor's new building for the twenty-third street between Seventeenth and Seventh Avenues. A very beautiful and complete piece of workmanship in all its details, and it would pay all admirers of fine workmanship to examine. They are also continually putting up some of the very fine brass and bronze stop-cills seen throughout the city. For quality, finish and workmanship this Company cannot be excelled.

The Whittier Machine Company have recently put into the house of Mr. U. H. Crocker on Commonwealth Ave., Boston, Mass., an hydraulic plunger elevator for passenger service in the Tremont Temple in Washington, D. C., one horizontal steel boiler and an hydraulic piston passenger elevator 200 feet high. Also in their Present Line of Messrs. Prestwich & Fuller of Westerly, R. I., three horizontal steel boilers, each two and one-half feet in diameter.

DIxon's SILICA-GRAPHITE PAINT, made by the Jos. Dixon Crucible Co., Jersey City, N. J., covers everything, and is applicable to any other paint. It is unaffected by heat or cold, storms, salt air, rust or even acids. A tin roof well painted will need repainting for 10 to 15 years or longer. It is equally good for metal, iron or wood work.

MESSRS. J. & R. LAMB have recently executed for the Church of St. Martin, in the Fields, Chestnut Hill, Philadelphia, Pa., from plans by G. W. & W. D. Hewitt, architects, brass pulpits, eagle lectern, brass and oak communion-rail, and a brass and oak font-cover.

All are of intricate design and elaborate workmanship, and have been admired by many ladies and gentlemen. The price is 400.


puttyless-glazing will be well appreciated. The Helliwell Patent Puttyless Glazing has been used in this country for the past three years, and has proved itself adequate to all the varying conditions of our changeable climate. It has given universal satisfaction and wherever it has been used, a glance over the letters and testimonials given will show what its patrons think of its superiority. Another successful example of this system has been erected by me for the following gentlemen, among many: L. L. Lorillard, Esq., Newport, R. I.; Henry Green, Esq., who have just erected a store and glass company, Northboro, Mass.; J. E. Pierpont Morgan, Esq., Highland Falls, N. Y.; Alfred C. Harrison, Esq., Chestnut Hill, Pa.; H. M. Boies, Esq., Scranton, Pa.; Edward D. Adams, Esq., Soul bright, N. J.; W. D. De Forest, Esq., Summit, N. J.; James Clarke, Esq., Louisville, Ky.

In the matter of sky-light or roof-lights, the Helliwell system is altogether without a rival. For strength, lightness and durability the new patented rolled-steel bars are not to be compared with bars made of galvanized-iron. This system has now been specified by the most prominent architects of the country on their best work.

We give an illustration of the new passenger-stretcher arranged for the new system under this Central Railroad of New Jersey, and Baltimore and Ohio Railroad. The lightest weighs about 36,000 square feet of glass, the main trusses are 32 feet apart, and the sky-light-bars span 181 6" between purlins. The architects are Messrs. Peabody & Stearns, Boston, Mass.

We also give sectional cuts of the shape of the bars, and of the method of arranging and fastening the glass in position. Any one who contemplates the erection of glass buildings of any description, will benefit by copying the sections and circulars and other papers on this subject published by

JOSPEH PLENTY,
144 Pearl Street, New York.

THE STAR METAL-CORED RUBBER-STOPPER.
Among the many firms engaged in the manufacture of bath-room and laundry appliances, there is none that stands higher than the Wm. Powell Company, of Cincinnati, Ohio. Organized in 1848 under the style of Wm. Powell & Company, and incorporated in 1886, they rank among the pioneers in this business.

Entering and ever on the offensive, we have been quick to note the demands of the trade, and have been in the lead in the manufacture. In 1886 this Company was incorporated as The Wm. Powell Company, and our faculties for doing good work have been constantly improving in this class of goods. And our reputation for fair-dealing and honest work speaks for itself. It has been said that our goods have become deservedly popular, and this is true. In 1886 this Company was incorporated as The Wm. Powell Company, and our faculties for doing good work have been constantly improving in this class of goods. And our reputation for fair-dealing and honest work speaks for itself.
DYCKERHOFF
PORTLAND CEMENT

Is superior to any other Portland Cement made. It is very finely ground, always uniform and reliable, and of such extraordinary strength that it will permit the addition of 26 per cent. more sand, etc., than other well-known brands, and produce the most durable work. It is therefore the most economical to use. 8,000 barrels have been used in the foundations of the Statue of Liberty. Architects and those interested in Portland Cement will please send for my pamphlet, which will be mailed free on application. It contains valuable directions for the employment of Portland Cement, a table of results of the strength of the Dyckerhoff Cement when mixed with sand and broken stone in various proportions, together with tests and testimonials of eminent Engineers, Architects and Consumers.

E. THIELE, 78 William St., New York.
SOLE AGENT FOR THE UNITED STATES.

Antique Hinge Plates
CAST BRASS.

ON HAND AND MADE TO ORDER FROM ARCHITECTS' DRAWINGS.
J. B. SHANNON & SONS,
1020 Market Street, PHILADELPHIA.
WRITE FOR ILLUSTRATED CATALOGUE.

BURDITT & WILLIAMS,
ESTABLISHED 1868.
Manufacturers and Dealers in
FINE HARDWARE
FOR
Dwelling-Houses, Churches, Stores and Public Buildings.

20 DOCK SQUARE, BOSTON. BRANCH OFFICES: | 1300 Broadway, New York.
| 1416 F St, Washington, D.C.

Our Hardware may be found in important buildings in the leading cities of the Country.

"WARNER'S" Electric Time System
For Public Buildings.
THE ONLY RELIABLE SYSTEM IN USE.

All public buildings and Schools should be supplied with Electric Time Dials. This system is now in use by the New York, New Haven & Hartford Railroad Co. and many others.

SEND FOR CATALOGUE.

The Stand, Elec. Time Co.
NEW HAVEN, CONN.

ELECTRIC TIME DIAL.
Wiggler's Patent Sash Lifters.

An Article long wanted but never before made. Holds the whole harness, takes no more room than the ordinary hook or peg, can be used for both single and double harness. Gives the harness-case a new appearance, as it carries the harness up uniformly, in with the saddle, beside keeping the bridles and breastplates in their proper shapes. They are neatly japanned, with gilt fittings. Price $1.50 per dozen. Are now in use in over 100 first-class private stables in and about Boston.

Each bracket lettered “J. J. Read, Boston, Mass.” For sale by dealers everywhere. Indorsed and approved by the following named gentlemen, all of whom have had the use:


The public are cautioned against all similar brackets, not marked with my stamp, as each bracket is infringements of patents held by me.

Also cedar-top riding-saddle bracket. Price $3.50 each. And whip-rack for English coach and straight with completeness. Price in cases each.

JAMES J. READ, 13 Tremont Row, Room 10.

Southwark Foundry and Machine Company,

PHILADELPHIA, PA.

BOILERS.
TANKS.
STEAM
HAMMERS.
HEAVY
CASTINGS.

SOLE MAKERS OF

Porter-Allen Automatic Engine.
HIGH ECONOMY. DURABILITY. CLOSE REGULATION.


A great improvement over all other blinds, slides up and down in the window like a sash, move easily, and stay where placed. No hinges, hence no sagging, sagging and tainting with curtains and window draperies. Must be seen to be appreciated. Each may other sliding blind in the market for economy, durability, style, beauty, convenience, etc. Also the most perfect arrangement for library screens, consisting of an additional section which slides same as the blind; very much admired by all.

They are also made to slide entirely down to the floor, into pockets, out of sight, without any additional expense, 25 cents, cheaper than the hinged blind, and will last twice the length of time.

No more to experiment; tens of thousands now in use. Architects are specifying them. They always give satisfaction.

The only blind that is furnished with an Automatic Burglar-Proof Lock, free of charge.

Agents wanted everywhere. Send for illustrated catalogue and prices to HARTMAN & DURSTINE, No. 72 Larwill Street, Wooster, Ohio.

WITHROW & HILLOOK, (Toronto, Ont.), M'TFs for the Dominion of Canada.

Wigger's Patent Sash Lifters.

A simple contrivance designed to facilitate the raising and lowering of one-light sashes.

A strip of concave-convex metal, with projecting knobs, fitting over the head on the stile.

Readily applied to either new or old work. Furnished in different styles—brass, nickel-plated, white, japanned, etc.—to correspond with painting or other metal trimmings.

Architects, Builders, Carpenters and Painters will be furnished with Circulars by the Hardware trade.

BRAINDER & CO.,
Manufacturers' Agents,
97 CHAMBERS STREET, NEW YORK.

COMINS & EVANS,
GRAVEL AND METAL ROOFING.

Artificial Stone Sidewalks.
Warren's Natural Asphalt Roofing.

TELEPHONE CALL, BROOKLYN 366.
41-45 WAVERLY AVE., BROOKLYN
114 JOHN ST., NEW YORK.

Esterbrook's Steel Pens

FOR SALE BY ALL STATIONERS.

THE Esterbrook STEEL PEN CO.
50 John Street, New York, N. Y.

A. G. NEWMAN, late NEWMAN & CAPRON.
MANUFACTURERS OF
Fine Bronze Hardware, Bank, Office and Stoop Railings in Bronze or Brass. Antique Furniture- Trimmings. Electrical and Mechanical Bell-Hanging Burglar-Alarms.
Warerooms, 1180 BROADWAY. Factory, 157-163 WEST 29th STREET, NEW YORK, N. Y.
MAY 4, 1889.
Entered at the Post-Office at Boston as second-class matter.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

THE LEGISLATURE OF THE STATE OF TEXAS has passed the law proposed not long ago, requiring all persons who wish to practise as architects within the State to present themselves before a Board of Examiners, for the purpose of obtaining a certificate of competency, without which they cannot pursue the profession. The State Association of Architects has approved the measure, so it is probably suited to professional needs and encourages good practice. Any person holding a certificate should be denied the assistance of the courts in collecting payment for their services. If any such rule has been adopted in Texas, it will be best for architects from outside, however well qualified, to be cautious in accepting commissions for which they may never be able to collect their pay; and, if they should be caught in the unpleasant predicament of having to resort to force to defend their rights, to see that they apply to the Federal Courts, which would, we suppose, take no account of local regulations.

A NEW source of danger in hospitals and similar buildings has been pointed out by an Austrian military surgeon. According to him, several cases of infectious disease had occurred in certain Austrian barracks, and, after a strong, healthy artilleryman had been carried off in a week by an attack of typhoid pneumonia, the floor under his bed was taken up, and a mass of mould and fungus two yards square was discovered beneath it. The surgeon proposes, in view of the dangers to be expected from such conditions, that the walls and floors of barracks and hospitals should be covered with a coal-tar, which is sufficiently antiseptic, he thinks, to prevent the formation of such growths, while it would cover up all seams and fissures with a smooth, impermeable coat, which could be washed with facility. If an architect were to propose such a thing he would be denounced as an ignorant and unskilful person, but because it is the suggestion of an expert we suppose the experiment is likely to be tried, with great glorification of its inventor, who will be forgotten by the time the timber, shut off from the air by the impervious coating, has rotted away, and the coal-tar, converted into dust, the evaporation of the volatile hydrocarbons which keep it plastic, is slowly brushed off in the lungs of the inmates of the building. To the mind of an architect, the existence of mould and fungus suggests the need of ventilation more than anything else, and we should say that there should be basement-windows, or rather, constructing the building on open arches, without any basement, as is now common for hospitals, with renewal of the floor, and removal of all impervious coverings that might keep the air away from it, would do more good than all the disinfectants, coal-tar included, that could be spread upon the interior.

A question sent to L'Architecture a warning, which we hand along to our readers, to the effect that if any of them should happen to be in the railroad station at Enghein, a little village near Paris, and should be tempted to lean against the iron columns which support the roof over the platform, they should resist the temptation, lest they meet the fate of Simon. As it is usual for iron columns to collapse when any one leans against them, the case of those at Enghein seems to need explanation, which the architect gives by relating that while waiting in the station one day, his attention was attracted by a small screw in the sides of the columns. The screws did not appear to hold anything, but looked as if they had been driven in at random, and closer observation showed that the columns so treated were broken in two across the middle, and the lower half was in some cases also split. The seams, as well as the screw-heads, had been put up, but did not escape the eye of the expert. The point was that one of the railroad men who could explain this architectural mystery. It then appeared that the columns had been broken, and mended by the ingenious process of arranging the fragments together, thrusting a stick through them, and screwing in the projections of the stick. The little point then gave the whole affair the appearance of perfect solidity, and, as the writer says, it will probably last until some crowd of holiday passengers presses against the columns and brings the whole affair down about its ears.

A QUESTION as important to architects and builders as it is common in their practice was recently decided by the highest authority in France in a particularly clear and succinct manner. As L'Architecture gives only the barest outline of the case, it can only indicate that certain circumstances may have been; but the details of the affair are not of much importance so long as the court clearly states the principle, as in this case, that "A town cannot refuse to pay for extras not included in the contract if such extras consist either in the execution of modifications from the original plan ordered by the superior authority of the Commissioners of School-buildings, or in work which was indispensable to the good execution of the building, and has been for the advantage of the town." In regard to the architect, the same decision says that, "Although the unused extra work was included in the contract and specifications if they had been prepared with more care, the cost of them cannot be charged to the architect, but the commission which he would have to make on these extra works may be withheld from him." Another point which seems to have been decided, and which is of considerable importance, was decided by the court in the following words: "When the contract between the architect and his client allows a certain sum as the 'frais de déplacement,' or compensation for being absent from his office, to the architect, the sum allotted may be increased according to circumstances." The story seems to show that the idea that the architect ought to pay out of his own pocket for everything that the owner wants in his house, which his inexperience did not enable him to discover before the contracts were made, occasionally makes its appearance in France, to meet with the same fate before the courts as in other civilized countries.

ACCORDING to the Wiener Bautenindustrie-Zeitung, the Emperor of Russia has given his assent to the project for the construction of a railway extending from the present terminus of the Siberian line to Vladivostock, on the Sea of Japan. The route which has been traced for the road follows the north side of the Altai Mountains from the present terminus of the Siberian military railway to Irkust, and then rises, easily, across the mountains, to the head-waters of the Amoor River. From this point it follows the Amoor Valley southeasterly until the river turns toward the north, when the railroad leaves it, striking southward to the coast, which it reaches at Vladivostock. The cost of this gigantic piece of engineering is estimated at four hundred and fifty million dollars, the total length of the line, from St. Petersburg to Vladivostock, being about sixty-two hundred miles, of which
more than a thousand is already in operation. As a commercial route the new line may not be immediately successful, but as an auxiliary to military operations it will undoubtedly be of the utmost importance. To say nothing of the fact that its stations, all of which will probably be fortified, as are those of the present Siberian Railway, will form a line of military posts close to the Chinese frontier, it is certain that no similar line will oppose nothing similar, it will bring St. Petersburg practically close to the door of Japan, and even in peaceful times will make St. Petersburg the market through which Japanese products must be mainly distributed to the rest of the world. According to the recent report of the Chamber of Commerce of California, has had a dream, or an inspiration of some sort, in which he has perceived that the United States and Siberia would before many years be connected by a railway. Just how the railway is to cross Behring's Strait is not decided, nor, indeed, is it at all certain that it is to be operated in winter in Alaska and Kammatchaka, but Russia seems disposed at least to do her part, and it is the turn of the United States to make the next move.

The Canal has just been constructed in Belgium, in which, instead of locks, the boats are hoisted by elevators from one level to another. The canal extends from the coal region in the interior of Belgium to Brussels, crossing several other coal mines, so that Belgian coal is brought directly by boats to Paris, as well as to all the principal towns in Belgium and Holland. As the line passes over a rather hilly country, various ascents and descents must be made, and to save the long delays incident to passing locks, the level of the canal is maintained by means of hydraulic elevators. The boats, which measure about sixty tons, are towed from a low level into an immense tank, with gates, which is submerged in the canal. The gates are then closed, and the tank, which rests on the pistons of a huge hydraulic elevator, is raised to the upper level, when connection is made with the next section of the canal by means of double gates, and the boat continues on its way. The lift of the Elevator No. 1, at Houlong-Guignies, which is carefully described and illustrated in Le Génie Civil, is about fifty feet. The hydraulic apparatus is calculated to raise a weight of one thousand and forty-eight men, or about ninety tons, and the cost of the works, exclusive of earthwork and masonry, patents, engineering and purchase of land, was about one hundred and seventy-five thousand dollars.

The Sanitary News reports a curious case of poisoning which occurred recently in London. At a children's party, at Christmas, which was enlivened by a Christmas tree, several of the guests, including older people as well as children, were attacked by singular symptoms which could not be ascribed to any of the causes which usually produce the ailments incident to children's parties. Some particularly intelligent person seems to have noticed a resemblance between the symptoms and those of arsenical poisoning, and attention was drawn to the candles on the Christmas-tree, many of which were of a bright color. Suspecting the greenish color, five of them were submitted to an official analyst, who reported that they were colored with arseniate of copper, and, presumably, in burning would diffuse vapors of arsenic through the air. Some of the red candles on the tree were also analyzed and found to contain vermillion, which might, we suppose, give off fumes of mercury during the burning of the candles. As thousands of Christmas trees are exhibited every year in this country, to many thousands of children, and the bright-colored candles burned on them must be counted by millions, it would not be amiss for our State Boards of Health to find out whether the cauldron of the Pacific Ocean can supply cost, and the closest of those who are successful in passing the preliminary examinations are stationed at a distance from Boston, and could only take part in a viva voce examination at considerable expense to themselves in the way of car fare and lodging, we shall endeavor to decide the competition entirely by means of the mail.

We are grateful for the solicitude expressed by certain well-wishers who have inquired whether the recent change in the composition of the firm publishing this journal would in any way affect its usefulness and prosperity of the American Architect. We are pleased to say that the change of partnership is likely to tend to the benefit rather than to the prejudice of our supporters, as it is the purpose of Messrs. Ticknor & Company to henceforward devote themselves to the promotion of technical art and to the better supply of literature. Naturally, the tendency will be to extend the line of architectural books which will support and will gain support from this journal, and, as one thing helps another, we believe that the greater interest that is now to be devoted to this line of publications will enable us to make this journal of greater value, even at present, to all classes of men who have an interest in building.

It seems to be well settled now that the Nicaragua Canal will at least be begun, and there is a fair prospect that it may be completed, and become the only navigable short-cut between the Atlantic and Pacific Oceans. Notwithstanding the courage and generosity with which the French people have supported M. De Lesseps in the Panama scheme, it now appears certain that the enterprise will be abandoned. So long as any hope of its completion remained, the French journals spoke with natural disfavor of the competing canal at Nicaragua, but they now, so far as we can learn, have generally made up their minds, and wasted millions of their own money in building a ship-channel over a mountain range, by means of locks which would apparently be dry most of the time, and regard the Nicaragua plan with much more enmity than before. So far as the United States is concerned, the completion of the Panama Canal, instead of that at Panama, is certainly very desirable. To allow the water through the Panama cutting from the Pacific, Liverpool would be about as near as New York, and traffic would go to the port presenting the preponderance of advantages, which would eventually be Liverpool. By the Nicaragua route, New York would be nearer, by canal, but the country would have a distinct advantage for the services of the canal, and the balance would be likely to incline toward our own ports in a great many cases; much to the advantage of our citizens, who, if they are forbidden to have any ships of their own, like to see their wharves occupied by foreign craft.

To recapitulate, according to the most recent information, the comparative advantages of the Nicaragua and the Panama routes are such that the line now determined upon, is one hundred and seventy-five miles long. This, of course, is something like five times the length of the Panama route, but the Nicaragua line has the immense advantage of possessing deep water at the highest level, while at Panama the locks by which the ridge of the Culebra must be crossed would have to be supplied artificially with water. At Nicaragua, the only excavation needed is at the ends of the canal, where low hills enclose a chain of lakes one hundred and fifty-two miles long, filled with water deep enough for navigation, and extending to within three miles of the Atlantic Ocean on one side, and fifteen miles of the Pacific on the other. By cutting through the hills a chain of locks will be formed, supplied with water from the lake at the summit, and vessels can easily climb the one hundred and seven feet of elevation which separates the lake from the oceans. Since the arrival of the colony of engineers which was sent out a year or more ago the final surveys have gone on rapidly, and a second working party is to sail from New York on the tenth of this month to begin the execution of the plans.
EQUESTRIAN MONUMENTS. — XV.
THE CONDOTTIERE. — II.

There are two points to be observed while dealing with this period of continuous petty wars: the first is that the greater part of these struggles took place either before the invention of gunpowder or before firearms had come into general use, and hence the contending forces were more or less completely clad in armor, thanks to which the losses of the contestants were ludicrously small in comparison with the effort, and consequently the second point, viz., the value of horsemen, was far more apparent than it is now. Thus at the battle of Aginagr, immortalized by Leonardo da Vinci in his famous cartoon the "Battle of the Standard"—which was an important engagement, the combined loss footed up one, a man-at-arms who tumbled off his horse, and being hampered by his heavy armor could not get onto his feet in time to escape being trampled to death. The second point, however, enough bloodshed, but it was that of the non-combatant, the citizen who attempted to defend wife or daughter after a captured town had been turned over to the last of the conquerors.  

The other fact, which has also a bearing on the singular immunity of the combatants, is that these battles were fought and settled by methods whereby the fighting of whose first care was their pay, and their next the ransom of their prisoners. So that where the battle was honestly waged the object was not to slay, but to capture for the sake of obtaining a ransom. Moreover, it was for the advantage of these mercenaries to prolong operations as much as possible, and at times came to be a perfect understanding between the leaders, so that it was not an unusual thing for a besieging force to set being introduced into the beleaguered place that might not be captured the speedily, and the hired forces being inside the walls and out be in consequence out of a job. When the amount paid to these men is known, and when it is considered what pleasures gold could secure in those days, it is not to be wondered that their battles were waged with a view to prolonging their income: Federigo of Montefeltro—who afterward became the "good Duke of Urbino," as captain-general of the Italian League was yearly paid 165,000 ducats, 45,000 of which were for his own purse, and while he served Alfonso of Naples, his pay was 8,000 ducats per month.

One of the acts that distinguished Federigo of Montefeltro as perhaps the most noble and humane member of his class, was his behavior during a time of famine, when the King of Naples and the Pope were making money by the monopoly they had established in corn. Federigo declared that he was not a merchant but merely a soldier, and that his only care was to save his people from hunger; accordingly he brought grain from Apulia and filled his storerooms that he might sell to his dependants at less cost than they could elsewhere procure the necessities of life. It is worthy of note that attached to Duke Federigo's court, to which all the chivalry and learning of Italy flocked, were five architects and engineers. Very different was the manner in which Bernabo Visconti treated his subjects while he ruled Milan. To help them save their hard-earned scudi was the last thing he thought of: on the contrary, one of his chiefest cares was how to empty their pockets into his own ever empty ones. A very ingenious device which exemplifies the "heads I win; tails you lose" principle was at one time employed by him. He was a mighty sportsman and particularly fond of pig-sticking, and as kept large packs of hounds, in all some 5,000 beasts; these he quartered on his unfortunate peasants and thus established a regular system of inspection; if the dogs were found to be thin and ill-kept, the man on whom they were billeted was notified, and he was fined, and punishment followed equally; while if any had died, the unfortunate keeper was imprisoned and all his property was forfeited. Whatever the condition of the dogs might be, the condition of Bernabo's purse was always, through this ingenious device, found to be in good case. This was one of the mildest freaks of this interesting personage who was afflicted with a blood-thirsty very similar to that of Ezzezino, and State criminals were by his orders subjected to torture during forty days—provided their endurance sustained them. The greatest attention was lavished on them after one torture, that they might recuperate enough to succumb to the next one.

The territory ruled over by the Visconti was at this time divided between Bernabo and his brother Galeazzo, to whose, after his, Gian Galeazzo, succeeded on his father's death. Then uncle and nephew were determined to obtain the other's portion and unite the territory under one head. The result of this common purpose was one of the usual family broils which add so much to the interest of Italian history. In it both force and craft were employed, the younger man mainly relying on the latter, and employing it most skilfully, the result being that Bernabo was led to believe that his nephew was but a poor creature, so that on the one hand, in 1385, pretended to make a pilgrimage to Our Lady of Varese, and in so doing paused at Milan, Bernabo and his son came out to meet him without the protection of a large guard. As the unfortunate Gian saw his uncle in his power he ordered his own guards to seize him, and at first Bernabo was hurried away to prison and served with a cup of cold poison in place of providing another. But, after the fashion in which he had served many of his victims in his last disrobing in this life. So Gian ruled over all the possessions of the Visconti.

But although Bernabo Visconti was not a condottiere or a particularly illusory person—morally speaking—his equestrian statue was wrought in 1384 and survives to us. It is one of the large class of equestrian statues—equestrian being a singularly unendurable job. Bernabo was supposed to have been born of a noble family, but he was not a very good man, and when his uncle, with whom he was brought up, died, he came into possession of his property. He was one of the principal men of the day, and was elected captain-general of the commune of Milan, and was held in high esteem by his king. When he died, he was succeeded by his son, who was also a great man, and was held in high esteem by his king.


[2] "Affair of the four days' devastation of Piacenza, which litora was compelled to permit the town stood empty, and at last had to be peopled by force." —Burckhardt's "Renaissance in Italy."
not a little to the dignity of the monument. The tomb was placed originally behind the altar in San Giovanni in Conca, but because of the height of the monument the mounted figure appeared above the structure of the altar, consequently, worshippers had the air of adoring their petitions to the bloody human tyrant, rather than to the all-glorious Deity. This sort of thing could not be long endured after Benabó's death, and it was soon after that event removed to its present resting-place, on the plea, perhaps, that secular, rather than religious, surroundings were most suited for it. The two figures, which, like pages, stand on either hand, represent Fortitude and Justice.

The islands in the Adriatic to which some of the inhabitants of Padua, Vicenza, Verona and Treviso had fled in 452 to escape the horrid slaughter which preceded the fall of their city, and at a later day was transferred to its present resting-place, on the plea, perhaps, that secular, rather than religious, surroundings were most suited for it. The two figures, which, like pages, stand on either hand, represent Fortitude and Justice.

The need of protection from the depredations of the pirates of the Adriatic and the Genoese Archipelago compelled the formation of a navy for the protection of their commerce and revenge upon the depredators. For centuries their operations were mainly in the East, and amongst other affairs they took a prominent part in the first crusade, sending a fleet of 400 vessels and taking part in the capture of Acre, Tyre, Sidon and Ascalon; and in 1198 their vessels were chartered by Fulk de Neufly for another crusade. But finding themselves unable to pay the charter money the whilom crusaders in its stead offered the republic their services to aid in the capture of the revolted city Zara, and the operations so begun were extended to an attack on Constantinople, which ended in the storm of the city in 1204, and the incendia in 1205, the capture of the horses of St. Mark's. During this period the republic of Genoa, in a corresponding position on the other side of Italy, had also developed into a maritime power of first importance, and in the confined area to which the commerce of those days was restricted, it is not strange that disputes should arise between the Venetians and the Genoese which developed into great naval battles. These quarrels naturally engendered the making of alliances by one power or the other with some of the cities or States of Italy and as a consequence, the struggles to be carried on by land as well as by sea and Venice was at length as bitterly embroiled with its northern neighbors as the non-ambitious cities of central Italy. As the sailor population of the Venetian republic were not accustomed to operations on dry land it became more necessary for them to rely upon their fighting men in the capacity of condottieri. In consequence the republic sent to Venice at war with Mohacs, and immediately entered the service of the republic of Venice at war with the Turks, and at once put the head of the republic's army; but because he followed the latter, his knapsack and bed were placed by his former companions in arms; he became suspected by his new employers and being decoyed back to the city on false pretenses was then accused of treason, thrown into prison, tortured and beheaded.

It is this employment of condottieri in the many campaigns in Italy that accounts for the presence in the Church of SS. Giovanni e Paolo at Venice, of several equestrian statues, a kind of monument seemingly having no connection with the ordinary pursuits of the citizens. It is not necessary to suppose that these monuments are always evidence of the actual intercourse within the city of these famous men they honor. In one case, at least, we know that a monument, that of Marc Antonio Bragadino [1596] marks the resting place not even of the ashes of this famous governor of the Republic, but merely of his skin. After a prolonged siege of Famagosta by the Turks, Bragadino surrendered after receiving a pledge of honorable treatment for himself and men; once in possession of the place the Turks disregarded their word, massacring the garrison after ten days of varied and ingenious torture, flayed Bragadino alive and then stuffing his skin suspended the horrid effigy from the prow of the Turkish admiral's galley during the voyage back to Venice. Subsequently Bragadino's family purchased this trophy and enshrined it at SS. Giovanni e Paolo. The monument erected to his memory was not of equestrian character, however. This church is to Venice much what Westminster Abbey is to London and rulers and leaders of every kind are here honored with monuments of many kinds, amongst which are the equestrian figure, in gilded wood, of Nicolo Orsini who led the armies of the Republic in the war with League of Cambrai and died in 1510; one of Leonardo da Prato, a knight (ritto di Prato) which so far as the photographs throw any light on it, may be also of wood; one of Francesco d'Este [1616] by Franc Terrilli and one of Orazio Baglioni [1617]. Besides these there are others which marked the ambisious character of the people, the church of Sta. Maria dei Frari contains the equestrian monument, which is surely wood, of Paolo Savelli, a noted condottiere who fell in battle against Francesco de Carrara in 1495; while in the church of St. Stofano is a monument of the Contarini which dates from the middle of the seventeenth century. It is possible that art could have spared these monuments but history could not. The grim and dwarfish figure of Savelli on his big horse is worth pages of word-painting in helping the student to acquire a true understanding of how it was possible for the men of those days to do the soulless things which they are credited. Perkins may speak of the "depth of degradation to which sacred monuments directed" yet fell" but he speaks as a student of art and not of history, and is quite as unwarranted in contending the equestrian mural monuments for their want of "sacred" character as he would be in disparaging Stevens' Wellington in St. Paul's. The wrong in both cases is that the public wishes and the artist are not in sympathy. The real interest is in the case of the Bufalini and the Orsini, the other case is that of the sculptured figures in St. Mark's, the one in the former case is one of the "artistic" group, as one might call them, the other was an attempt to add another column to the monument.

Annibale Bentivegna in the Church of S. Giovanni Maggiore, Bologna. From Letts's "Panegyrici celebres Italiani."
moment, had to content himself with a sumpter mule which he seized, and continued to lead his troops to final victory. The incident was thought memorable enough to be commemorated, and Farnese's tomb was surmounted by a wooden group, covered with canvas, of Farnese and his humble steed, though the sculptor, who is variously thought to have been Jacopo da Trevegna, Giuliano d'Arrigo, or Angelo Gaddi, felt obliged to disguise the hybrid character of the mount by throwing a hooded horse-cloth over it, and taking certain artistic license in the treatment of the tail. The statue existed until 1842, later day might be expected to practise rather than a master in the fifteenth century.

The same upholsterer's motive was adopted in another monument, that of the Marquis Spinetta Malsapina in the Church of S. Giovanni in Sacco, also in Verona, though here the drapery has more the appearance of tent-folds, and less that of curtains. Why it should be that less store was set on this monument by the Italian authorities than on some others it is hard to say, but for some reason this work

when, during repairs on the Cathedral of Santa Maria del Fiore, the monument had to be displaced and the statue fell to pieces, and has never been restored.

Another rearing steed, in high relief this time, is the one that supports the figure of Annibale Bentivoglio on his tomb in the family chapel in the Church of S. Giacomo Maggiore at Bologna, which is believed to be the work of Niccolo da Barl, and belongs to the fifteenth century. This figure is life-size and colored. Of about the same date is the statue of Certonio Sarego [or Savengo] in the choir of the Church of S. Anastasia at Verona, which, in style, is closely allied to the equestrian tombs at Venice, and, as the sculptor's name is unknown, we are at liberty to assume that some Venetian sculptor driven into political exile had sought refuge at Verona. The isolation of the figure by means of the drawn-back curtains is certainly ingeniously devised, though the device is one that a sculptor of a

Monument to Pietro Farnese in the Cathedral, Florence. From Litt's "Famiglie celebri Italiane."

Roberto Malatesta in the Louvre. From the Gazette des Beaux-Arts.
Architectural Court. Unfortunately, the figure, more than life-size, which was executed in stucco and gesso, was badly broken in transit, though it was still within the power of skillful restorers to restore it to an almost perfect condition.

South Kensington is not the only museum, however, whose walls are graced by the equestrian figure of an Italian condottiere. The Louvre, too, has its specimen, intrinsically, a more valuable one in that it is the work of Paolo Romano, which represents one of the typical condottiere of the fifteenth century, a member of the hated family of the Malatesta of Rimini. Roberto Malatesta was an illegitimate son of Sigismond, Lord of Rimini, and at his father’s death took the usual steps to secure the succession for himself. Dishonest diplomacy, poison and cold steel prevailed, and once firmly settled with the aid of the Duke of Urbino, whose daughter he afterward espoused, he overcame the papal troops of Paul II, who, for State reasons, upheld the cause of the legitimate heirs. Later, under another pope, he became himself commander of the papal forces, and rendered such good service that when he succumbed to poison, as usual, in 1482, he was buried in the vaults of St. Peter’s, and an equestrian bas-relief—which was to be one of a series commemorating the services of the captains-general of the pontifical troops—was executed at the command of Sixtus IV, by Paolo Romano. [Recent German research shows that this attribution of the work to Paolo Romano is a mistake.]

In 1619 this bas-relief was removed to the Villa Borghese, and there set up, but it was afterwards displaced and thrown aside. In its neglected state, it length caught the eye of the Inspector of Fine Arts for the French Government, who succeeded in buying it for the Louvre from Prince Borghese.

In the Church of San Giuseppe at Aquila is a tomb by a German sculptor Walter Alemanno, whereon the equestrian figure of Ludovico Camponeschi keeps watch and ward over the recumbent figure of his father, Count Lalle, Lord of Aquila. The work, which was erected in 1432, is said to be coarse in execution though the general effect is good.

BENVONTI. — Born in 1317, became master of Bergamo, Brescia, Crema and Cremona. He also ruled Milan conjointly with Galeazzo. He was notorious for his cruelty and audacity, and defied the power of the Pope, who excommunicated him. Urban V. preached a crusade against him, and united the Emperor Charles IV with other monarchs in a league against him about 1356. Bernabo, however, resisted them with success. He died in 1380, having been murdered by his nephew, Gian Galeazzo, who succeeded him.

ANNIBALE BENVONTO.—Lord of Bologna, died in 1458.

DICCOLO DA BARI. — Born in Bari, in Apulia, in or about 1414, and died at Bologna in 1494 or 1498. He was a follower of Jacopo della Quercia, and is often called Niccolo dell’Area from his work on the arcos or sarcophagus of St. Donato, in the Church of St. Dominick, at Bologna. He spent the greater part of his life at Bologna.

PAOLO SAVELLI. — Killed in 1495, in a battle against Francesco de Carrara.

NICCOLO PISANI. — Count of Pittigliano, a general in the Venetian army, 1518.

PIETRO FABRESE. — Died in 1503.

ROBERTO MALATESTA. — Stipend "The Magnificent." Born 1442; died 1482.

CORTESIO SANZIO. — Brother-in-law and general to Antonio della Scala.

PAOLO ROMANO. — Flourished in the first half of the fifteenth century, and in the latter part of it he retired from the world and spent his remaining days in solitude and peace. "We are told by Antonio Filarete, in his manuscript architectural treatise, that Paolo was a goldsmith, as well as a sculptor, and that he helped to make the silver statues of the twelve apostles for the altar of St. Peter's, which were destroyed in the sack of 1527." His other works in Rome are a statue of St. Paul on the Ponte Sant' Angelo, the tomb of Bartolomeo Castri, in the Church of the Knights of Malta, that of Cardinal Stefano, at Santa Maria, in Trastevere, and (probably that of Cardinal Filippo D'Alessandro in the same church. "Vanini speaks of a highly-praised statue of an armed man on horseback, by Paolo Romano at St. Peter's, and the epitaph placed upon Paolo's tomb mentions his statue of Cupid."
himself, says, that in an action between the Neapolitan and Papal troops in 1496, which lasted all day, not only one was killed but it is not recorded that any one was wounded. Goethe's general tendency to the abnormal is unexplained. He speaks of the battles of Fornova between the confederates of Lombardy and the republics of Italy in 1502 and returning from Naples in 1496, as very remarkable on account of the slaughter, which amounted on the Italian side to 5,000 men."—From Hallam's "Middle Ages."

[To be continued.]

THE TECHNISCHE HOCHSCHULE OF BERLIN

PROBABLY no other technological education which is equally recognized in the world can show a home so palatially beautiful in the grandeur, extent, and site of its buildings as the new quarters of the Technische Hochschule, or Technical High School, of Berlin. The location is a remarkably attractive one in the suburb of Charlottenburg. The main buildings front on the great avenue which runs from the Charlottenburg Gate, in Berlin, straight out through the park of the Thirergarten. The grounds comprise a large area, triangular in general shape, and charmingly traversed by a parallel style, formal in front, but natural in design at the rear, with paths, trees and shrubbery combining to make a delightful and tranquil park.

The first sight of the main building, of cheerful cream-colored stone, is its wealth of decoration well-balanced by the immense windows. In its long wings connecting the prominent ornamental portions, gives an impression of well-constructed richness and simplicity. The unity of the structure, in spite of the great length of its façade, and its uniformity of height, has been admirably maintained. The end-sections are brought forward, forming a half-closed great open court in front. The attention is first caught by the conspicuous decorative work extending along the end-sections and is then carried by the graceful repetitions of the long intervening portions of the edifice to the architectural focus of the composition, the central section with the grand entrance, where the whole design blossoms into a beautiful system of structural details, the contrast between the varied plastic forms of sculpture in the shape of statuary, panels of reliefs, medallions and more conventional stone-carving. The contrast of the light color of the stone with the clear, luminous shadows of the harmoniously accentuated recesses effectively heighten the working of the sculpture. The dominance of this central section is assured mainly by this concentration of decoration. In height it rises but a few feet above the rest of the building, and the quiet emphasis thus given is just sufficient to serve its purpose, without giving an impression of a restless self-assertion. As it is, the effect is that of majestic tranquillity. The dignity of the façade also much enhanced by the sentimental approach to the entrance, the broad driveway and walks assembling by a slight grade to a beautiful low terrace, while the broad steps descend directly to the street in a series of three short divisions across a central depressed space to the main entrance. The sculpture of the exterior is by several of the leading German artists, and its beauty testifies to the high rank in plastic art occupied by Germany to-day. Two niches, on the right and left of the main story of the central section, are occupied by statues of Schiller and Leonardo da Vinci, and corresponding niches in the terminal sections of the great façades by statues of Breunant and Erwin on the east, and Stephenson and James Watt on the west. The sculpture of these is by Huntrieser, Eberlein, Encke and Wilke, also designed the allegorical reliefs crowning the arches of the niches. The central section has also five busts carried on postaments interrupting the balustrade of the main story between the columns. These are the work of Karl Begas, and represent five masters of art and industrial technique, Gauß, Eykelwein, Schinkel, Redenbacher and Liebig. Five sculptors shared in the creation of the three main statues that form so prominent a feature of the front and sides of the attic of the central section, Reuss, Hartzer, Hertel, Eberlein and Schöller. These figures depict each some branch of architectural or technical handwork, and the idea thus embodied, of illustrating the practical side of technical work, is further carried out in the great reliefs occupying the broad spaces between these figures. These rich compositions are by Otto Lossing. They represent various events in art, science, architectural activity, etc., with an illustration of a festival in honor of the completion of a house. The terminal sections of the north façade and the central section of the south façade, are crowned by the great sculptural groups of the sciences, arts and industries, such as astronomy, optics, geometry, art-history, painting, sculpture, commerce, mechanical construction, railway construction, etc. The sculptors of these are Lürszen, Franz, Karl Rehberg, Faust and more various. The great sculptural of the façades was designed by Otto Lossing and C. Dankberg.

The talented architects Messrs. Lucaze and Hitzig have created an interior worthy of the noble exterior. Color is here a leading element in the effect, working by means of the natural hues of the
The German pairs, 1879 the hochschule general Classe certificate It authorized sgraffito, soft, "monochrome, these the same. noble are materials granite same architectural degree, course, supported fields the figure statuary walls Ravenna, the drawings, museum photographic made in Ravenna, ruins antedates the vaulted impression. The stucco-work. made by theRuins steps the room is reached in the halls, occupied the latter, entered, would have arrived by a great staircase lighted with stained glass, it makes a noble impression. The architectural features are here preserved in the light tones of the natural stone. The broad surfaces of the pillars in the ground story are painted in tapestry design. The upper arches are framed by three sgraffito representing various activities of art, construction and technique, supported by boy figures. These symbolize the various branches of instruction taught in the school, and light up a yellow ground, and are by von Beckerath. In the two stories above stand double rows of dark granite columns, standing in pairs, one behind the other; their bases and capitals imply the division of rooms above the ground story, and gray, with medallions, one series composed of the faces of artists, and the other of the arms and names of leading German cities; the ground-work of these is blue. The skylight is composed, in its main surface of green glass, but in appropriate patterns; the surrounding frieze is composed of a glass mosaic of brilliant colors. From the centre there hangs a great sun-burner of decorative design. The framework of the gallery representing the times is painted in two alternating colors. The grand stairways are splendid with columns of granite and marble, balustrades of bronze with fields of wrought-ironwork, and vaulted ceilings of barrel-arches with bands of color. The decoration from the upper stories is in statuary in the grand central hall, including the bronze cast of the figure of Beethoven by Rauch, and that of Schinkel by Wiese, for the monument at Neuruppin. Another splendid room is the aula, or grand auditorium. The walls are divided by pilasters of stucco beautifully counterfeiting red marble, and animated colors predominate on the walls and ceiling of this hall, in the fields of the arches, deciding the softness of the upper portion of the walls, there are nine architectural paintings by Spangenberg, Jacob and Körner, representing famous architectural monuments of various periods: the Parthenon and a portion of Athens, the Ruins of Festum, San Apollinaire in Classe near Ravenna, the church at Lauch, the Elizabeth Church at Marburg, the Marienburg in West Prussia, St. Peter's and the Arch of Titus in Rome of Poutish. The rich collections of the institution, consisting of casts, models, drawings, etc., belonging to the various departments of technical activity, form a large and instructive museum. Several rooms are devoted to the "Schenkel Museum," containing a large collection of the drawings and models illustrating the manifold works of that great and versatile architect. By the way, would not a Richardson museum on a similar plan be an admirable feature of the Massachusetts Institute of Technology? The corridors are largely occupied by the rich collection of ornamental casts from the former Bauakademie and the Gewerbeakademie, dating back into the ancient, Greek, Roman, Byzantine, Moorish, Romanesque, Gothic and Renaissance periods. The entire edifice encloses four open courts of comparatively simple architecture, their walls in yellow and brownish brick, with details of sandstone and bands of granite, partly decorative and partly with figures, the former work by Eusdorff and the latter by Oskoon. The chemical laboratory has a handsome exterior, harmonizing with that of the main building, but not so elaborate. The interior is provided with apparatus adapted to its possible opportunities for the most thorough instruction and investigation in all branches of the science. Among the interesting objects to be seen here is a collection of the work by Professor Vogel, the famous pioneer in the domain of photography, who is at the head of the photographic department. The Technische Hochschule was formed in 1879 by the union of the Bauakademie and the Gewerbeakademie, or, in English, the Academy of Construction and the Academy of Industry. The origin of the former antedates the latter by over a century, for in 1699 the Prince Elector of Brandenburg, Frederic III, founded the Academy of Arts, comprising instruction in architecture as well as in painting and sculpture. Since, however, architecture could find little consideration in such an institution except as a fine art, and its technical aspects were not sufficiently pursued, those departments were transferred to a separate institution, and on March 18, 1799, King Frederic William III authorized the establishment of the Bauakademie with its declared objects consisting of "the theoretical and practical education of engineers for the various fields of architecture, of architects for building, chiefly for the royal states, although foreigners may be admitted in so far as it may occur without detriment to the interests of native students." Each of the three departments was divided into three separate studies at the start. It was required that the students should visit the royal edifices of the city under the guidance of a teacher in order to receive practical illustration of their studies. The entrance of the Bauakademie was free for all students. The requirements for entrance were a good readable handwriting and an orthographically correct composition, a fundamental knowledge of languages and French, a few Latin verses and a few principles necessary in common life. The term for students of surveying was a year and a half, for students of architecture, two years and a half. This was the first institution of the kind in Germany, and, with the exception of the Ecole Polytechnique, founded in Paris in 1794, the first in Europe. In 1801 the number of students was fifty-nine, including eleven foreigners. The institution first occupied the old building of the present town-hall, after which building a cottage building on the Werdcrachen-Markt was begun after a design by Schinkel, in brick. A word about the Gewerbeakademie illustrates the examen of the Polytechnic Institute established in Praga in 1806, and in Vienna in 1815, Prussia founded in 1821 the "Technische Schule" in Berlin — an institute quite different from that under consideration that in Berlin the instruction was from twelve to fifteen years. The instruction for the lower classes consisted of geometry, arithmetic, natural philosophy, drawing and for, some, modelling. For the upper class, arithmetic and algebra, geometry, mechanics, mechanical construction and technology, and theoretical chemistry. A mechanical workshop was early connected with the institution. In 1827 its name was changed to Gewerbe-Institut, and in 1830 it was the German Institute for Science and Technology. In 1876 the union of the two institutions was concluded upon the name of "Die Königliche Technische Hochschule zu Berlin," or the "Royal Technical Institute," the academy for the training of chemists and physicists, and the academy for the training of those in the mechanical arts being combined into one. The name of "University of Berlin," in a broad sense (real-school of the first degree) or a Prussian upper real-school (industrial school with a nine years' course and two foreign languages). There are five departments: architecture, civil engineering, mechanical engineering, including ship-building, chemistry and mining, and a general scientific course, with mathematics and natural science in particular. The various courses have no binding upon the student to take the full normal course, but to take such studies as he may think fit, and in obtaining the instruction they desire. As in the universities of Germany, so in the Technical High-School, or, more correctly, the University of Berlin; there is complete freedom of study, every student being at perfect liberty to study how, when or what he may choose, the entire responsibility being placed upon him as to whether he shall take advantage of the opportunities for self-improvement which the system is known by its fruits, and by these it may be judged whether the custom of regarding the student as a responsible man is not superior to the English and American custom of continuing the schoolboy and school-master policy into the higher seats of learning. The government of the institution consists of a rector and senate, and a "syndicus" for the administration of the financial affairs. The university department is governed by a board of three men, with the President as chairman, and all financial affairs administered by a chairman and the members of its faculty. The rector is elected every year by the collective faculties, the choice being formally ratified by the King. The president also, the College of any responsible in the university of the King Berlin. The splendid buildings at Charlottenburg were finished in 1884, and dedicated with elaborate ceremonies and festivities on November 12 of that year. The cost of the edifice was $2,000,000. To duplicate them in this country, it would probably require at least considerably more than double that sum. In the winter of 1885-86 there were 562 regular students and 365 "syndicus," or unenrolled students, making a total of 1,930. The present total number is something like 1,200. The instruction-corps consists of regularly appointed professors, named by the King, and the deans and professors, as well as instructors. The latest statistics gave the number of professors and instructors as 57, and of unofficial instructors as 24. There is a considerable number of stipendiums, or scholarships, provided by the state, and also by the private individuals, mostly consisting of sums of 600 marks annually, and with other amounts from 300 marks upwards. Most of the scholarships also carry the privilege of freedom from the payment of instruction-fees, and, moreover, six per cent of the students are also absolved from the same. The Louis Boisselet scholarship for
architects and civil engineers yields an annual income of something like 3,000 marks, or about $750, which is annually given alternately to an architect and a civil engineer, who have been the best candidates of their training at the institution, in very much the same manner as the Rotch scholarship here; that is, with the condition that the recipient shall use the money in undertaking a journey connected with a professional task, and shall report upon his experience. There are also two travelling-scholarships of 1,500 marks each for students of Divisions III and IV, respectively, mechanical engineering and ship-building, and who have distinguished themselves at their diploma-examination. From the income of the Von Saydlitz scholarship-fund—a sum annually fixed by the Curator—at present about 2,300 marks, is awarded as a prize to a student of one of the aforementioned two divisions who, in the diploma-examinations of the previous year, has specially distinguished himself. For each division, and also the ship-building section, a prize-problem is set, with 800 marks and a silver medal as the best solution, and a silver cup for the second-best solution.

The Technische Hochschule includes the following collections and institutes:

The Physical Collection, containing all the apparatus necessary in the courses on experimental physics, and is particularly rich in instruments relating to optics and electricity.

The Kinematic Collection contains 590 models, comprised in two divisions, one illustrating the control of motion, and the other the transmission of motion.

The Electro-technical Laboratory affords the students an opportunity to familiarize themselves with the practice of electrical measurement.

The Geodic Collection is devoted exclusively to means for instruction.

The Mineralogical Institute comprises, besides its lecture-halls, the laboratory for crystallographic-physical and chemico-mineralogical researches, a mineralogical collection for instruction, a geological collection for instruction, and the mineralogical museum, containing a collection for instruction in organic chemistry, another for organic chemistry, a metallurgical laboratory, a laboratory for technical chemistry, and a photochemical laboratory.

The Royal Mechanical-technical Institute is designed for the testing of all materials used in technical work, with the exception of specifically building materials. Among the apparatus are two testing-machines of the Werder & Martens pattern, with a power of 100,000, and 50,000 kilograms respectively. Among the great tasks now in hand are an investigation of railway material at a cost of about 60,000 marks, the experiments lasting about two and a half years, and an investigation of the sailing or testing vessels, the cost of the preliminary experiments being about 4,000 marks; both of these are carried on in behalf of the Ministry of Public Works. In behalf of the Ministry of Commerce there is being conducted an investigation of the products of the German and foreign wire-manufacturing industries, lasting about two years, and costing about 4,000 marks; and an investigation of German and foreign lubricating oils, at a cost of about 3,500 marks for preliminary experiments. There are also various scientific investigations in the hands of the Chemical Laboratory, including a study of the chemical composition of the institution itself, such as the conduct of plastic masses under pressure on all sides, the sweating of powder-form substances under high pressure, and microscopic investigations of structural changes in metals under tests of strength, etc.

The Royal Testing-station for Building Materials was established in 1871, particularly for the purpose of deciding disputes concerning the worth of cements. The station has apparatus for testing the strength and other physical properties of burnt and unburnt artificial stones. The hydraulic press can exert a power of 14,000 kilograms. Among the means for testing cements are sieves with 600, 900, and 5,000 meshes to the square-centimetre.

Sylvester Baxter.

THE ELECTRICAL TREATMENT OF SEWAGE.

WHERE is a universal consensus of opinion in large towns, and in a good many small ones too, that "something must be done" with the sewage other than to let it into the nearest stream. In many places "something has been done;" the results have always been costly, and we have yet to learn that they have ever been quite satisfactory. The Chemical Laboratory of the Technische Hochschule is still being laid out upon works for carrying on the precipitation process introduced by the late Prof. Pfleiderer. The Royal Mechanical-technical Institute is carrying on the process noted by the late Board of Works. This process consists in the precipitation of the solids in the sewage by the addition of 3.7 grains of lime sulphate, and 0.2 grains of sodium carbonate per gallon of fluid. By this means the matter in suspension is precipitated as mud; the clear fluid is allowed to flow into the river, while the sludge is carried out to sea by steamers and deposited in deep water. There are plenty of chemists who do not hesitate to declare positively that these quantities of chemicals are quite insufficient to produce a satisfactory effluent, and that if they are not increased the condition of the Thames will undergo no amelioration. Experience can only decide this, and it is certain the works are being built and the exact method to be followed remains to be determined. It is true that the interest of Londoners that the river should be rescued from its present state of filth, and that it should be done as cheaply as is consistent with efficiency of results.

Among the many processes of sewage purification which are being offered for adoption at the new works by the London County Council, one more prominent than that of Mr. William Webster, of 8 St. Martin's-place, Traflagar-street, is the process of an experimental plant, capable of treating 1,000,000 gallons of sewage per day, which has been erected at Mr. Webster's expense, at the South Metropolitan outfall of Crossness, and for more than twelve months trials have been conducted there on a scale corresponding to the requirements of a fair-sized town. These trials have certainly demonstrated the clearancy of the process, and so far as their size and intermittent character are concerned, it promises to be economical. The method followed is to electrolyze the sewage between iron electrodes. The chemical reactions have not yet been very closely ascertained, but the effluent is clear, and the iron has been so far used as a conductor of electricity, probably in the form of hypochlorous acid, the strongest disinfectant known, and there they rapidly oxidize the organic matter. The iron is also dissolved as a hypochlorite, and combines with the suspended matter, coagulates it in flocculent particles. These are buoyed up by the hydrogen bubbles, and rise to the top as froth, leaving clear liquid beneath. If the treated sewage be run into a tank and kept agitated for two hours, the hydrogen gradually disengages itself, whereupon the coagulated particles subside to the bottom as sludge, and the liquid can be run off. It is found on analysis that the amount of iron saved is equal to 5.2 grains of iron per gallon of sewage, and the suspension, as shown by the following Table, is nearly all removed, while the free ammonia and albumenoid matter are very sensibly reduced. Any one may try the experiment for himself in a beaker with a sample of sewage in it, by the simple process of adding a difference of potential of 2.3 volts; in a very few minutes the organic matter is rendered flocculent, and an hour sees it precipitated.

The Electrical Treatment of Sewage.—Analysis of Experiments, 1886-9. Paris per 100,000.

| Nitrogen as ammonia | Ord. | Suspended Matter | Raw sewage, very
|---------------------|------|-----------------|----------------
|                     | (A)  |                 | turbid & opaque |
|                     | (B)  |                 | dad            |
| Raw sewage, very    | 2.37 | 0.66            | None           |
| turbid & opaque     | 18.0 | 12.45           | 2.37           |
| dad                 | 4.03 | 3.04            | 2.37           |

<table>
<thead>
<tr>
<th>Average</th>
<th>1.88</th>
<th>0.54</th>
<th>23.5</th>
<th>5.77</th>
<th>15.1</th>
<th>7.35</th>
<th>8.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Suspended Matter</th>
<th>Raw sewage, very turbid &amp; opaque</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.34</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>0.35</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>3.35</td>
<td>0.35</td>
</tr>
</tbody>
</table>

| Average | 3.22 | 0.20 | 16.52 | 0.52 | 1.50 | 0.50 |

(TAB) Time of settlement one hour in open reservoirs.

At Mr. Webster's works the raw sewage, as it is received from London, is lifted into a tank, from which it flows through a long inclined channel to a settling reservoir. In this channel there are a large number of iron plates arranged in groups. All the plates in each group are parallel to each other and to the sides of the channel, the sewage flowing between them in streams about an inch thick and the depth of the channel. The plates are alternately positive and negative, the difference of potential being 2.3 volts. The dynamo delivers current at a pressure of 20 volts, and six groups of plates are arranged in series. The time a particle of sewage is occupied in passing through the entire length of the channel varies, according to the degree of its pollution, from two to ten minutes. It is estimated that on the average it requires .25 ampere-hour of current per gallon of sewage the current density being 1 ampere per 11 square feet of electrode.

No positive estimate of cost have yet been made. The sole working expenses are for coal, and it is calculated that these will amount to 13s. per million gallons of London sewage, if treated on a large scale. Interest and depreciation of plant have to be added to this, and all the labor of dealing with the sludge. According to the Market reports the sludge has been found to discharge this into the sea and about 1s. 6d. per ton to press it in. In a town of 333,000, having a sewage discharge of 20 gallons per capita, the electricity, the coal, and the expenditure of iron at 464 tons annum. This latter is in the form of plates, 1 inch thick, run directly from the blast furnace. There is a charming simplicity about Mr. Webster's process. He makes use of his great external iron to electrolyze and he uses them in the nascent state where it is well-known they are most powerful. Instead of adding 5,10,12, or 15 grains per gallon of solid matter, as is now done, he only adds two, and he not only separates the matters in suspension, but he also removes some of the organic matter in solution. This latter is an important matter, as it defers the second decomposition so long that the effluent may be
carried down to the sea, or oxidized by natural influences, before it can occur. The extent to which the purification can be carried is merely a matter of time, and in hot weather, when the quantity of sewage is reduced, and is consequently fouler, it can be allowed to remain for a longer period in the electrolytic bath. — Engineering.

CHIMNEYS!

Chimneys are required for two purposes: 1, to carry off noxious gases; 2, to produce a draught, and so facilitate combustion. The first requires size, the second height.

Each pound of coal burned yields from 13 to 30 pounds of gas, the volume of which varies with the temperature. The weight of gas to be carried off by a chimney in a given time depends upon three things: size of chimney, velocity of flow and density of gas. But as the density decreases directly as the absolute temperature, while the velocity increases with a given height, nearly as the square root of the temperature, it follows that there is a temperature at which the weight of gas delivered is a maximum. This is about 550 degrees above the surrounding air. Temperature, however, makes so little difference, that at 550 degrees above, the quantity is only four per cent greater than at 300 degrees. Therefore, height and area are the only elements necessary to consider in an ordinary chimney.

The intensity of draught is, however, independent of the size, and depends upon the difference in weight of the outside and inside columns of air, which varies nearly as the product of the height into the difference of temperature. This is usually stated in an equivalent column of water, and may vary from 0 to possibly 2 inches.

After a height has been reached to produce draught of sufficient intensity to burn fine, hard coal, provided the area of the chimney is large enough, there seems no good mechanical reason for adding further to the height, whatever the size of the chimney required. Where cost is no consideration there is no objection to building as high as one pleases; but for the purely utilitarian purpose of steam-making, equally good results might be attained with a shorter chimney at much less cost.

The intensity of draught required varies with the kind and condition of the fuel, and the thickness of the fires. Wood requires the least, and fine coal or slack the most. To burn anthracite slack to advantage, a draught of 14 inch of water is necessary, which can be attained by a well-proportioned chimney 175 feet high.

Generally a much less height than 100 feet cannot be recommended for a boiler, as the lower grades of fuel cannot be burned as they should be with a shorter chimney.

A round chimney is better than square, and a straight flue better than a tapering, though it may be either larger or smaller at top without detriment.

The effective area of a chimney for a given power, varies inversely as the square root of the height. The actual area, in practice, should be greater, because of retardation of velocity due to friction against the walls. On the basis that this is equal to a layer of air two inches thick over the whole interior surface, and that a commercial horse-power requires the consumption on an average of 5 pounds of coal per hour, we have the following formulae:

\[ E = \frac{0.3 H}{\sqrt{A}} = A - \frac{0.6}{\sqrt{A}} \quad 1 \quad S = 12 \sqrt{E} + 4 \quad 3 \]

\[ H = 3.33 \sqrt{E} \quad 2 \quad D = 13.54 \sqrt{E} + 4 \quad 4 \]

\[ h = \left( \frac{0.3 H}{E} \right) \quad 5 \]

1 Extract from "Steam," a book which can be procured of the Babcock & Wilcox Company of New York, without cost.
In which \( H \) = horse-power; \( h \) = height of chimney in feet; \( E \) = effective area, and \( A \) = actual area in square feet; \( S \) = side of square chimney, and \( d \) = diameter of round chimney in inches.

To find the draught of a given chimney in inches of water:

\[
D = \frac{1}{1.5} \times \left( \frac{t + 460}{t_1 + 460} \right) \times \log \left( \frac{t}{t_1} \right)
\]

To find the draught of a given chimney in inches of water:

\[
D = \frac{1}{1.5} \times \left( \frac{t + 460}{t_1 + 460} \right) \times \log \left( \frac{t}{t_1} \right)
\]

To find the height of a chimney, to give a specific draught-power, expressed in inches of water:

Proceed as above, through the first two steps, then divide the given draught-power by the remainder, the result is the height in feet. Or, by formula:

\[
h = \frac{d}{\left( \frac{t + 460}{t_1 + 460} \right) \times \log \left( \frac{t}{t_1} \right)}
\]

To find the maximum efficient draught for any given chimney, the heated column being 600 Fahrenheit, and the external air 62 degrees. Multiply the height above grade in feet by 86.7, and the result is the draught-power in inches of water.

The above diagram shows the draught, in inches of water, for a chimney 100 feet high, under different temperatures, from 90 degrees to 800 degrees above external atmosphere, which is assumed at 60 degrees. The vertical scale is full-size, and each division is \( \frac{1}{2} \) of an inch. It also shows the relative quantity, in pounds of air, which would be delivered, in the same time, by a chimney constructed of the same dimensions and temperature. It will be seen that practically nothing can be gained by carrying the temperature of the chimney more than 350 degrees above the external air at 60 degrees.

To determine the quantity of air, in pounds, a given chimney will deliver per hour, multiply the distance in inches, at given temperature, on the diagram, by 1,000 times the effective area in square feet, and by the square root of the height in feet. This gives a maximum. Friction in flues and furnace may reduce it greatly.

The external diameter of a brick chimney at the base should be one-tenth the height, unless it be supported by some other structure. The "latter" or taper of a chimney should be from \( \frac{1}{2} \) to \( \frac{1}{4} \) inch to the foot on each side.

Thickness of brickwork: one brick (8 or 9 inches) for 25 feet from the top, increasing \( \frac{1}{2} \) brick (1 or \( \frac{3}{4} \) inches) for each 25 feet to the top downwards.

If the inside diameter exceed 5 feet the top length should be \( \frac{1}{2} \) bricks, and if under 3 feet it may be \( \frac{3}{4} \) brick for 10 feet.

The architects of Philadelphia gave a dinner to the lately appointed United States Supervising Architect, James H. Windrim, at the Hotel Bellevue, Philadelphia, on Saturday evening, April 26, 1889. Owing to the day only the following were in attendance:

Mr. T. Roney Williamson, John Stewartson, Frank Mills Day, Amos J. Boyden, R. G. Kennedy, Guy King, W. B. Powell, John J. Deery, Wilson Eyre, Jr., C. Balderston, Oscar Frotscher, Walter Cope, Lindley Johnson, Thomas Lonsdale, John Ord, Grayson P. MacArthur and John T. Windrim, the eldest son of the guest. Mr. T. P. Chandler presided, and after the menu had been about half discussed, he introduced the guest of the evening in an unusually brief, though well-chosen words. Mr. Windrim evidently felt the compliment of the occasion, and referred in feeling terms to the invitation of his professional brothers and to the letters of congratulation he had received from his comrades here on his appointment. He then rapidly sketched his connection with his old master, John Notman; the duties of the Supervising Architect of the Treasury Department; his hopes of lifting the office from politics to a plane of business and artistic excellence, and referred humorously to some of the petty troubles which such an official daily encounters. His impromptu remarks were liberally applauded by his colleagues, particularly where he spoke with great earnestness of his intention to appoint men of mechanical and technical knowledge to positions of superintendents and supervision, instead of the recent crop of ward politicians and men utterly unfamiliar with the work in hand.

Mr. Frotscher, after making extended remarks upon the Palais de l'Industrie, said American architects were in advance in his work. Mr. John Ord, in speaking of the development of the art in America, knew that the honored guest would give as high a character as the achievements of his trusts as to the Federal depart-ments. Mr. T. Roney Williamson made pleasures remarks and Mr. John J. Deery dilated upon the benefit of re-unions of architects. Mr. Wilson Eyre, Jr., made complimentary remarks, and referred to his hurried trip to the Appenines during the early winter. Mr. Walter Cope gave a sketch of his tricycle sketching tour in Norway, Mr. John Stewartson, R. G. Kennedy, Mr. Guy King, Mr. W. B. Powell, Mr. Lindley Johnson, Mr. Thomas Lonsdale, Mr. Grayson P. MacArthur, Mr. Amos J. Boyden, Mr. John T. Windrim and Mr. Frank Mills Day were at their best with salutations, which were highly gratifying to Mr. Windrim.

It is proper to state that Mr. T. Roney Williamson was Chairman, and Mr. Frank Mills Day was Secretary of the Committee which brought about this fraternal meeting of gentlemen devoted to the best interests of a great people. The evening was as generous as the reception, and will be long remembered by all the participants.

THE ARCHITECTS' CLUB OF ST. LOUIS.

I enclose a copy of the Constitution and By-Laws of the Architects' Club of St. Louis, which has just been formed with a membership of fifteen. The Executive Committee for the first year are:

President, P. P. Furber; Secretary, L. C. Bulkeley; Treasurer, A. F. Rosenheim. The Committee thought you might like to know that St. Louis was trying to keep up with the procession.

Very truly yours,

P. P. FURBER.

St. Louis, April 18, 1889.

[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

HOW TO MAKE A CELLAR WATER-TIGHT.

NEW YORK, N. Y., April 15, 1889.

To the Editors of the American Architect:

Dear Sirs,—Instead of lining the inside of walls with asphalt for preventing the ingress of water, I have found that the best method was to build the cellar wall as per sketch and place the asphalt (afterwards covered with cement rendering) on the outside. This has been tried successfully in several warehouses on West Street, New York City, for the Rhinelander and Renwick Estates and by so doing valuable cellar-space was saved and the weight of the wall utilized for resisting tide pressure. In one instance the cellar floor was 3' 4" below high-tide level. The use of a part of the floor is patented. The suggestion about asphalt is for professional use.

Yours faithfully,

George Martin Hess.

A BOOK FOR A BEGINNER.

INDIANAPOLIS, IND., April 22, 1889.

To the Editors of the American Architect:

Dear Sirs,—Please state in the next issue of the American Architect a good work on general construction for a beginner. Also state where same can be purchased, and oblige.

R. E. O'BRIEN.

[*Building Superintendence,* by T. M. Clark. Ticknor & Company, publishers.—Eur American Architect.]

NEW PROCESS OF HARDENING PLASTER-OF-PARIS.—The French Academy of Sciences has just received a communication from M. Herouard, a new process of hardening plaster so as to adapt it to the construction of flooring in place of wood, and to other purposes for which it cannot be used in its ordinary state on account of its want of hard-ness and resistance to crushing. M. Jutie recommends the intimate mixture of six parts of plaster of good quality with one part of finely sifted, recently skated white lime. This mixture is employed like ordinary plaster. After it has become thoroughly dry, the object
TRADE SURVEYS

In all the voluminous statistics published relative to railway earnings, under the rubric of "receipts," the most interesting and necessary of all the underlying tendency is observable, viz., the lessening of cost and the improvement and expansion of facilities. Capital is earning less in all proportions, and charges are higher. In business in general, there is a tendency towards one result, viz., the centralization of enterprise on one hand, and the breaking up of the former solution on the other. Construction of railroads has necessitated this on one hand, and made possible industrial enterprises on the other. Demurrage, and speculative holdings are increasing at an alarming rate. Eventually, there will be a pressure from agricultural and other monopolies to which much has been said above, and the" free and open competition" which will depress the value of mechanical labor. The virtue and strength of our past inhabitants will be their own destruction, its inherent weakness will be then manifest. But, meanwhile, social and economic problems are in process of solution, which will prevent or control the appreciation of land to the advantage of the community on the one hand.
SOME of the rooms in the new Public Library in Boston are being covered with a sort of vaulting which, so far as I know, has not been used in this country only in this building, and in some at New York. The vaulting is composed of thin, flat tiles, about one inch thick, six inches wide and a foot long. These are laid in three or four courses, according to the span and the weight to be sustained, with Portland cement between. At the Library, the rooms already covered are about twelve or fourteen feet wide, and the vault, in most cases, of a nondescript order, forming a portion of the surface of a ring of circular section. This shape is given to it for convenience in construction. A skew-back, or rather, a formcrete, is made on one wall by means of three or four courses of tiles built-in in the form of a circular arc. Another skew-back, in the form of another circular arc, is then formed on the walls at right angles with the first. These skew-backs spring from the same point, in the corner of the room, as the first, but the radius of their curve need not be the same, and in the oblong rooms is generally longer, so as to make the rise the same, with a longer span. The mason then begins the first skew-back, using a light centre, which he can carry in his hand, formed to the same radius as the skew-back from which he starts, and lays a row of tiles on the centre, the ends of which he supports on the side skew-backs. The edges of the tiles are jointed with plaster-of-Paris, which sets immediately, so that by the time the ring of tiles is finished, the centre can be taken out and moved along on the side skew-backs for setting another row of tiles. In this way a sort of dome is formed, of rings of tiles, all of the same radius, but rising from all sides to the centre. As the dome approaches the remaining side, a fourth skew-back is formed on that side to rest it on. As soon as the first shell is completed, it forms a platform capable of bearing the weight of the men, and the subsequent courses of tiles are laid by hand directly upon it, taking care to break the joints. All the subsequent work is laid in Portland cement, the plaster-of-Paris being used in the first course only to hasten the hardening, so that it can be worked on. In the case of large rooms at the Library, where piers occur in the middle of the rooms, they are used to carry arches, also of three or four rows of tiles, on which the domes rest as on skewbacks. The appearance of the tile domes is very monumental, even without any painting or decoration, but of course they can be finished as required. The appearance of the room, however, without the new vaulting appears to surpass a construction of iron beams and terra-cotta arches, as usually put in. A heavy load has been put on one of the arches at the Library, and after the cement has had time for setting, the load is to be increased until the structure breaks down. Whether the thrust is greater than that of the brick or terra-cotta arches between iron beams seems to be uncertain. The Portland cement unites the tiles into a solid mass, like an eggshell, and it was found at the Boston Library that no distortion caused by the heavy load placed upon it, showing pretty conclusively that it acted as a shell, and not as a proper dome. The cost of the new construction is about the same as that of iron beams and brick or terra-cotta arches over the same span, supposing that to be made. For many people, the appearance would be better, although it takes much more height, compared to the height from the springing to the crown. The weak point, as it seemed to us, is in the cross arches, between the piers, on which two domes descend from opposite sides. The three or four rows of tiles which form these arches, if they constitute a real arch, give a very thin one, which without the support of the height, one would think, easily distort beyond the limits of safety. If they do not form an arch, but a curved lintel, the thickness appears too small to sustain safely the strain which would be brought upon it by anything like a heavy load on the two vaults which it has to support. This, however, is a matter which can be determined better by tests that by theorizing, and it is to be hoped that the trials which the Trustees of the Boston Library propose to make will cover all these points, and that the results of them may be published for the benefit of the building public.

An architect's suit was recently decided in the Supreme Court of Massachusetts, which has a certain interest. The architect of the Adams House, a well-known hotel in Boston, sued the owner for something over twenty-five thousand dollars, for services in preparing plans and superintending the construction of the building. The architect admitted the agreement to render the necessary services for three and one-half cent per foot of the building. This was four hundred and fourteen thousand dollars, so that his commission amounted to fourteen thousand dollars, of which they had paid him eight thousand dollars, and were ready to pay the balance. The architect claimed three and one-half cent per foot for three and one-half cent per foot commission, but claimed additional compensation for extra services and for superintendence. Evidence was brought as to the skill and reputation of the architect, and the auditor who first heard the case awarded him eighty-five hundred dollars. The case was tried again before a jury, which brought in a verdict for thirteen thousand dollars for the architect. This, added to the eight thousand dollars previously paid on account, is about five per cent on the total cost of the building, so that the jury seems to have taken the view that five per cent on the cost is about what an architect gets for such a job. It was thought that the architect was foolish enough not to come to a clear understanding in the first place with his clients, about what he was to do and what he was to be paid for doing it, he deserved to lose the comparatively small compensation which he might have earned by extra work.

The city of Toronto is having a little experience with building contracts which is likely to be valuable to it hereafter. It seems, so far as we can gather from the Toronto Globe, that a firm of contractors agreed to furnish the city with paving-blocks of "first-growth cedar, free from pinholes." They furnished the blocks, but some one happened to examine them and found that they were furnished with "pinholes," and the inspector on the work gave notice to the contractors that no more blocks not in strict accordance with the specification would be received. The contractors appealed to him to the Chairman of the Board of Public Works, saying that all first-growth cedar had pin-holes. They would be as reasonable to expect them to find trees without bark as timber of the kind specified without them. The chairman gave them no comfort, but announced his intention of supporting the inspector, and the contractors, after a little consideration, resolved to "throw up the contract," and, accordingly, took six hours of the board's time to discuss the matter, and left the work, leaving them to settle. If the contractors expect to coerce the city authorities by this expedient to accept materials of a different quality from those contracted for, we hope they will be disappointed. If the specifications called for materials which could not be furnished, the time to find it out and speak about it was before the contract was signed, and representations
of the kind should not now be listened to for a moment. Still less should the city allow itself to be threatened or bullied by men whom its officers are simply trying to compel to live up to their contracts. If the contract contains, as of course it ought, provision for having the work completed by other parties at the expense of the contractor in case the latter neglects his duty, and if the engineer in charge has been careful to guard the city's interest by keeping back a good reserve of payments, a good lesson can be easily and quickly taught those who wish to have dealings with the municipal authority. Of course, we do not advocate anything like oppression, but the right-handed practice which is so popular among contractors for public work of "throwing up" their contracts at the least provocation, and turning a lot of hungry voters into the streets to defy the politicians, needs repression to be reined. If a contractor has in good faith undertaken to do what is impossible, his best and most natural course is not to try to terrify the other party to the contract into accepting something else in place of what he agreed to do, but to go to him, or the expert who has charge of his interests, and explain the situation frankly, asking for such relief as can be fairly granted. Very few architects or engineers would advise their clients to take advantage of an innocent mistake, or to insist upon impossibilities merely for the sake of distressing a person who had inadvertently entered into an embarrassing agreement; but no architect or engineer would fail to instruct his clients that in such a case they were entitled to insist upon the letter of the agreement, and that any concession they chose to make would be simply a favor on their part. However it may be with private individuals, municipalities are usually very willing to pay their fair share of the materials honestly and faithfully rendered, even though the contract provides only an inadequate price, and it would have been much better for the Toronto contractors to have appealed to the public sense of justice for subsequent reimbursement, if the fulfillment of their promises involved them in loss, than to have consented at once to a settlement of the claim, in order that the contract be carried on, or in order that the law, but the general sense of what is courteous and fair, will be against them.

So many architects carry accident-insurance policies, that the following case, which was decided in France the other day, has a certain interest. A man held an accident-policy, in which it was stipulated that accidents proceeding "from infractions of the laws and public regulations" should not be covered by the policy. The holder of the policy, being in a railway station, crossed the tracks to reach a train, although he was warned not to do so by the station-agent. While he was thus engaged, a train ran him down and he died. The effect of the blow. The accident-insurance company refused to pay the indemnity, on the ground that death was caused by infraction of the public regulations, and the widow sued to recover the money. The court decreed in her favor, on the ground that the warning of the station-agent was an official act of an agent of the railway company only, and could not be called to serve, in a contract of insurance, as the act of a public officer. Last, however, any reader should be tempted to risk his life, as well as his insurance, by crossing tracks in front of trains in this country, it should be remembered that American accident-policies often provide expressly that the insurance shall not cover accidents arising from crossing railroad tracks or walking on them; and in some of our States, if we are not mistaken, the act of walking on a railroad track is itself made a misdemeanor, so that insurance could not, under the ordinary accident-policies, be collected for mishap due to this violation of law.

The Roth Scholarship for the present year has been awarded to Mr. Henry Bacon, Jr., of Boston, one of the best-known draftsmen of the city. As usual, the number of competitors was very small, only three or four having applied for the preliminary examination. Fortunately for the reputation of Massachusetts Institute of Technology, the quality of the candidates has been uniformly good, but it is astonishing that so great a prize, the realization of the dearest dream of most ambitious young architects, should not be pursued by them more eagerly. To say nothing of the pleasures of a two years' sojourn abroad, as a young architect, the advantage to his future career, not only of the study in which he would occupy his time, but the reputation which the winner of so renowned a scholarship gains, is almost inestimable. We are so little accustomed to artificial distinctions among men that it hardly occurs to us that the winner of a great professional prize in this country, quite as much as in any other, has his future practically assured. If he has been moderately possessed of prudence and common-sense, employers and clients will come to him, in preference to others, simply because they have heard his name in connection with a professional distinction which could not have been gained without professional ability and in which he took the first place. A project of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel. With this charge, a projectile of bronze, six feet long, and weighing about two hundred pounds, was used in the experiments, with a charge of explosive gelatin which may be carried up to six hundred pounds if desired, although not more than seventy-five pounds was employed in the trials at Kiel.
BUILDERS' HARDWARE.—XXV.

DOOR-KNOBS.

The ordinary appliance for operating a door-latch consists of a knob on each side of the door, made of pine, larn, wood, composition, or metal in various forms, but generally in the shape of a flattened sphere. The knobs are attached to metal shanks serving to hold them away from the door, and to prevent their pushing in, and the two knobs are connected through the lock by a square spindle. The spindle is firmly attached to the shank of one knob, and on the other side of the door it fits loosely in the shank, considerable length being allowed for the adjustment to various thicknesses of doors, the inner knob being finally secured in place by a screw on one side of the shank which passes entirely through the spindle, and sometimes is also made of sufficient length to turn into the opposite side of the shank. The hole in the door through which the spindle passes is covered by a metal disk technically designated as a rose. The rose is secured to the door by screws, and as the shank of the knobs is made to fit closely against the rose, it must put on there will be very little work on the lock when the knob is pulled from the opposite side, all strain being gathered on the rose itself. Knobs are usually provided with a number of small washers, so that the adjustment between the bearing-surfaces of the rose and the ends of the shanks can be made exact, and thus any rattling is obviated. In many instances the shanks are secured to the spindle with screws on each side of the door, so that the knob can be taken off from either side of the door. For front-door and vestibule work the outer knob should always be securely attached to the spindle, so that no screw is necessary, as otherwise, if the shank is held by a screw it can be removed first, the spindle pushed in and the inner latch follow turned back. For interior work, however, it makes little difference whether screws are used on one or both sides, though many consider the use of screws as altogether objectionable, owing to their liability to work loose; and, aside from any questions of design, the ingenuity of hardware manufacturers has been chiefly expended upon securing a better connection between the knob and the spindle. Still, few of the patented forms of attachment have been very generally received, and the old style of screw attachment seems to meet with the most favor, if we may judge by usage. It is not the question of cost which is in the minds of many builders and architects, but rather a belief that a tangible fastening like a screw which is easily placed and easily removed, is, after all, more satisfactory than any concealed device.

The objections to the old style of fastening are, however, easily appreciated. One trouble is that the spindle will work and wear away so as to be loose in the follow, and rattle every time the knob is touched. This is particularly noticeable in very old work, in which the parts are sometimes so worn as to admit of as much as half an inch play at the end of the knob. In new work, the spindle, the follow and the roses can be fitted so that any rattling is impossible, though with the old styles of fastenings this is accomplished only by the best manufacturers.

With the old style, the screws are apt to work loose, as applied by ordinary mechanics. In cheap work they nearly always do so; still, if proper care is taken and the screws turned up with a drop of thick shellac in the threads there will be little trouble, and none that cannot easily be remedied with a screwdriver.

There are other objections of less moment, such as the fact that considerable time is occupied in fitting the washers necessary to a proper adjustment of the spindle and shank; and the proper attachment of the screws takes time also. It is further found that when the spindle and shank wear away there is apt to be a strain brought upon the lock-plate through the door, thereby endangering the proper action of the levers. We have still, however, that these objections are by no means vital, and are such as might be due to careless or indifferent workman.

One of the best evidences that the old style is the most satisfactory, is that every manufacturer has it on his catalogue-list. Anything else is really an exception, and we know of only one instance in which a manufacturer has undertaken to push exclusively a single form of knob attachment differing from the common style. It must not be thought, however, that no clever or good devices have been thought out. It is hard to simplify simplicity, and the screw connection, all things considered, gives eminent satisfaction.

The first variation from the old style has been to enlarge the rose, extending it out over the shank so as to partially or completely cover the screw-hole, a slot being left at each side through which the screw can be applied, the rose subsequently being turned and secured against the door so as to completely cover the screw. Figure 356 shows such a form. This device renders it absolutely impossible for the screw to become detached, though it does not prevent it from being a little loose, and so permitting the knob to rattle; and, as the difficulties of getting at the screw are increased by this method, the probabilities are that most people would let the knob rattle instead of taking the trouble to tighten the screw. Still, this is an improvement, and when well applied is very satisfactory.

The next step has been to cover the screw entirely. Figure 367 shows one mode in which this has been accomplished. The screw is made in two portions, one consisting of a flat piece resting against the door, and serving as a bearing-plate for the shank, while the other portion of the rose, which would show in the finished work consists of a thin shell covered out so as to entirely cover the screw. The screws which hold the rose to the door pass through both the outer shell and the inner plate.

Figure 368 shows another form in which one screw is done away with. The spindle is cut with screw-holes. The rose is made in two portions, one being screwed to the door, and the other acting as a binding-screw or washer, screwing onto the threads of the spindle at the same time that the shank of the knob screws behind it, the two locking, and preventing the knob from being unscrewed except by forcible means. As the spindle is held in the latch, the knob can, of course, be turned but half way in either direction.

Another form of knob substitutes a continuous ratchet on one face of the spindle for the screw-holes of the common form. These knobs are made by the Boston Knob Company, and outwardly appear like an ordinary knob. The advantage is that the knob can be adjusted at any point without the aid of washer, the screw catching onto the ratchet in any position of the shank.

Figure 369 shows a form which does away with the screws entirely. The key escutcheon and the rose are combined in a single plate on each side of the door. Inside of the rose is a hub which is cut with a screw-thread. The spindle passes through this and into the shank of the knob, which is cut with a thread corresponding with the thread on the hub. In applying this fixture the knobs are simply screwed on until

* Continued from No. 399, page 161.
they bear slightly on the edges of the rose. The escutcheon-plates are then screwed together through the door as shown on the drawing. As the spindle passes through the latch it will readily be seen that the knob cannot be unscrewed except by removing the escutcheon-plates, and as these plates bear on each side of the door above and below the lock, it is almost impossible to bring any strain on the lock-plate itself.

Figure 370 is a somewhat similar form as regards the escutcheon-plates. The knob, however, is attached by means of lugs on the shank, which in one position of the knob will slip into the hole in the rose; but when half turned will catch on the inner side of the plate, thus rendering it impossible for the knob to be removed except by unscrewing the face-plates from the door. Figure 371 is a device practically the same as that shown by Figure 368. Figure 372 is still another variety of the same general style of attachment, using a steel binding-screw to hold the knob-shank in position.

The Yale & Towne Manufacturing Company has recently put on the market a form of screwless knob-shank shown by Figure 373. In this case the spindle is turned round at each end and threaded. The knob is provided with a swivel-nut, D, which fits the thread of the spindle. In applying, the nut is turned up until it bears slightly against the face of the rose, and is then left in that position, a washer being interposed between the rose and the nut. The nut takes the place of the ordinary shank, and as this portion of the knob is seldom touched, there is little liability of the nut working loose, especially as it can be turned up pretty tight, and is made so as not to work too easily.

Figure 374 represents still another variety of screwless knob-fastening. The nut, C, forces the washer, B, against a shoulder inside of the shank, A, binding the latter firmly to the rose and to the door. The knob is then slipped over the spindle, and the shank, D, screwed over the shank, D, until the knob is drawn up tightly. The only chance of the fastening working loose is by accidental turning of the shank, A, which is not likely to occur.

The Yale & Towne Manufacturing Company has a device illustrated by Figure 375 which is a very different principle from any of the foregoing, as it does not depend upon screws of any kind. In this case the knob-shank is cut out with an eccentric socket or bore. The ends of the spindle are turned down to exactly the same contour as the bore of the shank; so that while the knobs on either side of the door can easily be slipped over the ends of the spindle, they can be fastened by simply rotating them in opposite directions, when the fine pitch of grade of the eccentrics causes a great pressure to be exerted, which results in binding the knobs rigidly to the spindle. This is the simplest form of knob attachment in the market, and if properly applied, will always remain in order, though great care must be taken that the knobs are turned up firmly.

For front-door locks and latches it is necessary to have some form of spindle in which the two extremities may be worked independently, so that the outer knob may be locked while the inner one is free to rotate. The commonest form is to connect the two halves of the spindle by a swivel joint, Figure 376. Corbin has in the market a spindle in which the two halves screw together, thus permitting of very careful adjustment to the thickness of the door. The pitch of the screw-threads is so slight that the quarter turn necessary to open the latch does not throw out the knob from the door.

There are various methods of attaching the head of the knob itself to the shank. When porcelain or mineral composition is used, the shank is leaded into the knob, Hemacite, zylonite, etc., are cemented or screwed to the shank, as are the cheaper forms of wooden knobs. Metal knobs are blind riveted, cast solid to the shank, or shrink on. Glass knobs are commonly leaded, but in some cheaper forms are cemented or even pounded.

There are, however, some devices which are intended to attach the knob more firmly to the shank. Figure 377 is one which is used in connection with wooden knobs. The shank is cut with a screw-thread which turns into a corresponding thread cut into the knob. Before the shank is screwed in, a metal key extending through the shank is placed in the slot, and after the knob is firmly screwed on the key is forced into the wood by means of a punch placed in the opening of the shank, the key thus effectually locking the shank into the knob. Figure 378 shows a form of attachment for either wood or metal. In this case the knob is held by a screw passing from the knob through the upper portion of the shank and into the head of the spindle. The spindle can be adjusted for any thickness of door by means of a small wedge which can be driven in before the knob is attached, in such a manner as to hold the shank at any given position.

(To be continued.)

LONGSPAN OF A SILICON-BRONZE WIRE. — A wire belonging to an English telephone company, which traverses the entrance to Dartmouth Harbor, has the remarkable span of nearly half a mile, or, 880 yards. On leaving the Dartmouth side the wire is 332 feet above high-water mark. It drops to 198 feet near the Kingswear side, and then rises again to 207 feet. The wire is very fine and light, being No. 17 silicon-bronze, weighing twenty-four pounds to the span.—Exchanges.
ARCHITECTURAL SHADES AND SHADOWS.1 IV.

CHAPTER IV.-LINES AND PLANE FIGURES.

Principal planes, lines and diagonals, and their projections and traces; shadows of points on either plane of projection; shadows of lines and figures parallel to a plane of projection and of principal lines in general.

If we suppose a cube or rectangular prism to stand with its faces respectively parallel and perpendicular to the planes of projection, its six faces and six edges will form what are called principal planes and lines. Such planes are parallel to VP and perpendicular to HP; parallel to HP, and, consequently, perpendicular to VP; or perpendicular to both planes of projection and to GL. Principal lines are, similarly, vertical, horizontal, and inclined. What is the case of planes at an angle of 45° to one or the other plane of projection (as AF, BE, AG, HB), Figure 28, will be illustrated in Figure 29. The three principal planes for railroad structures, Figure 29, are illustrated by Figures 28 and 29. Principal lines are formed by the intersections of principal planes, and any two such lines intersecting determine a principal plane.

35. Lines parallel to the diagonals of the faces of a cube placed as above may be classed as principal diagonals. They lie in principal planes at an angle of 45° to one or the other plane of projection. As shown in Figure 30, a cube may be divided into two cube-diagonals, and having for one trace a line at 45° to GL, and for the other a line normal to $90^\circ$ GL, or else having both its traces parallel to GL (Figure 30). The shadows of these various lines and of figures in these planes, being those most common in architectural drawing, should be thoroughly mastered, and to these our investigations will now be directed.

36. As a large proportion of the shadows in architectural drawings fall upon vertical or horizontal planes parallel to HP and VP, and the picture-plane or plane of projection may be assumed so as to coincide with such a plane (the trace of the latter forming the ground-line), it will simplify matters to consider the shadows in the following rules as falling upon the plane of projection itself, thus avoiding the constant repetition of the words, or on a plane parallel to the plane of projection.

37. If a point O be given by its projections, $o'$, $o''$ (Figure 34), its shadow on VP (for example) is found by drawing both projections of a ray passing through the point. The horizontal projection of this ray intersects GL at $o''$; the horizontal projection of whose vertical projection will, consequently, be at $o'$ on the vertical projection of the ray. In the same way its shadow on HP may be found, remembering that it may fall behind VP (i.e., above GL) quite as often as in front of it, in which case care must be taken not to confuse it with its projections on VP. $o'$ is the vertical and $o''$ the horizontal projection of the shadow of $o$ on HP in Figure 34.

Fig. 30.

Principal Diagonal Lines.

Fig. 31.

Projections of Principal Diagonal Lines.

The letters indicate lines parallel to HP and VP.

Hence this rule:

(I) The projection of the shadow of a point O, cast upon a plane of projection, is found upon a line drawn at 45° to GL through the point O. Its distance from the latter, measured horizontally or vertically, equals that of O from the latter.

Hereafter, for the sake of avoiding tedious repetition, points, lines, and shadows will be distinguished from their projections by prefixing the word "real" or "actual," omitting the words "projections of" wherever it can be done without obscuring the meaning.

38. The shadow of any right line is determined by the shadow of its extreme points (a, Figure 35). When only the direction of its shadow is required, the shadows of any two of its points will suffice (b).

40. It is easily seen from the rule in 38 that the shadow upon a plane of projection cast by a right line parallel to it must be equal and parallel to the line, since all the points of the latter are equidistant from the plane.

41. And finally, since any plane figure and its shadow on any plane parallel to itself are really parallel sections of its shadow in space, these sections are equal. Whence this general rule:

(II) When a plane figure casts its shadow on any plane parallel to itself, this shadow is both equal and parallel to the figure, and its projections are equal and parallel to the projections of the figure.

42. Applications of Rules (I) and (II) may be found in Plate II. In No. 1, for example, the difference between $a'$ and its shadow $a$ measured horizontally, is $a'o$, and vertically $a'o'$, each of which is equal to the distance of the point $a'$ from the plane of incidence. In the same way, the horizontal and vertical distances of $b'$ from $b$, are each equal to that of the edge of the cube falling upon the face of the projecting picture. In No. 3, the shadows of $a'$ and $b'$ are found by laying off horizontally and vertically the distances of $a'o$ and $b'o$, from the plane of incidence, which distances in many cases may be ascertained without trouble by drawing a plan. So, also, the shadows of the horizontal and vertical edges cast parallel horizontal shadows on the treads as wide as its own height above each tread. This is made clearer by the perspective sketch, Figure 35. From all these examples it is evident that the width of the shadow upon a vertical plane, of any horizontal or vertical member parallel to it, is equal to the overhang or projection of the line or edge casting the shadow. This gives a simple rule applying to a multitude of cases: the jams and lintels of doors and windows; the lower edges of window-sills, cornices of crenels and corona are found by means of the shadow of a single point in each of these shadows being parallel to the corona in each case. In Nos. 2, 3, 4, 6 and 7 the shadows of the horizontal and vertical edges cast parallel to VP are at once drawn parallel to these edges, and limited by the shadows of their extreme points. In No. 5 the vertical right-hand edge of the parapet casts vertical shadows on the risers of the stairs in elevation, their width in each case being equal to its distance from the riser; while in the plan its upper horizontal edges cast parallel horizontal shadows on the treads wide as its own height above each tread. This is made clearer by the perspective sketch, Figure 35. From all these examples it is evident that the width of the shadow upon a vertical plane, of any horizontal or vertical member parallel to it, is equal to the overhang or projection of the line or edge casting the shadow. This gives a simple rule applying to a multitude of cases: the jams and lintels of doors and windows; the lower edges of window-sills, cornices of

and string-courses; horizontal and vertical mouldings; the edges of piers, pilasters and projecting rectangular masses of building, and many others. Nos. 10 and 11 contain several examples of its application, while No. 9 illustrates the shadows of arches upon vertical planes drawn by means of the shadows of their centres (Figure 37). The plane of each stepping of the arch is supposed to be extended across the opening so as to receive the shadow of the centre of the arch next in front, as shown by the dotted lines in the plan. Having thereby found the vertical projections of the shadow of the centre, the shadow of the arch is then drawn from this new shadow-centre with a radius equal to that of the arch. Thus c', is the shadow upon the plane of the main wall of the centre of the arch, which radius is then used to describe its shadow from c'; c' is the shadow-centre from which the shadow of the first arch upon the plane of a second is drawn, and so on.

45. A line perpendicular to a plane of projection has for its shadow a line inclined at $45^\circ$ to $G L$, parallel to the projection of a ray of light. For the projection upon either plane of a line perpendicular to it is a point (note to Chapter II, 4), which we call $p$. As the projection upon the plane of the whole line, it is the projection of every point in that line; consequently, a line drawn through $p$ at $45^\circ$ to $G L$ must contain the shadow of every point in the given line (Rule 1). But this will be true whatever the nature of the surface. The edge of the shadow of such a line, even when it falls upon an irregular surface, must still be in the line drawn through $p$ at $45^\circ$ to $G L$. This is further evident if we consider that the invisible shadow of the line in question is a plane perpendicular to the plane of projection, and contains the cast shadow of the line (22, Maxina VIII, 6), which is, therefore, projected as a line perpendicular to the line of projection (section of its own shadow). Whatever the real form of the cast shadow, it lies in this plane of invisible shadow, and, as this plane is seen edgewise, every line in it will appear straight, although in perspective its irregular form becomes evident, as appears by comparing Figure 38 with No. 5, Plate II, and Figure 39 (note to Chapter II, 6, and Figure 37).

The length of the shadow of such a line falling on the plane of projection or upon a plane parallel to it is equal to the diagonal of the line itself. This is easily deduced from 38 and from inspection of the geometrical relations of the shadow itself. The various facts we have considered may be stated thus in the form of a rule:

45. (III). The shadow of a line perpendicular to a plane of projection is a right line at $45^\circ$ to the horizon, regardless of the size of the surface upon which it falls. Upon a plane parallel to the plane of projection its length is equal to the diagonal of the line casting it.

This rule has very frequent applications in architectural drawing, some of which are shown in Plate II. In No. 1 the right-hand upper edge of the abacus casts its shadow on the wall, while that of the lower left-hand edge falls across the ceiling, fillet and necking (crossing several other shades and shadows); both are alike lines at $45^\circ$ to $G L$. In No. 10, the shadow of the horizontal angle seen as a mere point over the window in the wing, and the shadow of the right-hand cornice of that wing running back to the main body of the building, are both drawn at $45^\circ$ to $G L$, though they cross a variety of surfaces, mouldings, pilasters, windows, etc. In the edges of such a solid; the extreme outline formed by these shadows bounds the shadow of the solid, and since by means of the shadows of squares and cubes the dimensions and direction of the shadows of their diagonals and of the sides of the inscribed octagons may be found; these two rules suffice for all the various classes of lines described at the beginning of this chapter, and the figures and solids composed of them, as may be seen in Nos. 2, 3 and 4 in Plate II, and in Nos. 6 and 7, which show their application to octagonal forms. But it will be advantageous to examine certain special cases more closely, and the following chapter will embody the application of these rules to the most important of them; namely, the square, "diamond" or lozenge, octagon, and their derivatives.

(To be continued.)

---

*It is hardly necessary to specially repeat the qualifying phrase," parallel to the projection of a ray of light," which may hereby be taken for granted with the words," at $45^\circ$ to $G L$", unless the contrary is specifically stated.

---

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSE OF MRS. JEREMIAH MILBANK, GREENWICH, CONN. MESSRS. LAMB & RICH, ARCHITECTS, NEW YORK, N. Y.

[Glottine Print, issued only with the Imperial Edition.]

THE building is about one hundred and eighty-five feet long and covered with Spanish tiles. The interior feature is the large hall with Connecticut stone fireplace and a window in staircase
SHADES AND SHADOWS.

No. 2. Rectangular Horizontal Prism.

No. 3. Square Horizontal Shelf and Shadow on Vertical Wall.

No. 4. Vertical Square Tile and Shadow on Vertical Wall.

No. 5. Rectangular Flat Irregular and Shadows on Table, Risers, and Door.

No. 6. Vertical Square Octagonal Tile and Shadow on Vertical Wall.

No. 7. Horizontal Octagonal Tile and Shadow on Vertical Wall.

No. 8. Shadows of Windows with Pediment on Arch, from 6 dollars 26 cents.

No. 9. Repeated Arches and their Shadows on each other and on the Door.

No. 10. Shadows of Rectangular Projecting Masses of Windows and Lines parallel to Lines on Face of Building.

No. 11. Tuscan Engaged Capital, Shade and Shadow.

PLATE 2.
View from the South

View from the North

Heliotype Printing Co., Boston.
AUGUSTE RODIN.—VII.

THE DOOR.

No one outside of the little circle of Rodin’s intimate friends had the slightest idea of the importance of the commission that M. Turquet had given him. At the time of receiving it he explained the plan he proposed to follow in its design, and that official expression of his entire confidence in the sculptor’s ability to carry out any scheme he might undertake. “I was sure,” said M. Turquet on a subsequent occasion, “that I had discovered a great artist, one fully capable of executing any task confided to him. The result, as is now well-known, has amply confirmed my judgment.”

Rodin’s friends were equally confident, for, though he had not yet made any work composed of many figures, save a decoration or two on vases at Sevres, they felt that the idea of “The Age of Brass” and the “St. John” gave unmistakable traces of a thought in the sculptor’s mind. The giving of such an order to Rodin, in view of the unfortunate circumstances which had surrounded him since his return to Paris, and the opposition to him, as expressed by the leading art influences of the city in refusing to justly compensate him at the Salon, was regarded by him and his friends as a bold and noble act on the part of M. Turquet. This feeling was expressed by Dargente in L’Art of 1869, when he wrote: “It is to the honor of M. Turquet that he has dared to order of Rodin a monumental door.”

A year after the commission was given, a journalist, whose name is not known, found his way to the sculptor’s studio and reported that “one has a right to hope that the door will introduce a new and large style of sculpture, a style very much needed in these days of antique imitations and commonplace School Inanities.” For the next year or two an occasional journalist also caught a glimpse of the door, in spite of the desired seclusion of the sculptor, and wrote of its colossal proportions, with prognostications of its eventual success. In 1863, L’Art contained a number of illustrations of the first sketches on paper of the door, but on the general composition giving the readers of that journal the first idea of the character of the sculptor’s starting-point. The exhibitions at Petit’s galleries, 1885–86, before alluded to, caused a general interest in the sculptor’s work, and before the close of 1887 the most distinguished art lovers, littérateurs and critics of Paris, as well as many from Belgium and England, had visited his studio and seen the door. As its general composition was defined, its principal statues and busts executed by him; in all a more complete exhibition of Rodin’s works than has hitherto appeared.

The preceding pages have been written for the single purpose of giving the bare facts of Rodin’s life as they occurred, with the circumstances that immediately surrounded him, in order that the reader may be free to form his own impressions and draw his own conclusions from the direction of these facts. The study of it, and the simplicity and force of his character; of his single-mindedness, his courage, his perseverance, his high idea of art, and his perfect belief in himself.

The writer first saw the door and its author in November, 1887. On entering the studio, a large, barn-like looking place, he saw an enormous structure in plaster, reaching nearly to the ceiling. This was the door upper which more than seven hundred and fifty figures, the principal statues and busts executed by him; in all a more complete exhibition of Rodin’s works than has hitherto appeared.

The first impression is one of astonishment and bewilderment: astonishment at the size of the door and the style of its design, and bewilderment at the extent and variety of the forms that compose it. If possible, this impression is heightened by a glance at the floor, as well as every available space in the walls of the studio, is covered with plaster figures, in every conceivable position, that are destined to complete the work. It is like looking into an entire and strange world. And it is true that this impression is succeeded by the more gratifying one of wonder and admiration of the prevailing life of the figures and the fine sense of true sculpture that everywhere abounds. All idea of subject, illustration or purpose taking a second place is in mind, or is forgotten, in presence of the charm, the sensibility, the divine touch of art that takes possession of the beholder. He stands there one healthily enchanted and suffused by the sculptor’s imagined, if he looks upward, three sinister left arms, from as many herculean forms, point straight at him, as though in condemnation of his intrusion; if he turn to the right, his eyes meet the beautiful eyes of a young girl, whose whole being of a product of his, seen from above, to the left, a commanding statue of St. John the Baptist bids him to waiting silence; if he turn around, the piercing look of the life-like sketch of Bastien-Lepage greets him, and at his very feet, the sculptor’s model and body of a colossal Ugolino. Where to, at a colossal Ugolino, or a sculptor’s model and body of a girl who will, tread where he may, these silent images follow him like a united shadow.

Though the door is generally understood and popularly called, for description’s sake, an illustration of Dante’s Inferno, it is only true to a limited degree. Of its design and the thoughts and sentiments that have actuated the sculptor, he says: “I had no idea of interpreting Dante, though I was glad to accept the Inferno as a starting-point, because I wished to do something of a grand and important character. I had been accused of using casts from nature in the execution of my work, and I made ‘The St. John’ to refute this, but it only partially succeeded. This work, without the analysis of Dante, shows how far other sculptors, I determined, simple as I was, to make the sculpture on the door of figures smaller than life. My whole idea is simply one of color and effect. There is no intention of subject, illustration or method of representation, but of an intended moral purpose. I followed my imagination, my own sense of arrangement, movement and composition. It has been from the beginning, and will be to the end, simply and solely a matter of personal pleasure. Dante is more profound and has more fire than I have been able to represent. He is a literary sculptor. He speaks in gestures as well as in words; is precise and comprehensive not only in sentiment and idea, but in the movement of the body. I have admired Dante, and have read him a great deal, but it is very difficult for me to express in words just what I think of him, or have done on the door. I have only read one translation, that of Asscher, the five-cent edition of the Inferno. I did not care for it and the pocket. Other translations have been recommended to me as better than his, more learned, but I have never seen them. Rivarol’s seems to be clear, charming, simple, and without pedantry. He may not have been the greatest of men, but the most profound sculptor, but I like his translation. It has always satisfied me.”

“The salient subjects of the door are the two episodes of Paolo and Francesca and di Rimini and the story of the holy phantoms and Dante. I never so much as thought of Beatrice, though I know it is a beautiful subject. Perhaps I may include it yet, but it will be difficult to treat, because I only make nude figures, and I don’t like to do any nudes. I don’t think of her as a nude figure, and for the door she could not be made otherwise. Besides, she is an angel, and I don’t see angels as bodies, only as heads. Neither do I consider the figure through the sculptor modestly says that he has been unable to fully represent Dante, the writer believes it will be heartily conceded that whenever he has treated any of the latter’s subjects it has been with all the fire and comprehension of the text, and has produced works of sculpture equivalent to anything that ever came from the poet’s pen.”

Group from the Door. Auguste Rodin, Sculptor.
What greater sense of speechless dole could be shown than by the three phantoms which surmount the door:

"It is I that saw the fall of the rebel legions;
It is I that saw the guilty races pass;
It is through me that they go to everlasting sorrows.
The hand that made the heavens laid my foundations:
My birth was before men or days,
And I shall remain longer than time,
Enter, whoever you may be, and leave hope." — Ricard's Translation.

Nothing less can be said than that this group is matchless as a conception. And its opposition of masses and power of concentrated purpose — daring in repetition — make it a work of sculpture as fine as it is original. It is a trio of despair; a drama conclusive in design and propriety of place. It tells the story of the whole door.

And the Dante: he that looks down upon hell. For an expression of a deep understanding of and a penetration into the very soul of him who walked through the abodes of the cursed and saw its endless grief, what could be more complete than this statue. This awful Thinker: seen from his left, he looks like a bird of prey contended with the vengeance he has meted out to the vile of the earth; a composition of physical and mental dominance, an effect of personality seemingly without a rival in all the sculpture of the world. More vital than he of the Medici Chapel, and more to be feared than the motionless prophet who keeps his vigil in the icy loneliness of St. Pietro in Vincoli. Here, then, are two works every way worthy of the imperial source that suggested them; as complete, as firm, as living. Of Rodin's power of seizing the most dramatic point of a subject, the group of Ugolino and his sons is a terribly real example.

Various artists have treated this subject at the moment when the father is in the act of biting his fingers in the first scene of his agony, and when his sons are suffering the first pang of hunger. Rodin goes at once to the depths of the whole tragedy. The youths have fallen to the ground, and Ugolino, seeing them so, and feeling the full terror of his situation, throws his own emaciated carcass down and crawls over the bodies of his offspring like a beast benumbed with rage and famine.

"They expired at my feet, falling one by one, all my three sons, between the fifth and sixth day; seeing them no more, so slowly had they fallen; I threw myself down, shrieking and creeping over their inanimate bodies, calling them for two days after they died, and calling ever until the grief which hunger hath awakened in me shall die out. — Ricard's Translation.

The impression made by this being is so forcible that it seems more like the half-conscious response of an unburied corpse to the trumpet of the resurrection than the closing moment of a period of torture. So far as delineation of subject is concerned, this group stands quite alone in vividness and dramatic force. It is the horror of the door.

The other important subject included in the scheme of the sculptor is the group of Paola and Francesca di Rimini, the first study of which was too large for the purpose intended, it being over half lifesize. It represents the lovers sitting close together with their arms around each other. Its whole expression is the embodiment of accordant love: beautiful in its contrasts of form, delicate and chaste in sentiment. Paola, the strong, sensitive, tenderly expectant lover; Francesca, the fully confiding and willingly submissive mistress. No note or vibration of this exquisite subject that was not lived by the sculptor while this group came into being. It was exhibited in Brussels in 1887, and criticised because it was made.
The Architect and Building News.

"What! make them naked. Who ever heard of such a thing. It's dreadful." That it was a superb piece of sculpture passed unnoticed. Only the casual touch of the sculptor has made the traits of the individuals in relief. It seems as though the soul of the woman, in its haste to meet her lover, had shot through the air like a thought, to find rest in his arms. Neither figure seems fully conscious of the apparent effort which is like something done without being done. In no work of art familiar to the writer in which corposale bodies are represented as going through space without effort is there such a delicate balance of this difference between the figures and the door, and this group is perhaps the most emphatic of them all. It is the urgency of a great emotion unchanged in identity and individual force even during that mysterious moment when life on earth closes. The spectator will recall the five pictures of sculpture which had given the varied character of their execution find an abundant counterpart in the other figures of which the door is composed.

The structure is about eighteen feet high and twelve feet wide. The door itself, which is immediately under where Dante sits, is not divided into a series of panels, each containing a special subject and treated independently, as great doors generally are, but represents a perpendicular section of the damned world, without apparent background, and with a slight moulding running through the centre from top to bottom.

The formations of rock, sea, fire and cloud are peopled with the phantasmagoric vision of human beings, sirens, harpies, fauns, furies and monsters; all in more or less movement, according to the desires, emotions or propensities of their natures while on earth, and as affected by their present surroundings. They sail through the air, dive into the sea, dart here and there as though they were possessed, or stand as motionless as death.

The spectator looks through the framework of the door into this indescribable scene. Many of the figures are in full relief, and are placed well in advance of the surface-line of the door, and from them the relief gradually lessens until the dimmest perceived distance shows the vanishing forms in delicate mass or outline.

The frame of this door, composed of small mouldings set in relief, is also covered in the most surprisingly ingenious manner with figures of every kind, age and sex, making it appear like the shores of an overflooded sea of inconceivable detail, but without the stately authority of an architectural form. The sculptor, more pitiful than the poet, grants a little respite to these unfortunates, and permits them to leave their dreary abode. Or, carried away with the process of his passion he has unwarily set in motion, and in no way restricted by the arbitrary topography of the poet, he in very truth lets Hell loose, and the limits of that locality are only bounded by the imagination of the artist.

After the first large sketch of the entire structure had been determined upon, the sculptor intended to model the sculpture in wax on its background of plaster, but as this material was found to be too expensive clay was used in its stead. The figures were then finished and figured in relief, and were placed well in advance of the surface-line of the door, and from them the relief gradually lessens until the dimmest perceived distance shows the vanishing forms in delicate mass or outline.

The form of the door, composed of small mouldings set in relief, is also covered in the most surprisingly ingenious manner with figures of every kind, age and sex, making it appear like the shores of an overflooded sea of inconceivable detail, but without the stately authority of an architectural form. The sculptor, more pitiful than the poet, grants a little respite to these unfortunates, and permits them to leave their dreary abode. Or, carried away with the process of his passion he has unwarily set in motion, and in no way restricted by the arbitrary topography of the poet, he in very truth lets Hell loose, and the limits of that locality are only bounded by the imagination of the artist.

The large unfinished panel, or the tympanum of the door, before which Dante sits in silent state, contains two subjects, that on his right, "The Arrival," and the one on his left, "The Judgment." The first represents a crowd of spirits pushed on by relentless death, the second, the Styx, with her hold already on the arrival of Charon's boat. The central figure of this part of the panel is a kneeling female satyr clasping her hands behind her head. She personifies eternal passion, and expresses in her position the complete rejection of her condition and acceptance to the coming punishment.

The principal figure of "The Judgment," is a young girl whose right hand is raised in her last actings at the door when while her left arm is extended near her body. If any distinction can be made in regard to the character of the sculpture on the door, this statue would be called the most beautiful. Beautiful in every sense is the construction, naturalism, definitiveness of modelling. It is delicious a consummation of gipsy despair. If an unexplainable fate has placed her among the lost who will, you people, have bloomed in Paradise, it remained for the human artist to reproduce in marble the embodiment of innocence, a joy to the hearts of the generations that will see her here.

This figure, like many others made by the sculptor without reference to any personality, has suggested to the minds of writers and others a variety of names, though it has no name. It may be selected as an excellent example of the character of Rodin's art temperament. He works from the force of the sentiment that possesses him, that he lives, and not from the motive of any given name or outwardly defined subject. The Ugolino group is the chief point of interest of the right-hand part of the door, and is placed on a line with the eye of the observer. At its left there will be a group of human and half-human figures surrounding "The Three Syrens." These syrens, unearthly creatures, weird and seductive in every form and movement, make perhaps the noblest figure of a man, and three equally fine ones of women, the latter representing fear and uncontrollable grief. A short distance below Ugolino a narrow panel begins, which has two central pieces of masks of those实际上 the trading in these was concluded. There were no wars that bordered an analogous with the "egg-and-dart" mouldings. One of these is shown in Figure 1. A little examination and comparison proved this decoration to be a double lotus border, of which one side appears in 2, taken from another vase. In this border the dart appears in primitive form as the central triangle of a simplified lotus resembling 3. The oval corresponding to the "egg" of the moulding are formed by the connecting exterior curves of the flowers. Between the flowers, i.e., in the middle of each oval, is placed a bud.

This observation was assisted by the comparison with a decoration in bronze found at Olympia (4) bearing some resemblance to the moulding in question, in which the motive is a simplified lotus form corresponding to 5. It then occurred to me that the excavation at Naukratis in the Nile Delta ought to have revealed some traces of this connection if it really existed. In this turned to the then recently issued publication of the Egypt Exploration Fund, "Naukratis I" and the conclusion of the Egyptian demonstration. This is offered by the architect mouldings hereafter which are copied from the plates in

2. Naukratis was ultimately the only Greek colony of the Nile Delta because the trade privileges then conferred to it, but the temples were never confined to this spot as individuals. They formed the most important mercantile fleet in the Egyptian kings from the middle of the eight century B.C. until the Persian conquest, 525 B.C. The excavations at Naukratis date from 1865.
the buds of the blue lotus, which occasionally have the same square angled section. This is attested by the botanical cut of the bud of the blue lotus in the Description de l'Egypte as well as by my personal observation from nature. It is quite likely that the forms were mistaken for spear heads by the Greek artists. The diamond-shaped form looking like an arrow head above the lotus proper in (12) is not more remote from the central lotus calyx leaf which was its original form than are the exterior spear heads from buds.

Comparison of the lotus buds on the oval 3 with the design on the relief oval of 6 shows that this also is a bud and the elementary original form for petals of a lotus. This is the Ezechielium (16, 11). The "egg-and-leaf" moulding, so-called, seen in one line of the Erechtheum moulding, is of course only a modification in outlines of the "egg-and-leaf" moulding.

It thus appears that the "egg-and-leaf" moulding is a decoration in which the egg is originally an oval projection resulting from the

incised cutting of a series of simplified lotuses placed side by side.

It is well known that the ornamental motives of Egyptian architecture were mainly painted rather than incised. It is also a matter of general information that the development of ornament in Greek Art was one from decoration by color in flat to decoration in relief and that the incision grows deeper and the relief higher according to sequence of time. Under-cutting first appears in the Greco-Roman art and this also grows in extent and depth according to the same progressive.

According to the foregoing observations the supposed "leaf" decorations found in color on the capitals of the Doric order and elsewhere (Figure 13) will also reveal themselves as reversed lotus borders.

After making the foregoing observations I was somewhat disappointed to find that they had been partially anticipated by Owen Jones as early as 1856. According to the prefatory remarks of the "Grammar of Ornament" the "egg-and-dart" moulding is derived from an Egyptian border in which lotuses alternate with bunches of grapes. The bunches of grapes are said to be the origins of the egg. An example of this border is shown in the "Grammar of Ornament". The illustrations offered in this paper from Nauckraith make the hypothesis as to the egg and the bunches of grapes quite unnecessary. It is not from one of the rarest but from one of the commonest forms of Egyptian border that the Greek moulding is derived. The oval is simply formed by the side outlines of alternate lotuses. In my reading has carried me.

Another partial anticipation of my observation on the "egg-and-dart" moulding was made by M. Leon de Visy in 1821 and published in the Journal (Annales) of the "Société Centrale des Architectes." M. de Visy transports the "fir cone" which according to my views has disappeared in Assyria into the heart of Egypt and places it in alternation with lotuses as the origin of the "egg." M. de Visy has clearly been misled by the bulbous form of the lotus bud in the border in question and the bulbous bud of the rose lotus, from nature (as in my last paper). "Fir cones" are unknown in Egyptian ornament, but the mistake is equally clear in either case. The bud is placed on the oval (see 6, 10 and 12) and the oval itself is formed by the bud and no case in which the bud can be assumed to have formed the starting-point of an oval. (It is worthy of remark that a projected "egg" moulding without the dart is as old as the fourth dynasty, as appears from an illustration in M. Denufio's "Monuments Antiques de la Perse.")

The imporatnce of the fact to which this paper is devoted is not to be judged by the brevity of the demonstrations. The intimacy of relations thus proved to have existed between Egyptian and Greek decorative art reacts on the whole argument as to the importance of Egyptian lotus forms as bases of early Greek ornament in general. Any supposable inherent improbabilities as regards, for instance, the Egyptian origin of the lotic capital are entirely removed by the demonstration for the moulding which is constantly found on it. The Greek colonies of the Nile Delta date from about 550 B. C. and precede by three centuries the present known cases of a developed Greek "egg-and-dart" moulding and abundantly explain the Egyptian influence in question. W. H. Goodyear.

The intelligent building-committee.

M. Suffit reports in L'Architecture the transactions of a special meeting of the Council of Architecture of an imaginary department called on the twenty-ninth of February last to consider the designs for a town hall, which have been prepared by Mr. Beaubian, architect, and have been considered by the highest body by the jury of experts. Mr. Beaubian's drawings are spread out on a table, and are not found to have the slightest merit. Who is a member of the council who have arrived earlier than the rest, and who occupy the time in exchanging views upon architecture in general and architects in particular.

"Yes, Mr. Hodge-row," says the legal member of the council, evidently in conclusion of a long story, "the architect has forgotten the stairway from the entrance-hall to the assembly chambers.

"I can easily believe it, my dear sir, for the same thing happened to the architect of a cousin of mine. I have often heard my aunt say.

"There is nothing surprising about that," interrupts another.

"They are always doing something of the kind, and I could tell plenty of stories of similar forgetfulness. The explanation is very simple: the stairs are in their way, and so they suppress them."

Then everybody laughs.

At this moment the President of the Council enters. All the members sit themselves, and the President of the meeting is to examine and pronounce upon the merits of the design submitted, and to make such suggestions as may seem advisable, which, if the Council so decides, will be followed by making a modified design in conformity with their wishes.

The architect is then invited in, and the legal member takes the floor. He begins by felicitating the architect upon his manner of laying waxes of Inflinisk, about which, as he says, he happens to know a good deal. He would like, however, to inquire why the entrance-hall is placed over the vestibule, and why there is no stairway from one to the other. "Ordinarily," he adds, "there are two apartments on the same level, and open directly into each other.

"You see," he remarks to the architect, "I know something about these matters."

"But," expostulates the architect. "But?" repeats the other angrily. "I have eyes, and I see there is no staircase shown."

"But," persists the architect, "the drawing before you is a floor-plan, and the rooms are shown on a level, not one over another."

"That is this is a floor-plan, is it not? And not a section on top? You cannot expect people to guess at these things. Let me advise you, Mr. Architect, to put always on top 'Floor-plan'; then people will understand.

"Mr. Architect," gently inquires Mr. Goodman, the President of the Charitable Association, "are your plans made by hand?"

"Ordinarily, sir, we make them by hand when we have time enough.

"Ah! I have heard that there are machines for that. I suppose, in fact, that you could hardly do it all yourself."

Mr. Shorts, President of the local grange, takes the floor. "Why do you have so much black on this drawing, Mr. Architect?"

"Those are shadows, sir."

"Now stop right there. You acknowledge that they are shadows. That is unfortunate. In a town-hall it is very necessary to be able to see clearly. No one in the town will have any light at all for long. I see you have no windows in your section; that is why you have to make those black shadows."

"But the windows are not on that side of the section."

"Well, then, put some there. I tell you that we must have light. What do you say, Mr. Beetroot?"
"I am entirely of your opinion, my dear colleague, but permit me to ask Mr. Beaton one question: Why are the shadows in your section surrounded with red?"

"That, sir, is the conventional color for showing sections."

"Oh, dear me, what do we want with the Convention and the Sections. You know we don't want political emblems on our plans, I advise you to rule out that socialist red, and put red, white and blue in its place."

Here Mr. Hairygoat, member from a manufacturing town, leaps to his feet and exclaims:

"Mr. Hairygoat," says the President, "you have not the floor."

"I know it, Mr. President, and that is why I take it. I vote for the red, do you hear. That is the color of the supremacy of the public, and a town hall is a public building."

The President: "Well, gentlemen, to satisfy every one, I will ask Mr. Hairygoat to make one side of his section red, and the other side, white and blue."

"Enough of this," Mr. X., member of Congress for this district, has the floor.

Mr. X. rises. Profound silence. "Gentlemen, to the interesting object of the convention, it has already been made manifest to you, I will not only one, but many, relating to the façade. Why, I would like to know, are those lead-lights in the windows? In our town, we built last year a lock-up, and there were no windows, yet every one said it was a splendid building, and it was done by the best mason in the town. We have no millions to spend on our buildings. We must keep the cost moderate. What do you think, Mr. Senator?"

"I think that the public interest must be guarded. Mr. Architect, do not forget to have weather-strips around the doors. They keep out the cold in winter."

"The President: "Has any one anything more to say? The meeting is closed."

PFEIFFER'S AMERICAN MANSIONS.

We have been not a little disappointed that the architects of this country, giving due weight to the circumstances, have not accorded a more hearty support to the proposition that was submitted to them last autumn in the form of the signed circular:

BOSTON, November 13, 1888.

During the past ten years or more of his life, the late Carl Pfeiffer, F. A. I. A., of New York, busied himself in preparing for publication a work on American Domestic Architecture, and during this time he had prepared with much elaboration over three hundred drawings. The executor of his estate, finding it necessary in the interests of Mr. Pfeiffer's family to realize as much as possible, has undertaken the publication of this material. This we have consented to do, provided that the members of the architectural profession, taking the circumstances into consideration, will assure us by their subscription that the undertaking will be of value to the beneficiaries. On examination, we find that from the material there can be selected 100, 150, 200, or 300 drawings, which we propose to publish in five parts, each part containing twenty plates, at the price of $1.00 for each part, payable on delivery or for the entire work in advance; and you are invited to sign your name to the list to subscribe for the work by filling out either of the annexed forms.

The drawings represent designs by Mr. Pfeiffer for dwelling-houses of various classes, with all their details both decorative and constructive, carefully worked out. The draughtsmanship is excellent, and many of the drawings have been made by Mr. Bassett Jones and other draughtsmen of the highest capacity. Trusting that we may hear from you promptly on this matter, as publication depends entirely on the response we receive, we remain Very truly yours,

TICKNOR & CO.

Those who have subscribed for the work have done so with expressions of warm approval of the undertaking, but the plain fact is that unless a greater number of subscriptions can be secured the benefit accruing to Mr. Pfeiffer's family is likely to be but small.

If any of our readers have overlooked the matter, we ask them, once more, to send in their subscriptions at once.

A STAIN FOR BRICK WALLS.

AKRON, Ohio, April 22, 1889.

To the Editors of the American Architect:

Dear Sirs,—Can you furnish us with address of parties handling a successful stain for brick walls (not an oil paint), so as to produce a realistic flat brick appearance surface.

Oblige respectfully,

WEARY & KRAANE.

[Truly Samuel Cabot, 70 Kilby Street, Boston, Mass. — Eds. American Architect.]

SEVILLE CATHEDRAL.—The ruinous condition of Seville Cathedral has become so serious that the Spanish Minister of Public Works has appointed several eminent engineers and architects to go down and report on the state of the cathedral, and the best plans for rebuilding this magnificent specimen of Gothic architecture. At least ten million pesetas would be required to rebuild the famous cathedral and the Giralda tower. The repairs attempted last year, when several pillars in the central nave were discovered to be in a ruinous state, have proved insufficient, many more pillars in other parts of the cathedral having been very badly conditioned. The Government is disposed to ask Parliamentary assistance for the Seville Cathedral restoration, as the subscription started in 1888, under the patronage of the Queen-Regent, would seem very successful and the decision has been arrived at none too soon. For many years past this magnificent specimen of Mauro-Gothic architecture has been falling more and more into decay, until temporary repairs are no longer sufficient to stay the ravages of time. Pillar after pillar has fallen away, and, unless the roof is strongly supported, the famous church which for ages has attracted sigh ters, will cease to be in Andalusia and be a monument of the decay of that country, where every other city has a church which it considers the finest, or among the finest. In Christendom. Accordingly, Parliament will probably be asked for immediate aid, and the Spanish Ministry, Cortés, which requires all the funds at the disposal of the Treasury for works far more pressing than the restoration of old buildings, will be inclined to take the same view of the matter as the rest of the world. For the Cathedral of Seville, and above all, the Giralda Tower, which forms part of it, have been, like the Alhambra and many other remnants of the painful days of the Moorish rule in Spain, in one sense

BOSTON ARCHITECTURAL CLUB.

The regular conversations of the Club was held Wednesday evening, May 8. During the week the successful drawings of the past six years in competition for the Rotch Travelling-Scholarship have been on exhibition at the rooms of the Club, and the conversation was entirely devoted to an examination and discussion of these, while at the same time, the general subject—the scholarship, its aims, methods and achievements, was considered in detail. Prof. W. F. Chandler of the Institute of Technology was the last speaker. He spoke of the advantages of such joint competition as competition for the scholarship can give a student, and expressed regret that so few of our younger men should have presented themselves for the recent competition. As an example of this, by Mr. Bacon, the successful competitor for this year, is a great help to one not only in a general way, as influencing the ordinary problems of everyday office practice, but is also the very best preparation for a trip abroad, enabling one to more truly appreciate Europe and its monuments. While the advantages which would accrue to any one travelling under such a scholarship, the special opportunities for study and research which would be offered only to one who is, in a measure an official delegate from the profession in this State, are such as would make the prize worth far more to the holder than the mere amount of money which he receives with it. Prof. Eugène Leüng was called upon for a paper with some excellent criticisms of the competition drawings, continuing Professor Chandler's remarks about the value of serious systematic study. In the general discussion which followed many suggestions were offered to the scholar: the advantages of the scholarship and the general sense of the meeting seemed to be that it was perhaps desirable to hold the competitions earlier in the year, at a time when architects would be less busy with office-work, and the draughtsmen would consequently be more free to compete; and it was questioned whether the scholarship, which is now open only to those who have been employed two years in the office of a Massachusetts architect, should not be extended to any one, no matter what his previous training, who was able to successfully compete for the prize. It was also suggested that the labor involved in preparing the competition drawings might be lessened by having a preliminary sketch made by the competitors, and from those offered, three to be selected for a final competition. In reply to inquiries as to the expense which the competition entails upon those who enter it, several who had taken part during past years agreed that the students can hardly have to spend more than fifteen or twenty dollars, as that amount would cover all strictly necessary outlay.

The meeting was closed with a description by Professor Léonard of the manner in which the competitions are conducted for the Grand Prix de Rome, in Paris. The attendance was quite large and a great deal of interest was evinced in the scholarship and the prize drawings.

THE SKETCH CLUB OF NEW YORK.

Will you please announce under heading of "Societies" that the Secretary of the Sketch Club of New York may be addressed at No. 57 Broadway. Very truly, Willis Pole, Secretary.

May 11, 1889.] The American Architect and Building News. 227
The property of mankind at large. In truth, it is a question whether the students of the law have done more to assist the building of American railways than the students of the law would admit. It is a question whether the students of the law have not been more occupied with the building of the American railways than the students of the law would have been, if the students of the law had not been so occupied.

The omniscient schoolboy of Macaulay's History of England will find the latter half of the twelfth century, by order of Sultan Abu Yusuf Yakub, and the upper portion, with the belfry, surmounted by the spires of Seville, by Fernando VII of Spain.

The cathedral is now the larger of the two structures. But, historically, it is simply an impecunious to the Giraldes.

London Daily Telegraph

FLOATING EXHIBITIONS. — Floating exhibitions seem to have taken, at least, a new lease of life. One of the largest concerns of the kind is the Kaiser Wilhelm Company, which has decided to apply the sum of $250,000 (50,000,000 marks) to the building, equipment and working of a very large steamer, which is to be called the Kaiser Wilhelm. The principal dimensions are as follows: length, 600 feet; breadth, 60 feet; depth, 40 feet; so that the question is not a small one of how and by whom she is to be fitted up in the spring of next year. A previous undertaking of a similar nature, the steamer "Gottorp," despatched from Hamburg, is understood to have given a satisfactory result. Not only are German goods being shown in many different parts of the world, but the staff accompanying the steamer has ample opportunities for studying in each place the peculiar local and special requirements, and to see just what extent and in what manner the different wants are being supplied, either by home or by other foreign makers.

London Engineering

LIABILITY OF LANDLORDS OF FURNISHED HOUSES. — When paterfamilias packs up his traps and conducts his family to the seaside, one of the first things he does is to have his landlord in his official capacity sign a doctor's bill for the typhoid, which may be contracted in the lodging house, where it takes up a permanent billet, and of course has no place of rest. When the landlord signs this bill, if he ever lives to bring his action. Let the worthy man imagine that he has a similar remedy for a similar sickness against a landlord in a furnished house in town. Wherever he has once agreed to hold down in Charsley, Jones is only applied to "furnished houses," as to which there is, in the eye of the law, no reason why another man should not be as fit for human habitation as another.

With regard to the ordinary house leased in the ordinary way, there is no such legal fiction. If the new tenant wishes to make himself safe, he must get an express undertaking from his landlord, and, if he lives in a furnished house, he must have the landlord's promise in writing. With regard to the ordinary house leased in the ordinary way, there is no such legal fiction. If the new tenant wishes to make himself safe, he must get an express undertaking from his landlord, and, if he lives in a furnished house, he must have the landlord's promise in writing.

An UNDERGROUND RAILWAY FOR PARIS. — M. Berlier has laid before the Société d'Encouragement a scheme for an underground tunnel railway for Paris. The scheme was such as to be independent of the Boul' de Bologne, a length of about two miles; another from the Place de la Bastille to the Place du Concorde, a distance of about three miles. The project was designed to relieve the Porte de la Concorde from the pressure of the Porte de la Bastille. The plan suggests the idea of a circular iron tube, 15 feet, 4 inches in diameter, containing a double line of rails of 5 feet, 7 inches gauge. The service is to be carried on by single cars, driven by electric motors, and running at intervals of one minute. The rate of speed would be much greater than with omnibuses, and the cost of the line has been calculated at $12,500,000, the annual receipts at $15,000,000, and the annual receipts at $12,500,000. The project was such as to be independent of the Boul' de Bologne, a length of about two miles; another from the Place de la Bastille to the Place du Concorde, a distance of about three miles. The plan suggests the idea of a circular iron tube, 15 feet, 4 inches in diameter, containing a double line of rails of 5 feet, 7 inches gauge. The service is to be carried on by single cars, driven by electric motors, and running at intervals of one minute. The rate of speed would be much greater than with omnibuses, and the cost of the line has been calculated at $12,500,000, the annual receipts at $15,000,000, and the annual receipts at $12,500,000.

Manufacturing, railway and commercial statistics for April and the first four months this year just published, indicate an expansion of business in the aggregate of industries, profits, and employment during the past few weeks.

The annual receipts at $15,000,000, and the annual receipts at $12,500,000.

The manufacturing, railway and commercial statistics for April and the first four months this year just published, indicate an expansion of business in the aggregate of industries, profits, and employment during the past few weeks.

Development has been irregular. Certain industries and commercial lines have prospered, while others have lagged behind in their growth. It is only fair to say, in this connection, that the expansion of business has not been uniformly distributed. Some industries have been prospering, while others have been lagging behind. But, in general, the expansion has been steady and progressive, with only occasional periods of depression.

The general manufacturing activity is indicated by the following figures. The value of factory products in April was $26,000,000, while in the first four months the value was $62,000,000. In the first four months, the value of factory products was $62,000,000. The retail sales of manufacturers in April were $26,000,000, while in the first four months they were $62,000,000. The retail sales of manufacturers in April were $26,000,000, while in the first four months they were $62,000,000.

The manufacturing activity is indicated by the following figures. The value of factory products in April was $26,000,000, while in the first four months the value was $62,000,000. In the first four months, the value of factory products was $62,000,000. The retail sales of manufacturers in April were $26,000,000, while in the first four months they were $62,000,000. The retail sales of manufacturers in April were $26,000,000, while in the first four months they were $62,000,000.

The manufacturing activity is indicated by the following figures. The value of factory products in April was $26,000,000, while in the first four months the value was $62,000,000. In the first four months, the value of factory products was $62,000,000. The retail sales of manufacturers in April were $26,000,000, while in the first four months they were $62,000,000. The retail sales of manufacturers in April were $26,000,000, while in the first four months they were $62,000,000.
The exterior of this house is stained with
CABOT'S CREOSOTE STAIN
for Shingles, Fences, Clapboards Etc.

These Stains are very durable
and give a much more artistic effect
than paint, while they are cheaper,
and very easy to apply.

Our Stains contain no water and
are the only exterior Stains that do
not contain kerosene.

PRICES are 40, 60 and 75 cents per Gallon
According to Color.
SEND for Samples on Wood, and Circulars.

SAMUEL CABOT
70 KILBY ST., BOSTON, MASS.
CHEAP QUICK LIFTING
Portable Hoist.

Price, $2.00.

The Caldwell Sash Balance.

The Caldwell Sash Balance is compact, simple and Durable. It is easily applied and is superior to all other methods for Balancing Window Sash. Adapted to old or new windows, does not require box frames and does not get out of order. The Caldwell Balance for Mullion Windows is the best yet invented.

N. R.—In ordering sample set give exact weight and height of each sash. Send for catalogue to

Caldwell MFG. CO.,
288-290 State Street, ROCHESTER, N. Y.

FREY’S NEW BRICK & TILE MACHINE
With Self-Loading Trucks

Price, $25.00.

The KODAK

ANYBODY can use the KODAK. The operation of making a picture consists simply of pressing a button. One hundred Instantaneous pictures are made without rest or reloading. No dark room or chemicals are necessary. A division of labor is offered, whereby all the work of finishing the pictures is done at the factory, where the camera can be sent to be reloaded. The operator need not learn anything about photography. He can “press the button,”—we do the rest.

Send for copy of KODAK Primer, with sample photographs.

The Eastman Dry Plate and Film Co.,
125 Varick Street, NEW YORK.
SUMMARY:
Metropolitan Sewerage System for Towns near Boston.—The
Unpaid Service of Mr. H. F. Mills to the State of Massachu-
setts.—The Results of the Court Martial on Major Lydecker.
—A Boating Accident at Provi-
dence, R. L.—The Centennial Arch in Washington Square,
New York.—Copper.—Preserving Marble Statuaries.—Na-
ture in New England:

BUILDERS' HARDWARE.—XXVI

LETTER FROM PHILADELPHIA.

ILLUSTRATIONS:

House of Frederic Frelighuyzen, Esq., Lenox, Mass.—Gothic
Street may very probably put some of them into bankruptcy,
appear to sink into insignificance in the minds of the Massachu-
setts legislators in comparison with the glory of being concerned
in the building of thirty miles or so of brick conduit through
meadows where wild ducks and sea-gulls will be the only wit-
nesses of the operation, to drain away the "sewage" of towns,
whose prosperous market-gardeners pay six dollars a cord for
manure, while the cost of connecting the houses of those who
will have to pay for the trunk-sewer with it by any kind of
conduit would be nearly, if not quite, as much as the entire
realization of the towns in question, even supposing
that there should then be any sewage to convey, and that the
original proprietors of it were disposed to give up the advan-
tage of using it on their own land. If there were anything to
be gained by the scheme, even for Boston, it would be easier
to speak of it with respect as an improvement which Boston
might some time be disposed to carry out at its own expense;
but as the inhabitants of the water-front of Boston, who are
now so desirous of purging the air which they breathe from
the scent of the sewerage of Newton, Arlington and Waltham,
none of which have ever had any sewer or any sewerage, have
for a hundred years discharged their own drains through the
sea-wall in front of their dwellings, and still continue to do so,
while the sediment from the kitchen-sinks of their ancestors,
unredressed and undisinfected, lies by the acre under their noses,
exposed at every low tide, it would seem fitting, to say the
least, to wait until there was something about the water-front
of Boston capable of further defense before subjecting the
villages in the river-valley above to a ruinous expense in order
not to forestall the possible addition of a microscopic quantity of
bacteria to the vast accumulation which the Boston people look
out upon, without any attempt to remove it or check its in-
crease. It is very likely that a few houses or factories on the
upper banks of the river surreptitiously discharge their offal
into it; but a simple enactment, if there is not one already,
forbidding the defilement of the stream, and leaving it to the
persons concerned to find other ways of disposing of their
refuse, would, it seems to us, answer every purpose, without
imposing a fearful burden upon thousands of innocent people
who never could, and never would, make any use of the great
"trunk" sewers, even if they were built.

THE governors of Massachusetts have been fortunate in the
material which they have secured for their State Boards of Health;
could so original Board, under Dr. Walcott, Dr. Bowditch, Dr.
Derby, Dr. Pulsom, Mr. Webster and others, made itself and the State which it served famous throughout
the world by the thoroughness and originality of its work, and
since it has emerged from its eclipse under the shadow of the
Board of Lunacy and Charity, with which it was for a time,
would have some credit connected with it. Mr. Mills has entered upon a new career of usefulness. One of the most
active of the new members, who has taken up his duties quite
in the spirit of those who have preceded him, is Mr. Hiram F.
Mills, perhaps the best authority on water-supply in the State,
and one of the best in the world. According to the Engineering
Record, Mr. Mills, since he assumed his duties as a member
of the Board and chairman of its sub-committee on water-
supply and drainage, has devoted himself to the work of serv-
ing his fellow-citizens without compensation, to the serious
judicial practice of his private practice. Although he has been
late engaged, perhaps principally, in advising as consult-
ing engineer in matters of water-supply, he has, since his ap-
pointment to the Board of Health, declined employment which
would have brought him in several thousand dollars a year, on
the ground that the public duties would not allow him to have
enough to attend to it. Fortunately, Mr. Mills is, as we under-
stand, comparatively a rich man; but it is not always rich men
who are most eager to work for other people for nothing. And
Massachusetts is to be congratulated on being able to command
such devotion from such citizens.

NEW and valuable suggestion is to be found in the
account of the recent great fire in New York, which is
given in Fire and Water. During the progress of the
fire, a slaughter-house near the river was threatened by the
flames, and some men went on the roof to pour water on the
火 composition of which it was made, in order to prevent it
from being kindled by the sparks which kept falling on it.
While they were thus engaged, one of them was struck by the
idea that if the surplus water, which was running off into the
gutters, could be saved, it might be made to afford still further
protection from the impending disaster. He therefore, with
some of his companions, punched holes through the bottom
of the gutters, so as to let the water run through. By this means
a sheet of water found its way down the walls and over the
exposed window frames and sashes, protecting them very effi-
ciently against the scorching heat from the buildings burning
in the neighborhood.
SINGULAR accident took place the other day at Providence, where an elevator, which had been allowed to drop through a shaft fitted with the Ellithorpe air-cushion at the top, suddenly fell its way through the air-cushion with such violence that the first 1888 and consequent injuries which were thrown down, receiving such injuries that one of them died at the hospital the same night, and the others, although not fatally hurt, received severe injuries. The elevator was made by Messrs. L. S. Graves & Son, of Rochester, and the air-cushion was built by the same firm under a license from the owners of the Ellithorpe patent. The car and the air-cushion had already been tested, once by dropping the car alone, and a second time by dropping it with six hundred pounds of iron in it, and in neither cases was any injury done to the car or the air-cushion, or even to a batten large, which was placed arch, thus on in the second experiment. For the third test, the car was dropped with two of the representatives of the builders in it, together with an enterprising newspaper reporter. Whether the air-cushion gave way under the shock, as was the case in a similar test made in Boston some years ago, or whether an unexplained leakage of air through the counterbalance ways, or some other office, may have diminished the elasticity of the cushion, is uncertain, but the concession of the fall was so great that all the men received serious spinal injury, and in the case of the heaviest of them, who happened, moreover, to be sitting on the floor of the car, the injury was fatal.

MR. STANFORD WHITE, whose cleverness in such matters is well-known in the profession, designed a temporary triumphal arch for the celebration of the Washington Centennial in New York. In front of this arch, which are probably familiar to our readers in the illustrated papers, proved so pleasing to the spectators that it has been seriously proposed, on the suggestion of the Centennial Committee, to reproduce the arch in permanent materials at the Washington Square end of Fifth Avenue, as a memorial of both Washington and of the celebration. As the cost of the undertaking will be between sixty and eighty thousand dollars, there is some doubt whether the money can be raised for it in New York, which is not famous for the enthusiasm with which select schemes are taken up by the people. It is not unlikely that the advantages presented by the site for such a structure may tempt the rich inhabitants of the neighborhood to subscribe liberally enough to carry the plan through.

L'Heure Industrielle has an article on the collapse of the great French copper speculation which will interest a great many owners of shares in copper mines on this side of the ocean. Although the writer of the article thinks that the copper syndicate is still strong, and is in condition to make a losing deal, he draws the essential fatal error in allowing the accumulation on its hands of a stock of copper, so large that prices must inevitably be lowered in order to get rid of the burden of carrying it. At the time of the organization of the syndicate, the annual production of copper was about two hundred thousand tons, and the low range of prices had had the effect of diminishing production, and increasing consumption; copper, as we know, at that time replac|ing iron for many purposes where iron had previously been used. On the appropriation of the product of most of the mines by the syndicate and the doubling of the price, a change took place. While consumption fell in 1888 nearly eight per cent below the former average of two hundred thousand tons, the production rose to two hundred and fifty thousand, having a surplus of sixty-five thousand tons, which the syndicate has not been able to buy at any price. It contains its prices. If the syndicate had been satisfied with moderate profits, watching the market so as not to check consumption, and had, by the same means, made it for the interest of the mines to restrict production, the affair might have gone on prosperously, the supply and demand being kept equal, and the actual price of copper maintained. In other words, the copper producers have misjudged the market, their affair having passed, and nothing can be done until the surplus stock, which now amounts to about one hundred and thirty thousand tons, has been sacrificed to meet the demands of the bankers who have lent money upon it as security.

M. BONNAFE has recently written to the Journal des Arts a letter about the preservation of marble statues exposed to the weather, which is very curious. The announcement was made in the official papers that an appropriation had been made for the purpose of cleaning the statues in the garden of the Tuileries and at the Luxembourg, which had not been cleaned for several years, and M. Bonnathi calls attention to the fact that the antiquities not only do not have to scrape the marble, but that it is a great engine for the preservation of the statues. He speaks of covering them with a waterproof coating of wax and oil, which gave transparency, and a kind of polish, to the marble, while it prevented dust and the spores of lichens from attacking themselves to the stone. According to Vitruvius, the "art" was made by melting together white wax and oil, and putting it on while hot, with a brush. This application was followed by one of tallow, and the whole was then rubbed with soft cloths. Vitruvius speaks of this treatment as being useful for making walls impervious to moisture, and recommends, moreover, that it be adopted in the making of statues heated with charcoal stoves, as is now done in applying various waterproofing preparations. In modern times the process has been occasionally revived. In 1803, when the fountain in the Rue de Grenelle was cleaned, Quatremerre de Quincy, with the two official architects, resolved to apply the ancient process as an experiment. After cleaning, the marble of the fountain was warmed by means of charcoal stoves or braziers, and covered with a coat of virgin wax, mixed with poppy oil. After this, the marble was well heated, marle more was put on cold, and covered with linen cloths. The result was then considered very satisfactory. The marble thus injured in the least by the heating, and the smooth wax coating was impervious to water, and afforded little lodgment to dust. Among the reminiscences of old Paris, which M. De Cleuziou publishes in La Semaine des Constructeurs, appears a story about the first Napoleon which we hope may be new to some of our readers. In speaking of the ancient College de Cluny, which existed until within a few years in the neighborhood of the Sorbonne, M. De Cleuziou remarks that the painter David had a studio for many years in the little church attached to the building, and it was here that Napoleon came to see the picture which, at the height of his fame, he had ordered from the fashionable artist. David had been for a long time at work on the painting, when the Emperor came, one day, to see if his picture was done, and to have a look at it before it was exhibited to the public. As he dashed up, surrounded by his brilliant escort of generals and marshals, and entered the old church in which the painter worked, the curiosity of the neighbors knew no bounds, and they took advantage of every opportunity to see what was going on behind the plain chapel walls. The picture was an immense affair, in the most correct style of high art, representing the consecration of the Emperor; and David had applied with consummate care to the execution of the most trifling details, filling the foreground with the Empress and her ladies, whose faces were repeated with such care that the unoccupied corners, and lent variety and grace to the scene. Considered in itself, it would have been, and still is, considered a fine picture, but its method of treatment did not at all suit Napoleon, who had no relish for figuring in the background anywhere, and least of all behind a lot of women. As the conqueror of the Pyramids entered the studio, he was almost paralyzed at seeing that his own portrait was less conspicuous in the picture than that of the Empress, or even than those of some of the ladies-in-waiting. He paced up and down the room for about a quarter of an hour seeking in vain for words to give expression to his feelings. At last, suppressing his rage, he said, "I thank you, Monsieur David, for having represented me as a true knight." The generals and marshals, who had no idea what he meant, smiled somewhat faintly. The painter could do no more, and in order to satisfy the Emperor, he conspired with the ladies to say, "We must always show deference to the ladies." Then, turning to the painter, with a world of suppressed rage and scorn in his voice, he said, "But what is the Pope doing there?" "Nothing, Sire," said David. "And did you suppose that I could have in my picture a pope who came from Rome to consecrate the Emperor?" "He might be represented as giving a benediction," ventured the artist. "It is well; let him be shown giving a benediction," replied the Emperor, and with a curt "Good morning," he departed. The picture was completed, but a new one was ordered from the painter, a picture to represent the "Day of the Eagles." In the representation of this scene there would be sure to be no ladies to eclipse the Emperor, and David did not need a second hint as to the way in which Bonnarti liked to have the composition arranged in pictures in which he figured.
SKETCHES OF THE AGE OF FRANCIS FIRST

COURTYARD OF THE CHATEAU DE PLOISI
BUILDERS' HARDWARE.—DOOR-KNOBS.

Figure 379 is a form of attachment designed for wooden knobs. The shank is split lengthwise and the ends of the two pieces cut away from each other on a bevel, with wedges or lugs on the outside, the berels being so cut that when the surfaces are brought together the lugs can enter a hole in the wooden knob of the same diameter as the main portion of shank. By then bringing the opposite ends of the shank together, the lugs are forced side-wise into the wood so strongly that they cannot be drawn out except by breaking the parts. A light thimble fits over the shank and into the rose, securing the whole.

Figure 380 is a form of knob secured by a screw entering the head of the spindle, at the same time wedging it to any adjustment by reason of the screw being slightly larger than the hole in the spindle. All the foregoing knobs are constructed with spindle extended through the door and continuous from knob to knob. Some locks are so devised that the spindle is done away with, each knob acting independently of the other, inserted of shoulder or extension on the shank. Figure 381 illustrates the form of knob which is used with all of the "Niles" locks. The end of each knob is provided with a shoulder of about the same shape as the ordinary lock follow, acting directly against the latch-leaf. The shafts rotate freely in the escutcheons. To apply the knob, the shank is passed through the escutcheon plate and the shoulder or follow inserted in the lock, the latch-leaf being pressed back with a flat blade or a screw-driver until the follow can be snapped into position, which is easily accomplished by inserting the shank at an angle. The knob is then brought around square with the face of the door and the escutcheon plate screwed in position, holding the knob so it can be removed only by moving the plate. The chief advantage of this arrangement is that there can be no rattling in the lock. The latch operates the moment the knob is turned, be it ever so little; nor are there any screws to work loose.

The Gilbert Lock Company manufactures a knob especially designed for their locks, the construction of which is illustrated by Figure 382. In this, as in the preceding example, there is no spindle. The knob-shank is secured to the escutcheon, which is boxed out sufficiently to allow play for a lugged plate, turning with the shank and acting against a lever. The latter is hinged at the top and fitted with an arm at the bottom which works in a slot through the lock, drawing back the latch by a direct, lateral action. The escutcheon is secured by long screws above and below the lock. There are some excellent points about this device. There is no spindle to work loose and rattle, no screws in the shank to drop out, and no adjustment of washers or screws, as the knob has a perfect adjustment to any thickness of door without binding. An improvement might be made by so extending the lugs on the spindle plate that when the latch is out, both lugs will bear against the plate of shoulder material that the latch may move at once, no matter in which direction the knob be turned. This form can, of course, be used only with "Gilbert" locks.

In regard to appearance, and the materials used, knobs of the following materials are found in the market. In wood, they are made of mahogany, cherry, oak, ash, apple, maple and ebony. Glass knobs are cut, pressed, silvered or of black glass. What are known as mineral knobs are made of earthenware, porcelain or lava and can be had either black, white or gray in color. The metals used for knobs are brass, bronze, silver, nickel and iron. Compositions of celluloid, hemalite, etc., are also used. The shanks in all cases are made of either bronze or iron, the latter only in the cheapest work.

Wooden knobs are generally finished in natural colors, and can be obtained with wooden roses to match. They are very good, strong, and serviceable, and are excellent for interior use.

Glass knobs are somewhat out of style just at present, but are still made in a great variety of forms, both cut and pressed, and are really very handsome in appearance. The silvered-glass knobs are rather cheap looking, though the cost is somewhat higher. Figure 383 shows a few of the great variety of knobs made in glass.

Black glass, and what is known as mineral, and white porcelain are all used a great deal for common purposes. They are cheap, clean, and as generally constructed are quite strong. Lava knobs are used but little.

The greatest variety of designs is found in metal knobs. These are made in all shapes and in all colors. Some of the special shapes will be considered subsequently under the head of styles and design. Some of the styles of iron knobs recently put on the market by the Yale & Towne Mfg. Co., and finished by the Bowser-Burlt process are very serviceable and pleasing. Hopkins & Dickinson have a very dark rich bronze, almost as black as gun-metal which they use for some of their hardware. Of late years oxidized silver has come in as a great favorite for knobs and knob-plates, and is now worked up in a great variety of designs and in several different colors. The Yale & Towne Mfg. Co., has a grade of oxidized silver which almost matches the dark bronze of Hopkins & Dickinson. Metal knobs are made either oval, spherical or in a flattened egg, sphere-shaped and indeed in an almost infinite variety of shapes and designs. In the nicest grades of work, the knobs are always made to order. In some of the very choicest work, knobs are gold-plated. This increases the cost a great deal, to an extent, indeed, which renders it beyond the need of the ordinary market; but the advantage is not so much in the looks, for a gold-plate has exactly the same color as some shades of bronze, but gold-plate is absolutely unmarriageable, and will not change its color, whereas all the finishes of bronze.

[Figures 379, 380, 381, 382, 383, illustrating various types of door-knobs.]
silver, brass or nickel, are more or less liable to change. The
various finishes for metal knobs have been previously con-
sidered in the introduction.

The knobs of the Boston Knob Co., are made of composition,
presumably celluloid, or at least of that nature. Celluloid
plates are bent over a strong metal frame, and held in position
by a brass rim which is shrunk on to cover the joints between
the two plates. They form a very neat pretty knob, Figure
384. The celluloid is made in a variety of colors, including
several shades of blue, garnet, malachite, green, drab,
slate, yellow, brown and white. In many cases the
varied colors will be an at-
traction. One would imagine this form of knob made in white
with a simple band of brass around the edge might be used
very nicely in connection with rooms that are furnished in the
prevailing Old Colonial white-and-gold style.

Hematite is a composition which as nearly as can be dis-
covered, consists of blood, glue and sawdust. This is pressed
in moulds and finished in several different shades, either jet
black or a deep rich brown. Figure 385 shows the common-
est form adopted for hematite knobs. They are usually made
with face-plates of brass or bronze, inserted in the front of
the knob and the edge of the knob are rilled. This composition
is most excellent for interior use. It will wear indefinitely
and is exceedingly strong and tough but is not altogether
suitable for exterior use as it is said to be affected by the
weather.

Besides the ordinary double knobs it is often desirable to
have a lever or one side of the door and a knob on the other.
Figure 386 shows a typical knob and T-handle. There is, of
course, an infinite variety of styles of this sort, some of which
will be considered later on. Figure 387 illustrates a so-
called ship-handle, consisting of a plain knob at one end of
the spindle and a ring-handle at the other form the
by Figure 388 is termed a crank-handle, being intended for
French windows and narrow style doors. The inner knob is
kept away from the jamb so that in opening the door the hand
will not be caught. The common forms of pulls or handles
employed for sliding-doors have been previously discussed.

Bell-pulls are usually similar in appearance to door-knobs,
and in order-work are made exactly the same, and to match.
The internal construction of the spindle however is a little
different. Figure 389 shows the commonest form,
the rose being pro-
vided with a long
hub fitting over the
spindle, and screwing into
the frame of the door.

Door-knokers are made in a great
variety of shapes. A few of these will
be considered later on in connection
with the designs. A single example,
Figure 392, will be sufficient
to illustrate a typical door-knocker in this connection.

The following table gives the average retail prices of the
principal styles of door-knobs. The prices are for a dozen
pairs of medium-sized (2½ inch) knobs, complete, with roses
and screws to match.

<table>
<thead>
<tr>
<th>Knob</th>
<th>Shank and Rose</th>
<th>Manufacturer</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>367</td>
<td>bronze, plated</td>
<td>Russell &amp; Erwin</td>
<td>8.50</td>
</tr>
<tr>
<td>369</td>
<td>porcelain, brown</td>
<td>Russell &amp; Erwin</td>
<td>18.00</td>
</tr>
<tr>
<td>372</td>
<td>Morris Patent Door-knob</td>
<td>Russell &amp; Erwin</td>
<td>12.00</td>
</tr>
<tr>
<td>373</td>
<td>verres, knob, brass</td>
<td>Yale &amp; Towne Mfg Co.</td>
<td>15.00</td>
</tr>
<tr>
<td>374</td>
<td>Phelps Patent Door-knob</td>
<td>Milford Door-Knob Co.</td>
<td>15.00</td>
</tr>
<tr>
<td>375</td>
<td>door-knob, expanding spindle</td>
<td>J. B. Johnson</td>
<td>7.00</td>
</tr>
<tr>
<td>382</td>
<td>Gilbert Door-nob and escutcheon</td>
<td>Gilbert Lock Co.</td>
<td>40.00</td>
</tr>
<tr>
<td>384</td>
<td>Boston Door-knob, celluloid</td>
<td>Boston Knob Co.</td>
<td>30.00</td>
</tr>
<tr>
<td>385</td>
<td>Hematite Door-knob</td>
<td>Dibble Mfg Co.</td>
<td>10.00</td>
</tr>
<tr>
<td>386</td>
<td>door and T-handle</td>
<td>Hematite</td>
<td>15.00</td>
</tr>
<tr>
<td>388</td>
<td>ship handles, brass</td>
<td>Russell &amp; Erwin</td>
<td>25.00</td>
</tr>
<tr>
<td>389</td>
<td>Lever Bell-pulls</td>
<td>Russell &amp; Erwin</td>
<td>20.00</td>
</tr>
<tr>
<td>390</td>
<td>antique knockers</td>
<td>Russell &amp; Erwin</td>
<td>27.00</td>
</tr>
<tr>
<td>391</td>
<td>Common style Door-knob</td>
<td>Russell &amp; Erwin</td>
<td>27.00</td>
</tr>
<tr>
<td>392</td>
<td>pressed glass</td>
<td>Russell &amp; Erwin</td>
<td>3.00</td>
</tr>
<tr>
<td>393</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>394</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>395</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>396</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>397</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>398</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>399</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>400</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>401</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
<tr>
<td>402</td>
<td>pressed glass, brown</td>
<td>Russell &amp; Erwin</td>
<td>15.00</td>
</tr>
</tbody>
</table>

There remains but a single door-knob to be considered. One
ingenious person who had been troubled by tramps, or
who imagined that everybody else was, devised a burglar door-

This consists simply of a knob on the inside of the
door, which at the same time is a bell, the mechanism of which
years of use will not disarrange. It costs but little more than
a common knob and can be applied by any person, the least
turn of the outside knob causing the alarm to be rung on the
inside so that immediate warning is given of even an attempt to enter. The knob is so constructed that upon being turned from the inside it gives no alarm. It is known as the Bur- glar Door-knob and Window-alarm, and is manufactured by Wm. C. Matthews & Co.

ESCUTCHEONS.

The term escutcheon is used to designate the peculiar locking mechanism of a cylinder-lock, as has been explained in the previous chapter. It is also applied to other material, about the key-hole of a lock. Escutcheons are made both with and without drop or covering pieces. For inside work the drop had better be omitted, though for front doors both the latch and the lock key-hole should be protected. The common forms of escutcheons are too well-known to require any illustration.

The following table gives the average retail prices.

<table>
<thead>
<tr>
<th>Material</th>
<th>Price per dozen pairs with drop and screws</th>
<th>Price per dozen pairs without drop, with screws</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron bronzed</td>
<td>$2.00</td>
<td>$2.35</td>
</tr>
<tr>
<td>Porcelain</td>
<td>$1.75</td>
<td>$2.35</td>
</tr>
<tr>
<td>Wood</td>
<td>$1.60</td>
<td>$2.25</td>
</tr>
<tr>
<td>Brass</td>
<td>$1.30</td>
<td>$1.85</td>
</tr>
<tr>
<td>Bronze—plain</td>
<td>$1.50</td>
<td>$2.00</td>
</tr>
<tr>
<td>gilded</td>
<td>$1.00</td>
<td>$1.42</td>
</tr>
</tbody>
</table>

[To be continued.]

A FINE BANQUETING-ROOM.—STONE CARVING,—ROCK-FACE WORK.—MR. WINDRIM’S APPOINTMENT.—OLD HOMES NOT MARVELS IN PENNSYLVANIA.

WHEN a work is conducted as magnificently as possible, its cost is admired; when well built, the skill of the workman is praised; when beautifully, the merit belongs to the architect, on account of the proportion and symmetry which enable him to carry out the design. Whether in mentioning cost first in his list of the admirable qualities of a building, and beauty last, Vitruvius meant to put them in the order of their relative importance is most difficult to determine; but his arrangement is very suggestive of the sentiment of the Philadelphians of forty years ago. Certainly there never was a time in the history of the city when so much money was being poured out that each company’s building might have a show-window beside it. The “proportion and symmetry” of which the earnest Old Romans speak are quite lacking as a rule, but excepting the use of galvanized-iron (rarely sanded) in some of them, the new fronts are being “con- ducted as magnificently as possible.” A large part of the magnificence is apt to consist in a lavish use of rock-face work of varying degrees of boldness. There would seem to be no valid reason for the sudden outbreak of this style of wall except possibly a vague hope of the architect’s that its glaring inappropriateness might startle the beholder into overlooking the childishness of the design.

The success of this plan, however, may be doubted, for in spite of their jagged projections many of the front openings do not give the scanty relief of — say the foundation of a medieval fortress — nor do the every-day red brick party-walls that come confusingly up to the very edge of these towering heaps of part- pendiculat rock tend to help the illusion. The Pennsylvania Company for Insurances on Lives and Granting Annuities, in the building it is now putting up on Chestnut Street, opposite the State-house, has a front that in spite of the rather questionable taste of the design shows an admirable way of getting over the rock-face and-part-wall difficulty. It is crowned by a gable that rises from two huge steps. The doors and are of these, and here one of course, interior walls below the roof and where they show above it have a surface of the same rock-face as the front. Of course the walls do not run back far from the building line before they are quite hidden from the street, and as a matter-of-fact the front is about as imposing as the building — five stories on small rooms — has but little depth. Just behind it comes the huge banking-room — with the exception of the Brussels Bank, the largest in the world. The room is as yet quite unfinished but if its interior treatment is as pleasing as its general proportions it will be an unqualified success, so that the Company’s clients, when once inside will be made to forget the outer shell, with its austere arrangement.

May 18, 1889.]

The American Architect and Building News.
The dinner of the Master-Builders, that the architects asked him to do what the law, as it stood, did not allow him to do. This was perfectly well-known at the time of the protest, and the Governor was neither misunderstood nor in any way injured by the protest. There was not only a desire but a positive demand by the people there to erect a monument; but there were both protest against the result of it. At a time when the public taste had reached the point where it takes an interest in architecture without knowing the rudiments of it, when it mistakes the pretenses of a perspect view from one point of view for the character of a monumental building — which is to be walked through, and not seen through the small end of a field-glass — there is no substitute for a competitor, who can attract all the specious cleverness in the profession, while it would repel, at least, a good part of the men of restraint and of other qualities. It was time to make a protest.

The old cry arose that undeveloped talent might appear. Of all studies, architecture is the most gradual in its growth towards achievement. A poet may be born, but an architect must also be made, and it is believed that a designer or draughtsman, by a stroke of genius and without previous training, is a faith in a fortuitous correlation of forces that is scarcely sane. The fact that three of the protestants were as well as the others, with a great deal of talent, and an indelicate especial confidence in the quality of the protestants or — a sop to Ciceron. The design as revised and published in the daily press is quiet, follows the key set by the old building and is well-planned. The colonnades come in the right places, the arcades of New Vernon Street give an excellent opportunity for a treatment that is so well-handled in the Genoese palaces and in the Louvre. The pediment seems to be ample and unnecessary; there is something in a very awkward thing to deal with, unless it is filled with sculpture, a thing that it would be as well to be chary in doing, as it has rarely been done respectably well since the time of the Greeks. It is, of course, impossible to judge the whole treatment of this movement over that of the present State-house, of which it is its weakest point.

In Cambridge there are several new buildings approaching completion, of which the best is Hastings Hall, the gables of which are especially well-handled. It is our chief bane, so far as architectural effect is concerned, that each building erected is a unit sufficient to itself, and is not connected by clerestory, arcade, wall or roof with others. As a result, Harvard is devoid of interest as a whole, and excites varying sensations as to parts. There is no unity of idea, method or proportion in a combination of masses; each lacks the balance of alone and with the whole, and the whole impression is one of a lot of scattered fragments, of all sizes and shapes. This would be well enough for a country academy, but should not influence the disposition of the buildings of a University; and it is much to be hoped that at some time the buildings of Har-

maid may be connected and made into some sort of a heterogeneous whole. What is true of Harvard, is true of all our towns, excessive, isolated individuality — a kind of individuality that is insensibly original. There is an example in the two new buildings near Felton Hall — the Industrial School and the Library: two more different buildings it would be difficult to find, as to material, lines and masses. The School is the better, as it is simpler and more direct, and the Library, as a whole, a very good building. It has the motive which may be eluded in the citedentral motive, as an entrance with the two flanking towers, the stone arcade, etc. It is very correct in every respect, and the whole impression is one of a lot of scattered fragments, of all sizes and shapes. This would be well enough for a country academy, but should not influence the disposition of the buildings of a University; and it is much to be hoped that at some time the buildings of Har-

vard may be connected and made into some sort of a heterogeneous whole. What is true of Harvard, is true of all our towns, excessive, isolated individuality — a kind of individuality that is insensibly original. There is an example in the two new buildings near Felton Hall — the Industrial School and the Library: two more different buildings it would be difficult to find, as to material, lines and masses. The School is the better, as it is simpler and more direct, and the Library, as a whole, a very good building. It has the motive which may be eluded in the citedentral motive, as an entrance with the two flanking towers, the stone arcade, etc. It is very correct in every respect, and the whole impression is one of a lot of scattered fragments, of all sizes and shapes. This would be well enough for a country academy, but should not influence the disposition of the buildings of a University; and it is much to be hoped that at some time the buildings of Har-


BOSTON

THE COURT-HOUSE.—THE STATE-HOUSE ALTERATIONS.—HARVARD COLLEGE BUILDINGS.—OTHER BUILDINGS IN CAMBRIDGE.

DURING the last few months there has been but little progress in much of the building in the city. The Court-house has gone on steadily, and the façades are practically completed. The Pemberton Square front references the fact that a simple repeated motive, if on a large scale, is always impressive from its size, and is dignified in spite of ordinary detail. The great arcade is certainly a thing for which to be very thankful, a thankfulness that is tempered somewhat when the mouldings are considered. Its virtues are great ones — the virtues that are seen in the aqueducts of the Campagna and of Segovia; but it will be at its best by moonlight, when all the smaller parts are fused in the mass. The clock is as much a mistake as ever. A clock-face is, in point-of-fact, merely a dial over which two hands travel, and requires only a straight-forward frame about it, round or square as may be, and possibly enriched. Yet, the popular impression seems to be that this dial is a climax, a thing worthy of pedestals, of pediments and heraldic supports, until it becomes a very apotheosis of time. The clock very seldom fits thoroughly well.

The smoke has begun to clear from the State-house competition skirmish, and the result is seen to be better than there was cause to expect. Now that matters have regulated themselves, the question can be referred to without creating further unpleasantness. The protest of the architects against the terms of competition was taken expressly for the purpose of destroying the effect of such terms as a precedent. The Governor objected and reiterated his objection at
AUCHMUTY BUILDING

Cor: Kingston & Essex Sts.

Owned by the Boston Real Estate Trust.

Occupied in part by: Brown, Burdell & Co.

Winslow & Wetherill, Arch'ts.
RESIDENCE OF Mr. J. FRANK COLLOM
G. W. F. D. ORFF ARCHITECTS
MINNEAPOLIS, MINN.
OF THE AMERICAN INSTITUTE OF ARCHITECTS AND WESTERN ASSOCIATION OF ARCHITECTS.—PROJECTED OFFICE-BUILDINGS. EXHIBITIONS.

Considering that the city directory contains over two hundred and fifty names of architects acting in various capacities in Chicago, it is quite remarkable that their names so rarely figure in the courts in connection with any proceedings to obtain their fees. Lately, however, quite an important suit 1 was brought in the Supreme Court of Illinois, which is instructive, not so much for unusual and extraordinary services, which excited general interest among the professional fraternity in the city, as the fact that the plaintiff had the courage and foresight to push the matter to the witness-stand. The facts of the case are as follows: The defendant, a sometime architect, had a contract for work in the city, which cost nearly $150,000, and is to-day the most elegant piece of its kind in the city, made a written contract with his architect for the regular professional service at the rate of three per cent instead of five per cent. The desire to have the building ready for occupancy upon a certain date, but in order to accomplish this it soon became evident that the greatest possible speed would be necessary, and in order that whatever should be pushed along as rapidly as possible and that nothing might be delayed, the defendant desired his architect to devote his entire time to the building, promising him, but not in writing, additional compensation. As a result the defendant gave his personal supervision to the work daily, the entire day, and as a consequence the building was occupied at the, desired time. When, however, it came to a settlement between the architect and his client, disputes arose and finally the case was brought into court.

The architect filed the following bill of particulars.

A SUIT FOR EXTRA COMPENSATION.—THE PROPOSED CONSOLIDATION OF THE AMERICAN INSTITUTE OF ARCHITECTS AND WESTERN ASSOCIATION OF ARCHITECTS.—PROJECTED OFFICE-BUILDINGS. EXHIBITIONS.

The defendant admitted that $68,570.70 was due to the architect and upon this basis the case was argued. Both parties waived the jury, and the case was submitted to the court, so that the result is unusually interesting, as no one can say that that rhetoric had influence on an impartial jury.

The defendant submitted to the court: First, that the services rendered were simply the services contracted for in the original written agreement. Second, that the contract in question should go and that the defendant should be paid for all their services on the same principles as would go to pay further compensation was a promise without consideration and therefore void and not enforceable.

On the other hand the plaintiff submitted that the regular professional service contracted for, did not include any such extraordinary labor as he had rendered at the special request of the defendant, and that such services were extraordinary and extra according to all rules of architectural practice, and in consequence the defendant was entitled to a larger compensation. The court found that under the contract it was necessary that the plaintiff should devote his entire time to supervising the building he was bound to do, but the court further found that the plaintiff at the request of his client, devoted a much greater portion of his time to the business and interests of the defendant in the matter of the construction of the building than was necessary to properly superintend the construction of the same and much greater than is customary among architects in this community under like circumstances. As a result, judgment was given in favor of the defendant for $2,150.00 and the case has not been appealed.

An unusual amount of interest is felt here in the building now in progress for and against the consolidation of the Western Association with the American Institute of Architects, and the feeling so far as can be judged seems to be practically unanimous in favor of the consolidation. Should the measure be defeated either by the extreme East or the extreme West, there will be much disappointment, for the feeling at this point is that the cordial character between the principles, of both of which, indeed, many are members, and this good fellowship has been strengthened by several recent events, notably the invitation from the Illinois State Association to the Chicago chapter of the A. I. A. to be present at their last regular monthly meeting and luncheon, and afterwards to accompany them through one of the large office-buildings that is just on the point of completion. There are several of these buildings that are now under construction. Although such buildings as these are not yet quite ready for occupancy, they are scarcely so and cannot be seen at their best, until the workmen are out of the way. Although these large structures are not yet filled with tenants, the projects for extremely heavy buildings seem to continue and should the sketches now on the boards be carried out some of our large buildings, now the largest of their kind in the world, will in their turn be eclipsed by mammoth constructions.

The curious scheme of bringing the old historic Libby Prison to Canton in sections and rebuilding it here, as mentioned in a previous letter, is now being accomplished. A large piece of property has been leased for ninety-nine years and a high, picturesque stone-wall with tower and battlements is being built across the street so as to give the prisoners but a presidently bite of the outside world until one is inside the inclosure. The prison building, it is understood, is now being taken down at Richmond preparatory to shipping it to its new resting place, where it will serve the purpose of a war museum.

Art exhibitions continue to be numerous and well attended. The Palette Club (formerly the Bohemian Club) an association of ladies who have professional and artistic bent, which is an hotchpotch of all kinds of art, has had its annual exhibition where many good things were shown, some of the charcoal-work being very far above the general average of work of that kind in this country.

In the case of the Annual Exhibition of Miniatures at the Art Institute, the miniatures attracted unusual attention. The annual Water-Color Exhibition at the Art Institute is now in full blast and many very excellent things that were shown a year ago are being exhibited, and many of this exhibit had already been hung at New York earlier in the season. The Chicago Artists' Club in a few days will open their exhibition in black-and-white from which their friends are anticipating much pleasure.

COMPETITIONS. NEW OFFICE-BUILDINGS. ROYAL VICTORIA HOSPITAL.—THE PARLIAMENT BUILDING AT TORONTO.—PROPOSED BRIDGE AT QUEBEC. THE ST. CLAIR TUNNEL. UNDERGROUND WAYS.

The Ontario Association of Architects is now inviting competitors to bring in plans, is showing signs of activity. As a first official action, it is setting itself against improperly conducted architectural competitions. There is a very strong feeling among professional architects and pettifogging gentry that many take forward with hope to the time when the public will have learned that it is serving its own interests best when it goes direct to any architect it may feel confidence in and give him the work it wishes to have carried out, without resorting to public competition. Of course, the idea of the public is that through a competition more can be got for the money; the most, in fact, that money could be possibly made to produce; so much, indeed, that it is doubtful whether any other circumstances money could be made to go so far. And as the public holds out what it thinks is a tempting bait, it winks and puts its finger to the side of its nose and contemplates the interesting spectacle of hungry architects, like so many mimnons, struggling to get hold of it. But the end of this kind of thing is at hand, and we to the committee who, in the Province of Ontario, offers such an insult to the professional architects, the Kentish village building committee we suggested a few months past as a suitable subject for Dickens' pen, and imagine the change of expression on the placid and well-satisfied and rather the sort of face that the Ontario Association of Architects descends in their midst, taking them suddenly aback, and informing them that their proposed competition must be very differently conducted if they wish architects of standing to enter into it. The Secretary has recently sent a circular to the members of the Association, advising them not to enter into a competition just advertised, and respecting all architects who know of any contemplated competitions to communicate with him, that because such a competition will be taken as may lead, if possible, to the fair management of the competition. Such energetic action is very praiseworthy, and, it is to be hoped, will be well persevered.

The Confederation Life Association in Toronto intends to erect a great block of offices soon, and will probably throw the work open to competition before long. I believe the preliminaries of the competition have been under discussion, and that professional advice has been obtained on the manner of its conduct. They will probably spend some $400,000.

The Equitable Life Association of Toronto and the Young Men's Christian Association of Montreal intend also to erect large blocks of offices this year. The Young Men's Christian Association, with praiseworthy and Christian humility, intend to surpass all other

1 Francis L. Charnley, Esq., Herbert M. Kinsey.

2 The providential wrecking, near Mayville, Ky., of the freight train upon which the bottles containing fragments of the HunLimburg balloon crashed, at last put an end to this most un-American enterprise. We fear, however, that the number of relief-hunters in that neighborhood was not large enough to counterbalance the total disappearance of the material. In case the enterprise is carried on it would not be as unrighteous an act for the press to assure its failure by stating that the wreck caused the total loss of the original material and that the manufac-
similar associations in the splendor of their new building and the perquisites of the arrangement. Mr. Saxon Snell has appointed Mr. J. R. Rhind, an architect of considerable ability in Montreal, to be superintending architect under him for the design of the Victoria Hall. His preliminary estimate of the cost, Mr. Snell being, naturally, unacquainted with the details of prices of material and labor in Canada. The work will be put to tender as soon as possible, and commences as soon as the site is cleared for the most perfect ever erected, and architects and students will do well to make a study of it as the work proceeds.

The bridge, measuring half a mile from end to end, has been entirely rearranged and the front elevation completely altered, and the design already published, and which caused the outcry against the building, withdrawn. Several hundred thousand dollars have been spent in altering the approaches to the building, and the street which is to be constructed between the two buildings is a standstill, owing to the sudden decease of the contractor, Mr. Lionel Yorke, for many years a prominent builder in Toronto. Mr. Yorke was a much-respected citizen and a worthy contractor, having one of the largest businesses in the city. He was taken suddenly ill, and died after a few hours on April 15. The Ontario Association of Architects and the Architectural Guild of Toronto sent condolences to the family.

The plans for the Board of Trade Building have been tendered on during the last few weeks. The tenders are all in by this time, until the city exchequer, so we may soon hear what it is to cost. The general idea seems to be that it will foot up to nearly $300,000.

The Toronto Court-house site is still vacant, and the building therefore, not yet begun. The corporation have not quite enough money yet to warrant their making a start, and they will submit a by-law soon to the rate-payers to ascertain their opinion upon the raising of another mill of the assessment in the city for the latter years. Justice and grand juries are continually remarking that it is about time we had a new court-house, but it must be remembered that Rome was not built in a day.

It is observed by one of the old city of Quebec is usually very quiet, and goes on placidly with its building operations without attracting much attention. But some people of an engineering turn of mind there have suddenly waked up. The corporation have a scheme of colossal proportions in view, and one which one would imagine took some of its dimensions, at least, from the dream from which they awakened. A deputation of sixty gentlemen recently arrived at Ottawa to in- tentiately on the project of the subject, which they have submitted to the lever principle, to be constructed across the St. Lawrence, six miles above Quebec. The request of the deputation was for a subsidy of two million dollars, or interest thereon at 6 per cent. for twenty years, for the purposes of the bridge. It is difficult to see what advantages would be gained by such a bridge, the ordinary traffic is amply supplied by the ferry-boats nearer the city, and the railway companies have sufficient means of crossing the river at Montreal and Lachine. The Govern- ment promised to give the subject due consideration, but did not hold out any particular hope of success for the scheme in view, as St. Clair, the object of which is to connect the Grand Trunk Railway systems at Sarnia and Port Huron, has been begun. The present connection is maintained by ferries which travel to and fro between the two points. A thousand persons were employed for seven months in Michigan. The proposed tunnel will be about three miles south of the present ferry. The total length of the tunnel will be 6,500 feet, of which 2,210 feet will be under the Canadian side, and 2,380 under dry ground on the American side; about 1,500 feet in the part under the river will be level, and from either end of this length there will be an upward grade of one in fifty, which will be continued through the cuttings forming the approaches on either side. On the Canadian side the length of the ascent will be 4,970 feet, and on the American side, 4,900 feet. The depth of the lowest part of the tunnel is about 15 feet on the surface of the ground, will be 38 feet 6 inches, and the minimum depth from the bed of the river to the top of the tunnel will be 15 feet. The tunnel- ealing will be of iron, with an internal diameter of 30 feet, and it will be considered as a counter to the competition of the new independent company, and not the Grand Trunk Railway Com- pany, and the work is being executed without contractors. The total cost is estimated at $2,500,000, towards which the government has allotted a grant of $750,000. The works are to be completed within two years.

As the result of a tour of Toronto Corporation officials through such cities as New York, as well as Old and New England, and other wires placed underground, Toronto is seeking legislation to make the various electric companies in that place take down their wires from on high and put them in channels underground. A committee has been appointed to report on the subject. The inability of the City Solicitor to find which Parliament, the Pro- vincial or Dominion, had power to legislate in the matter. As it proved, the City Solicitor, when he had gone to Victoria, had made his report to the Ontario Provincial Parliament. But this Government thought that as the companies had received their charters from the Dominion Government, it was necessary to apply to Ottawa for the required power. A bill was consequently introduced, which passed through both the Dominion Parliament this session, but it was thrown out, because it was proved to be a Provincial matter, and the matter must be held over until the next session of the Ontario Parliament, before anything can be done. I do not suppose the overhead wires in Toronto are more unsightly than they are in any other prosperous city of equal proportions, but they are certainly bad enough. Hamilton is certainly a smaller city, and Victoria, B.C., in its smallest proportions, is more disfiguring, because of all the tough old posts that stick up in the streets of that little place used to be the very toughest. It is some time since I happened to be in Hamilton, so, perhaps, they have improved in these matters. But beginning with the weak-kneed telegraph-poles there, to every one that was at all of a decent shape. I recently saw an account of a trip to Canada, published in England by Sir Edward Yorke, which appeared to show that such things as appear to have struck him most in Toronto were Jarvis Street, which the author saw in midsummer, and speaks of as one of the most beautiful streets in the civilized world; and the quantity of overhead wires is in great part due to the telegraph wires, and even more astonishing was the sight of the avenue of shade-trees, grassy 'boulevards' and detached houses in their gardens; but it hardly comes up to Sherbrooke Street, Mont- real, which is much wider, and with an avenue of much older and larger trees; and when one looks round the "civilized world" certainly the boulevards of Brussels and Paris and other Continental cities surpass it by a long way. But of its kind, Jarvis Street is a good example. It will soon be paved with Val- de-Travers asphalt, which will make it a particularly choice drive.

THE ART COLLECTIONS OF MR. WALTERS.

With the last Saturday of April the Walters gallery was closed to the public for the season. It has been Mr. Walters' custom for several years past to open that portion of his house known as the galleries proper—containing the principal paint- ings and Oriental bronzes; and the Oriental bridgework, which has been long promised to the public, will be soon open for inspection. As the result of February, March and April, for one or two days in each week, from eleven to four o'clock, for which tickets are sold at fifty cents apiece up to a year in advance for the benefit of the "Poor Association," which is handed over to the "Poor Association" of the city. On certain other days in the same months the galleries, and sometimes the whole house, are opened on the same conditions to schools, art- classes, artists, etc.; and again, by special invitation, Mr. Walters occasionally meets a number of artists and amateurs, or some distin- guished strangers in the city, and, as a genial host as well as a connoisseur, will himself show and discuss with them his treasures. From May to February again the house remains jealously closed to the public, and it is only a visitor having some exceptional claim who is admitted within its doors during that time. It is stated that about six thousand persons visited the gallery by ticket during the season just over, covering in all about twenty days.

The question is not infrequently asked by those who have not seen it, "What is the Walters gallery?" A great many scattered accounts have been written about it from time to time, and have appeared in various newspapers; descriptions of the pictures alone, of the marbles or the bronzes; reports of artists' receptions given at the house; eulogistic rhapsodies, superlatively hardened with lady- like adjectives, from the pen of some enthusiastic visitor from another city, but none of these seem to have accomplished the result of giving a comprehensive and correct description of it.

It is not a public building, a mere art museum or a picture- gallery, originally designed for that purpose, in any sense of the word. It is simply a dwelling-house, rather above the average size, and exceedingly commodious, designed during the summer of last year, and from what uninteresting in itself, and not meritoriously "old-fashioned," which has, by a very gradual process, and with a fairly successful result, been down to the present day, with a series of "rooms" of the most interesting collections of art-objects, in its size, now existing, in America certainly, if not in the world. The building stands on the south side of Mt. Vernon Place, in the middle of the block, and has a three-storied façade, not over thirty feet wide, of brick painted gray, with some white marble about it, and a small Corinthian entrance portico, where, in the centre of the ceiling, hangs a rather curiously-shaped little lamp, said to be always burning. The interior, as a whole, is a very sumptuous room, but is not so well ventilated. The principal room is the one intended to be the dining-room that day—the "three-rooms-deep"—with a ball some eight feet wide, on one side, containing the stairway, the middle room being rather imperfectly lighted by an open space near the centre of the building, and this same general arrangement is maintained through the three principal stories. Gradually almost the entire house has, bit by bit, been abandoned as a home, and has become an art- repository, only one or two of the less important rooms being reserved for domestic purposes; but the familiar and unchanged arrangement of the plan causes a strong suggestion of the dwelling
still to cling about it, which rather adds to than detracts from its interest as one straggles leisurely through the rooms.

A number of years ago an addition was made at the rear in the form of a corner a-story building of height about 30 feet, lighted from the ceiling, and covering the entire remaining space of the lot, its end wall abutting upon the narrow street that bounded it on that side. This was the so-called "little annex" gallery, a room in which the objects that were continually being gathered and re-arranged and systematized began ere long to cry out again for more room to show themselves, and heroic measures had to be adopted to accommodate them. All the rooms in the main building, having been on the ground floor, had been the task of constructing a building and lot fronting on Washington Place, and whose long axis ran at right angles to that of Mr. Walter's house. This property was acquired, and while a portion of it was the left for present use, a building was built a new and larger one, about 75 by 25 feet on the interior, approximately fireproof, and lighted from the ceiling. The city architects, jade, silverware, fabric-stuffs and bits of furniture, etc., etc., enclosed bridge, forming in itself a little "annex" gallery across the narrow street, which was far below the level of the gallery-door, and the thing was accomplished. A very general re-arrangement of the pictures and of the furniture followed, and the public was invited. This is one of the most interesting and valuable portions of the house, and is considered as a link in the history of the kind in the world. It is entirely devoted to a collection of Barye bronzes, massed together on tables and in cabinets especially fitted for them, and we are told that the two dragon serpents or miniature dancing bears to the large, allegorical river figures and the marvellously complicated groups, such as the tiger-burst and others, with lion and horse studies in every imaginable attitude, fads of objects massed in motion of nature and life and in their power of reserve and selecton.

On the third floor are two small rooms only to be seen. One is called the "Marie Antoinette" chamber, a little room furnished with various small pieces of the classically refined furniture of the Louis Seize period, some of it claiming to be genuine, others only reproductions, all pretty and interesting, and the walls and bed hang with canvases of more or less interest. One of the most interesting small apartments is usually called the "Dutch room," furnished with some old and odd pieces not corresponding in date, style or locality: old pewter, amber, colored glass, blue-and-white china, etc., each interesting in itself, but rather a combination of oddments as a whole. We may now finally retrace our steps down-stairs to the gallery, passing various etchings and engravings of more or less interest on the walls, and in the upper hall a table holding an old merino figure in which have been gathered a number of sketches representing the ideas of different modern artists on the subject of "prayer.

Reaching the first floor again, and passing down the long corridor by the side of the guide-books which we enter the first gallery. This in former days where the pictures were hung, and the walls are still covered with a sort of drab-colored tapestry; but every available spot is filled with pictures, and the wall of the left is piled with such a collection as we enter the second hall, and on the picures is a collection of Vienna cups and saucers and some Venetian glass, while scattered about the room are "Solon" vases, some marble busts, and little models, and to the right and left are various descriptions of Chinese, Japanese, and other objects of the best periods and rarest workmanship.

The designs of the pictures, especially the Oriental ones, are more or less interesting, and the artist's names, with careful regard to form and color, show a most artistic hand, and add greatly to the impression produced. As we stand by one for the first room filled only with the most valuable bits of old blue-and-white, we may look through the glass of another, containing only ivory and lacquers and kindred objects, to gorgeous masses of red and orange and green beyond. We tread softly over the old Eastern rugs, and breathe the odor of old oriental wainscoting, and as we pass into the second room, we are told that the upper story is the "Chinese" room, being a room to which special attention was paid, and, as we again pass through the Chinese gallery, we can only wish it would serve us some purpose here too; but it does not, and the task, indeed, seems almost hopeless to give names and numbers to hundreds of objects massed in these cases. It, however, could in some way be even approximately accomplished, the intelligent enjoyment of the gallery would be greatly enhanced for most people.

From the other far corner we pass under a little green velvet portiere into the annex of the "bridge," where is concentrated the special attractions of the more delicate "peach-blow" vases and a large group of pieces by many of the most popular of modern masters, size portraits by Bonnat, - one, the best, of himself - forming a sort of introduction to the large gallery of the oil-paintings, the last being the most inspiring to the lover of art. In the very center of this, giving access through an unobtrusive little green-ported door in an extreme corner, which is almost lost to your notice as soon as you pass through it and you find yourself shut in by apparently four or five feet of specimen of Eastern decoration, as otherwise the dimensions of the room are such as to produce the impression of a certain staliness, as in a public gallery, and seem to demand a large group of objects or evident evidence of the man's artistry. The lower rooms could not perhaps have been well avoided under the conditions of the alterations. These walls also are covered with a drab tapestry of a conventional dragon pattern; the heavily-carved ceiling is also decorated a little with the same motives, the cornice, is rubbed and panelled in very bold gold relief on a bronze background; a low wainscot in ebony wooden panels surrounds the room below the pictures. The entire floor is covered with a heavy, rich, red carpet, and down the centre of the room is alternate couches of dark-green velvet and low, flat cases of lacquers.

We come now to the pictures themselves. Of no part of Mr.
WALTER'S collection has so much been seen, so much written, and so much known. As we stated, we do not propose to enter here upon the field of criticism. Perhaps it would be better if such things were only written by artists themselves, and read only by connoisseurs, if we could devise a means for a connoisseur becoming such without the aid of a critic in the first place. It is stated that there are not two or three here that are of the same interest, either from size, subject or brilliant treatment, as are found in some other private galleries of America, but it is also asserted that its fortune derived has not from the whole collection a feeling of general satisfaction, both to the artist and the amateur. As is well-known, the pictures are all modern. There are here the several familiar types to be found in all such collections: there are those of special merit and value from authorship or technical handling; there are those that most attract public interest from the subject chosen or from brilliant treatment; and then, among all the rest of more or less merit, there stand out conspicuously those particular ones — and they are not few — that we feel and know are the best, without having to give a special reason for the opinion, and that they are very great pictures indeed for these days. It is in this group that the visitor can see the work of the great masters.

Looking at each other from the two opposite places of honor at the end of the gallery are Corot's "St. Sebastian" and Delaroche's "The Homily," totally different from every point of view, but each equally worthy of its place; and, as we wander from one to the other, we irresistibly pause before Rousseau's landscape, "Winter Solitude," Tadema's "Sappho" and his "Roman Emperor," de Nerval's "Surprise at Dawn," and Barye's "Class of Day," Dagnan-Bouveret's "An Accident" and Gérôme's "After the Masquerade." We cannot omit, but we turn willingly from the scientists of his "The Martyr," to Barye's strong and interesting canvas, "Eloët de Charles V." Many others we have seen, and again and again to go back to and dwell upon, but the fading light warns us the hour for closing is near, and we feel that we have attempted to see too much at once, and in too short a time. To thoroughly enjoy and become familiar with all there is to see in this house, experience has taught us that our visits must be frequent and not too long if we would avoid intellectual as well as physical fatigue.

**THE TIFFANY EXHIBIT FOR THE PARIS EXHIBITION.** — _The desirability of Exhibitions of the Art Industries._ — _The Washington Square Centennial Arch._ — _The Protestant Cathedral Exhibition._

OF the most interesting collections of modern industrial art work, which it has been my fortune to see, was the recent exhibition at Tiffany's of the jewelry and work in precious metals, they were about to send to the Paris Exhibition. The jewelry, while remarkable in its way, was less interesting and showed less of the influence of modern methods on design and execution. The other art objects, however, ranging from card-cases and snuff-boxes to tea and coffee services, and even a complete toilet-set with pitcher and bowl, etc., in hammer silver, were designed with an appreciation of the qualities of the different materials, textures and colors, that made them fascinating studies to any artist, and particularly to architects. Not that they were in any sense architectural as the word is commonly used, but that the architect could not but see, in miniature, the same problems that confront him every day — how motives as old as the hills are revivified by new and personal interpretations, how closely interdependent are beauty and fitness, and how much effect lies in the true appreciation and original conception of objects.

I have only referred generally to this collection realizing the futility of attempting any description of particular pieces. To one who has not seen them, nothing short of a very clever drawing at a large scale could render their beauties in black-and-white, so delicately and justly have the different materials, textures and colors been combined and so good are the details. Some of your readers will want to see them, and I think it would be wise for them to have their being returned. It ought to be possible to have these and other notable achievements in the art industries, publicly exhibited, where they could be seen, studied, and admired. Paris has the Société des Beaux Arts depicts aux Industries, which holds periodical exhibitions of the greatest interest, at which old works and new are exhibited side by side, or special industries, as tapestry or cabinet-making, and emulate technical development, and it is to be hoped that as seen, as if some such exhibitions might be initiated here under the impartial direction of some institution like the Metropolitan Museum, or better still through the cooperation of the kindred institutions of the principal cities of the country. The management being in capable hands, not only the producers of art industrial works, but private collectors of fine pieces, and all the artistic societies would have their sympathies enlisted and could be counted upon to contribute. Many treasures now practically inaccessible could be seen and studied by the already large and constantly-growing body of designers. The value of great permanent collections like those of the South Kensington Museum, is beyond dispute in forming the taste and developing the ability of the designers, and therefor influencing the perceptions of whole countries and adding to their well-being and prosperity. We have already several such permanent collections, barely outlined as yet, but increasing constantly in efficiency and scope.

The value of exhibitions of works of the same character brought together temporarily and embracing not only the old but also the latest productions in the different industries would have an equally beneficial influence and would not only interfere with the usefulness and the resources of the permanent collections, but would, by bringing vividly before people the intimate relation between a knowledge of past work and the results of to-day, greatly stimulate their interest in all such matters and practically demonstrate the advantage and utility of all permanent collections.

The Société des Beaux Arts depicts aux Industries are very simple brick houses with white (wooden) cornices, etc., but large enough and quiet enough in design to have much of the charm and dignity of Colonial work, although built somewhere about forty years ago. Mr. White, taking advantage of these circumstances, has created a very clever display of his best work, with many different kinds of ornamental and architectural adaptions, such as are very popular in France, and mounted by an old carved and gaily-painted wooden Washington, about eight feet tall. It was further effectually decorated with groups of flags and streamers of bunting and numerous insignia draped through the arch for night display.

A simple round arch spanning the street, resting upon pediment resting upon a plinth crowned by a modified cornice and a balustrade was the motive, which would have been bare and cold but for a certain grace of proportion and an evident harmony with its surroundings. I think every one immediately concerned must have had a little surprise at the immediate popular success of this unpretentious wooden arch; it was, in a sense, the success of the celebration, and the suggestion was soon made, and as soon as made that every opportunity would be given to perpetrate the arch in marble, as a permanent record of the event.

At a committee meeting it was decided to raise by popular subscription, $100,000 for the arch and $50,000 for its adornment with sculpture. It was further agreed to entrust the designing of the permanent arch to Mr. White. In three days after the subscription
May 18, 1889.1

The American Architect and Building News.

239

was opened about $10,000 had been subscribed and the whole amount can without doubt be secured.

It will be most interesting to see what Mr. White will make of this exceptional opportunity. There are conditions, which make the problem peculiar, for instance, with the wooden arch spanning the roadway, the piers resting and encroaching upon the sidewalk, and in order not to block that passage entirely the piers had to be somewhat reduced in height. The work was done without plans out in stone they would hardly meet the requirements of stability and would certainly look thin and weak. The only way out of this dilemma would seem to be, either to encroach upon the adjoining property (the buildings setting back perhaps twenty-five feet from the building line), and the owners may not see the reasonableness of doing that, or to move the site to the lower side of the street in the park where there is plenty of room, thus changing radically the relations to the adjoining buildings.

The great Cathedral competition has reached another stage, it being announced that four of the designs have been chosen.

The lay committee, some weeks ago, selected three sets of plans, but not feeling absolute confidence in their own powers of discrimination they appointed a committee of two architects, Professors Ware and Babcock and one engineer, Mr. John Bogart, as an independent choice from their standpoint. This committee reported on Friday the 10th, recommending four designs and it appears that the three previously selected by the lay committee were also included in their choice. This coincidence, which would seem to point to a distinguishing excellence on the part of the three designs, so far simplified matters that the decision of the committee was at once adopted.

The author of one of these designs, one marked with three arabesques in a circle, is at present unknown to me. The other successful candidates are Messrs. Potter & Robertson, George Martin Hunt, and Henry T. Clare.

The four successful competitors will be required to do some further studying of their designs, the exact nature of which has not yet transpired and it is expected that by Fall the final choice can be made.

One member of the French lay committee has suggested, according to the reporters, that models, at scale, of the designs might be required, a method of showing the merits of the different compositions that would certainly be most interesting and would result in proper restrictions, an excellent opportunity for comparison.

It has also been said, that it might have to be settled definitively what the exact character of the dome of the Cathedral should be, and that provision should be made for different functions, ceremonials, sermons, etc., upon which points it is understood that the designs submitted, range all the way from the English Gothic Cathedral plan, through the Greek and the Classic to the type of St. Sophia with a great central space and hardly any transepts or aisles.

There is every indication that the competition has been most fairly and impartially carried out and that the gentlemen sitting in judgment upon the sixty designs submitted have spared no pains to arrive at the most judicious possible solution.

Lady Dilke's book1 might have been better named, "Art in the Modern State," seems to imply rather a history of art or the culture of art in modern times than an account of the foundation of the French Academy and the State patronage of art in modern France. The book is virtually a history of French art during the reign of Louis XIV, including the foundation of the Academy by Colbert and Le Brun. Lady Dilke has not only searched the National archives and those of the Institute, and read up all authorities upon the subject, but she gives her authorities in notes, and at the end of the volume gives the index of the records of the Academy, so that the only fault which can be found in the book is a certain obscurity in the language here and there, and an occasional paragraph which is rather involved in its meaning.

The art movement by Colbert was assisted by Louis XIV's ignorant love of grandeur. When the King determined to build palaces for himself and his mistresses, regardless of cost he sub

jects John had made the painter Colbert determined to profit thereby. Taking Le Brun as his leading artist, he brought into his service all the principal painters and sculptors of the day. Not only did he commission plans and architectonic designs, but he intended all branches of the artistic work going on at Versailles, Marly and the Louvre, besides doing a great deal of the ceiling decoration himself. What remains in finished works and cartoons (and an

immense deal has perished), proves him to have been an indefatigable and most industrious workman; and although they are often tainted by the sham grandioso, there is a certain amount of real magnificence in some of his designs. No one can walk down the Salle des Bains without being impressed by the general effect, and the beauty of the workmanship of much of the ornament. But the fault of it all is the mixture of the sham and the real, apparently, any reason; as for example, the magnificent marble staircases, with its wall decorated with false balustrades and admiring men in gorgeous drapery.

The teaching department of the Academy, seems to have been of great benefit, and the academicians were ever ready to shirk the work. Oddly enough, too, they were averse to exhibiting their works, and had to be forced to do so. It was well, were (some of them) of the same opinion now. But if averse to exhibiting, they were ever ready to undertake other laborious duties, such as providing all requisites for their models in life and death. The model was attached to the Academy and received a fixed salary; consequently here was no competition for the demands on the artists, who were called, "besques" in the archives which gives us an account of the cost of the funeral of one Jean Francois Deschamps, Academy model during the treasurership of Charlon in 1775. The grand total amounts to 126 livres. On the other hand, a grand banquet hold about the same time, only cost the Royal Academy 83 livres, although the prices of some of the stands were much the same as at present time.

Lady Dilke pays a jaunty compliment to France when she says that in the early days as now, she was at the head of the artistic culture and taste of Europe. Other countries have produced greater painters and sculptors; but taking art in a wide sense, which regards fine arts, so called, and artistic industries, France has always been the greatest educator, and has generally been the principal motive power; it has, in fact, been a good organizer and a school, where the talents of the new generation may develop, (much) lost in the service of the State and the general proficiency of its subjects.

THE DETROIT ARCHITECTURAL SKETCH CLUB.

The Detroit Architectural Sketch Club, on May 9, 1889— their second semi-annual meeting— elected the following officers for ensuing term: President, T. R. Laist; Vice-President, W. B. Stratton; Secretary, Clarence A. Fullerton; Treasurer, R. Milder; Executive Council, Jean A. Hackett, Max Grylls, and J. B. Nettleton.

The club finds itself on a firm footing, and will banquet the architects of the city, on May 16th, the architects, by the way, have greatly assisted the club in getting through their first year, by various ways.

Communications should be addressed to CLARENCE A. FULLERTON, 18 and 19 Burns Block, Detroit, Mich.

A SUN-DIAL IN PARADISE.—Charles Lamb was possibly not far wrong, says The Heraldic and Social, when he conjectured that Adam had a sun-dial in Paradise. Dials are probably older even than alchemy. The Babylonians had them; though the Egyptians, that wondrous people who knew most of those things the moderns have rediscovered, seem not to have used them. The Babylonians gave them to the Greeks; the Greeks to the Romans and the Romans to the Christians. French and Italian architects have borrowed the idea of the sundial from walls of sunny châteaux they are fixed in hundreds. In the old days, when there was time for sentiment and room for it, sun-dials were favorite gifts from great personages to one another—from people to princes, and from princes to people. Cosmo de' Medici, whose fateful humor so angered Benvenuto Cellini, gave one to the Florentine intendant of astronomy; and on a monument to Novella it still marks the time of day. But even in our own cold land of fibre and complexion there are dials not a few. In Mrs. Gatty's book some 800 gradual growth, and the Academy some few casts of the sun-dial to many dials, the recorded number is probably close upon 1,000.

AN ATTEMPT TO GET EVEN WITH A LANDLORD.—An instance of the immemorial feud between landlord and tenant, and one particularly noticeable because the latter was hoisted by his own petard, occurred recently in a fashionable up-town neighborhood. The tenant had been on unpleasant terms with his landlord for nearly a year, and took every occasion which presented itself to make himself particularly unpleasant. He held a five years' lease of the property, and this was to expire May 3. He sought to renew it, but the landlord

The Freezing Process in Building. — The Chapin Mining Company, of Michigan, has recently made a very successful application of the freezing process of Dr. Pootsch, for the purpose of sinking a shaft through quicksand. The method of Dr. Pootsch consists in sinking a circle of pipes in the quicksand, and circulating in them a freezing-solution until the quicksand becomes hard enough to excavate. The shaft to be sunk in this case was 16 feet in diameter, and was to pass through two layers of quicksand to a depth of 101 feet, the nature of the ground made it imperative that the tunnel should be 20 feet in diameter when laid out, and twenty-six holes, 10 inches in diameter, were bored. Eight-inch wrought-iron pipes were then sunk into the sand, having their bases closed. In the last inch of each pipe a smaller pipe was inserted, reaching nearly to the bottom, and the upper ends of both systems were connected into the circulation of the freezing-solution. After this had continued for some time it was possible to keep a continuous circulation of cold solution through the pipes, which gradually absorbed heat from the ground and froze the quicksand until it could be excavated. The pipes were driven in already frozen, to a depth of over 70 feet, and the quicksand has been frozen as hard as rock, so that the work is carried on by blasting. The operations have been comparatively successful, and without the freezing of the shaft the sinking of the shaft would have been an impossibility. — The Architect.

Effect of Different Woods on Metal. — The bearing of chromed copper on iron is less by the Lumber Tenders for the 11c.; it is safe to say that no two varieties of wood possess the same essential chemical characteristics, and the instant one possessing much alkali is placed in contact with the iron, the latter is dissolved. What is true with reference to wood applies with all the force to the other materials used in structures. Two pipes, the mainstays of a quite large intercity bridge, rotted off at the ends when bolted together with an iron bolt. New ones were put in and fastened with wooden pins of the same variety, and ten years have elapsed and still they stand. In the first instance beech, which is known to contain much acetic acid, was used, and the iron soon oxidized, transmitting the rot to the wood, and though the rest was perfectly sound, the splice soon rotted out, while in the other case the same wood from the same tree was used, but the wooden pins did not rust, and these pipes, placed at this writing, have apparently ten years since the renewal was made. Now if a wood like ash or oak, having less acetic in its composition, had been used, instead of beech, the iron would not have rotted. But iron, hence would last longer than if fastened with pins made of its own species of wood, or any for that matter.

Coal Brochette in France.— Among the new features that distinguishes the surface works from those which one remembers a year or two ago, says Mr. André in The Colliery Guardian, the most prominent are the washing and screening machinery and the plant for the manufacture of briquettes. Great progress has been made in the former, the latter has grown into a very important industry, the beneficial influence of which is felt in the parent industry of coal mining. The "small" and the "sluggard" now find a ready market. A few memoranda concerning this matter. At the Anzin colliery briquettes of various sizes and shapes are manufactured (11 pounds to 17.6 pounds) blocks for the use of the Navy, turned out by Revoller presses; perforated blocks; and the oval blocks, the manufacture of which is now in progress (oval blanks of uniform solid blocks of five kilograms (11 pounds). The Neuve Company are making, with a Continuous machine, blocks of five to eight kilograms, and much smaller blocks. There are the five to eight kilograms (2.5 pounds), as well as the larger sizes. The Meurich Company have directed their attention to the production of large blocks destined for fuel, and this they have made here. These are occupied in the manufacture of large rectangular blocks for the use of locomotive engines. At the Oustrolent Colliery there are very many of these blocks, altogether, for the manufacture of blocks from one kilogram to five kilograms (2.2 pounds) upwards, except the largest used in the navy. At these works there are large blocks of solid bolts in different sizes from one kilogram (2.2 pounds) upwards, except the largest used in the navy. At these works there are large bolts of solid bolts in different sizes from one kilogram (2.2 pounds) upwards, except the largest used in the navy. These works have made in definite proportions, in view being a more effective packing of the blocks in the furnace. The packing as a whole is much more regular than before, and is more firmly pierced with from six to nine holes. Their weight is 1.5 kilograms. They burn freely and regularly. Especially worthy of notice at Oustrolent is the economical and hygienic character of the "small." By means of revolving cylinders a perfect mingling of the two sorts in definite proportions is effected. This mixing of the two classes of coal constitutes a very important progress in coal preparation.

Less than five years ago there was practically no market for non-coal to feed to the small, they were used only for the creation of that scoundrel landlord." The plumbing in the house had been allowed to deteriorate, and the tenant concluded that it would be a great convenience to him to complain to the Board of Water, which, when it discovered the unsanitary condition of the place, would compel the landlord to improve it. So the complaint was entered and the sanitary inspectors were summoned, and declared to be in an outrageous condition. The owner was notified of these facts by the Board of Health. He paid the rent, but, like most tenants, to other, except in addressing a polite note to the latter, calling his attention to the lease, in which the tenant had contracted, in consideration of a reduced rent for the premises, to keep the house in good condition for all time, might be needed by the house until the expiration of the lease. The wholesale repairs required by the Board of Health, accompanied by a claim for the rent not paid to thebert would be expected, but will spend the summer in some farmhouse, and the landlord is regarded by his associates as one whose success in life has made him a veritable leader among landlords. — Exchange.

TRADE SUBSIDIES

Business is halting in nearly all directions, according to reports from commercial sources. Yet bank failures have been recorded in Europe this year for the first time since 1881. The number of mortgage foreclosures in the six years one hundred and seventy millions of dollars of National bank currency has been in circulation. The fluctuation of this time in all, upwards of three hundred millions. The possibility of a financial stringency must be kept in mind, for the conditions are worse around the world that any that have been experienced by railway officials by the Senate Committee only intensifies the appreciation of the difficulties to be encountered before the questions involved can be decided. The week's business shows that trade is active. Permits for new work are flowing in; and the men are busily employed. Managers of the larger concerns are busy, and are looking for more capital, and mortgages are recorded with as great frequency as last year, but more are being paid off than last year, and the volume of mortgage indebtedness continues to decline.}

S. J. PARKHILL & CO., Printers, Boston.
M CHARLES GARNIER wrote some time ago one of his half-serious essays on the disfigurement of city streets by hand-bills and painted signs, which has a great deal of truth and reason in it, and Mr. Planat has done his readers a service by reproducing it in "La Construction Moderne." M. Garnier complains that he hears where he-who, without having his enjoyment of the picturesque and architectural beauty of the streets nearly destroyed by the appurtenance of some huge sign or rude picture, so enormous as to take away the scale of the more worthy objects near it. As he says, no sooner does he begin to admire the peculiar position and delicate detail of some beautiful front, than he sees on the side-wall of the adjoining house a representation of a gray overcoat, the Redingote Grise so familiar all over Paris, large enough to clothe the Colosseus of Rhodes, which immediately destroys the effects he was admiring. The graceful costumes become mere mouse-holes, the carefully studied string-courses and cornices disappear, and the harshness of the colors of the signs spoils the tone of the whole view. Most people, as he says, pay no attention to these things, but he cannot see why the public that does care for them has not a right to have its feelings respected. None, he says, that we go and sojourn at the Louvre, and paste his little advertisement on the nose of the "Vierge à la Chaise," or would even dare to hang a sign-board on the tail of Charlemagne's bronze horse in front of Notre Dame, yet the sign-painter does not hesitate to disfigure the sanctity of the Sainte Chapelle with his creations, and no architect has hitherto cared to complain in public. With us the practice of painting or pasting signs on every vacant surface is so inveterate that we can hardly conceive of a city view without them, while it must be acknowledged that our architecture need fear less injury from such causes than that of Paris, we can console ourselves by thinking that our signs are much less objectionable than those of Paris. It is possible that the unrestricted competition of the composers of advertisements here has been the cause of the display of more taste in their manufacture than would otherwise have been shown; but, whatever the cause may be, it is certain that American posters and other things of the sort are superior to those seen anywhere else in the world. When we were first in Paris, many years ago, there was an exhibition of American posters and hand-bills going somewhere in the city, which was at least considered interesting enough to be advertised. Since that time, the art of designing theatre hand-bills and advertisements has made great advances in this country, while it has stood still, apparently, in Paris, and if the exhibition were to be repeated, we imagine that it would attract so small attention, even from such artists as M. Garnier himself. Perhaps, in the present stage of the art, it might not be a bad idea for architects to interest themselves in such matters a little more than they do. It is getting to be quite common for architects to design the sign-boards which are to be placed on the buildings erected under their care, and the late Mr. Godwin, in England, gained a high reputation for designing the costumes and stage-settings for many successful plays. By combining these two things, and arranging to show a play attractively to the outside world, as well as to the audience, a clever architect might be of great service to a manager. Of course an artist, and a good one, ought to draw and color the figures to be dispayed, but an architect is yet not uncommonly not much the surroundings of the picture to be displayed, so as to give it the utmost value and effect, and might often suggest decorative treatments of the composition or the color, which would make them far more attractive.

AMONG the curiosities of the Paris Exhibition, not the least interesting will be M. Garnier's "History of Habitation." This consists of a range of dwellings of the most ancient forms of stones, and overgrown with weeds and vines, followed by a lake-dwelling, restored from the remains found in the Swiss lakes, and this by an Egyptian habituation of the type of those existing in the period of the Pharaohs. Then come Assyrian, Phoenician and Hebrew houses, followed by Greek and Roman ones, and so on, through those of the Middle Ages, down to our own time. In order to utilize the buildings, all the dwellings except the caves and the Swiss lake-cabins, about whose inhabitants we know absolutely nothing,
are tenant by people as nearly related to the real inhabitants as possible, dressed in costumes accurately studied, and surrounded by furniture of the style of the period to which the building belongs. In these cases the mantels are allowed to carry on a small business. Thus the inhabitants of the Etruscan house are permitted to dispense refreshments, which do not necessarily have the flavor of the eighth century b.c.; and a real Persian café occupies the Persian house, and is carried on by real Persians, dressed in their ancient costume, with Persian singers and musicians to divert the guests. In the Roman house is a glass-blowing establishment; the house of the Slavonic peasants is devoted to distilling rose-water from the roses of Kesaulk; and the Russians who live in their cabin make the characteristic wooden goods of Russia for sale among the Indians, the house, in another case, being surrounded by the plants of the country to which it is supposed to belong. The Egyptian house is buried in papyrus; cedars of Lebanon surround the Hebrew dwelling; the Japanese house is placed in the midst of a garden of cyclamen, hortensias, and other Japanese shrubs; and the Chinese one is hedged with bamboo, tea-plants, azaleas and fan-palms.

WE are gradually becoming wonted to having foreigners, especially Frenchmen, write amiable and appreciative criticisms on the work that our architects are doing. Other foreign critics, and particularly English writers, have a way of discussing the matter de haut en bas, so as to leave rather more sting than balm behind. But, as we have found a review of our present work from a German standpoint, the general trend of which is more in line with French than English comment on American architecture. Not only do the French take note of our artistic progress, but the publication of a translation of our articles on "Builders' Hardware," which is now appearing in the pages of our estimable contemporary, Le Construction Moderne, shows that they also appreciate the practical constructive ingenuity of Americans at a proper value. The publication of these articles in America and in France, supported, as they probably will be, by some exhibits at Paris, should make this a red-letter year for makers of builders' hardware in this country.

MANUFACTURING firm in Milwaukee had an experience recently with a rat, which is instructive. Noticing that the bills for water delivered through the meter were unusually large, the managers ordered an investigation, and at last discovered that the lead supply-pipe in one place ran in contact with a waste-pipe, also of lead. A rat, who frequented the waste-pipe, having appeared to be thirsty, and divining, by the curious instinct peculiar to such animals, the proximity of a supply of water, had gnawed a hole through the walls of both pipes, in order to get a drink. He succeeded in getting his drink, but omitted in another place to turn the tunnel to flow through the meter, and out again through the waste-pipe, until the investigation revealed what had been done. Possibly some architect, who has had experience with rats, may do the profession the service of compiling an essay on the subject of catching rats as well as of preventing them from doing mischief. We have heard it said recently that a rat will not gnaw a hemlock board, and that a grain-bin in a stable, if made of hemlock, or lined with it, is as safe against rats as if it were lined with galvanized iron. Whether this is so we cannot say, but some one ought to know about the matter, and if that person will come forward with his information, he will deserve the thanks of the building community.

EACH one may not know that the renowned Leaning Tower of Pisa has been set up as merchandise by the municipality, and, in order to bring the highest possible price, has been made the capital prize of a lottery, which is to be drawn at some period unknown to us. According to the Local Zeitung, from which we gather this information, the city of Pisa has spent so much money on improvements that it is practically bankrupt, and its creditors are making themselves quite disagreeable by the urgency of their demands. In this strait, and more particularly, to prevent the town-hall from being seized, the city government has betought itself of one of its pieces of antiquity, and hopes to get enough for the tower to pay off its duns for a time. Whether the tickets are eagerly taken or not we do not hear. A native might, we suppose, make a certain income out of the price by charging an admission-fee to visitors, but a foreigner would be better off without it than with it.

FIRE AND WATER gives a curious account of a fire which took place upon an English steamer, on its way to Rio Janeiro. When the ship was still twenty-three hundred miles from its destination, the cargo was discovered to be on fire. All the ordinary means for extinguishing the fire were employed in vain, and the boats were got ready and provisioned for a long voyage. Having taken this precaution, the captain, a man named Thompson, who deserves to be remembered for his courage and ingenuity, persuaded the crew to remain on the ship, and keep on at full speed, but not to fire a gun. The fire continued to spread through the cargo, and the deck and sides of the vessel became in places, red-hot, so that the sailors could only get about the ship by spreading sails over the deck, and keeping them constantly wet. Holes were then made in the deck, and steam, under high pressure, injected from a donkey-boiler, which had been provisioned beforehand, soon extinguished the fire. After one night's work the fire was so much reduced that it was at first believed to have been entirely subdued. To finish it, water was pumped into the hold during the whole of the next day, but instead of quenching what remained of the fire, it seems to have rekindled, or at least increased it, and in twenty-four hours the deck and sides in the vicinity of the conflagration were again red-hot. Again steam was injected, and again the fire died away, and the temperature of the deck fell. It was then discovered that the coal was on fire in the bunks on the port side, and it was hopeless to do anything more except to remove the coal. This was done as long as the men could bear the heat. A can of water was passed from man to man, and the cargo as could be reached was taken out of reach of the fire. The ship had fought the fire for twelve days, the ship reached Rio Janeiro, with all its crew safe and sound except the captain, who had been badly burned on the leg in fighting the flames, and is to be consoled by the presentation of a medal from the government, in reward of his services. A commission of which architects will draw from the story is that for fighting a fire in a confined place, steam appears to be far more effective than water. In fact, in this case the application of water seems to have increased the fire, in a way which can only be explained by the fact that the heat was greater on the cargo than can be learned from the telegraphic reports.

HISTORY has been commenced upon the Hudson River tunnel, the necessary money having been raised in England, by a loan of nearly three million dollars. A commission of English engineers was sent out to examine the plans for the tunnel, and to inspect the work actually done on the ground, and their report, instead of being unfavorable, as was at first reported, turns out to have been very favorable — so much so, in fact, that the same engineers are said to have made copious notes of the scheme, with a view to repeating the construction on a great scale under the River Ganges. Some of these English engineers, are, without doubt, to stay and carry on the work carried out, and the force now in the tunnel will soon be increased, and the undertaking pushed rapidly to completion.

THERE is a chance, perhaps, for one of our cities to get a first-rate statue, compared with most American statues, at no small price. Many architects, and especially the Parisian etablissements de bouillon, will remember the statue of Joan of Arc, which ornamented the middle of the little Place des Pyramides, opposite one of M. Dural's principal establishments. This statue, the work of Fremiet, has never been quite satisfactory to the artist's friends, and he has, as a consequence of a long course of badgering, determined to replace it with another, at his own expense. The model for the new statue has already been made, and is to be shown in this year's Salon; and, at the close of the exhibition, the artist intends to cast it in bronze and put in place of the present one. Now, as any of Fremiet's friends, or his author or his friends like them or not, would be a great deal better than most of the sculpture that does duty in America, and the "Joan of Arc," which will be a mere load on the artist's hands, could probably be bought for a low price, it certainly seems as if some of the rich citizens of some aspiring city might do their fellow-citizens a great service by securing it without delay.
A FOREIGNER'S VIEW OF AMERICAN ARCHITECTURE.

WHEN the conditions are considered under which the art of building is exercised in this country, then a number of favorable circumstances will be noticed. In the fullest sense of that word, there is only an influence that has been a strong, general and fundamental force in the development of the present high stage of development, but that carry in themselves promises of a still greater development. From the position we hold among nations, there is a probability that the principles of architecture, the peculiar and unique beauty of which is supposed to be destined to overshadow everything the old world has ever produced during the long course of its civilization. Such a theory should be considered. The whole energy of the people is therefore devoted to win and utilize the inexhaustible treasures of the soil and a competitive progress is thus caused. This is an astonishing result which exceed the greatest anticipations ever made for the same purpose by the princes, the republics or the churches of the old world.

In the buildings put up by the federal government the endeavor is notable to provide the means for the maintenance, without munificence, of the public buildings under the administration of the people itself. States and cities vie with each other to give a monumental and imposing form to the structures which are destined to harbor their legislative bodies, their administrations, their courts of justice; the great interest of municipal and railroad corporations raise mighty buildings expressive of their sphere of action; wealthy citizens and families enter into a noble competition in founding and lavishly endowing establishments for schools, museums, hospitals and other establishments of public use, and in all these cases ample means are furnished to create something great and lasting.

The characteristic disadvantage with which the typical American regards anything small or petty on no occasion shows itself more than in his willingness to give unstintedly in order to obtain something standard and sterile.

In a country like this, filled with the unceasing spirit of enterprise, the architect will be called upon to solve problems of the most interesting kind, sometimes wholly unique, such as, for instance, the construction of an entire town, which was completed in the vicinity of Chicago by George Pullman. The various cases coupled with the independence of mental grasp and ideas, that is produced by the all pervading liberty of action and movement, will naturally tend to raise the power of those to whom the execution of such extraordinary projects is entrusted. They will commence their task, unlike the masters of the old world, free from those bonds in which traditions and impressions of a great past have held the imagination since the days of youth. Thus they will produce something new and unique, which may bear the stamp of creative genius.

Wherever there is light there must also be shadow, — this old rule holds good here as elsewhere. The very same circumstances, which favor the invention of new forms also carry in themselves the danger of arbitrary and whimsical ideas taking the place of the beautiful and the practical. The eternal laws of nature, and the necessities of public buildings, can be understood only after a careful study of the best monuments of all ages are easily lost sight of by those, who, without having gone through a thorough course of training, have commenced in early years to work independently. Similar opinions are evidently gaining ground among American architects themselves; the Western Association of Architects, for instance, has resolved that the right of architectural practice should be made dependent on a State examination.

Without at present entering on questions of style, I believe that the great and undisputed advantages of the best specimens of modern architecture in this country are to be found in the heavy masses of the buildings, in the artistic treatment of wall-spaces, in the predominance of gravity of expression, and above all in the effective crowning of buildings in the way in which they pierce the air. I do not believe that these American creations can be excelled as regards profile and general impression from a distant point-of-view. Another point that deserves commendation is the sterling solidity with which elevations are constructed. With rare exceptions, there is nothing false, everything is genuine and presents its natural appearance. The observed experier will regard with special interest and satisfaction the excellent treatment of wall-spaces in natural stone material, the striking effect obtained by finishing the surfaces of the fronts in bas-reliefs, sometimes rough and heavy, sometimes finer, and finally, in well considered contrast thereto the charred and polished surfaces which set off the fine groundwork of marble, of the various kinds of granite, marble and sandstone, of which this country possesses such a marvellous abundance.

An equally healthy and novel treatment we find in the better specimens of brick buildings and in the application of effective terracotta ornaments. The interiors show the same sterling quality of material; in the flooring, the wall-scotting and paneling, be it of wood or plaster, with a well conceived understanding of forms and colors, which knows how to attain the finest effects by utilizing all available means, such as checker-work, colored-stones, metal or glass.

It appears to me, however, that a certain contrast exists between the beautiful exterior, which gives evidence of so much talent, and the invention of the ground plan. Clearness and beauty of the latter are the points-of-view, in which the architect, do not seem to me to receive sufficiently weighty consideration; solutions are accepted, which might be improved upon by careful study and ripe experience. Correct proportions in length and width, and form and function are very often of the relative importance of each room, imposing spans for stairways uniting in themselves the requirements of utility and beauty, in which various ingenious tricks, with the affront of space in architecture, do not appear to me to be considered as much here as they are in the monumental structures of Europe. Sometimes even, the first practical requirements of air and light are not sufficiently considered.

Casting a glance now at the ecclesiastical architecture of the United States, we have to remember, that it cannot be measured with the same scale which is applied to the most perfect cathedrals of the old world; but here we must bear in mind the youth of the country, the great number of congregations and sects, as well as the fact that the means for the erection of churches are raised by the congregations themselves, without distinction as to the denomination. When all this is considered, then we can only judge favorably of what has been done in this field.

From the wealthy and large cities down to the smaller townships, nearly every one possesses a number of churches, which if not the equal of the English, at least present a pleasing appearance. The style of most of them is derived from medieval traditions, but frequently happy and original novelties are found in the various localities. Our architecture in this respect belongs to the little wall-croppers, or by surrounding groups of trees, shrubbery, etc.

According to votes collected by the American Architect, Trinity Church, in Boston, is looked upon as the finest building of its kind in the United States. This church was built by Gambrel & Richardson and doubtless is an important as well as an instructive structure, because it is independent of all traditions. Contemporaneous opinions are divided as to what more or less of the Gothic should be introduced in this Gothic Church, in the purely ecclesiastic forms of the old Christian, the Romanic, the Gothic, and the Renaissance periods; again, whether this interior, which is so admirably and to us crowded with ornament, should and grandeur approaches the ideal as nearly as do the venerable works of the past.

Judging from such a point-of-view, it is probable that many will prefer the Baptist Church, the New York Trinity Church, built by Mr. Upjohn. From Trinity as well as from Grace Church, which forms a beautiful group in connection with its rectory, a friendly spirit seems to breathe into the fastening and nervous life of Broad- way.

It would evince a lack of correct judgment not to share the enthusiasm, with which Americans regard their Capital at Washing- ton, especially, when it is remembered, that the building was not constructed at once, but was gradually made what it is today: seven architects share the honor successively of having contributed to its completion. From its wisely selected site, its beautiful contours, by the effectual shielded out the light of the sun, the Capitol, dominating the entire landscape. In its general character it unites the refinement and the magnificence peculiar to the forms of Renaissance, but it is a matter of regret that the front elevation is not equal to the work viewed in perspective view of an image. All is laid open, as well as the most ones of the ground plan, with its intricate corridors and its modest stairways, also the fact that the square on the other end, the glazed beams is not as it seems solid stone construction but one of iron.

Among the numerous great and magnificent buildings put up by States and cities for administrative purpose, the Connecticut Capitol, in Hartford, appears to me to be an especially Meritorious work. The Albany Capitol, notwithstanding many external beauties and excellent interior details, cannot be rated equally high as regards

\* By C. H deselect, former Technical Attaché to the German Legation at Washington.
novelty of invention and general proportions; neither is it to be expected that the present favorable opinion of the majority on the Philadelphia City-hall, will be indorsed by posterity. The much-contested selection of the site was decided by public vote, and the site selected had to meet the best of ground, under alterable conditions. But, it having been decided to erect the building on the crossing of two main thoroughfares, would it not have been more permanent and great public openings, instead of the insignificant entries in which they are now lost to sight? Is it not a non-artistic exaggeration to develop from out of this building a tower rising to the enormous height of 500 feet? Is it not true that, at least in this, the inevitable is abandoned of crowning this dizzy height with the venerable figure of William Penn?

The great buildings subject to the Treasury Department (court-houses, post-offices and revenue buildings) evince an unsurpassable family-likeness and, notwithstanding excellent execution, a lack of inventive talent, which, however, is readily understood when it is seen in which they are grouped. The incumblents of the position of Supervising Architect, in their annual reports during the last ten years, have constantly called attention to the difficulty of giving an individual appellation to buildings in which the practical requirements are alike. This difficulty cannot be overcome by a single individual moving in the routine of office. Why, for instance, is the impression of the New York Post-office so unmeaning and shapeless? Is it not the lack of contrast in the various stories, the subdivision of all wall-surfaces by means of columns arranged on a small and petty scale, and the non-artistic, material, in the absence of any swelling of the cylindrical columns? If this is compared with the forms invented by a talented artist in a similar building, the impression, for instance, of the Jefferson County Court-house, built by Mr. Withers, then it must be conceded, that success as failure is not a question of the problem itself, but merely of the way in which its various features are grasped.

The great railroad stations in New York may be looked upon as a group in which modern architectural ideas appear most expressively, a number of remarkable examples of which are found in the erection of the Pennsylvania Railroad Station, of the Boston & Albany Road, in Boston, the Darien Park depot in Chicago, and the Grand Central depot in New York, give striking evidence of the ability with which their architects have raised them far beyond and above all the attempts of practical use to the sphere of monumental importance.

Equal appreciation is doubtless due to the numerous buildings devoted to scientific purposes, the universities, colleges, and libraries, and the hospitals of this city and of others. Whether these would not be filled with genuine satisfaction on passing through the manifold buildings of venerable Harvard University; who would not admire the grand institution of the Johns Hopkins Hospital, the pride of Baltimore? And surely every one, who ever crossed the Potomac from Washington to Arlington, will retain the memory of the impression made by Georgetown College, high above, with its effective forms, so animated.

A decided disappointment, however, is experienced on turning to the American institutions for public amusement. In the erection of these the instinct ofugliness is carried out, and of what part of the owners, has compelled the architects to depart further from compliance with artistic demands than in any other field. The greater number of theatres are hidden behind dwelling or business fronts. Therefore, a premeditated work of art; but the true character of a temple of art has rarely been developed, even in those cases where circumstances permitted the erection of an independent structure, free from its surrounding. It will be conceded, for instance, that the exterior of the New York Metropolitan Opera-house does not betray in any way its destination, although the means at disposal were ample. In the interior there is no lofty and spacious hall, no magnificent way, and the auditorium, which is reached through low and insignificant ante-rooms, impresses us as barren and cold.

More to the interior of the house, opposite the foregoing, doubtless is of a high artistic order. Original and varied forms and magnificence of colors unite in impressing the visitor, and carrying his mind into the sphere of imagination. But it seems a strange world within which the Metropolitan Opera House, of Messrs. Kilburn & Willits, stands, in front of a New York theatre the forms of Moreau architecture, the massive wall-spaces and small openings of which are adapted alike for winter and summer, and for hiding shelter from the rays of the sun in a hot climate. Again, notwithstanding the assurance that everything is fireproof, an uneasy feeling is created when ascending those winding stairs by the thought of what might be the result of an explosion, should everybody rush towards the exit.

One of the most horrible examples in this line is found in the new Opera-house, at Chicago, which really is nothing but an immense race-track. The forms and proportions of this, on the other hand, I would name as works deserving all praise, the University of Chicago and Baltimore: in the latter the architect, Mr. Neilson, has succeeded with moderate means in creating a simple but characteristic exterior, an excellently arranged ground plan and a pleasing interior.

The mighty buildings devoted to business purposes are more and more becoming a decisive element in the appearance of the large cities of this country. The mere technical achievements found in them, may doubtless be pronounced to contain the sum and the substance of all modern constructive possibilities and knowledge. Only a minority of them, however, will stand an aesthetic scrutiny equally well. I will depart from rail yards and factories, the great exception. I believe comparison to be admissible between the proud Palazzo Farnese, towering with its grand horizontal lines above the multitude of houses of Rome, and the Prodigal Church dominating in the picture of lower New York. Nay, more, the latter appears to me even more impressive than the first named, through the addition of the proud tower, which, with its calm and beautiful contour and its almost inaccessible height, offers a favorable characteristic feature of New York. The architect, Mr. Post, a most gifted master, in this building has shown the meaning of true and genuine effects in architecture. In this simple work you do not find any weak results, no playful divisions, no meaningless ornaments; but you find grave and grand wall-spaces in noble proportions, and adorn these with the various stories, everything true, natural, practical and perfect and does the single exception that the main entrances are not sufficiently characterized, and that the form and color of the small projecting granite supports, in a measure, disturb the harmony of the lower portion.

A second remarkable example is the well-known Sloane Building, on Broadway. Its purpose could scarcely have been expressed better than has here been done by its architect, Mr. Wheeler Smith. In the treatment of the pillars, in the arrangement of the openings, in the placing of the intermediate columns of iron; in short, in the composition of the whole, as well as of the details, a true artistic spirit, confidence and skill is seen.

Now, very different, however, are the latest works out West, notably those of Mr. Beman, the gifted architect of Pullman City. In the treatment of the freestone at Steelmaker Bros. manufacturing building, in Chicago, and at the American Life Insurance Company Building, in Milwaukee, a transition appears to an affected aboriginality, not to say brutality, and the various members, forms and proportions are handled with the evidences of a somewhat progressive a one. The same is true of the almost grotesque bank-buildings on Chestnut Street, Philadelphia, in the forms of which the last vestige of proper restriction appears to have been lost sight of.

Finally, I have to mention dwelling-houses. From Mr. Hunt's magnificent work — the Vanderbilt house — down to the modest cottage in the suburbs, the character of each is a question of what grace of form and what diversity of plan and exterior! It is erroneous to suppose that the great development of dwelling-house architecture in this country is largely due to the refining and enhancing influence of its women.

I have seen multitudes of cosy houses in Washington, Baltimore, Philadelphia, Allegheny City, Chicago, Milwaukee, St. Paul, Minneapolis, Buffalo and Boston, and the impressions that I have received from such inspections I count amongst the most instructive, pleasing and lasting ones.

In conclusion of this sketch, I would say that from a point-of-view rising above national prejudice, it is sincerely to be wished that American architects may continue in the splendid beginning that they have made, and that they may succeed in carrying that place of honor in the world's history of culture at which the best of the aiming.

MALARIA. — I.

Fortunately, the question of malaria has not with us, in our temperate climate, the fatal significance that it has in the tropics. With the exception of yellow fever, which reaches us so rarely, and which seems to require for its development something more than the ordinary malarial condition — probably the concentration of several malarial agents — we are free from the dangers of its offspring. During the present summer, we have seen the danger of malaria in America without the malarial agents of the United States, and when we consider the degree to which this disease appears to be a prominent characteristic of the climate, and the results of its complication with other diseases, we may justly regard it as one of the most serious and distressing of human ills.

It does not figure to any great extent in our death-rate, but it most certainly affects the health of the whole community, and it lowers to a marked degree the industrial capacity of communities subject to it.

The disease is singled out for exceptional treatment here because of the well-founded belief in its belief in its being due to excessive soil moisture, and that good drainage constitutes almost universally its most effective remedy. It is not proposed to touch upon its characteristics as a disease, nor upon its medical treatment; only to
consider its causation, and the manner and extent to which it may be prevented or modified by improved drainage.

As to its causation, we are really much less clear now, when we know so much more about it, than our grandfathers were with their limited knowledge and more positive speculations. A belief in the relation between malaria and undue soil moisture has prevailed through all time, so far as our records reach. There is little doubt that not only the swampy lakes but also the species of plants which preceded them in southern Italy held this belief and acted upon it.

The drainage works of the Roman Campagna, which are supposed to have existed before the Roman period, were probably carried out with the knowledge that it was due to the effect of this cause, and the speculation that there was a natural cause or agency which, in a little swamp or slight depression in the country, is thought that it is largely due to the fact that these works have fallen into disuse that the Campagna owes its present healthy condition. Yet it is very likely that malaria was caused by the moisture of various conditions was formulated and clearly set forth by Lancisi in the seventeenth century. His writings and the records of the observations and discussions of his successors for a century and a half confirm this theory. This is the subject, which, in spite of its peculiar turgid style, remained until recently a standard authority on malaria.

MacCulloch leaves us earnestly to consider Lancisi's theory that malaria is due to a combination of excessive moisture, a certain considerable elevation of temperature and the decomposition of organic matter. These conditions were most prevalent in the case of actual marshes, the uncovered surfaces of which, at a time when they were peculiarly turgid, remained until recently in lands which were not at all of a marshy character. MacCulloch says:

"I am persuaded that it will be found the most common cause of the malady is a kind of this. In extreme cases, it is inundation and following drying, failing, therefore it must be considered again elsewhere, in others, it is that drying during which the marshes were covered with dry somewhat dew or wet condition of such meadow lands, as they are left by the winter rains. Instances of thirty-five years ago, as one example is enough, I may point out the lands about Fontainebleau, at the junction of the Yonne and the Seine, notorious for the 'Fievre du Pays,' the disease is not convention or intercovenit over a considerable tract, while it is a pure example, inasmuch as there is nothing else present; nothing but that drying of moist meadows, whether previ. mow malarious, not as a result of the winter, which they were under the summer heats. How extensively this cause operates as to meadows in all cases, be their character what they may, I need not dwell, the obvious before unknown. I need not dwell on a subject so obvious; but the history of all lands is full of events of this nature, even in the countries where this disease is not so frequently detected, in certain parts of Europe from attempts at drainage. It serves to show what was then suggested, that a very wet state of the soil was not so much an intervening cause between complete inundation and swampiness and absurdly dryness."

This bad effect of drainage he regarded, however, as only temporary, for he says:

"The simplest and the best known cause of the diminution of malaria, is that which arises from the drainage of marshes, swampy or fen; and the more perfect the drainage is, the less does the evil last to the production of the disease. He also recognizes the fact that complete saturation of the ground is less to be feared than a less, but still sufficient, state of wetness."

"This fact is, in another sense, of some value, as tending to explain what happens where this particular case of lowering the water is found in certain parts of Europe from attempts at drainage. It serves to show what was then suggested, that a very wet state of the soil was not so much an intervening cause between complete inundation and swampiness and dryness absolute."

This bad effect of drainage he regarded, however, as only temporary, for he says:

"To proceed, and to the reverse case, it is plain that wherever a tract of dry land has been converted into marsh by inundation, whether from a breach of the sea or the overflowings of rivers, we must expect an event the opposite of the preceding, or the production of this point, previous to the appearance of malaria."

"I may quote one instance among ourselves of the complete ex. tinction of malaria by the drainage of a very small piece of water and it is worth quoting, as equally proving athen almost unsuspected cause and its remedy. This was the North Loch of Edingloum, formerly full of water, on which, since the draining work has been carried out, the spot, have disappeared. And even the insignificance of this spot renders it a valuable example, as proving how very small a body of water is capable of being a permanent source of the diseases of nature, even in a climate so little favorable to the production of malaria as is that of Edinburgh."

One of the most interesting of modern writings on the subject is an essay of more years ago which was published by Dr. Mitchell, of Philadelphia, "On the Cryptogamous Origin of Malarial Epidemic Fevers." This essay also was written long before the discovery of the malarial plasmodium. He regarded the microcosm, which is now receiving so much attention in the scientific world, but it foreshadows the results of that investigation in a rather remarkable way. Dr. Mitchell advanced what he called the "miasma" theory that malaria was due to an unhealthy "current" or "vortex," which from the soil, or from stagnant waters, and which, by the action of special cryptogamic growth, and he made this notion fit the various conditions of locality, temperature and season favorable to the production of malaria in a manner that seems prima facie, to be universally satisfactory than any previous theory on the subject; for example, this seems, better than any other theory on the subject, to account for the fact that malarial fevers are much the most active in the rainy season and when the temperature is lower than in summer. It is at this season that the growth of fungi is the most active. In like manner, if we accept the fungoid current, it may better understand why the spores of fungus should be arrested, as is the progress of malaria at times, by hail, a road or a stream. Dr. Mitchell's essay cannot be regarded as of scientific value, but it must seem at least curiously prophetic in view of the results which have been since arrived at of an infestential cryptogam, such as the bacillus malaris of Klebs and Tommassi-Cruden.

Dr. Mitchell's suggestion is much more carefully and thorough-}
The
drift.

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The

The
ST. ZENO

CLOISTER OF ST. ZENO
THE CATHEDRAL

JULIET'S TOMB

ITALY
and drying, it is slowly produced and its maximum effect does not become active for two or three years. The most tenacious lumps of earth crumble and crumble under the alternative presence of air and water. Water drains away little by little and air takes its place. Furthermore, this air with its oxygen also enters the soil from below, reaching it through the drains and escape-pipes at the joints. This action is most important, and is generally not understood by agriculturists. It is one of the principal agents of fertility. As Barral has proved, the oxygen of the air penetrating the humus of the soil in all directions comes in contact with all of the organic matters of the surface-layer, unites with their carbon and forms an enormous quantity of carbonic acid. This is evident in breaking-up the adhesion of particles of clay which have been puddled together; it serves at the same time to dissolve the phosphates, carbonates, oxides, sulphates, etc., and places them in a condition favorable for absorption by the roots of the plants. We understand from this the reason of the enormous influence that the application of drainage to broad areas has exerted on public health. It results in the most marvellous results that we have just cited in the one city of London, and especially in Scotland, and which have led Graves to this conclusion: 'The extinction of intermittent fever is the most striking, and most eloquent of all the modifications caused by drainage.'

GEORGE E. WARING, JR.

[To be continued.]

ILLUSTRATIONS

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

ST. PETER'S EPISCOPAL CHURCH, ALBANY, N. Y. MR. E. M. UNJOIN, ARCHITECT, NEW YORK, N. Y.

[Geletain Print, issued only with the Imperial Edition.]

KING MEMORIAL DECORATION, ST. PAUL'S CHURCH, AUGUSTA, GA. DESIGNED BY MR. F. S. LAMB, NEW YORK, N. Y.

THIS occupies the entire west end of St. Paul's Church, Augusta, Ga. The important feature of the composition is the central figure of St. Paul, heroic size, flanked on either side by life-size figures of the four Evangelists. The color scheme is very rich and in connection with the oak is pronounced a decided success. The work was executed by Messrs. J. & R. Lamb of New York.

VIEWS IN VERONA, ITALY: Six articles elsewhere in this issue.

COMPETITIVE DESIGN FOR CHURCH, CLERGY-HOUSE AND SCHOOLS FOR TRINITY CORPORATION, NEW YORK, N. Y. MR. E. M. HUNT, ARCHITECT, NEW YORK, N. Y.

DESIGN FOR A COUNTRY HOUSE. MR. C. W. STOGDON, ARCHITECT, NEW YORK, N. Y.

ITALIAN CITIES—VII. VERONA.

HAVING contemplated the tomb of the Scaligers, a visit must be made to the Arena, which, after the Colosseum at Rome and the Amphitheatre at Nimes is the finest and most complete monument of its kind which remains to us from Roman antiquity, only here the aesthetic effect is spoilt by the painful awakening of the historical recollections which attach to these ruins. It is a feeling from which one never escapes when he finds himself in the presence of the ruins of Roman grandeur, and it is a feeling of dejection and of self-conscious griefs; the temple evokes the image of human sacrifice which have so often soiled the altars of pagan worship; the triumphal arch recalls people who perished under Roman conquests; Grulla, cradle of the arts, transported upon the feet of the legions, who did not even spare Greece, whose devastation achieved later by the Venetian republic was first begun by the Roman cohorts; the circus suggests to us those spectacles, such carnage consumed to amuse the crowd eager for blood. Everywhere, murder, drama, massacre; everywhere man sacrificed to give pleasure to man, a human life offered up to gratify a crowd of other human beings. The arena at Verona is so well preserved that even to-day spectacles can be held there. At the time of the triumphal entry of Victor Emmanuel the city held a fête there, at which more than sixty thousand persons were present, and at a certain moment more than sixty thousand. On the outside it measures 156 metres in length by 125 in breadth. The area reserved to combatants was 75 metres long, 55 metres wide; the amphitheatre contained 45 ranges of seats, which are still perfect. At the two extremities of the ellipse there were two large doors, below which run platforms or tribunes enclosed by balustrades. The origin of the arena is to be attributed to Brutus which serve to facilitate circulation and the departure of the spectators. The doors are of the Doric order, and some of them still preserve the lintel, and a door with a small lintel which probably served to indicate the class of people for whom these different entrances and benches were reserved. It is generally believed that this arena was built in the reign of Domitian or Nerва, and that the architect was Lucius Vitruvius Cassius, whose name is also found on the inscription that was on beholding this strange and terrible edifice that Dante conceived his idea of the circles of the nether hell; but this is only a position, it is confirmed by no historic document.

Verona still preserves several other remains of Roman antiquity—rare things in northern Italy, amongst others the Porta dei Borsari, which crosses the whole breadth of the Corso, and is composed of two arches surmounted by two tiers of round-arched windows. Each arch is framed with Corinthian columns supporting pediments with dents like the farmers of the Doric entablature. It is easy to understand why this work is a work of a different period, and its decoration would be very hard to determine from its appearance. In a word, it still, preserved, did not inform us that these two doors were restored by Emperor Gallienus, a.d. 265. From the general appearance of these structures, we can conjecture that they were actually built under the Antonines. At the commencement of the Via del Leoni is found an arch of the same style, which, although less well-preserved, has a more striking air. To-day it is not certain if we know with accuracy this monument, and for a long time the question was debated whether it was an entrance to the forum or a triumphal arch. These two hypotheses are inadmissible. For Roman architecture, the triumphal arches a bolder and more imposing men. As to forums, they were usually approached by an entrance whose monumental decoration never gave to these places of meeting the appearance of an enclosed space. I am rather inclined to believe that the Via dei Leoni was anciently one of the city gates, and that its age dates beyond the reign of Titus.

The columns of the Scaligers form perhaps the most curious monument which Verona possesses, and it may be considered unique of its kind; but the very numerous churches are still worthy of study, for these, comprised between the epoch which reaches from the sixth to the fourteenth century, offer every variety of the Lombard style, and more than in any other city of Italy allow us to take notice of the fashion in which this style was formed and transformed, to be subsequently absolutely swallowed up by the Italian style.

San Lorenzo, which dates from the fifth century is not of less historic value, because it was restored four centuries later by order of the Arch-deacon Pacipus; but the interior, which has three bays, was supported by columns with dimensions and proportions very remarkable, and which, by their heavy and stunted form, give us precisely the idea of an art which still lacks dash, and which has not yet known how to raise itself above the vulgar means of architectural construction. Santa Maria in Organo, the remains of a Roman church, has been restored and building and more boldly conceived. Unfortunately it, too, has been restored by the Lombard kings of the seventh century and by succeeding bishops; and in the last place the façade has been rebuilt by San Micheli, a Veronese architect, whose work is certainly remarkable, although it has the great misfortune of being attached to the present building which would much rather have retain its original character. The interior decoration is extremely interesting. The choir is painted by Paolo Farinato, and the stalls are composed of curious pictures in inlaid woods, executed by Fra Giovanni, one of the most ancient monks. Formerly there was a cross in this church, which was carried our Lord Jesus Christ to Jerusalem; but little by the monks thought they perceived that visitors turned in decision from this relic, whose authenticity appeared to them very doubtful, and they finally shot it up in a cloud of the sacristy from which it at length disappeared.

The Church of San Zeno gives us a nearly complete type of the Leonese Church. It is a quadrangular temple with a small structure superimposed upon a larger one, so that the interior has three naves, the central one of which is more lofty than the lateral ones, and the façade is divided into two stories, the bottom of which goes with the gable of which so much depended the base of the edifice, while the upper story projects in the centre and rises to the pediment which crowns it, and is surmounted by a beautiful round tower which ends a short distance below and which finishes in crenellations in Ghibelline form, formerly was a portion of the residence of the kings of Italy. The first story is cut at half its height by a range of elongated and coupled windows, and the single doorway which opens in the centre of the design declares itself under a full-centred arch projecting from the main wall and supported by two columns which rest on two crouching lions, and bear on their Corinthian capitals equally quaint figures.

(Continued from No. 696, page 304.)
The American Architect and Building News. [Vol. XXV., No. 700.]

which receive the feet of the arch. The panels which flank the columns and the void of the tympanum are enriched with sculptures in high relief, representing various sacred and historical subjects: amongst others we see a huntsman on horseback, who is accosted by the devil. People have taken great trouble in past times to decipher the significance of this allegory, and President Des Droches may be considered as having contributed much toward the elucidation of such subjects. This criticism has discovered that the huntsman naturally represents King Theodorich, who in his quality of Notary of Arius was conceived as travelling in company with the demon Hershey. The allegory, then, is a figure of the morality with the devil, and it is the one figure amongst all others that has remained a riddle.

The three interior naves are separated and sustained by alternate pillars and arches, of which all the bases, capitals, and abaci are enriched with sculptures of seafarers, lions, dogs, and serpents. In the choir can be seen the statue of St. Zeno, who was bishop of Verona in 382. This is a polyehronsatic statue of grotesque style which represents the bishop sitting on a throne, with bare feet, and two children, who also figures amongst the sculptures, has always remained a riddle.

In the subterranean portion of the church, supported by a forest of columns, is the baptistery, of prodigious dimensions and constructed, as the story goes, of a single piece of hollowed stone. The story used to be that a holy-water font placed near by had been brought there by the devil in person, who had gone in search of it to destroy the edifice of St. Zeno. While Pepin, son of Charlemagne, and restored by Otto I of Germany, belongs almost entirely to its ensemble to the twelfth century. The sculptures, which cover the entire facade and edifice, are barbaric in all Italy, if we except those at Pisa. Jesus Christ, the saints, and angels are shown in grotesque attitudes, with miasma, limbs and monstrous heads. They are really unpleasant, disproporionate, and, as we shall see, the Gothic sculptures for the Gothic style would destroy the edifice altogether.

Art was at the lowest depth of its degradation, and while architecture was already taking on just and graceful forms. The statues, which are freestanding and nude, are very feeble. It is well to remark that in Italy as in Greece and Rome it was architecture which first broke the mold of barbarism and disclosed to art more true harmonies, and that it was in Italy that the edifice and example of the sixteenth century, and sculptors perfected themselves in their turn. In proportion as the edifice acquired polish and finish, the accessories were also formed, and the harmony was increased.

The architecture of the church was the work of the architect who took the first step, and in all Italian, at Verona, as at Siena, Pisa, Florence, Orvieto, and everywhere, we can still discover evidence that the sculpture and painting always lagged behind architecture, and the frescoes, the statues, the reliefs, destined to decorate the monument, are always inferior to the monument itself.

The cathedral which, although in the first place built, about the tenth century, out of the ruins of the Temple of Minerva, really dates from the end of the tenth century — the epoch at which it was rebuilt — already begins to present a little more complete type of the Italian Gothic. We see the carvings of the Gospels, and the carvings of Gaudioso, are distinct from Byzantine. The facade is harmonious, although still a little cold. The twin sculptures are well connected and complete. The statues are not equal to the accessory, not equal to that which we see on the facade of an earlier date, although in its entirety it preserves that aspect of bareness proper to those periods when architecture is not yet in possession of all the resources which can enrich its elevations, and it is still constrained to exert all its energy in order to make sure of equilibrium and stability. The portico, whose apex reaches to the height of the rose window which punctures the centre of the design, is supported by two twisted columns planted on griffins. Inside the Gothic character is more prominent, although here, also, the mixture of styles is very visible, especially toward the choir, built by San Micheli who, indeed, had all the good lines of him and the defects of the sixteenth century, and by whom the choir was connected with the central nave by a belt of Ionic columns. Nevertheless, in spite of this jumble, the impression is one of great force and deep solemnity.

It is why I do not agree with M. Taine, who said apropos of this cathedral that bands, arches and enrichments are alone able to give a church mystic sublimity, and that when these are multiplied the effect is a barbarism. That which imparts upon a church the Christian character is in the first place the degree of Christianity practised by those who frequent it: I have seen in the monastery of St. Maria dell'Arco near Bergamo, a little chappels of walls simply whitewashed, which on Sunday at the moment when the crowd, possessed of fervor while the priest officiates at the altar, have an aspect much more serious and inspiring than the vast basilica which Gothic art does to the world.

As to that which concerns style, I have already expressed my admiration of the pointed arch and the cylindrical vault, which is called respect for purity of style is only proper to an age of feebleness. The artist who has imagination and genius is forced to create and break the consecrated forms. Style is a barrier to which only spirits looking in fire and dash can accommodate themselves, while all the great inventions in the domain of art have been made in defiance of accepted forms. Art is eternal and indefinite, consequently it must progress by innovation. When it ceases for instance of obtaining the "Stanza" at St. John lateran in Rome, it gains a weight and importance that it was conceived by the same Raphael who painted the "Stanza." In architecture there is perhaps more fixedness, for here the domain of invention is circumscribed by the unity of a design. The style of a church can only be two hundred years, and it is marked by a right line in a certain manner that he succeeds in creating a "chef-d'oeuvre," but if he happens to achieve an original thing with such facility and grace that his contemporaries believe that it is necessary to accept with much reticence the scholastic traditions which attribute certain elements of architecture to one style rather than to another. It is agreed, for instance, that the pointed arch is "Gothic" in itself to the Gothic style, and there has been much discussion in times past to determine whether it was the Gothic or the Arabs who invented it. Now, it is enough to know the principal data of Cyclepeon or Pelasgian structure to be convinced that the pointed arch was an architectural form to which architecture would be inevitably conducted with or without the Gods or the Arabs, and that with the full-centred vault it was called to constitute one of the most productive elements of church architecture. The gallery of Tians, for instance, was formed by two bands upon which are supported two rows of stones disposed as a triangle, and in like manner the Cordonata, the Saracen staircase with its triangular opening upon which rests the weight of the edifice. Now when the triangular form was discovered, the reign of the pointed arch was inevitable, and these were made, as we see, long before the first Christian church was built for the Gothic style.

To the question which the pedants make so much noise, I will remark once for all that the Greeks, who have remained our masters in the art of constructing fine museums and magnificent edifices, from the Athenaeum at Tegtemus, restored by Scopas, the portal was of the Ionic order, and in the cella a Corinthian was superimposed upon a Doric order. In the temple at Bassae in Iligalina a column of the Corinthian order was put on top of a Doric one. In the interior of the nais was supported on each side by five Ionic columns. The Phillipion at Olympia was decorated inside with Ionian columns but it was outside with Ionic columns. The pediments of the temples containing the treasures at Olympia were half Ionic and half Doric. At the beginning of the fourth century before Christ, the three orders of architecture were introduced in the temple of Athena at Tegtemus, restored by Scopas, as already stated. Finally, in the Propyla of Athens the Doric and Ionic orders alternated, as we see at the temple of Athena Aipetos and the Erechtheum. Finally in this same acropolis, which is still the greatest and most perfect architectural work which human genius has yet produced, we see on the face of the Erechtheum which looks toward the Parthenon a superb specimen of the Ionic order superimposed upon their heads for capital the moulded cushions which enhance the entablature. We place these instances of promiscuousness before those of our Chinese, and these last applications of the grandeur which art can achieve by unity and purity of style.

This is wandering some distance from the churches at Verona. It is time we retraced our steps.

The Measurement. — The American Architect has this: "Why is our hour divided into sixty minutes, each minute into sixty seconds, etc? Simply and solely because in Babylon there existed, by the side of the decimal system of notation, another system, the sexagssimal, which counted by sixties. Why that number should have been chosen is enough, and it is no marvel that it was the ancient Babylonian merchants. There is no number which has so many divisors as sixty. The Babylonians divided the sun's daily journey into twelve hours, the hour was subdivided into sixty minutes. A parasang is about a German mile, and Babylonian astronomers compared the progress made by the sun during a day's hour, at the time of the year when the sun was at good walking during the same time, both accomplishing one parasang. The whole course of the sun during the fourteen equinoctial hours was divided into twenty-four parasanges. The ancient system was handed on to the Greeks, and Hipparchus, the great Greek philosopher, who lived about 150 B.C., introduced the Babylonian hour into his astronomic calculations. Fehrenly, the ancient Greeks, who still live in that of the Ptolomeus system of astronomy, gave still wider currency to the Babylonian way of reckoning, and the quiet system of traditional knowledge through the Middle Ages, and, strange to say, it sailed down safely over the Navigar of the French Revolution. For the French philosophers, measures, coins and dates, and subjecting all to the decimal system of reckoning, were induced by some unexplained motive to respect our hour's watches, and this idea has remained ever since. What is, Babylonian — each hour consisting of sixty minutes. Here we see the wonderful coherence of the world, and how we call knowledge the result of an unbroken tradition, of a teaching descending from father to son."
T

They rush through every nook and corner, over rock and under sea, blindly feeling, falling and crawling after some never-to-be-forgotten loved one. The pathos exhibited by some of these beings is not softened by their surrounding sea, but meets one with a breath so loud, so full of sound, and checks cast in everlasting agony. Not all the pains of Hades can quench this angelic sentiment.

(2) Those phantoms who have become accustomed to the place, of these, some are continually affected by their surroundings, while others faintly and persistently grope around in the attempt to re-efect their lives on earth. Here and there is seen an isolated spirit, like a wisp of smoke, frozen in the point of a firmament, and peeing down, with the most important curiosity, into the whirling circles below her. Another, a robust figure of a man, throws up his arms around his body, as if to hold himself from bursting with indignation at the awful sights which meet his protesting eyes. A third, raises his head and hands upwards in cursing reproof of the punishment of faults for which those committed them were not responsible.

In some retired spot a majestic shadow stands in quiet contemplation of a flock of delightful little male figures, who flit about and come and go, like so many fairies, as careless of their surroundings as though they were with a breath, and a breath would go. The grave old being that sits with his legs well apart and rests his hands on his knees, represents a man turning into a tree. On the door his back is towards the observer, and while going through this peacefully transforming process, he contentedly views the agitated panorama that stretches out in an endless vista before him. Near by, a hideous female monster has caught, within the slimy meshes of her serpent arms and legs, a gay and handsome youth, who, in his reaction, presses to her breasts with an evidently mutual satisfaction.

The predominant emotion expressed on the door is that of love, in all of its unnumbered degrees, phases and characteristics, and by every kind and degree of humanity, both high and low. Some of its expressions find here their appropriate environment, while others evidence, in their every breath, that love is there is Heaven. If sweet submission and helplessness had any effect in softening punishment, the very rocks themselves would melt in pity and forgiveness before the appealing forms of the female spirits with which the sculptor has blossomed his inform. Perhaps he means to suggest that Heaven and Hell are individual rather than collective localities, and that no place, however dreary, is unhallowed by the presence of woman's highest claim to mercy.

The sculpture of the plaister of the door is in low relief, and treated with extraordinary reach of line. As pieces of color they are almost beyond praise. The one on the right of the door represents souls in limbs, and is composed of figures of all ages and sexes who have sinned in ignorance. The sculptor chose to treat this preliminary re-efect in order that he might introduce infants and children, and thus give greater variety of form and interest to the art-effect. And here are scenes of the most touching dramatic interest. Half a dozen mothers pressing their longest infants to their enamelled and milkless breasts; children, in sweetest innocence, calling in vain for some affectionate recognition from the now insensible, but once loving arms of their parents, and aged souls gazing from the earth and heaven in tender and comforting embrace some young and saddened spirit.

The other plaister illustrates the circle of love, and has for its principal subject the group of "Paolo and Francesca," as it is usually described. It is placed at the top, with the back of the lover towards the observer, thus emphasizing, like a crowning capital, this saddest of all heart tragedies.

Auguste Rodin. Sculptor.

Figure from the Door. Auguste Rodin, Sculptor.

The moulded exterior sides of the frame of the door, running back from the plaisters to its surface-line, are also decorated with figures, "Flowers of Evil," in low, high and full relief. All arranged with surprising grace and masterly sense of decoration.

He who is a great admirer of Gothic architecture and sculpture, and it has often been affirmed, because of his piercing way of seeing and reproducing Nature, that we was an ancient Gothic artist come to life again; or if a Themistocles in spirit set back by the modern art to take possession over the sacred structures set up by them on their journey through this sublunary sphere. Certain it is that the delicate and cunning way in which the figures have been placed on the sides of the door gives a little weight to this interpretation of another world.

This, with, as with all the finer Gothic decoration, there is an inseparable connection between it and its background.

A high-relief group of "Mother and Child" occupies a small panel above one plaister, while its corresponding panel is filled by two young female forms embracing each other. The illustrations of a few of the sketches of groups and figures of the door can give but an impression of what he was able to render a masterful sculptor. It is a trite in composition that they are impossible to render except by outline. In fact they are not subjects for illustration on paper, but are combinations of forms only to be fully seen in their proper places.

If the variety of individual action and general movement on the entire structure is endless, so is the world of emotion expressed inexpressible. Each and every individual soul in the male and female groups, expressive of the passions they represent are vibrating and individual. To attempt to give any satisfactory idea of it would be like trying to delineate the inner life of him who has the sublime audacity to cut in twain the very regions, and reveal to mortal eyes the denizens thereof in living fact and form.

The writer knows of nothing in art that can compare with the door. It is for pilgrims.

Of the character of the design, in comparison with that of Giuberti, it must be said that it is more original and more varied. Over all the figures, conscious or unconscious, there is spread a veil of mystery, a sense of waiting from the event not yet arrived, though no less than those suggested by the poems of Baudelaire, between whom and Dante there is, the judgment of Rodin, much community of spirit. Between the two he ran riot with the creative sources that flowed in upon him, and from the end of the Tyrrhenian Sea went out a great multitude. One idea inspired by the French poet is represented in the figure of "Sorrow," a young girl pressed down by a weight upon her shoulders, as difficult to reproduce by any process, as the Syren group. Nor does any single view tell the whole story, for each profile gives a new and unexpected grace. This supple little creature, not more than eighteen inches high, is regarded by the sculptor and his friends as one of his very best compositions, and many copies of it have been made for the latter in both marble and bronze. Its commercial success was cut short at the beginning, for the first duplicate was ordered by a German dealer, who, when the plaster arrived, was completely decided that he did not like it. The sculptor in due time sent him a better plaster illustrates the thought contained in two verses of Baudelaire's poem, "The Death of the Artists," which reads as follows:

"There are those who have never known their idol; Those who have lived by the hand and mouth, The old woman, That forever beats her breast and forehead. They have one hope, strange and dark Eading: That Death, hovering above them, so here Will blossom the flowers of their souls!"

The group is composed of two figures, the poet, standing mournfully, with his left hand pressed against his forehead, while an unseen female form, full of the sweetest sympathy, appears at his back and extends her arms almost around, without touching him. Always near though never known.

Of Rodin's Busts, Statues and Sketches.

The appreciation of the bronze mask of "The Broken Nose," given in a previous article, resume pretty fully all that need be said concerning it. It is an inevitable reminder of early antique sculpture, and long as it is beautiful it is doubtless if ever it will pass down to us since that period that so closely resembles it. Possibly a trifle dry, it is yet carried to an extreme of a great kind of modelling. It is nurse and mother, as such, has always been the case, and that it should be made by a youth of twenty-two! The little plaster bust of the priest Aymar, is also dry, though thoroughly studied as a form, and the nature of the subject preserved with inflexible gravity.

These two pieces are all that the sculptor possesses of the first twenty-one years of the study of his art.

The Age of the "Buses" would be written without doing injustice to its merits, and the time will come when such carving tasks will be more often pleasurably performed than now. We may this unlegended bronze tempt the curiosity of the beholder to find out its meaning, and inspire the giver of names to search his mythological catalogue. For nomenclature is uncertain as the ridle of Omar Khayyam, and as reticent as a Hindu idol.

Of Rodin's larger figures not one is so pure a work of art and

1 All rights reserved. Continued from page 228, No. 496.
sculpture. Pure, because it is the strongest and most spontaneous expression of his nature, burdened with neither name nor outward purpose, merely the immediate expression of its own necessity.

Due to the urgency of a sentiment so complete that it formed itself, the aching hand of the sculptor, into a sphinx, so splendidly does his secret lie.

It was the sculptor's full statues seen by the writer, and it seemed to him the most living piece of sculpture, except the Greek, that he had ever seen. And he feels that there is no other way but to set it up as a symbol of the civilization in 1880, and note the ever increasing pleasure the sense of elegance and fineness by which the noble Belgian soldier has been made immortal. Immortal, not only in the conventional idea of a negative expression, but also as the symbol of the workings of a poetic and mystical soul.

In conception "The St. John" is as complete as its purpose is evident. It seems an embodiment of the forerunners of all centuries, and of the authority of a much higher order, and it is to the visible audience, and creates its own atmosphere. The primitive propriety of its type, rude and ungainly, is a twin brother to its faithful reproduction. And it finishes, until a greater than Rodin shall come, the whole race of harlequins. It is greater than "The St John" of Donatello, because it needs no accessory to indicate its identity. He that runs may read.

Of the type selected by Rodin to represent St John there has been some criticism, because it was adhered to be physically lower than that of Donatello. This criticism suggest some very important idea of the mature sculptor, and the essential propriety of different ways of reproducing them, and above all, upon what Rodin's style of sculpture is founded, and requires more space than can be given to these articles.

To Rodin is the sculptor himself concealed in the figure of a young warrior wakening from the half-sleep of unknown strength, in "The St. John" he is fully manifest as the mature sculptor, and the visible author of a style, which is Rodin's.

But from a true point of view the latter has little to do with any biblical purpose as the former with an historical period. Both are, purely and simply, pieces of sculpture.

DUAL represents a class, the legend of which is, "He faced sorrow and walked in loneliness." A bust, sent into posterity with a grip and fibre as determined as that of a conventional architect who preaches by his own life the abnegation of every human joy.

Of no bust that Rodin has made would there be such curiosity to know what he could get out of it, as that of Rohefert. A cold and insensitive man, a" cavalryman par excellence", pushed out of oblivion by some resurrecting power, bearing upon his venerable form the dust and mold of forgotten ages.

Legros, a fiery sensibility harassed by antagonistic surroundings, the lineaments preserved in saving metal by an almost painful sympathy.

Hugo is an old god put together with the eagerness of a Titan, and fits to mark an epoch.

Dalous represents a class, the legend of which is, "He faced sorrow and walked in loneliness." A bust, sent into posterity with a grip and fibre as determined as that of a conventional architect who preaches by his own life the abnegation of every human joy.

Rochefort.

He is, practically, a member of the unrecorded generations of the sculptor, who practised as a profession, and the art of sculpture as a passion, with few exceptions, as the best piece of sculpture there, and in nearly half of them, its author was referred to as the greatest sculptor of his time.

Of great artists who have never been recorded in the works of the Renaissance, such youthful lines or an equal swatieness of contours. Those half-closed eyelids, the sweetly raised head, the young woman by Rodin seems to wake from some dream, some mysterious vision.

The admirable modelling of the gown of fur that oppresses it. Strange creature! one would say that the girl escaping from her marble covering like a flower from its verdant envelope, as fresh, as pure, as virgin. It is the masterpiece of Rodin, and perhaps the masterpiece of the Salon of XXV.

This bust was the first work purchased by the State, at the Salon, for the Luxembourg gallery, for the sum of eight hundred dollars. Exquisitely charming as it is, the sculptor does not regard it as a fully satisfactory reproduction of his model, because he bears too much the impress of the character of the Superior marble cutter that he is.

Rodin understands that a marble workman excels in his trade does he unconsciously give his work his own interpretation of the model which he copies. And this, in spite of the most exacting means of mechanical measurement and skill in reproducing the line of the figure, this is the way by which a sculptor distinguishes himself. Rodin understands that what he wants is not the engraving of the fine details of the model in marble, but only that he can inscribe the exact reproduction of his model in marble is to do the work himself. But this is beyond his strength, because a sculptor cannot do a work of art for the prices he receives. To escape this unfortunate condition of things, Rodin, like all good sculptors, prefers bronze reproductions of his models, and by the wax process. In this way his work is not changed by any intermediate hand in its transformation from one material to another. The color of bronze is also a matter to which the sculptor gives the most taste attention. When possible, he casts his models in bronze.

The unfinished condition of the bases of the Laurens and Morla busts, have been the subject of considerable critical comment, though one or two writers have suggested that none know, so well as Rodin, will ever be completed. He is the first and last sculptor his individual way, for the bases of his subjects. All is in harmony.

Another characteristic of the sculptor, is that of often stopping while a figure is not quite complete, and of regarding the fundamental object he was seeking, and leaving the head, hands, and feet unfinished. And he gets so much life in to this movement that the most fastidious art-lovers are glad to possess such unfinished heads, and always see to avail in retreating, in this way, the facts of primitive sculpture.

Physiognomical details are also often neglected by him, the pose of the head telling the whole story. He seeks the great germinal principles first, illustrating the old saying that the slightest touch of a master produces art.
A BILL TO BE ENACTED AN ACT TO REGULATE THE PRACTICE OF ARCHITECTURE.

SECTION 1. If enacted by the Legislature of the State of Texas: That hereafter no person shall pursue the business or profession of architecture in this State unless in accordance with the rules and regulations hereinafter prescribed.

SECTION 2. Within thirty days after this act takes effect, it shall be the duty of the Board of Architects to prescribe for the professional, the rules and regulations to which all architects shall conform. The Board shall have power to suspend or revoke the license of any person guilty of misconduct, whether as an architect or in any other capacity, for a term not exceeding one year. No license shall be revoked unless the person in whose favor it shall have been granted has been found guilty of such misconduct before the Board, and the certificate shall be forthwith cancelled, or the license shall be revoked upon the recommendation of the Board.

SECTION 3. Said Board shall be the "Board of Architects of the State of Texas", and shall have a record of all their proceedings and each record shall be in the office of the Secretary of the Board. Said Board shall be the legal custodian of all the records of such Board. Said Board shall receive no compensation for their services, nor shall the expenses of said Board be paid upon the public funds. Said Board shall not issue any certificate of registration until such time as they shall be satisfied that the applicant for such certificate meets the qualifications prescribed in this act. The fees for the examination of applicants for licenses shall be as prescribed by the Board, and no person shall be admitted to practice architecture within the State of Texas by any person not previously licensed.

SECTION 4. Within thirty days after their appointment, the members of said Board shall meet at the Capitol and organize by the election of one of their number as presiding officer, and the secretary and board, and the seal of the Board shall be adopted. The Board shall have power to administer oaths, and to take any other act or thing which shall be necessary or proper to carry into effect any provision of law relative to the practice of architecture. The Board shall also have power to make such rules and regulations as shall be necessary to carry into effect the provisions of this act.

SECTION 5. All persons proposing to practice the profession of architecture in this State shall be licensed, and no person shall be licensed without a certificate of registration issued by the Board. The certificate shall be in the form prescribed by the Board, and shall entitle the holder thereof to practice the profession of architecture in this State. Said certificate shall be valid for a term of two years, and shall expire at the end of each such term. The Board shall have power to suspend or revoke the certificate of registration of any person guilty of misconduct, whether as an architect or in any other capacity, for a term not exceeding one year. No certificate shall be revoked unless the person in whose favor it shall have been granted has been found guilty of such misconduct before the Board, and the certificate shall be forthwith cancelled, or the certificate shall be revoked upon the recommendation of the Board.

SECTION 6. All licenses shall be subject to revocation by the Board of Architects, for any reason, including, but not limited to, the following: 1. If any person shall practice the profession or purport to be an architect without a license from the Board of Architects. Any person desiring to receive such occupation shall apply to said Board for a license, and, after the Board, at some regular or special meeting, shall proceed to examine the applicant as to his qualifications, and with special regard to the education and experience of such applicant, and the Board shall then give a certificate of such knowledge in the ordinary professional work of the architect. Such certificate is satisfactory to the Board of Architects, who shall issue a license to the applicant, under the seal of the Board, authorizing him to practice the profession of architecture within the State of Texas. Said Act of Architects shall be entitled to license without examination.

SECTION 7. Any person may pursue the business or occupation of an architect in this State, but first obtaining a license therefor, in accordance with the provisions of the act, shall be deemed to be the lawful holder of the same; and such license shall be at all times valid and in force, and the Board of Architects shall have power to suspend or revoke the same, at any time, by reason of any violation of the provisions of this act, and any person desiring to compete for any special building, public or private, and who may be vested in the State in person for the time being, or in any person or corporation, may be required to produce such license.

SECTION 8. The fee for each license shall be ten dollars, which shall be paid to the State Board of Architects upon application for the same, or the license may be required to be paid by the Board for the payment of their travelling or other expenses. The license shall be subject to suspension or revocation at any time, for any cause, the Board of Architects, in their discretion, may see fit. No person shall be licensed as an architect without a certificate of registration issued by the Board. Said certificate shall be valid for a term of two years, and shall expire at the end of each such term. The Board shall have power to suspend or revoke the certificate of registration of any person guilty of misconduct, whether as an architect or in any other capacity, for a term not exceeding one year. No certificate shall be revoked unless the person in whose favor it shall have been granted has been found guilty of such misconduct before the Board, and the certificate shall be forthwith cancelled, or the certificate shall be revoked upon the recommendation of the Board.

THE IOWA SOLDIERS' MONUMENT.

New York, May 8, 1899.

To the Editors of the American Architect:—

Dear Sirs:—Would you kindly inform me if it has yet been decided which of the Iowa Soldiers' Monuments deserves the prize. If it has been made, I shall be glad to have information of the successful design.

Respectfully,

FREDERICK H. STEWART.

[We refer this query to our readers.—Eds. American Architect.]

Paper for Building.—In 1864 a hot-headed French inventor offered to contract for churches and cathedrals, including a peal of bells, the "Thermonut" to be built of paper. From chimes to cannons was but one step, and the Gallic inventor announced his readiness to supply a train of artillery of any given caliber, made of the same material. Building-paper, myrtilus, a perfect boom just now, and proving a fine material in the hands of architects and builders for several uses, inside and out. The advantage, briefly stated, are: Continuity of support, and adaptability for making into rolls of almost any width and length, and flexibility: or by gluing several layers together it may be made stiff, and will stop the passage of air because of the absence of joints. Unlike wood, it has no grain, and will not split. It is unaffected by change of temperature, and has an advantage over conventional roofing materials. In the fourth place, though in its natural condition it absorbs moisture, it can be rendered waterproof by saturating with asphalt or by other similar methods. Finally, as a non-porous body, it is well fitted to prevent the passage of sound. Finally, it is a proof of heat, and can also be made of combustible material like asbestos, or resistant to fire by chemical treatment.

Domestic Electric Heating.—One of the electrical projects in the air at present is the possibility of placing a network of electric wires throughout the country, making it possible to heat dwelling-houses electrically, without the use of any very hot substance. It is claimed that wall-paper can be made in such a way that the passage of current through it will cause it to moderately warm to the touch, and thus diffuse throughout the room an agreeable temperature. This is, of course, theoretically possible and may even become practical at some future period, but it would be a source of warmth coming from the entire surface of a room would be perfectly useless in hot weather, and would do much to make this so-called temperate zone of blizzards and temperature changes impossible.

Why may not the artificial illumination of the future be the same nature? Recent developments are tending towards the possibility of infinite subdivision. The charm of a room illuminated by a hundred candles is one never to be forgotten, though it is one which few of us are ever likely to see much of. The ultimate use of the glow-lamp for domestic purposes will be to diminish its size and increase its number.
INDIA—RUBBER PAVEMENT. — "I notice in the columns of several financial daily journals," said a correspondent of the Iowa State Register, "that for paving streets India-rubber threats to enter into competition with asphalt. This new pavement is said to be made by the Goethe brothers, who have a factory in Hanover. He used it first in the summer of 1887 for paving the Goethe bridge, which has a surface of 10,784 square feet. The new pavement is said to last five times as long as the asphalt, costing 17,000 rupees for the entire 10,784 square feet. The city of Hamburg is said to be experimenting with the ordinary carriage-way was paved with it last summer. The Berlin corporation, being favorably impressed with the new pavement, has laid a little over a quarter of a million rupees. It is seen that this is the necessity of a noiseless pavement to be used in the vicinity of courthouses, churches, schools and libraries, where the car-rolling over the noisy street is an imperceptible nuisance."

SODA LOCOMOTIVES. — Four locomotives to be run by soda, which takes in exchange the place of the steam engine, have been built in New York. They are for service on the streets of Minneapolis, Minn., where steam engines are forbidden. The engine is about sixteen feet long, entirely boxed-in, with no visible smoke-stack or pipes, as there is no exhaust or refuse. The boiler is of copper, eighty-four and one-half inches in diameter and fifteen feet long, having tubes running through it as in steam boilers. Inside the boiler will be placed five tons of soda, which, upon being dampened by a jet of steam, produces an intense heat. In about six hours the soda is thoroughly saturated, when the action begins. A stream of superheated steam from a stationary boiler is then forced through the soda, which drives out the moisture, and the soda is ready for use again. The exhaust steam from the cylinders is used to saturate the soda, and by this means all refuse is used. These engines are the first of their kind that have been built in this country.

The Death Roll of the Fourth Bridge. — A writer in the Pall Mall Gazette says that, including five drowning cases, the fatal accidents from all causes in connection with the Fourth Bridge amount to 53. As a result of actual contact, or of being thrown into the water, there have been 44 lives lost, death taking place either at the time of the accident or soon after. The total number of accidents which had occurred prior to September, 1888 — mostly in the four years previous — was 543, of which the greater part, of course, were of a non-fatal character, and the number of "slight" injuries, 106 cases, 81 were treated in hospital, and 459 at the homes of the injured persons. The following hairbreadth escapes are recorded: One man took a leap into the water on the west bank of the river below the Fifth, simply grasping a rope. His hands got muddled with cold, his grasp relaxed, he fell backwards down, and down, into the water; and he only saved himself in another instance, a spaniel fell over 200 feet, knocked off a man's cap and fell on the wooden stage at his feet, and went clear through a four-inch plank. In another case somewhat similar to this, a young man, a court rescuer, fell into the river, and lost the sight of his clothes from his waistcoat to his ankle, and left him uninjured. One of the most thrilling incidents I heard of was that in which the "display boat" was wrecked on the south side of the river before the steamers were able to bring it ashore. The owner of the boat paid the expenses of the glass, silver, and china which were broken. But the damage to the vessel exceeded $500, and was actually a complete wreck.

The strongest feature in the business situation to-day is the springing up of a great number of little industries. At no time in the history of the country has there been so many new concerns started up. A broad foundation is being laid for an immense business. Building activity was never greater. Lumber dealers and architects say that more material is going into building now than ever before. And further, the iron and steel industries will be built in new localities. Capitalists interested in Southern railroad construction, who have been very careful all along to not buy more material than they thought necessary, are now being compelled to buy more, but within the last four or five months than was done during the past twelve. The little manufacturers employ less hand labor than they were employed to do. The belief has been very general that the big manufacturers would be needed, but within the last five or six months the necessity has been very apparent in many lines. The boot and shoe makers have been very prudent this year, and have not been making larger stocks preparatory to a active fall trade. The paper-makers are finding it difficult, owing to a little apprehension of a break in prices soon to be to satisfy the output of the factories. Lumber dealers and others in the timber trade are hoarding their trade journals. They are better feeling among western manufacturers and their customers nowadays, and are making preparations for a heavier production. The prices in general have gone up, and production, if it has not reached its rock-bottom basis, is not far from that position. And the larger manufacturers are anticipating a recurrence of the active demand which has so often taken place after a fall break-down. The country is not at all overstocked either with crude material or finished goods.
The exterior of this house is stained with

CABOT'S CREOSOTE STAIN

for Shingles, Fences, Clapboards Etc

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply:

Our Stains contain no water and are the only exterior Stains that do not contain kerosene:

PRICES are 40, 60 and 78 cents per Gallon

According to Color.

SEND for Samples on Wood, and Circulars.

SAMUEL. CABOT,

70 Kilby St., Boston, Mass.
BEING IN REPLY TO REQUESTS FOR SPECIMENS OF MANUFACTURED WORK,

COMPANY, MANUFACTURERS OF

The Westinghouse, PA. U.S.A.

WESTINGHOUSE
ENGINES

Selling Department in the United States.

New York, 47 Cortlandt St. Pittsburgh, Westinghouse Building.
Boston, 150 Washington St. Chicago, 156 Lake St.
St. Louis, 321 Baltimore Ave. Kansas City, 1201 Seventeenth St.

Over 300 Sold the First Year.

All the above built strictly to Gauge with interchangeable Parts.

Send for Illustrated Catalogue.

CHEAP QUICK LIFTING PORTABLE HOIST.

Hereafter, Hoists have been either too cumbersome and bulky, or costly to erect. The lowest in price, the Lightest, and the most easily removed.

FRAKE E. PITT.
74 and 76 Pearl St., Boston.

THE BEST PREPARATION FOR HOUSEKEEPING IS A WIRE GAUZE DOOR.

MADE IN 19 SIZES FOR STEAM.
MADE IN 15 SIZES FOR WATER.

PLAIN, 100 TO 2000 LBS.

FLORIDA HEATING APPARATUS.
BURNS HARD OR SOFT COAL, COKE & GAS.
CONVEY DURABILITY AND ECONOMY.

PRIVATE RESIDENCES.
HOTELS.
STORES.
SCHOOLS.
CHURCHES.
CLUB HOUSES.

MADE IN 19 SIZES FOR STEAM.
MADE IN 15 SIZES FOR WATER.

SMITH VENTILATOR-FANS, ESPECIALLY ADAPTED FOR FIREPROOFING.

Send for Illustrated Catalogue.

HUYETT & SMITH MFG. CO., DENTAL MFG.

SMITH ASBESTOS FLOORING FELT.

Manufactured by THE ASBESTOS PACKING CO.,

MINERS AND MANUFACTURERS,
166 CENTRAL ST., BOSTON, MASS.
PAINTS.
Architects have an interest in all developments which directly or indirectly affect them. Working with them to a definite end are the manufacturers and artisans, who prepare and use the materials employed in erecting buildings, all tending toward a higher state of perfection, and all giving tangible and eloquent expression to their motives, talent and activity in the structures which they erect. Is this unity of interest between the architect, the manufacturer, and the artisan fully recognized? Is this essential co-working intelligently carried out? Do the manufacturers and the artisan catch the spirit of the architect, comprehend his drawings and specifications, so that his thought finds clear, tangible expression? Does the architect know the best the various manufacturers can offer for his use? Does he keep abreast of developments and improvements, so that his specifications call for the best articles? Can he be sure of satisfactory results in the carrying out of his designs unless he has entire command of his resources, and can select the best materials?

In the manufacture of paints, for instance, there have been developments which place within reach of architects an article superior to what has been, until recent years, almost uniformly specified for the painting of buildings. This article is a prepared paint. It is undeniable that there have been good reasons for adhering to the old rule for paint specifications. Many worthless mixtures have borne the name of paints, and architects who have taken the trouble to investigate the validity of the claims made for these mixtures have been convinced that the paints were worthless; or, if of any value, that there was no assurance that the standard of quality, if there was one, would be maintained for any length of time. The use of such paints has been found expensive, because of their poor covering qualities, and still more because they would perish soon after being applied.

Is it just, however, to judge prepared paints of all kinds by an unfortunate experience with a few? Is it consistent with an architect's interests to stick closely to an old custom from a firm belief that it is safe when there are other ways doubly better for him exposure to which it would be subjected; with a definite knowledge that it must be a preservative; with a clear conception of its service as a decorative element. With these objects in view, was it possible to use any but the best materials, the most efficient facilities, the highest order of talent, in its production? Is it possible that, with such good objects to attain at the commencement, and a phenomenally successful experience of nearly twenty years, during which time this product has constantly tended toward a higher quality, there could be any reason for the architect to maintain an attitude of indifference?
feet in all points of its adaptation to architectural uses, this paint is unworthy of the architect's favorable consideration? Would it be policy for a company of honorable gentlemen, who have spent the most fruitful years of their lives in producing, perfecting and marketing standard goods, who have made their products famous for excellence all over the continent, to sully their fair reputation by letting the quality decline? It would not. Such men have all the emulation for progress and perfection in their business that architects have in their profession. A good "prepared paint" is a decidedly important article for architects to seriously consider, and to include in their specifications. The Sherwin-Williams' Paint has advantages which will commend it to them. A profession like that of architecture, which, more than any other, must be studious and progressive to meet the increasingly exacting demands upon it, cannot afford to ignore the claims of reliable manufacturers.

THE SHERWIN-WILLIAMS CO., CLEVELAND, CHICAGO, NEW YORK.

A SPIRAL STAIRWAY.

A FIRE-ESCAPE WHICH WILL RENDER THE MOST DANGEROUS BUILDING SAFE.

We call our readers attention to the illustration of the Marshall Patent Spiral Stairway Fire-Escape.

The great trouble with most fire-escapes, as experience with their use at fires has shown, is that they themselves are elements of danger, especially where large numbers are trying to get away from the flames.

The Marshall Spiral Stairway and Stand-Pipe Fire-Escape is made entirely of iron, and is so constructed as to afford an easy and safe means of escape to the old and young even in a panic. The balconies connecting with the stairway are large and substantial, are furnished with an iron railing, adding to the beauty of the building instead of disfiguring it. The stand-pipe device around which the stairway runs, is a feature worthy of attention of hotel proprietors and others interested in schools, factories and public buildings and in fact wherever large numbers of either infants or adults are collected under one roof. The centre column is made of heavy wrought-iron pipe and has at each balcony and on the roof of the building hose valves, and steam fire-engines can be attached to base of stand-pipe. This feature is one which very materially assists firemen in handling the flames, and thus saves property as well as preserves lives. The frequent delays in hoisting fire-ladders is by this contrivance done away with. No mechanical operations of any kind are required, and the escape and stand-pipe are always ready for use, thus providing a means of reaching the fire as well as escaping from it.

Marshall Brothers of Pittsburgh, Pa., have placed these escapes on many of the large buildings in the country and are prepared to furnish plans and estimates for this class of work.

They are also manufacturers of the celebrated Marshall Positive Safety Hydraulic Steam and Hand Power Elevators for Passenger and Freight service.

The Marshall Fire-Escapes, Pittsburgh, Penn.

For full particulars in relation to both Fire-Escapes and Elevators, address MARSHALL BROTHERS, Iron City Elevator Works, 69 to 76 DIAMOND STREET, PITTSBURGH, PA.

HOUSE-LINING

The hollow wall and empty floor-space are necessary features in frame-buildings, and whether it is advisable to seal them tight with inflammable sheathing-paper, in order to obtain insulated air, or to gain it by filling-up the spaces with a low conductor of heat, depends largely on the practical working of what is considered an air-space, and again on the value of the material forming the lining.

Ten years ago steam-pipes and boilers were systematically covered with mineral-wool, which was designed to leave an inch or so of room for the quiescent air, but since the introduction of mineral wool the fallacy of this method has been so thoroughly exposed that the device is now limited to jobs not open to competition. The air on surface of pipe, of course, conveys the heat immediately to the interior of casing, and the temperatures of all these surfaces are manifestly nearly the same; again, when cracks occur in the casing, cold-air enters to replace the hot-air, thus creating a rapid circulation, which cools down the jacket from within and deceives the owner, for he is wasting fuel and does not know it.

The action of the hollow-wall space is similar to this, and quite as deceptive. The reason we make special mention of the theory is because it is widely accepted as true, and its working is so delusive that it requires explanation rather than trial.

Wherever the idea of the air-space is resorted to, whether on a boiler or in the side-wall of a dwelling, it simply introduces the properties of convection and absorption as factors, and these might better be eliminated by filling the space up.

The advantages of mineral-wool for houses will become apparent as we refer to the objects of such linings:

A. As to heat and cold.

— A filling of mineral-wool in the ground-floor, say two inches thick, protects against the dampness of cellar; in the outside walls, from foundation to peak, between the studding, it will prevent the exhaustion of the warmth of interior, and will destroy the force of winds, which otherwise will penetrate and cause draughts; in the roof, say two inches thick, it will retain the heat which rises through stair-wells, bringing about regularity of temperature in cold weather; the upper rooms will not receive the heat of the summer sun and store it up for the occupants during the night, but remain as cool as those on the floor below; the water-jackets in bath-rooms, closets and pantries will not be exposed to extremes of heat and cold.

B. As to sound. — As sound is communicated by the actual contact of beams, and also by the vibration of the air between them, it can well be understood how a porous material like mineral-wool will have a muffling influence on the solid parts of a building, and so occupy the space that wave motion will not be possible. Such a lining is especially desirable
about bath-rooms to deaden noise of valves and flowing water.

C. As to rats, mice, insects and disease germs.—The analysis of mineral wool shows it to be a silicate of magnesia, lime, alumina, potash and soda. The slag-wool contains also some sulphur compounds. It is plain there is nothing organic in the material to decay or to furnish food and comfort to insects and vermin; on the other hand, the fine fibres of glass are irritating to anything which attempts to burrow in them. From our experience during the past ten years, we feel confident in saying that new houses lined with mineral wool will not become infested with animal life, and old walls may be rid of their tenants by the introduction of it.

D. As to fire.—Our incombustible material renders a building slow-burning; we do not claim that the structure will be fireproof, for that is impossible so long as inflammable stuff is used in construction. In passages occupied by the mineral-wool, flames cannot spread; thus only will the flames be exposed, and an opportunity for quenching them be offered at the outset. As an escape for the inmates, it serves the purpose better than all the ladders ever devised.

What is described as spontaneous combustion takes place when the floor-beams, for instance, have been dried until the point of ignition is very low, and when in conjunction with this, the freely-circulating air is charged with moisture. With these two conditions fulfilled, it only needs the fanning action of a draught to start combustion. Such a coincidence of conditions cannot be brought about if the spaces between beams are filled with indestructible mineral wool.

Mineral-wool is invaluable in hospitals and asylums on account of its arresting the spread of fire, not to mention its other properties. Equally important applications can be made with it in public and private schools, music and concert rooms, soundings-boards, hotels, cottages, country residences, charitable institutions, and in deadening the flats of apartment-houses, and insulating the outside walls of conservatories, hen and pigeon houses.

FRANK E. FITTS,
Successor to Geo. Dunbar & Co.,
74-76 Pearl Street, Boston, Mass.

THE CALDWELL SASH-BALANCE.

The Caldwell Sash-Balance is a simple, durable and compact appliance for balancing window-sashes. It consists of a thoroughly-tested steel clock-springs, coiled within an iron drum, around which is wound a tempered brass tape or ribbon, which is attached to the bronze loop, held in place by a screw, which should be slightly loosened and the loop unhooked whenever it may be necessary to remove the sash from the frame; and, in replacing the sash, the tightening of the same screw over the loop will secure the window as before.

The mullion, or top-balance, can be applied at the top of the frame in all windows where it may be impracticable to use the side-balance. The balances are put up in boxes, each box containing one set of four balances for the two sashes of single window, with all the necessary screws, each sash requiring two balances. Full printed directions for setting and adjusting the balances are contained in each box.

When ordering balances, be careful to give the exact weight and height of each sash.

THE CALDWELL MANUFACTURING CO.,
28-29 State Street, Rochester, N.Y.

LESLIE RICH
The Caldwell Sash-Balance.

A BIG CONTRACT.

The Whittier Machine Company have just signed the contracts for furnishing the complete elevator system, together with the boilers and the entire heating and ventilating apparatus, for the new Exchange Building about to be erected on State Street, Boston. The aggregate work represented by these and other important contracts which they have recently taken, is very large. They are about to have plans drawn for a building specially adapted to the construction of elevators, which,

MINERAL WOOL.

THE BEST THING FOR
House Lining or Pipe Covering


FRANK E. FITTS, 74 and 76 Pearl St., BOSTON.

Bardley's Patent Wood Door Knobs.

The engraving represents No. 161 Ball Knob, a style which is meeting with great favor, as it shows up the grain of the wood strikingly, and makes a handsome appearance on a door. Besides the regular woods which we carry in stock, we make them to match special trims in such woods as Antique Oak, Red Oak, Hemlock, Hazel, Birch, Bird's-eye Maple, etc. These goods are first class in every respect, the trims are solid bronze; and every knob is warranted.

BARDLEY'S PATENT CHECKING SPRING HINGES FOR DOUBLE ACTING DOORS.

They operate absolutely without noise or violence, closing the door gently and stopping it at once in its proper position.

Descriptive Price List on application.

J. BARDLEY,
59 Elm Street, New York.

A. G. NEWMAN, late NEWMAN & CAPRON.

MANUFACTURERS OF

Fine Bronze Hardware, Bank, Office and Stoop Railings in Bronze or Brass, Antique Furniture, Trimmings, Electrical and Mechanical Bell-Hanging, Burglar-Alarms, Warehouses, 1180 BROAD ST.

THE YALE & TOWNE MFG. CO., New York, Boston, Philadelphia & Chicago.
with tools expressly designed to meet the requirements of the work, will greatly increase the capacity of their works.

They have recently put into the Brigham Estate building on the corner of Portland and Causeway Streets, Boston, two horizontal steel boilers, each four feet in diameter, together with two belt freight elevators, and also constructed for the Ficataguis Falls Pulp and Paper Company of Montague, Me., a horizontal steel boiler, five feet in diameter; and have put into the building of the Boston Real Estate Trust on Lincoln Street, Boston, two belt elevators for freight service.

ROCHESTER SASH-BALANCE.

The following cut and the one on the next page represent the Rochester Sash-Balance which will prove of great value to those interested in the construction of buildings.

It consists of a hollow pulley containing a coiled steel spring, and a braided sash-cord for suspending the sash. This cord is fastened to, and winds on the pulley passing over the small wheels, as shown in sectional view. These wheels are located in such a manner that the heft of the sash, being fastened to the cord, automatically regulates the tension or lifting power of the balance. This is a great advantage over weights as the sash is always accurately balanced, even though they differ in weight.

The cord runs smoothly over the grooved wheels and at no place can it rub against the balance, there is consequently no abrasion of the cord or friction to wear it out, but in case it becomes broken by accident it can be readily replaced at any hardware store, and with very little trouble.

The advantages of the Rochester Balance are numerous. No boxes or pockets are required in the window frame, more light can be obtained in factories, etc., as the walls can be built solid against a plank frame and the room that would be required for box frames could be added to the width of the sash.

The mortise for this balance is made with a bit, and it is attached very quietly to either old or new work, and it is very little trouble in handling. It is the cheapest means for hanging window-sashes.

The Rochester Balance is meeting with great success and the company requests all architects to send for a free sample to the

ROCHESTER SASH-BALANCE CO.,

151 PARKER STREET, ROCHESTER, N. Y.

NOTES.

The Lidgerwood Manufacturing Company, New York, find a steadily increasing demand for their improved hoisting-machinery throughout the South. They have recently appointed as their Birmingham, Ala., representatives, Messrs. Milner & Kettig. They are an enterprising firm, and will doubtless meet with much success in handling this well-known line of hoisting machinery.

The interior of the new building erected by the Murphy Yarnish Company, of Newark, from the plans of J. H. Lindsay, architect, has just been completed by finishing the decoration and placing the stained-glass. This work has been executed by Messrs. J. &

WESTINGHOUSE ENGINES

Selling Department in the United States.

New York, 71 Cortlandt St. Westinghouse.

Boston, Raceway Building, Church, & Ferry.

Pittsburgh, 219 Smith St., Garfield.

Chicago, 131 S. LaSalle St., Pullman & Co.


St. Louis, 450, 464 Washington Ave., Pullman & Co.

Kane City, 313 Union Avenue, Pullman & Co.

Denver, 1237 Seventeenth St.

Omaha, 1081 Capitol Avenue, R. L. Lyon.


Salt Lake City, 515 E. Main St. Thos. & William.

Butte, Mont., 511 State St. Huchinson Co.

San Francisco, 233 Market Street, Atkins & Co.

Portland, Or., 120 S. Front St. Parks & Lacey Co.

Charlotte, N. C., 21 College St. J. W. & D. Co.

Atlanta, Ga., 45 E. Park St. The R. & M. Co.

Dallas, Tex., 1312 Main St. Jordan & Co.

Chattanooga, Tenn., 10 E. Main St. W. & J. Co.

ESTABLISHED 1858.

MARSHALL BROTHERS,

Iron City Elevator Works

69 TO 75 DIAMOND ST., PITTSBURGH, PA.

The Marshall Positive Safety Passenger and Freight ELEVATORS,

Hydraulic, Steam, Electric and Hand-Power.

SPIRAL STAIRWAY FIRE ESCAPES, WITH AND WITHOUT STAND-PIPE,

For Offices, Hotels, Schools and Public Buildings.

SEND FOR CIRCULAR.

TO ARCHITECTS AND CONTRACTORS:

We desire to call your attention to the Superior quality of Plate Glass manufactured by the

PITTSBURGH PLATE GLASS CO.

The Largest Plates of Glass in buildings in the cities of Chicago, Cleveland, Detroit, St. Paul, Syracuse, Pittsburgh, Philadelphia, Baltimore, and many New York buildings, were manufactured by our Company.

The only fuel used throughout both our works is Natural Gas; which, owing to its superior heating power and cleanliness, enables us to produce an article which cannot be surpassed, besides glass melted and annealed by our process with this gas, is far more durable and not so liable to break.

We make a specialty of three-sixteenths thickness for fine residences, also extra large sizes, wide and long plates for store fronts, beveled and obscurd plates, skylight and floor glass.

With a capacity of 300,000 square feet monthly, we are prepared to execute all orders promptly, and invite correspondence.

WORKS No. 1, CREIGHTON, PA.

WORKS No. 2, TARENTUM, PA.

Western Union Wire and Telephone connection in General Office at Creighton, Pa.

E. L. FORD, Sec.
CURNEY HOTT WATER HEATER.

More extensively used and with better results than any other Hot Water Heater. Consistently demonstrating that horizontal heating surface is infinitely more effective than vertical surface.

Gold Medal Boston, 1887.
Highest Award New York, 1887.
Highest Award Toronto, 1887.

SPECIAL SILVER MEDAL FOR EXTRA-ORDINARY MERIT, NEW YORK, 1888.

For Full Particulars, See Catalogue Gratu.

GURNEY HOT WATER HEATER CO.
227 Franklin St., Boston, Mass.
New York Office, 88 John St.

San Francisco, J. J. Lawton, 457 Fulton Street.
Petersburg, T. R. White, 136 Carol Street, West.
Philadelphia, O. W. Milford & Co., 134 Third St.

MINISTER THIS PAPER.

One Fire Generates both Warm Air & Steam

In the Economy

Steam and Warm Air Heater,
Utilizing the entire product of Combustion in producing Heat. A perfection for warming Churches, Schools, Residences.

SEND FOR CATALOGUE.

J. F. PEASE FURNACE CO., SYRACUSE, N. Y., and
75 Union Street, Boston, Mass.
NEW YORK, CHICAGO, TORONTO.

Steam and Warm Air Combined. Sole Mfr's of the Economy Warm Air Furnaces.

BEST AND CHEAPEST

Means for Hanging Window Sash.
The Rochester Sash Balance

Works better than weights.

Hef of the Sash automatically Regulates the lifting power

Sample sent free to all Architects on application.

ROCHESTER SASH BALANCE CO.
Cor. Frank and Centre Streets, Rochester, N. Y.

IMPROVED IRON

CELLAR WINDOW FRAME AND SASH.
13 Sizes. Secure and Durable. Send for Price List.

THE MCLAGON FOUNDRY CO., NEW HAVEN, CONN.

HIGHEST AWARD, AMERICAN INSTITUTE FAIR, DEC. 5th, 1885-6-7-8.

THE FORSTNER AUGER BIT.

Hewing SMOOTH, ROUND, OVAL or SQUARE holes for hanging in door locks, etc. Without boring. 

For sizes, weights, and patterns, see.

Send 30 cents for a set or $1.00 for a set, sent free, with descriptive list, on receipt of price.

THE BRIDGEPORT GUN IMPLEMENT CO., New York Office, 171 Maiden Lane.
Detroit Heating & Lighting Co's

HOT WATER HEATER (BOLTON'S PATENT)

For Heating Public and Private Buildings by Hot Water Circulation.

THE COMBINATION GAS MACHINE

For Lighting all kinds of Buildings and for Furnishing Fuel Gas for Manufacturing Purposes.

IDEAL GAS STOVES.

WEBER STRAIGHT WAY VALVES.

Detroit Heating & Lighting Co.


Prescott’s Door-Hanger.

BRACE HANGERS.

For Barns, Warehouses, Freight Stations, etc.

BRACE HANGERS, concealed from view, for PARLOR DOORS.

No Rolls or Track. Hangers for Elevator Doors a Specialty. Send for Circular.

PRESSEY HARDWARE MANUFACTURING CO.

108-110 Randolph St., Chicago, III.

The Caldwell Sash Balance.

is compact, simple and Durable. It is easily applied and is superior to all other methods for Balancing Window Sash. Adapted to old or new windows, does not require box frames and does not get out of order. The Caldwell Balance for Mullion Windows is the best yet invented.

N. B.—In ordering sample set give exact weight and height of each sash. Send for catalogue to

Caldwell Mfg. Co.,

928-290 State Street,

ROCHESTER, N. Y.

COLORIFIC.

A deep and permanent Red for coloring mortar. The only reliable coloring on the market.

BUREKA SHEATHING - LATH

The Best Article in the Market.

Saves Mortar, Labor and Money.

Combined Sheathing and Lathing is now well known and is meeting with great favor, both from architects and the public. Manufacturing Rights for sale.


Historical, Theoretical and Practical, Illustrated with about five hundred engravings on wood. New edition (the sixth) revised, portraits rewritten.

Frank E. Fitts, 74 and 76 Pearl St., Boston.
DYCKERHOFF
PORTLAND CEMENT

Is superior to any other Portland Cement made. It is very finely ground, always uniform and reliable, and of such extraordinary strength that it will permit the addition of 25 per cent more sand, etc., than other well-known brands, and produce the most durable work. It is therefore the most economical to use. 8,000 barrels have been used in the foundations of the Statue of Liberty. Architects and those interested in Portland Cement will please send for my pamphlet, which will be mailed free on application. It contains valuable directions for the employment of Portland Cement, a table of results of the strength of the Dyckerhoff Cement when mixed with sand and broken stone in various proportions, together with tests and testimonials of eminent Engineers, Architects and Consumers.

E. THIELE, 78 William St., New York.
SOLE AGENT FOR THE UNITED STATES.

The KODAK
ANYBODY can use the Kodak. The operation of making a picture consists simply of pressing a button. One hundred instantaneous pictures are made without re-loading. No dark room or chemicals are necessary. A division of labor is offered, whereby all the work of finishing the pictures is done at the factory, where the camera can be sent to be re-loaded. The operator need not learn anything about photography. He can "press the button," — we do the rest. Send for copy of Kodak Primer, with sample photograph.
The Eastman Dry Plate and Film Co.,
ROCHESTER, N. Y.

THE BOWER SEWER-GAS TRAP.
A positive valve-seal and a sound water-seal. The most effective trap that is offered to the public! A combined valve and water-seal! With or without the valve it is the easiest water-seal! Easy to replace! Simple in construction! Cheap! Durable! The most perfect barrier against sewer gas.
Illustrative and descriptive de-page pamphlets sent free on application.
B. P. BOWER & CO., Manufacturers.
Cleveland, Ohio.

FINE POLISHED BRASS THUMB-LATCH.

No. 665. Fine Polished Brass Thumb-Latch.
MANUFACTURED BY
J. B. SHANNON & SONS,
1020 Market Street,
PHILADELPHIA.

WRITE FOR ILLUSTRATED CATALOGUE.

BURDITT & WILLIAMS,
ESTABLISHED 1860.
Manufacturers and Dealers in
FINE HARDWARE
FOR
Dwelling-Houses, Churches, Stores and Public Buildings.
Every Excellence of Mechanism. Latest and most approved Styles and Finish.
20 DOCK SQUARE, BOSTON. BRANCH OFFICES: 1300 BROADWAY, NEW YORK.
1416 F ST., WASHINGTON, D. C.
Our Hardware may be found in important buildings in the leading cities of the Country.

"WARNER'S"
Electric Time System
For Public Buildings.
THE ONLY RELIABLE SYSTEM IN USE.
All public buildings and Schools should be supplied with Electric Time Dials. This system is now in use by the New York, New Haven & Hartford Railroad Co. and many others.

SEND FOR CATALOGUE.
The Stand, Elec. Time Co.
NEW HAVEN, CONN.

ELECTRIC TIME DIAL.
TELESCOPE

Hydraulic Elevator.

Recent improvements have been made and patented in the Telescope Elevator which render it the Most Practical, Economical and Cheapest Elevator yet devised.

Constructed without the use of Cables, Ropes, Pulleys, Counter balances, or Safety catches.

NOT POSSIBLE TO FALL.

FRANK E. FITTS,
74 and 76 Pearl St., Boston.

THE BROOKLYN BRIDGE RESTS ON NORTON'S CEMENT.

(The Towers of the
NEW YORK and BROOKLYN BRIDGE,
Brooklyn, August 9, 1883.)

Mr. F. O. NORTON,

Dear Sir:

During the construction of the New York and Brooklyn Bridge upwards of 200,000 barrels of your cement were used. The concrete with which the caissons were filled was made with your cement, and the entire weight of the towers rests upon it.

Your Cement has always had the preference at the same price of other cements offered for, and during part of the time in important parts of the work it was selected, even at a higher price, on account of its percolation, its superior durability, especially in the points of uniformity of quality and hardness.

Without hesitation I can recommend your cement to those desiring a good and reliable article.

Very truly yours,

C. C. MARTIN,
Chief Engineer and superintendent.

F. O. NORTON,
99 Broadway,

NEW YORK.

Something New for the Stable.

Read's Patent Harness Bracket.

An Article long wanted but never before made. Holde the whole harness, taken no more room than the ordinary look or peg, can be used for both single and double harness. Clefts the harness become a neat appearance, as it carries the harness up uniformly in both with the saddle, besides keeping the bridge and breastplate to their proper shape. They are readily paped, with a gill, and never percolates. Available now in use in over 100 first class private stables in and around Boston.

Each bracket lettered "J. J. Read, Boston, Mass." For sale by dealer's Fitters.

Informed and approved by the following named gentlemen, all of whom have them in use:


The public are cautioned against all similar brackets not marked with my name, as such brackets are infringements upon patents held by me.

Also end-top-riding-saddle Bracket. Price $3.00 each. And whip-rack for English coach and straight whip combined. Price $6.00 each.

JAMES J. READ, 12 Tremont Row, Room 10.

SOUTHWARK FOUNDRY AND MACHINE COMPANY,

PHILADELPHIA, PA.

BOILERS.

TANKS.

STEAM HAMMERS.

HEAVY CASTINGS.

HEALTH AND REVERSING ENGINES.

CENTRIFUGAL PUMPS.

STEAM PUMPS.

SOLWS MAKERS OF

PORTER-ALLEN AUTOMATIC ENGINE.

HIGH ECONOMY.

DURABILITY.

CLOSE REGULATION.


A great improvement over all other blinds, slide up and down in the window like iris, more readily, and stay where placed. No hinges hence no swinging, sagging and tangles with curtains and window drapery. Must be seen to be appreciated. Each any other sliding blind in the market for economy, durability, style, beauty, convenience, etc. Also the most perfect arrangement for a front or rear fender, consisting of an additional section which slides same as the blind; very much admired by all.

They are also made to slide entirely down to the floor, into pockets, out of sight, without any additional expense, 25 per cent. cheaper than the hinged blind, and will last double the length of time.

No more slumbering; tens of thousands now in use. Architects are specifying them. They always give satisfaction.

The only blind that is furnished with an Automatic Burglar-Proof Lock, free of charge.

Agents wanted everywhere. Send for illustrated catalogue and prices to

HARTMAN & DURSTINE,
No. 72 Lawll Street, Wooster, Ohio.

WITHW & HILLOCK, (Toronto, Ont.), M'trs for the Dominion of Canada.

Wigger's Patent Sash Lifters.

A SIMPLE CONTRIVANCE DESIGNED TO FACILITATE THE RAISING AND LOWERING OF ONE-LIGHT SASHES.

A strip of concave-convex metal, with projecting knobs, sitting over the bead on the sash.

Rapidly applied to either new or old work. Furnished in different styles—brass, nickel-plated, white, japanned, etc.—to correspond with painting or other metal trimmings.

Architects, Builders, Carpenters and Painters will be furnished with Circulars by the Hardware trade.

BRAINERD & CO.,
Manufacturers' Agents,
97 CHAMBERS STREET, NEW YORK.

ATLANTIC WHITE-LEAD & LINSEED-OIL CO.,
MANUFACTURERS OF

"ATLANTIC"

PURE WHITE LEAD,

— AND —

Pure Linseed-Oil, Raw Refined and Baled.

FREY'S NEW BRICK TILr MACHINE WITH Self-Loading Trucks

From to 20 inches in Diameter. Made of Cast Iron. Complete Machines with or without Crushers. 6 different Brick Machines.

Address THE FREY-SHEELER COMPANY, BUCRIS, O.

ESTEBROOK’S STEEL PENS

FOR SALE BY ALL STATIONERS.

THE ESTEBROOK STEEL PEN CO.
90 John Street, New York, N. Y.

PEERLESS COLORS FOR MORGAR.

BLACK, RED, BROWN, BUFF, BRIGHTEST AND MOST DURABLE COLORS MANUFACTURED.

Send for Circulars.

Modellers and Manufacturers of Architectural Ornaments
From Original and Special Designs (Catalogue).

JUNE 1, 1889.

Entered at the Post-Office at Boston as second-class matter.

SUMMARY—

Broken Volumes of the American Architect for 1882, 3 and 4—The Result of the Ballot for the new American Institute of Architects.—Exhibition of the New York Cathedral Plans impossible.—A Charge of Suppressing Information.—Swiss and Italian School Buildings.—An Exhibition of Industrial Art at Philadelphia, Pa.—Architects' Schedule of Charges.

MALAISE.—II. 233

ROMANTICISM IN ART. 257

ILLUSTRATIONS:


SPANISH SKETCHES. 238

ARCHITECTURAL REVIEW. 290

COMMUNICATIONS:

Pointing for Concord Granite.—Hemlock and Rams. 203

NOTES AND CLIPPING. 204

TRADE SURVEYS. 204

W hat a common foible it is of humanity—architectural humanity of the American species—to suspect enmity and malice at every turn! This peculiar form of introspective sensitiveness has long been understood to be a peculiarity of artists, but architects who undertake to handle every-day matters in this work-a-day world ought, one would suppose, to have enough common-sense in their make-up to be able to realize that ninety-nine per cent of the inhabitants of the world are wholly indifferent to the success or failure of their fellows, and that the number who delight in malicious acts at the expense of others is infinitesimal indeed. The latest instance of this supersensitiveness with which we have been confronted is the charge brought against us by the "friends" of Mr. W. Kent, who maintain that, in giving the names of the successful competitors in the New York Cathedral competition, we "suppressed" the fact that he was associated with Messrs. Heins & La Farge in the preparation of their design. As the friends of General William S. Smith, who, it is said, were the associate in this undertaking, have not brought a like indictment against us, we infer that engineers, being of less artistic temperament, have friends of sufficient savoir-vivre to know that it is not necessary to charge malicious "suppression" in order to effect a desired correction of an "improper" action, as Mr. Kent and General Smith desire to say that at the time our statement was made we were wholly ignorant of their connection with the competition.

H ere Carl Hinträger, of Vienna, is an architect who has chosen to make a specialty of the design and construction of school-houses, and, in pursuance of this resolution, has made, what architects who have school-houses to deal with do not always consider their business. This year arrangements will be made for the annual competition by the Inland Architect, being against consolidation. The date of the first Convention of the New Institute has not been fixed and will not be for some time yet, but the profession is to be congratulated on the unanimity with which the reorganized National Association begins its new career. May it have a long and happy life!

S ome of the New York papers are talking about the decision of the Trustees of the new cathedral, in regard to the competitive designs, as if they found some sort of public grievance in it. The Times, for example, thinks it very strange that the designs of comparatively unknown men should have been selected, to the exclusion of those made by architects of long experience and well-earned fame, and thinks that if a public exhibition of the drawings had been made before the decision, the Trustees would have been assisted in coming to a more correct conclusion. We are quite sure that no architect has been concerned in any of these complaints, and hope that the profession will use all the influence it possesses in repudiating them, and in upholding the decision of the Trustees as having been made with the most conscientious care, and under the best and most impartial expert advice that this country could furnish, and as being final and binding upon all persons who think that courtesy and honor are the first consideration in such matters. The Times has perhaps a shadow of reason for thinking that a public exhibition of the designs might have conduced to a correct decision, the judgment of a large number of people, exercised upon objects which have become familiar by repeated inspection, being generally good, but in the case of the cathedral, as we understand, the Trustees wished to have such an exhibition, but were prevented by the refusal of a majority of the competitors to allow their drawings to be shown in public before the decision, so that the blame for this, if there is to be any blame, should fall upon the competitors, and not upon the Trustees, who have the best that they could, and all that any one could do, to secure for their great church the best design that the architects of the present day can furnish.
which is placed in the most healthful location that can be had—never in an abandoned graveyard, as in a case we once heard of in Massachusetts, and is arranged with particular reference to securing the best effects of air and sunshine that it is possible to obtain. There is just now a discussion whether an aspect due south or southeast is most favorable to the health of the children who are to occupy the school-rooms, but some sort of southerly aspect is secured in nearly all school-houses. In plan, the structure is divided like our own modern school-buildings, into class-rooms, arranged to accommodate not more than fifty at each, and approached by a brightly lighted corridor, often sixteen feet or more in width, which affords facilities for the orderly movement of the children and from their places, at the same time that it furnishes them with a play-room for stormy weather.

It would take too long to mention the other interesting peculiarities of the Swiss schools, which Herr Hintringer describes in his book, but we ought not to omit a reference to the gymnasia, which are in nearly all school-houses, in accordance with the Federal Law, which was passed in 1878, and requires that all Swiss boys shall have regular training in gymnastics during the last six years of their school life. In most cases, the gymnasia, or turn-halls, are airy buildings immediately connected with the school-houses, and well supplied with apparatus, so they may be, at certain hours, utilized also for social and private parties. In all the compulsory addition of a gymnasium to the other accommodations, the modern Italian school-houses closely resemble those of Switzerland. It is hardly necessary to explain to any one who has the smallest notion of what has been going on since 1860, that the art of the German writers, that produced nothing but hand-organ grinders, while the rest of Europe was trying to civilize itself, has long ceased to exist, and the Italian of to-day, in its efforts for popular education, presses closely on the heels of Switzerland, the foremost of European nations. Herr Hintringer, in an able essay of the average amount of money devoted by the Italian cities every year to the erection of schools, quotes the official statistics for 1881, which show that in that year Turin, a town of two hundred and fifteen thousand inhabitants, spent three hundred and seventy-five thousand dollars in new school-houses; Genoa, with a population of nearly all school-houses, spent two hundred thousand in the same way, and Naples, which we commonly picture to ourselves as being inhabited almost exclusively by lazzaroni and brigands, expended four hundred thousand. As architects will easily conceive, the new Italian school-buildings are of the most substantial class, and in Switzerland, where the limited space is made up with ample windows, occupies most of one side of the structure, and gives access to the class-rooms, which occupy the other, and are limited to a capacity of fifty scholars each. The class-rooms face directly south, and a spacious cloak-room often intervenes between the scholars and the corridors. The main entrance is on the side with ample windows, occupies most of one side of the structure, and gives access to the class-rooms, which occupy the other, and are limited to a capacity of fifty scholars each. The class-rooms face directly south, and a spacious cloak-room often intervenes between the scholars and the corridors. The main entrance is on the side

SOME time ago, a firm of architects wrote to the Engineering and Building Record for comment upon two forms of schedules of charges, which they had proposed to use in their practice on contracts for buildings under the two. The first schedule contains rates of commission for buildings of different cost, at about one-half more than the common charges, with the explanation that for these prices the architects will keep, at their own expense, a clerk-of-works company to work in the same way as the two. The second schedule, which is more like that in common use among officers, the fee is set at various sums for buildings costing less than seventy-five hundred dollars, seven hundred and fifty dollars for buildings costing from eighty thousand to a hundred and fifty dollars, and five per cent for those costing more than fifteen thousand dollars, the employment of a clerk-of-works being strongly advised in all cases, and the stipulation being made that, where one is not employed, the architects will not be responsible for any defects in workmanship which might have been avoided by such supervision as it is the province of a clerk-of-works to give. To both the schedules the usual clauses are added, providing for the rate of charge for monumental and furniture work, for selection of stuffs and furniture, for partial service, ownership of drawings, and so on, besides some novel, but ingenious, provisions for very wide limitations on the architect's responsibilities, and provisions requirements both as to the accommodation desired and the amount to be expended, the architects will not undertake to conform to both of them, but will agree to conform to whichever one the owner may select, and to comply with the other as nearly as circumstances will admit; and further, that if the owner specifies a certain limit of cost before the working-drawings are prepared, and at the same time insists upon items of accommodation, structure and finish which, in the opinion of the architects, will cause the cost to exceed the limit specified, the usual commission shall be paid for the plans, even though they may be destroyed, when the estimates are received, on account of the excessive cost. As it was supposed that was asked upon these schedules, we will not intrude it; but the publication in the Record has hardly elicited the discussion that the subject deserves, and we would like to do what we can to revive the matter, and we may, at least, express our satisfactions with the way in which the question have been drawn up. If architects generally would be as prudent and business-like in making terms before they began their work, they would be much better pleased with their clients when they got through, and their clients with them. The question of whether the architect shall under any circumstances provide a clerk-of-works at his own expense is only complicated by the consideration that the owner may be more likely to allow the building to linger along, to the great detriment of the architect, if it is the latter who pays the clerk-of-works; but there is something to be said on both sides, and we trust the whole matter may be thoroughly discussed, and some united action taken, at the first convention of that vigorous Young Institute which is to do so much for us all, whenever its somewhat protracted incubation shall be completed.
H CAREFUL study of the subject of malaria has been made by Dr. Nicholas,3 the Health Officer of the Panama Canal Company. He says that the atmosphere over marshes is much more pleasantly charged with bacteria and with fermentative and putrefactive influences than that over healthy land. He quotes from Monrou, who says:  

"The explanation is to be found almost solely in the configuration of the marsh and the change of its level at intervals sufficiently long for the ground uncovered by the water to become dry ground which, dry at the surface, is damp underneath, and that these zones occupy a surface of considerable extent. The minute organisms of the marsh over whose surface water may by reason of the configuration of the ground be carried by a sheet of water. This sheet of water is a preservative screen. All who have studied the progress of paludism understand this. The same is true of the veins that in the body vary in diameter and pass from different degrees of insalubrity. Some of the minute organisms find in this humidity a cause of adhesion sufficient to resist atmospheric movement and to remain attached to their natural medium. But let their dryness, let the abscission which has taken place, let the uniform coating become separated by heat, let these animals, momentarily transformed into minute pellets, lose all the hours in the heat, and all of these minute growths will be lifted by the least movement of the atmosphere, which may thus maintain them in suspension. To appreciate the quantity that may enter the respiratory organs it is necessary to calculate how much of water is exposed to diffusion. If all of one of these marshes is covered more than 100 litres of air, and that, notwithstanding, each drop of liquid contained some of these organisms, and if some among them are the minute types that emanate from a soil that is rapidly reduce by the action of air, the air the products of incomplete decomposition which have accumulated in the earth and which are exposed by the excavation (Cheveruel). This is the condition of the Roman Campagna."  

Nicholas adduces the opinion of Leon Colin that the ground here considered is not properly a marsh, and that the influence producing a miasm is rather telluric than paludal; that it is not the effect of the putrefaction of organic matters, but of an influence due to the soil itself. Dr. Nicholas thinks that:  

"These considerations relative to the 'dangerous zone' of swamps explain why the Embassy's well is indispensable to the production of fevers, but it would break out in a country where there is marshy ground. In a marsh, the inhabitants, it has been observed that marshes are formed by the vegetation of the course of a single season under a mantle of growing forest all trace of the most recent work, and even when there is no marshy ground on the surface, the earth is spongy, and the encampment as well. And thither they go, the virgin lands of hot countries need only a stroke of the spade to develop pernicious waters. The Olive is not affected by malaria may be produced there, it is always necessary that the water should have entered the ground (feconde le stephe), whether on the banks of the Sava, the Gobi, or in the fertile valley of the Euphrates or on the banks of the fluctuating White and Blue Nile. It often suffices that the course of a torrent, of a river, or of a small brook should be arrested when the banks are low, in order that malarial mortality should be again vated as a consequence of imbibation; and it is thus that we have seen an increase in malarial death on the course of the Missouri and its tributaries, in the Kansas and Nebraska, at least when we are considering the effect of excavations, to know that the number of germs, of whatever sort, decrease on virgin soils with the depth of the cut, and that the casualties will be much fewer on the river beds. According to Frankel, the number of microbes at a depth of 1.25 times less than at the surface. According to Maggiora, the number is much less in air which has been in the marsh for many years; it has been found by Maggiora the number to be inversely to the geologic age of the earth, to accumulate, and to increase by force of time, and to increase with the richness of manuring and the hardening of cultivation.  

Refusing to follow these erring geographers, and especially sanitarians, that neither humus nor water, nor the drainage in a marshy soil, is absolutely necessary to the evolution of malaria. In localities subject to paludal influence, these germs find in fog the humid medium that is necessary to them, and the fog does not require for its formation the presence of a marsh in the air, the exhalations of the most of the of San Angeles, and the continuous layers of air, whatever may be the cause of the coagulation of one or the warming of the other, subject to the condition that the air is free from the moisture that would cause the condensation. If so, it reverts to the mobile atmosphere, and no marsh can produce the fog. Thus the fog is not a cause, but a means for the collection of the moisture that is necessary for the generation of malaria, and prevents the diffusion of dangerous germs that are the cause of the prevalence of the disease."  

Dr. Nicholas writes:  

"...It is true that in the analysis of a salubrious air, these microbes may have been seen to develop, after a certain time, in the water by which the air has been washed, or in water of condensation. This has always required a considerable time, and in the atmosphere of marshes, I have met them in a full state of development."  

To Dr. Nicholas adds:  

"Drainage is another means which diminishes, and in certain formations of soil, entirely destroys malarial generation. In the case of marshes, this generation can be arrested or prevented by free drainage.  

"A case of the creation of malarious conditions by an obstruction of natural drainage was fully set forth in 1882 in a trial held before the Superior Court at Pittsfield, Mass., between the town of Lenox and the paper company. The Superior Court of Smith Patent and Company, the plaintiff in error. The paper company had raised its dam and flooded a large tract of bog and bottom that had previously been dry. In dry seasons, when the flow of the river was insufficient for its uses, the company was free to drain the water, thereby expelling the enormous numbers of malaria-bearing insects of the water, and the action of the sun and air. The flooding had the further effect of

1 Continued from page 267, No. 700, 1889.
prevent the adequate drainage of lands lying adjacent to the extended water surface, and converted these into swamps. This was accompanied by a serious outbreak of malarial fever previously unknown, which led to the death of many. Further, the use of billboards in bringing a criminal suit against the company for maintaining a nuisance, requiring for its success the unanimous verdict of a jury of twelve men, each of whom must be convinced beyond a reasonable doubt that the company was at the time engaged in违法行为 caused by a condition clearly resulting from the raising of the dam.

Dr. Adams' paper 1 concerning this case, after summing up the testimony on both sides, continues:

"The closing argument for the defense was made by Judge Soule. He directed attention to the difference of opinion among the medical and sanitary experts as to the causes of malaria, which rendered it impossible, he contended, to determine the sickness with accuracy. Liberal allowance was made to the defendants' dam. He quoted from the testimony of nearly all the experts that the malarial poison is introduced from without, and that the pockets of standing water in the vicinity, converted a healthy valley into a foul marsh, where malaria found its natural breeding place. The sufferings, loss and general deterioration of the patients from constantly recurring attacks of fever and ague, were well depicted. The remarkable changes of opinion on the part of certain experts for the defense were not overlooked.

Also of importance is the reservoir and movement of the depth and fluctuations of the water, testified to on behalf of the defendants, were made during the present year, when the supply of water to the area was not produced, that the pockets were dry, the water clean, and the locality a healthy one. The raising of the water-level, caused by raising the dam, made the same water to stand in pockets, and produce in the pockets of water to stand in pockets, and produce in the vicinity a healthy valley into a foul marsh, where malaria found its natural breeding place. The sufferings, loss and general deterioration of the patients from constantly recurring attacks of fever and ague, were well depicted. The remarkable changes of opinion on the part of certain experts for the defense were not overlooked.

"The District Attorney, in closing for the Commonwealth, quoted from the testimony of witnesses to show that before the dam was raised the area was a fertile and highly cultivated region, and that the 'pockets' were dry, the water clean, and the locality a healthy one. The raising of the water-level, caused by raising the dam, made the same water to stand in pockets, and produce in the vicinity a healthy valley into a foul marsh, where malaria found its natural breeding place. The sufferings, loss and general deterioration of the patients from constantly recurring attacks of fever and ague, were well depicted. The remarkable changes of opinion on the part of certain experts for the defense were not overlooked.

Also of importance is the reservoir and movement of the depth and fluctuations of the water, testified to on behalf of the defendants, were made during the present year, when the supply of water to the area was not produced, that the pockets were dry, the water clean, and the locality a healthy one. The raising of the water-level, caused by raising the dam, made the same water to stand in pockets, and produce in the vicinity a healthy valley into a foul marsh, where malaria found its natural breeding place. The sufferings, loss and general deterioration of the patients from constantly recurring attacks of fever and ague, were well depicted. The remarkable changes of opinion on the part of certain experts for the defense were not overlooked.

In his closing remarks the Attorney General contended, among other things, that the dam and Mr. Soule, in his charge to the jury, explained those legal and technical points which were calculated to confuse and perplex, and placed the essential points in the case in their clearest light. He did not attempt to prove, he said, that the defendants are responsible for the disease which the government contended had been proved a public nuisance and a cause of the prevalence of intermittent fever in the vicinity.

"The jury, after being out twelve hours, brought in a verdict of

"Not Guilty."

This was not a verdict justifying the raising of the dam, nor against the probable injury resulting from an obstruction of the natural waters. It refers to its failure to reach certain localities suitable for its development because there were no habitations to serve as stepping-stones for its progress, the idea obviously being that while malarial germs may not be transported for a considerable distance or time, the place where they may be carried is sufficient. Mr. Soule has contracted the disease in one locality to ground elsewhere favorable to its development. This idea is not generally accepted, nor can it now be proved to be true. There is nothing in the history of the disease to indicate the affection by slow stages over long, continuous reaches of country to controvert it. So far as malaria has followed the progress of railroad construction, for example, it may have been caused by the successive development of malarious conditions as the lines work extended. This, however, does not satisfactorily explain such a movement as that along the line of the New Haven Railroad from New York, and up the Connecticut Valley as far as Vermont and Massachusetts. The movement taking place long after the completion of the roads.

All observations as to the development of malaria and as to its elimination, while confirming more or less completely to the theories of a malarial origin, have made it clear that these conditions are not restricted to any single locality, but extend far as nearly the whole area of the United States is concerned, this development is in close relation to undue soil-moisture and to the undue prevalence of fogs or mists resulting therefrom; and that by drying the soil, and thereby greatly reducing or entirely removing mist and fog, we invariably reduce the intensity of malaria or

1. Boston Medical and Surgical Journal, December 29, 1892.

2. I now attach much less importance than I then did to the agency of the person in the spread of malaria.
ROMANTICISM IN ART.

At the Metra, Dowswell's gallery in New Bond Street there was recently shown a representative collection of the pictures of the great French painters who fought the battle of romanticism some fifty or sixty years ago. Called Romanticists rather because they belonged to the movement of 

Romantic poets—Hugo, de Musset, Gauthier and Berrias—than for any particular agreement in the term to their own work, they were, in fact, realists, impressionists and naturalists. The movement was a reaction against convention, a determination to take Nature as guide and paint her truthfully. There is beauty and charm of a high order about it, to my eye, a poetic feeling, in the work of Claude le Lorrain and Gaspar Poussin, but too much democratic to be tasteful; as we all see her from day to day. Watteau, Oudry, Desportes and Chardin had all some academicism in their work, but they were more or less naturalists; but their successors, starting from the same point, the over-Claassic and cold Prud'hon (refined and graceful though some of his works are), the hard and stagey David, and, later on, the stiff, wooden and intensely uninteresting Ingres, followed upon the road of debasement. Do let us keep our feet beneath the dignity of academical eyes.

But a band of innovators appeared, headed by Delacroix, who determined to paint the true instead of the false, whether or not they suffered therefrom. In the whole course of his life, had to concoct a frame with his own hands, being
too poor to buy one; Millet, later on, only just managed to keep himself going; and Diaz, Daubigny, Decamps and Rousseau were very poorly appreciated by their contemporaries. Even Corot was only admired to a small extent by the Liberty boys—Louis Napoleon being accredited with saying that perhaps Corot’s effects were true, “but, for his part, he had never been out early enough in the morning to see Nature enveloped in these silvery mists.” And now what is the fact? Five people are giving thousands for the first and most inferior work of any one of these masters. Grand were they as colorists, poets were they in feeling! but it is heartrending to walk round those galleries and see the mere sketches which are now valued at thousands of pounds, and reflect that, fifty years ago, masterpieces by the same men could be bought for a few hundred francs. The painters have gone into silence; they left the world with broken hearts, and one can only want for a little recognition from a blind and stupid public. Now that it is too late the public admires—and others profit. A picture by Rousseau, which was sold for 250 francs at a provincial exhibition during the paint- ing of the Paris Centennial, fetched in Paris two years ago, 50,000 francs. And so it is all round. A thousand pounds is nothing for a Corot or a Troyon, and £20,000 is spoken of as a possible price for a Corot.

The exhibition at Messrs. Dowdeswell’s included some fine Corots, a dozen or so of the still not-tupily appreciated Daubignys, and some examples by Troyon, Millet, Rousseau, Diaz, Dupre, Daubigny, and Decamps; and, of the Dutch school, several by Hieronymus, the three Maris, Mesdag and Mauro. It is a pity that some of Géricault’s sketches could not have been added, and that Bonnington (who were more than English) could not have been represented, though we have had the opportunity of seeing the latter at the Gros-Venor during the winter.

This collection must be a revelation to the mass of Londoners, for nothing the painters are rarely seen here. Corot, with his silver tones and feathery trees, his nymphs dancing on the green banks of the Seine at Neuilly and Asnières, is pretty familiar to most English people, but the beauty of Daubigny’s grey river scenes (mostly the Seine and Marne), his golden sunset boxes, his placid pools, are only known to those who are old enough to remember them aux Salons d’autrefois. Diaz is almost unknown — his marvellous coloring, his out-of-the-way versatility, being all but unknown in Lancashire and the figure. But Diaz is somewhat of the conventional old master, as compared with Daubigny, Corot and Troyon. What a marvel, too, is the slightness of the work of these. As a holy reprobate, “why don’t you finish it?” But who wants 515 is not a tree of Corot’s the perfection of painting, although the leaves look as if they were blown onto the canvas by a gentle breeze.

Whether Millet is not as much overrated now as he was depreciated during his lifetime is a question. His sentiment is charming, but his drawing is often rude; and, even in the former quality, he does not approach that poet of sadness and poverty, England. One of the interiors in this exhibition might almost be a De Heuvel, while his “Boys Swimming Boats” is an idyl of the sea-shore.

Amongst the Dutchmen, the landscapes of W. and I. Maris are charming in their realism; and, for those persons who can see poetry in pictures of cattle and sheep, there are the works of Mauve and Van Maree.

The collection included two Meissoniers (another of the over-rated artists), time will probably show how, and a Gérôme — a splendid, the Great playing his flute in mud-splashed boots, and surrounded by hounds and other properties in splendid disorder—a picture which must rejoice the hearts of the lovers of “finish” and “detail.” Meissonier is one of the unappreciated masters of our day, but it may be questioned whether the Gérôme will not meet with many more admirers, even now, than the former’s marvellous work.

Messrs. Dowdeswell deserve the thanks of all lovers of French art, bringing together this fine collection, and it is to be hoped that the fallacy that France has never had any first-rate landscapists may at last be exploded.

The proposed of failures, I see that French aqua-rellists will be represented at the International Exhibition, and I hope that English people—critics, as well as the public — will cease to affirm that water-color is not understood in France. To my mind, aquarelle is more beautiful than oil-painting in Holland than in France, pure water-color, not body-color, is the work niggled and stippled up. May any one compare the work of some Dutchmen now on view at the Fine Art Society’s galleries with these. I speak of Bossom, Wessels, bruich, Josselein de Jong, Bastler and Tholen — with that of Paul Naef in the same rooms, and I think he will agree with this statement.

S. BRALE.

STILL WAX FOR BUILDING-PAPER. — Resin, as used in building-paper, being largely composed of a petroleum product called "wax" or "wax-tallow." An important advantage in the use of this petroleum product, in connection with paper and fibrous substances, consists in its non-liability to oxidize, and thus produce spontaneous combustion. Moreover, it is said to toughen with age, instead of growing more brittle, like resin and coal-tar pitch. It is not more com- bustible than the former, showing itself to a dull flame, giving off immense quantities of lampblack of fine quality. It melts rapidly at 200° Fahrenheit, and in that state combines perfectly with resin, asphaltum and warm oil. Its use is, therefore, expected to increase largely. — Manufacturer and Builder.

[Contributors are requested to send with their drawings full and a legature descriptions of the buildings, including a statement of cost.]

HOUSE OF GRANGE SARD, ESQ., ALBANY, N. Y. MR. H. H. RICHARDSON, ARCHITECT.

[Galatina Print, issued only with the Imperial Edition.]

HOUSE FOR E. J. BARNEY, ESQ., DAYTON, O. MR. S. S. HEMAN, ARCHITECT, CHICAGO, ILL.

BUILDING FOR THE BERKELEY CO., BERKELEY, R. L. MESSRS. STONE, CARPENTER & WILLSON, ARCHITECTS, PROVIDENCE, R. I.

SPANISH SKETCHES.

IN THE BASQUE BORDER-LAND.

"Fair land! of chivalry the old domains, Land of the vine and olive, lovely Spain!"

The Cathedral Front, St. Sebastian, Spain.

I f one were obliged to give a reason for every journey, then one might stay at home. But surely, if one need an excuse for going anywhere, it may be found in Spain. Assuming this, let us journey thitherward, following the route of travel through England and France, and across the Pyrenees. Fortunately, the progression of events in times past has coincided with the march of progress in times modern. That is, we may enter Spain by rail and still follow the line of conquest, or re-conquest, that gave Iberrns to the Goths and Hispacia to the Castilians. Should it be preferred, however, to enter Spain with the Africans, who invaded the country in the early years of the eighth century, then we may take steamer, occasionally, for Gibraltar and Malaga; or if we would explore with the Iberianics, then at Cadiz, that city on the coast of Tarshish. The northern entrance is the more probable, especially in the summer months, on account of many things hereinafter to be mentioned. The sea-service, of course, to Liverpool or Havre, is more regular and comfortable than to the ports farther south. Once in Paris, we find several routes open to the tourist, and even reasonable "excursion rates," to every important city of the Iberian peninsula.

We may go by rail to Marseilles, thence by steamer to Toulon or Algiers, skipping the north coast of Africa to Oran, whence to Carthage, Malaga or Tangier (as the ticket may read), returning to Cadiz or Malaga, through Granada, Seville, Cordova, Toledo, Malaga, etc., to Barcelona, Taragona, Valencia, and Southern Spain, to Madrid, etc., or vice versa. Another route, and that I shall now follow, carries one from Paris to and through Bordeaux, Biarritz, and beyond this delightful resort, through a gap in the Pyrenees, to San Sebastian, Burgos and Madrid. I would not seek to deprive the subject of any of its charm of distance, either real or imaginary, nor to rudely tear away the veil of history, romance and poetry, that cast a glamour over its rugged features. But the truth is, Spain is no longer at a distance; it is many years since its capital
SKETCH FOR NEW BAPTIST CHURCH
AT MALDEN, MASS
SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS
was united with the chief centres of Europe, by rail, though the travelling public has hitherto been slow to find it out. Yet, the iron-horse has not invaded the country in the ruthless manner that is its wont elsewhere. He has at no time shown a tendency to play the rôle of locomotist, has destroyed no monuments, has not even soiled the cherished relics with his smoke. The jealous provision, that stipulated for a trans-Pyrenean track of different gauge, also provided that no locomotive should enter the precincts of a city. So it is, that the iron-steads parts at the portals, impotent, and glares at gates he cannot pass beyond. Once beyond the mountain-wall that divides France from Spain, we find a delightful halting-place at San Sebastian, a cologne of vantage whence we may sally out at leisure upon the richer fields of the South. So near the frontier as it is, its superficial character is French, as evidenced in the blocks of build-
ings along the boulevard, the hotels, the French plan, and their servants, with French airs and manners.

But it is an agreeable city, this Basque capital, clean and attrac-
tive, with a wide-awake air wholly its own, a brisk individuality, strikingly at variance with the somnolent habit of the cities beyond. As well at the centre of the Basques, a people who have preserved the language, the customs and traditions of most ancient times. Their province is an unconquered one, left undisturbed by Vandal, Goths and Moors. Hence it is, the Basques are arrogant yet simple, brusque yet courteous, well-grounded in the belief that their country was the first created land, and their language, spoken by Adam in Paradise (Adam of Eden, you know), was brought here by Noah, or Tubal Cain, sole survivor of the confusion of Babel. And do they not believe that Ararat was a peak of the Pyrenees, and their hill-tops were the first to emerge from the wild waste of waters? There is little a true Biscayan will not believe, provided it goes to swell the prestige of his ancestors. Primitive enough, this speech is, and it may have been, as certain

philologists claim, once the universal idiom of Spain. They will re-
peat with glee the statement of the Frenchman, that they cannot even understand each other, and that if they write, for instance, Solomon, they pronounce it Nkbebadijezzar. And finally, did not the arch enemy of man, el Diablo, wrestle with the language for seven years, and then give it up in despair?

Though the streets of San Sebastian are mainly broad and straight, yet there are narrow ones here and there, that wind tortuously up the hill and lead to nooks attractive. Such a one is that in front of the cathedral, which is buttressed by the older build-
ings of the city, and where the façade of the holy structure terminates the vista. Enter the cathedral, and you find it not much different from others grander, and not nearly so distinctive as the little church of Pasagés, a few miles distant. That, certainly, is Basque all its apparatus. Besides the ordinary ecclesiastical furniture, which is scantily supplied, the floor is covered with low chairs or praying-stools, with arm-rest, and with little benches or

A. In the lower town, a street of antiquity, in which many of the houses are of the sixteenth century, with haphazard building,

and brick reconstruction. The windows are of white stone, and the floor, and in front of portraits and images. Their ends sticking up, all over the floor, remind one of the heads of serpents, red and white.

Pasagés, by the way, has a land-locked harbor, reached only by a

narrow inlet, steep hills rise around it, and on their sides and on narrow shelves between them and the water, the town itself is built. It was in 1864 that the Vetérans of the Civil War, veterans of the\n
Spanish War, and three others, called themselves the Defenders of the Revolution, and camped here with sculptured escudos or escutecheons, over their doorways. Ruined and decaying is this old city now, yet the harbor is as good as ever and as beautiful. From this harbor, tradition has it, sailed Lafayette, when he escaped from France, and came to America to offer his sword to our revolutionary ancestors. Journeying back to San Sebastian, we are beset by troops of children, all happy, apparently, and all playing seriously. In a nook under a cliff where a spring gushed forth, a crowd of lavanderas, of washerwomen were assembled, merrily

mauling the clothes entrusted to their care, and entering with spirit into the fun of being photographed. For, my friend-of-a-day and

myself carried cameras, and popped at everything picturesque by the wayside.

The chief attraction of San Sebastian is its beautiful bay, pro-
tected by castle-crowned hills, on the shore of which La Concha, "the shell," the wealthy and fashionable deport themselves the summer through. The Queen-regent, Christina, and the Spanish apol

ogy for a King, Alfonso XIII, even condescend to appear here and wet their royal limbs. The Queen, indeed, is a favorite here, because she is the mother of the King, and because of her own beaming presence. Above the town towers the principal fort, and a winding path leads away to it, with glimpses over of bay and shore, green hills, white villas, harbored vessels, brown nets on white walls drying, and a glorious sweep of ocean out over the Bay of Biscay. The seaside slope is thickly strewn with graves, graves of English and French soldiers, who came here to fight over Spain, like two dogs over a bone, in the early years of this century. For this was

the last stand of the French, here at San Sebastian, before they were driven over the border, by the soldiers of Wellington, in 1813. A thankless task, that of the Iron Duke; though the Spaniards did re-

ward him with an estate in Andalucia, which a degenerate descendant owns to-day. I fancy the English general would have had a different task, had Napoleon's hands not been so full elsewhere, and the best of his soldiers not engaged on other fields. As it was, the Duke played war for several years, with the tag-rag-and-bobtail of Napoleon's armies, throwing up earthworks like little hills all over Portugal and Spain, from which he would emerge at times, chastise a detached fragment of the French army, and then scampor back again to his intrenchments. But his policy won the victory in the end, though the final excesses of the Englishmen, drunk with wine and glory, were tenfold worse than the French occupation. After

the French had gone, even though they ravaged and ravished, Spain's wish sometimes seemed to be that they would return and de-

liver her from her deliverupg. All are gone now; the broken

mounds and the mossy marbles on that hill sloping down to the sea remind us what fools there were in those days, who would spend thousands of lives and millions of treasure fighting for a country neither nation ever retained. The Spaniards, even now, speak of the French invasion and its barbarities with a shrug, but of the English deliverance with a grin. As we were engaged in focusing our cameras upon the tombstones, a herd of goats came up into the field of view, and one of them climbed upon a tomb and stood there, presenting an adornment not contemplated by the artist with satis-

faction. Down the hill, also, came hurrying a soldier from the fort,
with positive orders for us to cease our efforts to secure photographs on that sacred spot. It was not out of regard for the defunct French and Britshers but for the law of Spain, that forbade the sketching of a frontier fortress. It may not be amiss to remark, in this connection, that the Spanish offer little opposition to the photographer. They are the most liberal of people; they have long since ceased to regard strangers with suspicion. Were this an account of the experiences of an amateur photographer, I might relate many adventures, for I consider myself one of the very first to take up photography as a pastime. Indeed, when I undertook to learn the art, that I might secure pictures of scenes not else obtainable, I was severely frowned upon, and the "artist" who acted the part of Instructor charged me a good round sum for his teachings.

That was fifteen years ago, in 1874, and my first essay was in Florida, along the Indian River, and on Lake Okeechobee. It was the "wet process" that was in use at the time, and for a long while after; and wet it was on more than one occasion. I remember now as a nightmare the "dark tent" into which I had to crawl, on my hands and knees, after every exposure, and also to coat the plate, twice for each negative. It was quite small, for convenience sake, and was hot and close, even to suffocation. It was a "wet" process, I said, as applied to the plate and the photographer, for the latter was bathed in perspiration every time he emerged into outer air. One of my experiences is indelibly stamped in memory, and for several weeks was indelibly stamped upon my person, and that was when, one day, in crawling out of my box, I spat the "silver bath" — a two-part solution of nitrate of silver — into my lap. That I survived the terrors of that "dark tent" I attribute to a strong constitution and an overpowering love for adventure.

But to return to the subject of photographing and sketching in Spain, the interruption was the only one that occurred to me. I have carried my camera to churches, cathedrals, fairs and bull-fights, and have experienced no more difficulty than would arise from a good-natured curiosity.

In Cadiz, I even photographed the interior of a church while the people were at prayer, and the sacristan and chaplain aided me at my work! I secured not only the picture I was after (a copy of the last painting of Murillo), but also the people kneeling in front of the altar. I did not consider it sacrilegious at all, for I did not understand the prayers, nor did the people understand what I was doing. It was with some anxiety that I prepared for photographing the bull-fight, for when the people's blood is up they will not allow any obstacle to their enjoyment of the gory scene. But, though greatly bothered by the crowding of the masses, and subject now and then to some good-natured criticism, I experienced no difficulty whatever. As a rule, the crowd at a bull-fight is gay and thoughtless. Even the stolid Britisher cannot irritate them, though his apparent indifference sometimes costs a gleen over the immediate vicinity of his person. But they resent nothing except an abridgment of the pleasures of the ring. They will insist upon the last horse as a sacrifice to toro, and the last, best hero of tauromachy in front of them.

To return to San Sebastian. The soldier who warned us away from the fortress had an air about him that seemed to invite a bribe, and I suggested to my companion that a peseta well placed might secure us all the exposures we desired. But she thought otherwise, and, sooner than expose her to ridicule, I did not place any coin in the Spaniard's itching palm. That it did itch, and that he was disappointed in returning empty-handed, one might see by his dejected air. A short time after, I had curious confirmation of the correctness of my views in Paris. In a collection of views owned by a dealer there I found some fine ones of the very fort we were forbidden to photograph. I asked the dealer how it was he obtained permission, and he said that it cost him but twenty cents. He described the scene in all its details with the gusto of a Frenchman in his skill at finesse: "You see, Monsieur, the soldat be stand by..."
his valiant personal friends. Justly due, as well to the genuine character of the man as to his merits as an artist. Among these writers are Octave Mirbeau, G. d'Arquigny, Edmond Belamy, de Fourcaud, Roger Marx, Andre Michel, and Marcel Fougier.

L'Art was the first paper to defend Rodin against the accusation in regard to "The Age of Brass," in 1877. The principal illustrated paper of the day, champion of the heroes of the Salon, of the counts of Laurens, Hugo, Dalou, and St. John, with accompanying text. His friends and admirers among the painters number such men as Jean Paul Laurens, Puisis de Chavannes, and Claude Monet; and among the critics those of the Academie Francaise, and many others, especially of the younger generation.

The Englishmen who have written about Rodin are W. S. Henley, Charles Robert Ashbee, and many others. In England, and one of the first Englishmen to recognize the true merits of Rodin, and has done more than any other writer to make them known in England.

The first whole of the English writers were disposed to be a little guarded, and patronizing, even advising Rodin how to do better sculpture, and accusing him of being a reminiscence of Michael Angelo. The magazines, which, in comparing the hundreds of articles by writers of both countries, the impression is made that the Englishman is more disposed to argue, compare and reason, while the Frenchman makes it a matter of personal conviction. From this it is not strange that so much of the art is centred in the art of his country.

All in all, no artist of modern times has been so generally discussed by tongue and pen as Rodin, and with reason, for none have brought such a variety of disturbing and vital baggage into the warehouse of modern art.

Among English art-lovers the sculptor counts many friends, who would give their impression of buying his works. No less than ten duplicates, in bronze, of "The Broken Nose," as well as copies of some of his more important small figures, busts and groups, are owned in England, while not one copy of his great master works would be taken would be taken by any Englishman for his first, second, or third copy of "St. John" sold in France was bought by Mr. George A. Lucas, a well-known American artist-who lives in that city, and this as late as 1888, ten years after it was made. The English appreciation of Rodin is not a matter of getting away from those false ideas of nature and the antique, and to succeed in arriving at a great and truthful power of expression. For the better understanding of true sculpture, Rude was an old and a great deal, and, though there is much that is cold and dry in the most detailed and correct of art, as the Arc de Triomphe, its spirit is splendid and its planes are immense.

Carpeaux was the first sculptor of a later generation, though a generation, as it were, removes from his period, and Rodin twice: once for the latter, and the other for his great picture in the Pantheon, "The Death of St Genevieve."

Some Impressions of Rodin’s Ideas on Art and Art Education, and on the Character of his own modelling.

If the character of Rodin’s sculpture is radically different from the majority of that produced at the present time, it is to be found in the fact that his ideas on art and art education would also differ from those generally prevailing on those subjects. The almost-universally accepted idea of the French Revolution, and was indulged in by Canova, Thorwaldsen, and nearly all the painters and sculptors who succeeded them for a long time, David among them, that Greek sculpture is an ideal representation, and his attitude towards the state of the art of today, finds in Rodin a strong opponent. He believes that Greek sculpture is the perfection of realism, nature simply and comprehensively copied by the strongest, best known of the nearest eyes and hands; that the Greeks never commercialized their devotion of their statues. The Greeks moderns do, nor slighted nor attenuated the details, but made them as large, in their scope and place, as they did the more extensive problems.

He thinks, that following the teachings of the French School of Fine Arts, which are based on the Canovian idea, the pupils study nature to make it Greek, and copy the latter because they think it ideal. The pupils make ideal copies of the Greek that are convenional and weak, not representations of living sculpture. They, no doubt, wish to make sculpture that is large and simple in form, not by a direct study and respect of all there is in nature, but by eliminating too much that is important and characteristic. It may be what they understand as true Greek, but it is not true Greek.

Greek sculpture, Rodin asserts, is warm, strong, firm, simple, true to nature and full of power. It is life itself. Another error of the French school which Rodin regards as objectionable is that known as "la reproduction" or from one side of only one side of the model to get what is called a fine edge. It is well understood that by constantly looking at a model from one side or from one point-of-view, the eyes of the pupil become so accustomed to looking in one direction, that he sees his work in that manner, and can neither see nor work in any other way. The result of this is that the pupil learns little or nothing of the full, round figure, and its extremely difficult to make one, and still more difficult to compose two or more figures together; his work looks like a bas-relief; that is, the effect, not the fact, of a figure. Ingres is regarded as a great sinner in this respect. He made everything in bas-relief, was very cautious not to feel anything it. As a whole, Rodin thinks that the teaching of the Schools does not include a thorough comprehension of either nature or the Greek, and that its pupils are very imperfectly prepared for the execution of great works of art.

The future of French art appears to him to rest upon a return to a more faithful, serious and persevering study of nature, and he supports his opinion by referring to nature as the compendium of all invention and the stem of all great artists of the world, as unanswerable illustrations of its truth. He says that the human form has its own peculiar importance, and the fact that it cannot be compared with anything it is a world of charm and grandeur; that it is as endless as its variety of movement as it is unlimited in its beauty; that no imagination can begin to ask all that it can give, and that nothing is possible to the artist, artistically, without the subject, the art is centred in the human form; that everything that is typical and harmonious should be faithfully copied by the artist, and, when so copied, is good and beautiful sculpture. Nature never deceives nor betrays the persevering, thoughtful artist; he must see, touch, think, feel, and submit to the inexorable determination of a religious duty, even serenely.

It must be seen with soul and eye.

The Greeks were so strong that they could copy nature perfectly in all its depths and subtleties, there is no reason why, in Rodin’s estimation, the principles upon which they worked should not form the basis of all art-instruction. He insists that the pupil must make a study of what nature is, troops it with the most scrupulous care, and to study his model in all its forms, and then he will be able to make full round figures, as bas-reliefs, one as well as the other. He refers to Delacroix as one of the first artists to attempt to get away from those false ideas of nature and the antique, and to succeed in arriving at a great and truthful power of expression.

The greater understanding of true sculpture, Rodin was and is a great deal, and, though there is much that is cold and dry in the most detailed and correct copies; to, because, it is a formidable enemy to true art progress.

The practice, in and out of the School, of working with "bullets" finds no favor with Rodin.

The sculptor, instead of putting the clay with a sweep of his thumb or fingers, and thus indicating, with his every touch, the ever-important fact of planes, rolls it out into a little ball, and carefully places it where he desires with a slight pressure of his finger. A bullet is what Rodin made look like a bullet. Every one of the stages of modelling is not regarded as indicating a true sensibility of form, but a way of hiding an incapacity for second modelling. It is also true that when such work is executed in marble it is lifeless, hard and without character, because it has no element in it that will produce sculpture.

The Greeks saw and felt this, and they were so strong that they could comprehend what the Greeks did not, and were in accord with its most intimate harmony. Nor is their art confined alone to gods, it is in everything they made, animals as well as men.

The Greeks suppressed nothing, because nothing was beneath its apportioned and specific preservation. All there is in nature, is in the sculpture.

The imitation of nature, without feeling or comprehending this harmony and atmosphere, is not art.

And it is also true that all true criticism of art is based upon a knowledge and understanding of its truths, and not upon taste, because, as the most exalted eyes are ever so fine.

The affinity between the conceptional intuitions of the artist and the human form is as absolute as it is intimate, and as limitless as they are numberless.
A model may suggest, or awaken and bring to a conclusion, by a movement or position, a composition that lies dormant in the mind of the artist. And such composition may or may not represent a defined subject, yet be an agreeable and harmonious whole, suggesting to different minds as many names.

The physical and mental character of a model regulates, to a great degree, this affinity.

A model is, therefore, more than a means whereby the artist expresses himself, or evokes inventive inspiration to him. They work together as a productive force.

Rodin speaks of Barye as the master of masters, who clung to nature with the force and tenacity of a god and dominated everything around him. He was a man all and outside of all art-influences, save nature and the antique. He was one of, if not the most, isolated artists that ever lived. Emphatically original, and the first in the world in that kind of originality. He was himself and himself alone.

"One thinks of him and the Assyrians together, though it is not known that he knew anything about them. It is impossible to believe that he was affected by them, because everything that he did was Barye. He is too strong to be generally liked, even in France. Neither is he understood; he belongs to the centuries, and only after them will he be loved. He is our great glory, and we shall have to depend upon him in coming generations."

Rodin thinks that Rude should be placed next to Barye, and then Carpeaux. Puget also worked from nature and had a fine perfection of form.

The indescribable abnegation of such men as Barye, Millet, Rude, and Carpeaux, as well as to a sorrow to every true artist. They were heroes.

Donatello was also a student of nature, and how varied he is: more so than Ghiberti, Michael Angelo, or Signorelli.

Rodin says that the "St. George" of Donatello is all there is of Italian art, its sum and flavor—an angel. The other statues on the Or St. Michel, by this sculptor, are not so good. His equestrian statue, at Padua, is, in Rodin's estimation, the best one since the Greeks. All these leaders in Italian art were colossal giants. Of Michael Angelo, no writer, says Rodin, has touched the hem of his garment, in the appreciation and understanding of his immense genius. He was right when he said that Ghiberti's door was fit to be the gate of Paradise.

Although the dominating tendency of Rodin's nature is Greek, and his work is based on that, more than in any other he is, in his taste and admiration very cosmopolitan. Everything that is good sculpture, no matter what its style or date, gains his warm appreciation. If he loves the sculpture of the Parthenon the best of all, he is disposed to give to Assyrian sculpture the preference for grandeur of style and expression. Of individual specimens of Greek sculpture he prefers the Sleeping Fawn, Venus of Milo, and the recently discovered Greek Victory. Then follow the Ariadne, Venus of Vienne, the bronze in the Naples Museum, the Mar雅an, Dying Gladiator, and the Idol, at Florence.

He regards the statue of Demosthenes as a fine work, but not the best Greek. For the equestrian Marcus Aurelius, "there is no name." "One of the finest things in the world is the Mercury, by Brian," at the School of Fine Arts, in Paris. "It received the Medal of Honor in 1864, and it was the most deserved one ever given in Paris. The statue, as such, is nothing; but the work on it! Such force and beauty!"

This unfinished figure of a sitting Mercury, was found in the miserable attic-studio of the sculptor the day after his death. Of him died in poverty, and tradition has clothed the event with this touching story: Fearing that his clay model would freeze during the night, he covered it with his only blanket, and thus deprived his statue of the protection of his frozen corpse, witnessed in the morning this final sacrifice to art.

In urging the study of nature as the only guide and inspiration for the artist, Rodin gives in words the synonym of his own life-work. Nature has revealed to him her mysteries, and thus his sculptured counterpart, the antique. He feels the winning power of the former, and the truthfulness, life, simplicity, and never-changing, soul of the latter.

But it was only at the age of thirty-five, and after eighteen years of the hardest study, that he was able to fully assert his instincts and trust implicitly to the teachings of nature.

It is a singular fact that while he was all this time struggling and progressing, he was unable to see anything in Barye, and accepted the popular dictum that Pradier and Ingres were the greatest. It was all of his early work, the "Broken Nose" as an example, was in the right way of modelling, and without realizing its full significance, he was reducing his full figures from all profiles, and learning to make full round statues.

It is easy to understand why nothing that Rodin did, from the time the "Broken Nose" was made, and during the seven years that he was working with Boullée, should please his contemporaries. It was not the kind of sculpture then in vogue. It had too much nature in it and not enough of false Greek.

Rodin knew very well that he was doing a tremendous amount of study, and his only comfort was in the belief that he was a realist. His work did not please him, it looked small and lifeless. He labored in faith and darkness. Neither did the sculpture produced by others at that time.

Constantly hearing his things condemned, and never attaining his ambition to do strong and powerful work, he began to think that he was not in the right way. But as he saw no better he kept on, following blindly his own fancy and是什么样的 harder. At last, he got hold of nature, his modelling had life in it, was more ample, it had freedom, freshness, and the authority of a well-founded faith.

There was logie in the movement of his figures, and he expressed himself without let or hindrance. He felt that he was now a true realist. He made the "Age of Bees."

The character of the "Broken Nose," as a piece of sculpture, is a great explainer of Rodin's early life, a resume of the superior tone, firm temper, and desperate grip that carried him to victory, in spite of all obstacles.

It is singular, that master as Rodin is of the human form, and familiar with all the inner powers that actuate it, it is almost always at the very last moment that he is able to find the exact movement or expression that he wants in a figure or bust. And Rodin's evitable wandering around in desolation and discouragement, in the attempt to reproduce that which nature presents to him. Sometimes he does not find his movement or expression until after the work is in plaster, and then he produces it in clay and makes the desired changes. The character of his modelling is peculiar. At first, or in its early stages, it looks like the Renaissance, but if he carries it far enough it resembles the Antique, as in the case of the torso of "St. John," Carrying it far enough implies, with Rodin, a time and perfect tranquility. Two conditions that all serious artists seek with never-failing persistence.

The stage Rodin's modelling is direct, firm, full, and living; it never slows labor. His things seem to have grown. He accnts the typical characteristics of his model with taste and judgment.

Rodin has been severely criticized for a lack of taste in the selection, and a too faithful reproduction of his models, and for a too free representation of the divine passions of love. For "having a contempt, at one period of his career, when he was even the "St. John"—of the merel lively agreeable," and of endeavoring to express his conceptions in forms expressing more than in themselves beautiful, by means of gestures and attitudes passionate and significant, rather than at tempted to achieve a perfect and vital harmony."

The "St. John" has been pronounced a low physical and mental type, too low to defy really the great1
destions. Its head, head, and model, has too pointed a out as confirming evidence of the truthfulness of this criticism.

The "poetic realism," and the "nobility of the statue," have rarely been questioned.

To the ordinary observer it would seem that these objectionable parts help to make the statue and help to produce the impression of "nobility" and "poetic realism." As a comparative allusion to the Renaissance, it was affirmed that Donatello, Rodin's "great prototype, even when he accentuated to the verge of exaggeration, and sometimes beyond that limit, the methods he revealed to his followers, never deprived it wholly of its noble physical characteristics."

It has been said that no such perfect models, as those seen in the sculpture of Donatello and Michael Angelo, have ever existed, and that one of the unrivalled excellencies of these sculptors consisted in their power to perfect in their statues, the imperfect living model. The probabilities are that Rodin never thought or cared whether his model for the "St. John" represented the highest type, or whether the
head, back, or feet were those of a saint or sinner. The model appeared good to the sculptor, and was copied. For that time and purpose it suited the sentiment it suggested.

Rodin, if anything, liked the peculiar type of his model, its general construction, and its back.

Both model and statue represent a rude, earnest man of the people, in movement and attitude natural, primitive and unstudied, very true to life and the closely-woven purpose of French art.

As models go, the one used for "The Age of Brass" would be considered an excellent specimen of a young man. Some of the female figures on the door would escape the criticism of the model entirely, because of the difference in form and sex. When the model had taken off his garments, he assumed of himself a position natural to him. This position suggested to the sculptor the subject of "St. John"; he emphasized it and made the statue. The result was beautiful, but the sculptor himself had warned at the beginning that the subject of "The Age of Brass," in a different way, is quite as simple. The role in the sculptor's mind was to make a study of the nude, a good figure, correct in design, concise in style, and firm in modelling, make a good piece of sculpture. For the sake of elaboration, the process of the model may be sketched as follows: The necessity of artistic action moves the artist into contact with nature, its recognized inspirer, and he places his model in various positions, according to the subject which suggests itself, and subjects to those who see it, though it is really nothing more nor less than a piece of sculpture — an expression of the sculptor's sense of understanding of the character of his model, and of his capacity to reproduce it in clay.

Whatever place this process may occupy in the consideration of art-production, one thing is, at least, certain: the existence of a clay figure, from every view mysterious, and from its left side dramatic.

In the execution of these two statues, Nature was the guide of the sculptor.

If the statue of "St. John" did not have an immediate success, the model from which it was made became at once in great demand; but, not being understood and used in accordance with his physical and mental make-up, the statues that were made from him were not in the line of the sculptor's character. If his life work is to be painted, it is as if he was a sculptor of harmony with himself. Modern statues of "St. John" have been nearly always represented as boys or youths. Rodin makes his from a man of middle age, in order to emphasize more fully the purpose of the subject: a personality which approaches his hearers authoritatively, and in his function their superior.

Before leaving the "St. John" and "The Age of Brass," an allusion may be made, to the thing they occupy as curiosidades of one that is harmonious in every way. In this instance the question of subject is not included. The position, movement, attitude of the model, as found by the artist, is satisfactory to him, and he makes the completion. It is completed by Rodin with various names and subjects to those who see it, though it is really nothing more nor less than a piece of sculpture — an expression of the sculptor's sense of understanding of the character of his model, and of his capacity to reproduce it in clay.

Pointing for Concord Granite.

ST. LOUIS, MO., May 20, 1890.

To the Editors of the American Architect:

Dear Sirs,—What composition would you recommend for pointing a movement of Concord granite?

Want something about the color of the stone and durable.

Portland cement is said to be inadmissible on account of its staining the stone. Yours respectfully,

MONUMENT.

Do you think whether Portland cement, mixed with just enough water to make it as damp as fresh loam, and thoroughly compacted with a caking iron, or the jointer forei-gnly applied, would stain the stone, and it is by far the best material for the purpose? the cement mixed with oil, which is often used, would stain the stone and is not so good as when mixed with water. The Portland cement, Paris cement, or any composition, which can be obtained of importers, are nearly white, but are not very durable when exposed in our climate. —Eds. American Architect.

HEMLOCK AND RATS.

NEW YORK, N. Y., May 28, 1890.

To the Editors of the American Architect:

Dear Sirs,—In your issue of May 25, on page 242, you write about using hemlock lumber for grain-bins, as being proof against the gnawing of rats. Several years ago I had hemlock grainbins placed in my stable, and in a short time the rats had gnawed several holes through the hemlock boards; and they have given me trouble ever since, till I had to have recourse to tin. I would recommend every one wishing rat-proof grain-bins or other receptacles to line them with tin or galvanized iron.

Yours truly,

H. L. HARRIS, Architect.

To the Editors of the American Architect:

Dear Sirs,—In reply to your request for information as to whether hemlock is proof against rats, I have the following experience to offer:

Some years ago I had a cement floor laid in a building containing an incubator and a brooder. The cement did not set properly, and the rats, burrowing through it, carried off the chickens.

I had heard that hemlock would poison the thieves, and accordingly I laid a close-jointed floor of that wood over the cement. The day after, I found a hole three inches in diameter gnawed upward through the wood at one of the joints. As fast as one hole was stopped another was made.

HARRY A. Childs.

The Forests of Guatemala.—A consular report says the timber of Guatemala is abundant. There are forests of mahogany and pine, and a great variety of other woods capable of being used for manu-
The forests of Alaska. — It is a mistake to suppose that the whole of that territory is heavily timbered, a good deal of it being as destitute of timber as the desert of Sahara. There are nowhere any trees or vegetation above an altitude of 5,000 feet, the tree growth above 2,500 feet being of not much account. When it is considered how much of the country consists of lofty mountains, the area of timberland becomes, under these conditions, somewhat restricted. The above remark applies of course, only to that portion of the territory that has been explored, a comparatively small part of the whole. What of the timber or other resources there may be in sections remote from the coast no one knows. In the far North, where the country is believed to be less mountainous, the forests of Alaska, and the case on the eastern continent. The most common tree in Alaska is the Sitka spruce; the most valuable, the yellow cedar, which reaches a height of 250 feet, with a diameter of six feet near the ground. Generally they are about 150 feet high and measure four feet three inches in diameter near the base. The bark of the yellow cedar is much like the spruce and fir of California. The yellow cedar, however, is a much more valuable tree, having a close, fine grain, and being resistant to decay. A yellow cedar plank 11 inches thick and taking readily a fine polish becomes a most desirable cabinet wood. Henlock is also quite a common tree in Alaska, with willow and alder along the water courses. The bark of the hemlock will some day become valuable for tanning purposes. In依尾sentence refers to the fact that the forest of Alaska is in some sense restricted, with the effect that the territory is heavily timbered. It mentions the most common tree in Alaska is the Sitka spruce; the most valuable, the yellow cedar, which reaches a height of 250 feet, with a diameter of six feet near the ground. Generally they are about 150 feet high and measure four feet three inches in diameter near the base. The bark of the yellow cedar is much like the spruce and fir of California. The yellow cedar, however, is a much more valuable tree, having a close, fine grain, and being resistant to decay. A yellow cedar plank 11 inches thick and taking readily a fine polish becomes a most desirable cabinet wood. Henlock is also quite a common tree in Alaska, with willow and alder along the water courses. The bark of the hemlock will some day become valuable for tanning purposes. In Alaska, the forests of Alaska are in some sense restricted, with the effect that the territory is heavily timbered. It mentions the most common tree in Alaska is the Sitka spruce; the most valuable, the yellow cedar, which reaches a height of 250 feet, with a diameter of six feet near the ground. Generally they are about 150 feet high and measure four feet three inches in diameter near the base. The bark of the yellow cedar is much like the spruce and fir of California. The yellow cedar, however, is a much more valuable tree, having a close, fine grain, and being resistant to decay. A yellow cedar plank 11 inches thick and taking readily a fine polish becomes a most desirable cabinet wood. Henlock is also quite a common tree in Alaska, with willow and alder along the water courses. The bark of the hemlock will some day become valuable for tanning purposes.

The waste in smoke. — The weight of the smoke which cloud daily hangs over London has been estimated by Prof. Chandler Roberts, of the Engineering Times, to amount to about 30 tons of solid carbon and 200 tons of carbon in the form of hydro-carbon and carbonic-oxide gas. Calculated from the actual results of tests made by the Smoke Abatement Society, which is said to have the longest running discovery that no smoke flees from 3,000 feet of smoke lines, the cost of the waste smoke through the streets in drawing it, adds seriously to the cost of street cleaning and repairing. Then there is the cost of taking away the extra ashes. The cost of removing 1,000 tons of ashes is £2,500. The cost of waste coal may be set down at £2,000,000, plus the additional loss from the damage done to property caused by the smoky atmosphere, estimated by Mr. Chadwick at £200,000, the whole aggregating £4,000,000.

The recession of Niagara. — In a recent address in Washington before the United States Geological Survey, Professor Gilbert gave the following interesting information regarding the recession of the ground under Niagara Falls. The estimate is that for the past forty-four years the falls have receded at the rate of two feet and four-tenths feet in a year. The Horsethief Falls, on the American side, and the Falls of the Niagara, on the eastern side, but the time was when both were together, before the little point called Goat Island was reached. The recession is more rapid to the north than on the sides; as the crest of the Horsethief Falls retreats the water tends to concentrate there, and the time will probably come when the sides of the present falls will have become steep, and large enough to require more attention to their preservation. It has been shown that on this basis the falls began to wear away the rock of the escarpment near Lewiston — which had not then cut off a city channel, even now it is in 85 feet deep, and the highest part of it is 15 feet deep, and the depth has been soured out at the foot, probably by means of ice, which comes over the falls in great quantities in the winter. — Exchange.
This is a peculiar combination of indestructible gums with an oily solvent which prevents the penetration of water into either bricks or mortar: it greatly improves the appearance of brickwork, giving it a rich effect, free from gloss; the white efflorescence of salts on the surface and the formation of fungus is prevented: as it is much more impermeable to water it is far better than linseed oil, and it is not destroyed by the lime of the mortar. We can recommend it for use on chimneys, as it will prevent their disintegration by driving rains, while superior to the best paint for this purpose, it is also more economical.

Address orders and inquiries to:

Samuel Cabot, 70 Kilby St. Boston
Also manufacturers of creosote stains & ant pyre.
MOVEMENT has been started for a great exhibition, under the auspices of the three Americas, to be held in Washington in 1892, the four hundredth anniversary of the discovery of America by Christopher Columbus. Spain and Italy, both of which as a nation have had some connection with Columbus, have, it is said, shown a disposition to take part in the celebration, while Mexico, which had at one time an idea of getting up an exhibition of its own in the same year, and in honor of the same event, will probably be glad to expend the energy which was not sufficient for others. If a costume is making a credible appearance at ours. The South American States, unless they should be occupied by that time in a general war, which is said to be possible, will undoubtedly be glad to make another demonstration of their increasing wealth and enterprise, and it is to be hoped that our own people will do their best to help the affair along. It is said that thousands of farms in the United States were mortgaged in 1876, in order that their owners might go to the Philadelphia exhibition. If that is so, it will be about time in 1892 for the children of the Centennial enthusiasts to take their turn at seeing the wonders of the world. The site proposed for the Exhibition buildings is the reclaimed ground of the Potomac Flats, close to the Washington Monument. If this is sure to be free from danger of malaria, it seems to be very suitable, and Washington itself is as pleasant and attractive a town for the purpose of celebrating a grand holiday as could be found anywhere. It does not appear just who are the leaders of the movement in this case at present, but more particulars will undoubtedly be forthcoming before long.

M. HENRI MAMY is publishing in La Construction Moderne some papers on theatrical scenery and effects which may be of use to architects. Some of the apparatus that he describes is new, and in regard to that which is old it is more or less a surprise to many who would think it not payable as a biennial gift of thirteen hundred dollars, so that the holder may be enabled to pursue post-graduate studies abroad during that period. The fellowship is founded as a compliment to Mr. F. A. Schermerhorn, to whom the University owes the Department of Architecture, which was established at his instance, and at his expense endowed with the best equipment possessed by any architectural school in the country, and maintained during its early years. The fellowship will be confined to graduates of the Department, and will be awarded after a competitive examination. This makes the competition much severer than formerly it was open to in this country to students who wish to compete for this most valuable addition to an architect’s education. We do not, perhaps, realize that such advantages are not offered in any other country in the world. In France, it is true, the Prize of Rome opens to the fortunate winner a reputation and assurance of future success. Most probably the American scholarships do not, but, in return, the American scholarships leave their possessors much freer to follow their own inclinations in the matter of study, and, being generally given to men who have had a certain amount of practical experience, instead of to students fresh from school, they encourage their holders to sketch and pick up knowledge of all sorts, in a way which would be injurious to persons just set free from their lectures and drill in classical design. It is a satisfaction to think that the more such scholarships multiply, the more it will become the habit of young architects and draughtsmen to avail themselves of the advantages that they offer, and the pleasanter it will be for the holders of the three scholarships to form a little party for travelling and sketching together. Experienced architects, who have made their dozens of trips across the ocean, do not always reflect, in their surprise at the smallness of the number of applicants for the existing scholarships, that a prize which consists in two years of exile, alone among strangers, and in countries where the architectural student must necessarily depend upon his knowledge of foreign languages to enable him to study to advantage much of the best work, presents a good many terrors, as well as attractions, to the average American youth recently from college, and an arrangement by which the three American travelling-students may have the advantage of mutual companionship, at least during the first few months of their tour, would add much to the attraction of the examinations.
from the little trap behind her and seizes the rings on the cords, and pulls them, when the peasant's costume disappears, to give place to the airy skirts of the fairy, while the wand, the indispensable attribute of the stage fairy, is handed to her from the same trap. One of the most effective pieces of stage machinery is that by which the horses which draw the chariot through the market-gardens or the rock, or whatever it may be, made of canvas, with light doors in it, which close with a spring. As the hero, closely pressed by his enemies, approaches the rock, he takes aim at the proper spot and darts through the spring doors, which close so quickly as to make him think that the stage does not see how the feat is performed. A variation of this was devised for use in the "Roi Carotte." In that play one of the personages is seen on the stage, turning over the leaves of an immense book. The book is illustrated with pictures, and, as the leaves are turned, the people in the pictures jump out of the modern, as well as the older scenes, and turn a few somersaults, and then jump back into their places on the page. This curious effect was obtained by making the middle of the pages of India-rubber, with a cut through the centre. The book lay on a table, the front of which was concealed by some other objects, while the top was perforated with a hole large enough for a man to get through, and covered by the book. A lively boy was concealed under the table, with such costumes as he needed, and at a preconcerted signal he would jump out through the India-rubber, caper a moment about the stage, and jump back again.

LA SEMAINE DES CONSTRUCTEURS makes a complaint that is frequently heard here—that it seems to be impossible to keep apartments of moderate size and rent free from vibration in the modern, as well as the older houses. It is the rule for bugs under the wall-papers, which are the universal decoration in Paris, most of them belonging to colonies of insects, which have been sent out from some slovenly household in the neighborhood, and have multiplied under the papers, in spite of all the efforts of the smarter housekeepers to exterminate them. There are thousands of houses, inhabited by clean and well-bred people, where this nuisance persists, in spite of all efforts, and La Semaine asks if there is no remedy, short of the substitution of paint for paper, which, though effectual, does not please the taste of the Parisians. If any of our readers know of anything that can be done, many persons will be glad to hear of it. We might suggest that the paste for putting on papers in such cases should be mixed with corrosive sublimate, which would poison the bugs, besides preserving the paste from souring; and need not be dangerous to the lives of the occupants of the rooms, as a washable paint is undoubtedly much to be preferred to all such buildings.

A RATHER singular personal discussion is just now going on in Vienna, over the new Court Theatre, which is very magnificent, but which has the defect that the actors cannot be heard in it. The architect is Baron von Hasenauer, one of the most distinguished architects in Europe, and the newspapers seem to have been stimulated by his conspicuous professional position to lay a good deal of blame on him for the bad acoustic quality of the building. Naturally, Baron Hasenauer does not like this, and his friends have undertaken to defend him by explaining that the plan of the structure is not due to him, but to the late Professor Semper, who prepared before his death the scheme which was carried into execution. This explanation, which has probably some reason in it, far from allaying the trouble, has, as it seems, stirred up Professor Hans Semper, the son of the great architect, who demands an opportunity to demonstrate before a jury of architects that the defects of the theatre arise from errors in design and not from defect in the original plans. Disputes of this kind were introduced by Baron Hasenauer. Which of the disputants is right is impossible to say, and, in fact, in matters of the acoustics of buildings it is beyond the power of any person, architect or not, to make explanations that are of any value beyond the most rudimentary observations for the reason that no one knows, beyond such simple observations, anything about the causes which make a building hard to hear in, or the remedy for such a state of affairs, if it exists. Meanwhile, Baron Hasenauer's friends, including Baron Hansen and many other architects of high distinction, have shown their sympathy with him by presenting him with a eulogistic address.

On the fifth of April, the order was given for the immediate execution of the works which are to extend the sewers of Paris, so as to receive the house-wastes from the whole city, instead of from a small part, as is now the case, and convey them to the sandy peninsula of St. Germain, there to be used in fertilizing the market-gardens from which the markets of Paris are to be supplied. The land necessary for irrigation has been taken possession of, the scheme of conduits needed for bringing and applying the sewage to it has been carefully worked out, and nothing remains but to carry the plans into execution. To see that this task is properly performed, and with due regard to all public interests, a Commission has been appointed, not only to watch the construction of the system, but to observe the effects which it produces from year to year on the health of the people who live near the irrigation grounds. This Commission is to be permanent, and its chairman is to be elected by the Ministry of Agriculture; one by the General Council of the Seine, and a fourth by the Minister of Finance, while the fifth is chosen by the Committee of Hygiene, or, as we should call it, the Committee of Health, and dissolved immediately by the Ministry of Agriculture; one by the General Council of the Department of Seine and Oise, and a fourth by the Minister of Finance, while the fifth is chosen by the Commission of Agriculture, or, as we should call it, the Committee of Hygiene, and reconstituted immediately by the Ministry of Agriculture.

An artificial silk has been invented by M. Duvivier. The substance of the new fibre consists of gun-cotton, mixed with allayngers, and dissolved into a tough mixture which is placed in a receptacle having a small orifice at the bottom, and the drop which exudes is taken up and drawn out, forming a silk-like thread. This is passed through three baths, the nature of which is not described, and is then dried. When dry it is wound on bobbins, or in skeins, which are kept in water. The color of the thread is a pale brownish yellow, and it has been successfully woven into cloth. On the whole, the new material does not seem likely to come into very fierce competition with silk. The strength of the real silk fibre is so far beyond that of any imitation yet invented that it must continue to be preferred to any artificial product, unless, possibly, some sort of glass should be discovered transparent enough to go through the ordeal of spinning and weaving.

Die Deutsche Bauzeitung gives some particulars in regard to the new railroad which is to cross the South American Continent, from the Atlantic Ocean at Buenos Ayres to the Pacific at Valparaiso. The greater part of the road has already been built, but the mountain section, about one hundred and fifty miles long, between Mendoza, on the side of the Argentine Republic, and Santiago, on the side of Chile, still remains to be completed. At Mendoza, the elevation of the present road above the sea is about twenty-five hundred feet, but in a length of one hundred and twenty-four miles the new line ascends to a height of nearly ten thousand feet. The summit is formed by a tunnel, about seven miles long, from which a descent of seven thousand feet, in a length of thirty-two miles, leads to Santa Rosa, where connection is made with the existing road to Valparaiso. It is expected that the line will be finished by the end of 1890, with the exception of the tunnel, which will take two years longer. During the construction of the tunnel, however, the road will be open for traffic, passengers and goods being transferred over the mountain pass.

An "idea-competition" is just announced in Switzerland for a National Museum in Berne. The competition is open only to Swiss architects, who are invited to send sketches, at a scale of one to two hundred, for the elevations, as we suppose, and one to five hundred, which we imagine must be for the plans. Although the drawings will thus be very small, fourteen hundred dollars is offered in prizes, and a most imposing array of judges has been appointed, comprising Professors Auer, of Berne, and Bluntschli, of Zurich, Colonel de Sauissure, of Geneva, and three well-known architects, together with Dr. von Essenwein, Director of the Germanic Museum in Nuremberg.
SOME of the appliances included under the title of Closet-Fittings, appertain perhaps more truly to furniture than to Builders' hardware, though they are sometimes used in connection with the finished carpenter work. The designation of closet-fittings is a more or less arbitrary one and while the names apply to everything considered under this classification, might include many of the articles described in previous chapters. The limitations will, however, be sufficiently exact for the present purpose.

The simplest appliance for securing the door of a cupboard is what is known as a turn-button. Figure 393 illustrates the cheapest form, consisting of a metal-bar or button which is secured in place by a screw through the centre, the screw being turned in so as to allow the button to rotate freely. An improvement is to have the button pivoted on a plate which is screwed independently to the door-frame, Figure 394, while a plate is secured to the door for the button to turn upon, or vice versa.

A turn-button acts as a bolt, but it is often preferable to use some other form. Any of the flush, sunk, raised, mortise or neck bolts described in a previous chapter will answer for a cupboard, though there are a few styles which are especially designated as cupboard-bolts. Figure 395 is an example. Again, it is often desirable to have a spring-catch on a cupboard, such as that shown by Figure 396, which may be considered as a type of many different styles. Figure 397 shows a lever-cupboard catch, which works by gravity, without springs, the catch being released by raising the handle. Each of these varieties can be used for double or single doors, though with double-doors some form of bolt is necessary in addition. The book-case bolts and catches described in the chapter on bolts might properly be included, also, in the present category.

Drawer-pulls are made in a great variety of styles, only a few of which can be considered here. Figure 398 is a cheap and very common form of wrought-iron chest or drawer handle, suitable only for rough work. Figure 399 is a very serviceable drawer-pull, and in plainer form, with sides as well as front rounded in, is what is commonly employed for china-closets, wardrobes, etc. Figures 400 and 401 are drop-handles for nice work on the same principle as the first pull illustrated. The latter is a very old pattern, such as is found on most of the antique colonial wardrobes and dressing-cases, and is just now quite in fashion. Figure 402 is a straight bar-pull and Figure 403 is a serviceable and easily attached ring drawer-pull occasionally employed for wardrobes. Figure 404 is a type of what is particularly designated as a druggist drawer-pull, being on the principle of Figure 399 but with frame and slot on the face to receive a card or label.

Drawer-knobs are mostly too simple to require any illustration. They are made with heads of wood, porcelain, mineral, composition or metal, and are usually so shaped as to dispense with a separate shank or spindle, the knob sometimes having a slight metal rose or collar. In the cheaper grades the knob has led into it a gimlet-pointed screw-threaded spindle which can be turned directly into the drawer-front; but a more satisfactory form has a spindle extending entirely through the drawer, and secured by a nut and washer on the inside. With a wooden knob the attachment is sometimes made by means of a screw passing through the drawer-front and turning into the knob from behind. Wood or porcelain knobs are most suitable for kitchen and china closet work, though no knob is ever as permanent or satisfactory as a drawer-pull.

Figure 405 illustrates the ordinary shell-brackets. They are cast in malleable-iron in sixteen or more sizes varying from 3 x 4 inches to 16 x 20 inches. The form is a very strong one, and a great deal of stiffness is obtained with a minimum of metal. They usually fail, when overloaded, by the upper arm or flange breaking near the inner screw-holes, but it requires a greater load than one would suppose to break such a bracket.

---

1 Continued from No. 699, page 223.

In the chapter on knobs, the writer omitted to notice a very simple and effective form of screwless knob-fastening, recently put on the market by the Hopkins & Dickinson Manufacturing Company. In this device, the spindle, which is cut with a screw-thread, is rigidly attached to the knob and the knob on one side. The opposite shank has a swivel-connection with the knob, and is threaded inside to screw over the spindle. In application, the loose shank is screwed onto the spindle until two dogs or teeth on the inner end of the shank are engaged in slots in the rose. The rose, which protects somewhat from the faces of the door and has a milled-edge, then serves as a set-screw; drawing the two shanks together and binding against a washer on the door, so that while the knob can be rotated freely, the rose-washer and consequently the shanks, will not work loose.
There are many so-called "fancy" forms of shelf-brackets in the market few of which are in the slightest degree artistic, though most of them are stronger than the simple form shown by the figure, on account of having more metal-work between the flanges. Brass brackets are seldom required for ordinary house work and can usually be had only on a special order.

It is often desirable, in fitting up book-cases or china-closets, to have movable shelves. Shelf-pins of some sort are then used, holes being bored at regular intervals in the sides of the case into which the pins will fit. Ordinary screw-eyes answer very well for most purposes, but are rather conspicuous when proportioned for heavy loads, and are not very easily moved.

Figure 406 illustrates three patterns of specially devised shelf-pins. The ones with square and round heads are taken from the catalogue of A. G. Newman. The related pattern is manufactured by Russell & Irwin, and holds the shelf so that the greater portion of the pin is hidden.

Closet-hooks are made in so many different styles, and, withal, are so well-known that only a few forms need be considered, which will serve as types for three hundred or more varieties to be found in the hardware market. The hooks are invariably secured to wooden cleats which are nailed to the wall over the plaster. Figure 407 is a hat-pin with hook beneath, which can be turned directly into the wood by means of the screw-thread on the extension of the shank. Figure 408 is held by a nut turned up from behind, and can, of course, be used only on some form of hat-rack. This and the preceding are properly furniture-trimmings. Figure 409 is a familiar, old-fashioned coat-and-hat hook with porcelain knobs, a very serviceable article even though it is not quite in style. Figure 410 is a form of wardrobe hook usually made in brass or bronze, and Figure 411 is a wardrobe hook intended for dresses which are to hang from the ceiling. A similar hook, Figure 412, is fitted with a gimlet-pointed screw-shank, to screw directly into the wood. A very good wooden hook, Figure 413, is made on the same principle as a harness hook, the hardwood pin being inserted from the rear of the iron-base and bevelled, so it cannot work loose or pull out. Figures 414 and 415 are types of the common hat and coat hook, the latter being specially designated as for school use. Several styles of hooks are also made of bent steel wire. Figure 416, and are very strong, light and serviceable.

All of the foregoing closet fixtures can be had in various sizes and in different materials. The following table gives some average retail prices which will serve as guides in selecting goods. The prices are for a dozen medium-sized fixtures, complete, with screws.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>303</td>
<td>Turn-buttons, without plate, 11 in.</td>
<td>8.25</td>
<td>8.10</td>
<td>8.20</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>304</td>
<td>&quot; &quot; with plate, 11 in.</td>
<td>8.75</td>
<td>8.50</td>
<td>8.70</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>305</td>
<td>Cupboard-hooks</td>
<td>2.25</td>
<td>2.25</td>
<td>2.25</td>
<td>2.25</td>
<td>2.25</td>
</tr>
<tr>
<td>306</td>
<td>&quot; catches</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>308</td>
<td>Chest-handles, wrought</td>
<td>2.25</td>
<td>2.25</td>
<td>2.25</td>
<td>2.25</td>
<td>2.25</td>
</tr>
<tr>
<td>309</td>
<td>Drawer-pulls, plain</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>310</td>
<td>Lifting-handles, 3 in. single swing</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>311</td>
<td>Draw-handles</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>312</td>
<td>Bag-pulls, 4 in.</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>313</td>
<td>Ring-pulls</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>314</td>
<td>Drapery-pulls, plain</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>315</td>
<td>&quot; &quot; bolts and nuts</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>316</td>
<td>&quot; &quot; screw end</td>
<td>3.25</td>
<td>3.25</td>
<td>3.25</td>
<td>3.25</td>
<td>3.25</td>
</tr>
<tr>
<td>317</td>
<td>&quot; &quot; screw shank</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>318</td>
<td>Shelf-brackets, 8 x 30, per dozen</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>319</td>
<td>Shelf-hooks, 8 x 30, per dozen</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>320</td>
<td>Ordinary coat and hat hooks</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
</tr>
<tr>
<td>321</td>
<td>Wooden &quot; &quot; &quot; &quot;</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
</tr>
<tr>
<td>322</td>
<td>Wire &quot; &quot; &quot; &quot;</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
</tr>
</tbody>
</table>

[To be continued.]
EQUESTRIAN MONUMENTS—XVI.
THE CONDOTTIERI—III.

The successor of Carmagnola, the successful adversary of Pesciulino, the contemporary of Sforza, Alfonso the Magnanimous, Federigo of Urbino and of Sigismondo Pandolfo Malatesta, Bartolomeo Colleoni, to have achieved the success and final fame that befell him, must have been — well worthy of all the praise that has been showered upon him as a soldier and as a man.

Born of a noble family of Bergamo, Bartolomeo in his early childhood was a victim of one of the family intrigues common to those times, through which his father was slain by sundry cousins with whom he had allied himself, but who sought their own advancement by killing him and seizing his possessions. After a short stay in prison, Bar- tolomeo was allowed to escape and live with his mother in obscure poverty till he was of age to shift for himself. This he did by first taking service as a page in the retinue of the Lord of Pesaro; but at the age of twenty, having meanwhile taken advantage of all opportunities to attain skill and address in the use of arms, he finally took up the profession of the roving soldier, selling his service here or there where he could obtain most pay. His first real step was deserted the army of the condottiere Braccio to take service against him in the army of Queen Joan. When peace was finally declared he sought employment in the armies of Venice under Carmagnola in the campaign against Filippo Maria Visconti, and after Carmagnola's recall and judicial murder by the Seignory of Venice he continued in service under Gattamelata, who had succeeded to the chief command, and was waging the Republic's battle against the famous Pesciulino. In these years, between 1442 and 1444, his command had been increased as he approved himself a trusted and successful soldier and the leader of eight hundred men-at-arms, and at the death of Gatta melata in 1440 he was practically the most prominent general in Venetian employ. Further advance was, however, arrested by the Treaty of 1443 with the ruling doge, and Bartolomeo, in consequence, took service with Filippo Maria Visconti, who finally, becoming jealous of the ascendancy he was obviously acquiring, threw him into prison. Filippo's death within two years caused Bartolomeo's release, and he took advantage of the temporary confusion to seize his patrimony of Bergamo in 1447. From this time to 1455 he was particularly active in changing his paymasters, twice serving the Venetians before, in 1455, he was elected commander-in-chief of the Venetian forces, with a salary of 100,000 florins. In this interval all his changes had tended to increase both his wealth and his personal importance. From this time to his death, in 1475, he held practically the most important position in all Italy, and it is conclusive evidence of the ability and unquestioned preeminence of the man that so jealous an employer as the great Venetian Republic should have for so long a term left in his hands the practically unqualified control of its great armies; and he himself freely expressed surprise that he was able to maintain his ascendancy, and in his declining years he sought the Seignory never again to entrap so great power to a single man.

More soldier than cultivated man of letters, he yet felt the movement of the times, and followed the example of others in becoming the patron of men of learning and practitioners of the arts of sculpture; particularly was he fond of building, and it is less a wonder that poten- tates of that age, who, themselves, had no education in such matters, should have interested themselves in building than that any should have been found willing to foster the arts of sculpture. In bricks and mortar the self-made leader of those days may have felt that he had to deal with substances that he knew something about, and could understand that a certain height and bigness would produce the imposing effect he aimed at, though he may have shown an acknowledgment of appreciation of proportion as of the justness of the meter used by the poet who celebrated his success in battle. Be this as it may, it is to the relics of such men that we are to look for the grandest and most costly of the valued architectural monuments of Italy to-day, and Colleoni, moved by whatever motive, delighted in building, and building of a useful rather than an ornamental character. A man of unusual depth of religious feeling, he felt it his duty to use his largesse largely in the service of the Church, and accordingly built several churches and monasteries, and founded not a few endowed charitable institutions and hospitals, besides doing the duty of an enlightened ruler in providing the towns under his rule with good water, strong walls and other municipal conveniences. Naturally, Bergamo, his native town, benefited most by his care, and here he built, or rather reconstructed, the former Sacristy of S. Maria Maggiore, so that it might become the mortuary chapel of his family, and it is now known as the Capella Colleoni. It is said that in spite of his general loyalty to the Church, the Consiglio della Misericordia disliked and resisted his desire to augment this portion of their beneficence to the separation of himself and his posterity, and that, in consequence, he had to use force to secure possession of it. Here, opposite the door- way, stands the rich and elaborate tomb of the great soldier, sur- mounted by an equestrian statue in gilded wood, which was voted to his memory by the town of Bergamo, and was entrusted to the hands of the goldsmiths, among them Verrochio, a man who had gained a name for himself, and whose funeral had not only been a great public event, but also in a somewhat audacious way at Venice, the scene of his latest and greatest glory. At his death in 1475, it was discovered that he had bequeathed to the Venetian Republic the greater part of his wealth — more than 100,000 ducats — on the condition that a statue should be erected in his honor before the altar of S. Mark where, as perhaps he knew, the law forbade that any statue should be placed. Municipal petitioning found a way to secure the inheritance by complying with the letter of the law, but the statue was erected by Verrochio, who has been described as a man able to maintain his ascendancy, and in his declining years he sought the Seignory never again to entrap so great power to a single man.

1Continued from No. 697, page 911.

More soldier than cultivated man of letters, he yet felt the movement of the times, and followed the example of others in becoming the patron of men of learning and practitioners of the arts of sculpture; particularly was he fond of building, and it is less a wonder that poten- tates of that age, who, themselves, had no education in such matters, should have interested themselves in building than that any should have been found willing to foster the arts of sculpture. In bricks and mortar the self-made leader of those days may have felt that he had to deal with substances that he knew something about, and could understand that a certain height and bigness would produce the imposing effect he aimed at, though he may have shown an acknowledgment of appreciation of proportion as of the justness of the meter used by the poet who celebrated his success in battle. Be this as it may, it is to the relics of such men that we are to look for the grandest and most costly of the valued architectural monuments of Italy to-day, and Colleoni, moved by whatever motive, delighted in building, and building of a useful rather than an ornamental character. A man of unusual depth of religious feeling, he felt it his duty to use his largesse largely in the service of the Church, and accordingly built several churches and monasteries, and founded not a few endowed charitable institutions and hospitals, besides doing the duty of an enlightened ruler in providing the towns under his rule with good water, strong walls and other municipal conveniences. Naturally, Bergamo, his native town, benefited most by his care, and here he built, or rather reconstructed, the former Sacristy of S. Maria Maggiore, so that it might become the mortuary chapel of his family, and it is now known as the Capella Colleoni. It is said that in spite of his general loyalty to the Church, the Consiglio della Misericordia disliked and resisted his desire to augment this portion of their beneficence to the separation of himself and his posterity, and that, in consequence, he had to use force to secure possession of it. Here, opposite the door- way, stands the rich and elaborate tomb of the great soldier, sur- mounted by an equestrian statue in gilded wood, which was voted to his memory by the town of Bergamo, and was entrusted to the hands of the goldsmiths, among them Verrochio, a man who had gained a name for himself, and whose funeral had not only been a great public event, but also in a somewhat audacious way at Venice, the scene of his latest and greatest glory. At his death in 1475, it was discovered that he had bequeathed to the Venetian Republic the greater part of his wealth — more than 100,000 ducats — on the condition that a statue should be erected in his honor before the altar of S. Mark where, as perhaps he knew, the law forbade that any statue should be placed. Municipal petitioning found a way to secure the inheritance by complying with the letter of the law, but the statue was erected by Verrochio, who has been described as a man able to maintain his ascendancy, and in his declining years he sought the Seignory never again to entrap so great power to a single man.

1Continued from No. 697, page 911.
edict of eternal banishment against him and declared his life forfeit in case he should ever again put foot on Venetian territory. Verrochio took his fate coolly and remarked to the herald who brought him the sentence of banishment, that even if the Republic did cut off his head it would not enable any one else to put a hand on Colleoni's horse.

This lonely truth germinated slowly and bore fruit, for after the lapse of eight years the sentence of banishment was revoked, and the sculptor was promised not only immunity but double pay if he would return to Venice and resume his work. Return he did and went to work; but it was too late; nature was fatigued or the current of artistic ideas was checked and before he was able to bring the group once more into shape, death put an end to his labor. Just how much he had accomplished is a matter of dispute between the learned in matter of art, and it is not desirable here to go into the discussion. It is apparently safe to assume that even if his early sketches determined the final character of the group he succeeded in bringing the horse only anywhere near to completion at its present size. It was Verrochio's desire, and so expressed in his will, that his pupil Lorenzo di Credi should go on with the work, but the authorities decided differently and awarded the task to Leopardi, a Venetian sculptor.

The peloton temper of the Venetian rulers was continually bringing them into positions where they had to eat humble-pie or retract their own words, and in order that the work might go on it was first necessary to remit Leopardi's sentence of banishment, bid upon him because found guilty of forgery.

To Leopardi is due the figure of the rider, the pedestal, probably some of the trappings of the horse, and perhaps he was who by some subtle changes endowed the animal with a closer approximation to animation than any other sculptor has ever achieved. The vitality of the composition, its reality so to speak, make this monument the

The Horses of Colleoni, Gattamelata and one of the Bronze Horses of Venice.

standard of excellence with which all equestrian sculpture—of greater age as well as of less—may be compared. It is the ideal, the almost unapproachable rendering of the truthful conception of an artistic monument. Here a man and a horse each having the attributes that belong to the living animal, while in addition the master has endowed them with the very essence of monumentality, each having character enough to make, if separated, a remarkable piece of sculpture while, allied, the superiority to other compositions is a fact of whose infallibility the observer is more impressed each time he brings into comparison with the group some other monument which ranks high as an artistic success. To select for favorable comparison with this master-piece of the Renaissance period the often-criticized equestrian group of Joan of Are, by Preniet, in the Place des Pyramides in Paris, will probably cause many to feel that praise of the modern work is an injudicious way to enforce the applause awarded to the elder monument. But as the Venetian monument reveals a real man and a real horse, so the Parisian group represents a real horse beset by a real woman. In both cases the sculptor's conception of his subject's character is competently rendered. The fiery impetuosity of youth merged in the sedate impassiveness of mature age is adequately declared at Venice just as the emotional impulse of inspired girlhood is shown at Paris. The remorseless doggedness of the onward movement of Colleoni's horse befits the character of his rider as the most irresist-

Head of Bartolomeo Colleoni. From L'Art.


The Horses of Colleoni, Gattamelata and one of the Bronze Horses of Venice.

Colleoni's body, rigid from knee to hip but above that point yielding to every motion of his steed, so as to ease the animal in every possible way and prevent saddle galls. In the whole range of equestrian sculpture there are few riders who have such a seat as this, few who look as if horseback riding were an everyday affair and not a mere matter of picture-making. Usually the sculptor places a forked biped upon the back of a quadruped and makes a union between them by means of saddle and stirrup-leathers, but there are few besides Leopardi who seem to have conceived that it was possible for a man to keep his seat without the aid of the harness-maker.
VENICE, ITALY.

STATUE OF COLOMBO. THE SCHOOL OF ST. MARK AND THE CHURCH OF SS. GIOVANNI E PAOLO.
Trinity Church
New York

North-East View

Church and Adjoining Buildings for the Corporation of Trinity Church

Architect
F. W. Withered
The monument was unveiled in March, 1496, and Leopardi, the survivor, was showered with applause for the manner in which the work had been finished.

Those who seek to award to Leopardi the largest share of this successful work do so by belittling Verrochio, declaring that he knew little about the making of an equestrian statue, had few models to equestrian sculpture, and the animation of this little group is not so dissimilar in kind from that which inspires the Colleoni group as to lead one to put too great faith in the assertion that it was Leopardi's genius alone that saved the monument at Venice from being merely commonplace. The statement that Verrochio was greatly indebted to his study of Donatello's equestrian statue of Gattamelata at Padua study, and had made no previous essays in this line of work. The existence in a private collection at Genoa of an equestrian statuette ascribed with seeming reasonableness to Verrochio may be taken as evidence that at some time in his career he had given attention to is not improbable, and there is no reason why Verrochio should not have been eagerly willing to consult the work of a master whom he must have been ready to acknowledge as his superior.

Properly speaking, the monument at Padua should be considered

among the earliest of the condottiere monuments, not only in point of date but because of its intrinsic merit and the renown of the artist who made it.

The son of a baker, Erasmo (or Stephano or Francesco) da Narni, nicknamed Gattamelata, achieved greatness in true condottiere fashion — through personal prowess and the perception of how and when to take advantage of the moment. He was perhaps the last of the perpetual war heroes of the times thrown in his way. While still a young man, he was made commander-in-chief of the Venetian forces in their war with the Milanese, and in that position contended successfully with such great leaders as Ludovic Sforza and Fiescimino. At his death, in 1443, his son determined to erect a statue to his memory, and assigned the task to Donatello, who seems to have preferred to devote himself to glorifying an Italian leader, rather than to perform the same task for Alphonso Aragon, whom the same time sought to have him execute a similar monument to commemorate his capture of Naples in 1442.

The difficulties in the way of Donatello were not a few, since, first, equestrian sculpture was for him an untried field of art, and there were at that time few statues of the kind in Italy, and the means of getting at them were lacking in part because of the imperfect means of communication, and partly because it was not possible to visit at will many of the places where the time hostile territory; and, in the second place, it was an unusual thing to undertake the casting in bronze of so large a statue. What is thought to be the wooden model of one of his full-size studies for the horse is still preserved in the Palazzo della Ragione, at Padua, which, at a later day, was used in some civic festivity to bear an effigy of Jupiter in procession. Not unnatural, then, the lack shows traces of being inspired by the horse of the Aurelius at Rome, and the bronze horses of St. Mark's. Indeed, there is a very perceptible family likeness between the two, both in the size and lines of the horses of St. Mark's and those which bear Marcus Aurelius at Rome, Gattamelata at Padua, Colocci at Venice, Cosmo de' Medici at Florence and Henri IV at Paris; and no less can be said of the horse, as indicated by the drawings, which Leonardo da Vinci helped to execute for his statue of Ludovic Sforza. There is a sedate propriety of air about all these beasts, as if they felt that not only they must represent worthily the character of the steeds habitually used by their masters in daily life, but that also their deportment must lend an added dignity to a memorial that was erected not for a day, but for all time.

Donatello was employed about nine years in the execution of this monument — think of it, you American makers of soldiers' monuments! — and the monument was finished in 1453.

VENICE. — Donato di Niccolo di Betto Bardi, called Donatello, was born in Florence in 1386. His most noted works are a statue of David in the Bargello; one of St. Mark and one of St. George, both on the exterior of Or San Michele; a monument to Pope John XXIII in the Baptistry at Florence; the relief of dancing children, in the Pitti; the external pulpits of the cathedral at Pisa and of St. Mark's; and the group of Judith and Holopherne in the Loggia de' Lanzi at Florence. He was much honored and assisted by Cosimo and Piero de' Medici. He died in 1466 and was buried in the Church of San Lorenzo, at Florence.

VERROCCHIO. — Andrea Cione di Michele, called Verrochio. Born in Florence, 1435. Apprenticed to Giovanni Verrochio, a goldsmith, from whom he took the name of Verrochio, which he has been generally said to have acquired on account of his wonderful correctness of eye. Teacher of Leonardo da Vinci. Died 1507. Principal works: David; Boy and Dolphin; Monument to Piero and Giovanni de' Medici and Tomb of Savonarola. (To be continued.)

THE CATHEDRAL AND THE STATUE OF GATTAMELATA, PADUA, ITALY.

[Colotreal Print, issued only with the Imperial Edition.]

The church of San Antonio is understood to be the work of the clergyman, designed in 1237, begun in 1215 and finished in the main in 1307 though parts were not built till 1479. A conflagration caused its complete restoration in 1749. The building measures 280 feet in length, 138 feet across the transepts and is 116 feet high. "St. Antonio has no less than eight floors, which, together with the two octagonal bell-turrets, give the building a thoroughly Eastern appearance. As seen from the northeast, the grouping of the domes and turrets is very picturesque, its great size being varied to some degree by the pointed and round arches are used boldly, the walls are everywhere panelled, and there are great varieties of brick corbel advantage — for having the sides of this striking building is meagre and disappointing, the color of the red brick is too light, and stone is but sparcely used. The church was completed in 1307, with the exception of the cupola over the choir, which was not added till 1424."

COMPETITIVE DESIGN FOR CHURCH, CLERGY-HOUSE AND SCHOOLS FOR TRINITY CORPORATION, NEW YORK, N. Y. MR. F. C. WITHERS, ARCHITECT, NEW YORK, N. Y.

In order that the main entrance should be as near as possible to the Ninety-third Street station of the Elevated Railroad, a tower, 26 feet square, has been placed at the northeast corner of the lot, to serve as a porch. This porch leads directly into a large lobby, capable of accommodating 150 people. From this lobby the main body of the church is reached by three doorways, one facing the centre of the nave, and the others the passages in the aisles. Seats, all of which face the altar, are provided on this floor, which, including the movable benches in the centre passage, is 11 feet wide. Galleries, which are arranged in the nave over the lobby and in each of the transepts, will accommodate a total of 252 people. The galleries in the transepts will not interfere with the view through the arches at the end of the aisles. Each of the galleries has its separate staircase. In the chancel are stalls for 62 choristers and clergy, and, as its width is great (38 feet), a passage is made behind the stalls on either side of the exit of communicants through an opening on each side of the chancel.

Ample exits from the church are provided, there being, besides those into the lobby, a porch in each of the transepts, a separate entrance for the choristers on the south side, near to the robing-room, and a separate entrance on the west, for the convenience of the clergyman in charge. The "Chapel for Daily Prayer" runs parallel to, and is of the same length as the chancel, and has a separate entrance to it from a porch on Ninety-second Street. It will accommodate 161 worshipers, and can be thrown open and made a part of the church in case of great crowds.

A detached house, containing about 1,400 square feet, is provided for the clergyman in charge on the northeast corner of the lot. This location is the most desirable, as being near the chancel, and more private than if connected with the other buildings, with the advantage of having these sides in the light and air. The house for the rector (when needed) contains about 2,000 square feet on a floor, is located on the southwest corner.

The building for the Sunday-school, etc., containing over 4,000 square feet, adjoins the church on the southeast corner of the lot, having its principal entrance on Ninety-first Street. The plan provides a large room, 60 feet by 30 feet, on the ground-floor for the pastor's reception. A room for the Sunday-school, 67 feet by 60 feet, with 30 feet wide, a smaller room (25 feet wide) for the infant-class, is arranged on the second floor, having direct communication with the gallery over the lobby in nave. The principal staircase would stand under a large hall in the third story, of the same size as the room below it.

Well-lighted rooms for class-rooms, or for the guilds and societies, can be arranged in the basement of this building, with an outer entrance on Ninety-first Street, and a staircase to the ground-floor above.

On the west side of this building a private entrance from the
The central portion of Nicaragua, from north to south, is occupied by the main Cordilleras of the Isthmus, which is here greatly reduced in altitude, and consists merely of a confused mass of peaks and ridges. Over an average elevation of about 1,000 feet between this mountainous region and the shore of the Caribbean Sea stretches a low, level country, covered with a dense forest. West of the mountain zone is a broad valley, about one hundred and twenty-five miles long, divided into two parts by the eastern prolongation of the San Juan River. This valley is much wider north of Nicaragua, and the lower, 1,133 feet above sea level.

The American Architect and Building News.

On the 30th of November, 1887, a party of makers, Breed and Lehnardt, engineers, and the surveyors and draughtsmen returned home about that time, but several of the party remained in Nicaragua, and have since been employed in the construction of the canal, and have been constantly engaged in making the survey of the route, and in attending to the various works which are now in progress.

The width of the river at this point is 1,100 feet, and its average depth at low stage is 6.6 feet. The dam will be 1,255 feet on the crest, and 332 feet high. It will back up the water of the San Juan to a height of 420 feet. The upper end of the lake at an elevation of 110 feet above the sea. The upper end of the lake will be at an elevation of 420 feet above the sea. The lake will be 420 feet wide, and its navigation at low stage is interrupted by five rapids. Raising the water by means of the dam will largely increase the river's width, and give a clear width of 300 feet over all the rapids except the upper, or Toro Rapids. Between these and the lake-a
small amount of dredging and some submarine excavation will be necessary to obtain a thirty-foot channel.

From Fort San Carlos, at the head of the river, across the lake to the west side is 564 miles, and for a distance of 13.7 miles into the lake it will be necessary to dredge to soft mud, at some points 17 feet, to obtain a thirty-foot channel. The remainder of the lake is as free as the open sea. On the west side, the excavation will begin 1,200 feet from the shore, from which the channel will extend in a straight line up the valley of the Lagus and Guescoy 3.7 miles. It will then curve across the flat divide, the crown of which is 414 feet above the level of the lake, and 25,600 feet from the lake. From here it will make its way up the valley of the brooks Chocolata, and 8,600 feet west of the divide will enter the gorge of the Rio Grande, through which it will continue 13,300 feet to the eastern end of the basin. From the head of the canal, there are nine miles of prisms of the canal for this distance are: For 8,560 feet from the lake surface — width, 210 feet; bottom width, 120 feet; depth, 30 feet; area of water prisms, 4,859 square feet; for 26,600 feet through the divide, 80 feet width of surface, 30 feet depth; area of water prism, 2,400 square feet; through the gorge of the Rio Grande — surface width, 184 feet; bottom, 80 feet; depth, 30 feet; area of water prism, 237,289 square feet. The grade is gradual and regular. The bulk of the material is to be excavated in rock, which, throughout, is overlaid to a depth of 14 feet by varying strata of hard-pan, white and blue clay, and sand and black loam.

From the western end of the gorge of the Rio Grande to the head gate of Lock No. 4, a distance of 29,000 feet, the line of the canal passes over the flat, gradually-inclined floor of the valley of the Rio Grande and the Rio Tola. A dam 2,000 feet long and 74 feet high across the gap through which the streams of this valley flow to the Pacific will impound the drainage of 83 square miles of country, and form a lake, in a natural area of a little more than six miles, and a depth varying from 30 to 70 feet. The surface of this lake will be 110 feet above sea-level, the same level as the great lake itself. On the west side of the basin, and north of the dam, there will be a lock; and a combination lock and dam, entirely excavated in the rock of the hills, and forming the northern abutment of the dam. The line of the canal through and from the double lock to the Pacific is straight.

Lock No. 6 is 6,814 feet from the tail gate of the double lock, the third and lowest lock of the Pacific flight, with a lift varying from 21 to 29 feet. The prism of the canal throughout this distance is 13,400 feet wide, electric lift 62 feet deep, and area of water prism 3,673 square feet. Lock No. 6 d-ops the canal to the level of the Pacific, and from here to the Pacific high-water line, 6,000 feet, the material to be excavated consists entirely of recent and ancient sands, gravel, and pebbles, thoroughly cleaned.

To sum up: The total distance from the Atlantic to the Pacific by the Nicaragua route is, in round numbers, 170 miles, as follows:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles.</td>
<td>Miles.</td>
<td>Miles.</td>
<td></td>
</tr>
<tr>
<td>564</td>
<td>56</td>
<td>1,120</td>
<td>1,240</td>
</tr>
</tbody>
</table>

The summit level is 154 miles long.

It is estimated that thirty-two vessels can pass through any lock of the river in an hour. This already allows for a five-minute interval for each lockage. The estimated net tonnage per vessel is 1,750 tons, which are the figures for 1883. This gives a total annual tonnage of 29,000,000. It is believed, however, that the locks will be able to carry to forty vessels for vessels of less than 2,000 tons. This would give an annual tonnage of 33,000,000.

The estimated cost of the canal is, in round numbers, $66,000,000, including a contingent sum of 25 per cent for contingencies. These estimates include the electrifying-lighting of the canal, the lighting and buoying of the lake and the harbors, and railroads and telegraphs from the lake to the Pacific and from Greytown to the dam.

It is estimated that 50 per cent of the vessels will pass on the subject that the business of the canal will amount to from 5,000,000 to 6,000,000 tons in sight on the day it is opened. — New York Times.

I am inclined to question the correctness of the title. There is nothing of the real Japanese about it except the original motives or sketches. All else is either archaism or the illustrators. The results in the text and in the full-page illustrations, are French process-work — called engravings, — simply etched relief-plates, with some modifications in the more important examples.

The art of the Japanese is the unconfuted directness and frank simplicity in the way of handling of all the black-and-white work, and much of the reds and grasses, flowers, etc.

There is a little stork on page 10, No. 2, that is made with three streams of the brush, that gives a vivid impression of the bird; and on one of the full-page plates in No. 2, page 20, how a dog is made of metal, with jointed legs, like any other manikins, that are no end funny; but this is a high art.

Going through the numbers, we find little else than rough sketches — reproductions, mind, not of the original gravures — in the text.

We are unable to see why the majority of those should be reproduced and placed before the Western mind with a distinct "stand and deliver" challenge for its admiration.

No one questions the superb work in bronze and cloisonne, which has been for a long time the most successful line of art in Japan. The text illustrations do not run over the type limit, and in many cases so far that, in binding, much of the intention of the artist must be lost.

The question: may we not look for a sample of fine arrangement in the construction of the pages?

The face of this edition is hardly that of a Tokyo newspaper. Or is it a series of decorative cancellations for the average mind of a high-grade European or American painter.

The colored landscapes have no value. They are little better than what one sees on the five-cent fans which are hawked about by the children in the streets of the larger Chinese cities, and are hardly to be classed among the higher examples of Japanese art. In the collection of Professor Morse we see hundreds of sketches of Japon, that are not only finer, but more typical of "Artistic Japan."

The flowers and fruits are most unattractively fine — as sketches or decorations, as you will; but we will venture to say that Hamilton Gibson and Harry Furness have done a clever work, and certainly truer to nature. This is written in no carping spirit. The comparison may be made by any one who is familiar with the work of these two artists.

In the plate of pure decorative, work the Japanese show at their best. Some of the finer bits of close ornamental work might have been done in the American Bank-Note Company's establishment on the East Side, but in the larger, broader examples we have what we have been taught to admire, and our admiration is given most ungirtlingly.

Qualit fancy, delicate invention, curious conceits, run through all; figure this kind of art before which we must bow the knee? It is most unquestionably clever; but does it fit our means, may we say our civilization? The bric-a-brac, and stuffs open up another field. Here we have quiet, harmonious tones that are a charm to the eye, such as the taste of other nations, and is supple, and is certainly truer to nature. This is written in no carping spirit. The comparison may be made by any one who is familiar with the work of these two artists.

Some examples of these may be seen in the Boston Art Museum; but do not see some of the embroideries in the same collection, handsome as is the work, "yell" like a newly-gilded sign? Next to frankness and intention, should not all great art have the "easy" Dady, and when we find the term "artistic" is good for one in a while, as is the circus; but can we live with it?

I am aware of the fact that many artists of rank have been under the Oriental influence. But do not remember any instance in which their work was seriously influenced by it.

Fanci I find in the Japanese colored work nothing but false perspective, bad drawing and flat tints. I speak now only of the landscape and the sea. I see nothing of what is known to us as tone and quality.

The best of the European and American artists have little to learn from our almond-eyed friends in the matter of correct drawing, composition or color, but in much that is decorative, and in their inlaying and carving is superb. Skill and patience they have to a degree that is not possible in the busy whirl of our Western climate.

One word about the covers of the several numbers. Each differs from the other, and each is striking and taking to the eye. The color-printing on the covers, and through the several numbers on the various full-page plates, leaves nothing to be desired. Gillot has certainly done his work most splendidly; but, after all, is this not Japanese art translated by French process, and is it always at its best?

As art-work, one piece of Morse's poetry — the original work of Japanese hands — is, in the largest sense, worth many numbers of Artistic Japan.

ONE WAY TO GET A GATE.—An old tenant-farmer, on paying rent, told his landlord that he wanted some timber to build a house, and would be much obliged if he would give him permission to cut it. The landlord stated sharply, "Well, then sir, the farmer went on, "will you give me enough to build a barn for? No!" said the landlord, "to make a gate, then?" "Yes, that's all I wanted," said the farmer — "and more than I expected." — Timber Trade Journal.
The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.

THE NEW YORK CATHEDRAL COMPETITION.

NEW YORK, N. Y., May 31, 1889.

Dear Sirs,—At this time when competitions form such an important feature for the selection of designs for all buildings of importance, and are looked upon with so much favor by owners and committees having the selection of an architect as one of their concerns, it is well as being responded to so universally by architects in general, a few suggestions relative to the advantage and weakness of the system, may not be mal a propos. During the past few years much advantage has been made of their competition, and all architects, nearly as well as still and size and number of drawings, positions, angles and distances of perspectives, and the method of rendering are regulated and make the designs uniform and comparable; as regards size, cost and composition those requirements are very generally accepted and adhered to by the competitors, and there is little to be wished for in this branch, unless it be that those having the matter in charge should signify their preference for some particular style, when the choice is left to the architect. Then the efforts of all might be directed in the same channel, thus giving a larger number for the owner to choose from and the exclusion of fewer because of the style not acceptable. This would give to all the same opportunity and not handicap such as have had no personal knowledge of the likes and dislikes of owners or committees previous to receiving the information. The more minute and explicit the directions are, the more nearly will all the contributors be belied and mark and more successful will be the competition. With all the advancement for the preparation of drawings, the judging then remains in the same unsatisfactory condition its always has. There are no stops having been taken for improvement, and consequently after each decision there is dissatisfaction among the defeated members, charges of favoritism and unfairness are made and evil is the outgrowth of what should engender only honest exertions and good-natured rivalry. Architects, being intelligent, are quick to see and admit a better thing when the judgment is just, but being human are slow to forget (a real or imaginary) unjust criticism; to avoid which the most particular pains should be taken. The designs should be sent sealed to the judges, and should be regarded by them as strictly private, no one (but the judges) being allowed to see any portion of them until the final decision is made public, (and not as is sometimes the case recorded, competitors, strangers being permitted to examine them at leisure). When a decision is made, all the drawings should be on exhibition to the competitors and their friends. The greatest difficulty to overcome, is that of which design offers the greatest advantages and is best fitted to be executed. The system of Judge and Jury of Courts, has been so long tried and is so nearly perfect, as a means of reaching the correct result, it is generally thought that the selection and workings of these may well be adopted as the best means of deciding competitions. The judge to be appointed by the owner or committee and the jurors three or four other architects interested personally in the competition, and to be appointed by a vote of the competitors and be satisfactory to all concerned; by this method, all the various features of the several designs would be picked out and properly weighed and placed to the credit of each competitor according to a carefully prepared table of points which should be named in the paper of instructions. This method would do away with the injustice that is often done to some competitors because of the position they hold for a particular school, and would bring about the result of making competitions much more effectual and satisfactory to the principals and architects. The feeling would then be among the members that their least plans would have a fair chance of representation and stand or fall upon their own merits. The motto system is of but little value for the purpose it is intended (that of leaving the architects' identity unknown). The aim is to secure the best plan; and any architect or owner or committee, as an author of a set by his design, method of rendering, and individualities that must be visible to any one who would be likely to be called to the public eye. If this plan is correct the public will have the progressive steps to the present graphophote, illustrating his words with diagrams on the black-board and showing the present position of the process by the instruments themselves, which for an hour sound, and over, what was spoken into them. As yet its main use is to take the place of the stenographer, its record is correct and if the speaker erred, he can go back to the graphophone and find his mistakes. It is a wonderful invention and a man can say what its future may be. Meeting adjourned at 10 o'clock. Next meeting to be held June 18, prox.

[Notes and Cippia]

WESTERN LAKES DRYING UP.—The lakes in eastern Oregon, as well as in Nevada, are drying up. In some instances the water in the lakes is subsiding because the streams which empty into them have been diverted from their courses by the work of man. In the case of the Deschutes River, for example, the water has been taken to irrigate the land. In other cases, the continuous drought, doubtless, has had much to do with the low stage of water in them. The Herald, published in the new county of Harney, Oregon, says not only one, but several of the original beds of Warner Lake is now covered with water, whereas in 1886 there were seven feet of water where the land is now dry, and this spring a stock containing 300 tons of hay was burned on land which was formerly under water as Warner Lake. Goose Lake, which once reached Lakeview, Oregon, is now five miles away, and Mule Lake, in Harney County, is eight miles away, and many other similarly situated lakes in the state, have been affected. In this county Humboldt Lake, which some years ago comprised a sheet of water sixteen or eighteen miles long and from eight to ten miles wide, has now disappeared. The water is now about two wide. The Humboldt has not discharged any water into the lake for several years, and a large area, which was covered several feet of water at one time, is now dry. Many other sections of the State are in the same condition. It is a fact, however, that the lake was as low nine or ten years ago as it is now, and that five years ago it was as high as it was ever known to be. Immigrants in early days who saw the Humboldt discharge an immense volume of water into the lake, or “sink,” as it was called, believed it had a subterranean outlet; but that idea was erroneous, as the volume of water was reduced by evaporation, not drainage. — Winnemucca (Nev.) Silver State.
The Suez Canal. — It appears that the number of vessels which passed through the Suez Canal last year was 3,440, of a gross burden of 1,257,900 tons; the corresponding number of vessels which passed through the canal in 1887 was 3,157, of an aggregate burden of 8,630,842 tons; and in 1888, 3,190 vessels, of an aggregate burden of 11,013,090 tons. The transit revenue collected last year was £2,593,291, as compared with £2,314,404 in 1887, and £2,301,065 in 1886. Of the revenue last year, 65 per cent. was derived from the passage money of ships, 32 per cent. from the French, 187 French, 141 Italian, 163 German, and 121 Dutch. No other country is figured in the list for 100 ships. The proportion of British vessels passing through the Suez Canal last year was 1,084, or 31.6 per cent. of the total number passing, which was 3,440, as compared with 1,230, or 39.0 per cent. of the total number passing, which was 3,157, in 1887.

The Secret Writing by Means of Typewriters. — A device for secreting messages in a typewriter has been patented by Prostitute Vezzoli's, strikingly like the key in the usual way, really writes other letters than those in his copy, forming a cipher copy, which can be reproduced by his machine in opposite directions and written from the cipher copy, and his machine records the letters of the original copy. The principle is very simple, says the Mechanical News, and yet has not been anticipated by other inventors. How the process works is by the coincidence of the keyboard combination lock to such a contrivance for all typewriters, so that each owner of a machine can set it to any combination, which only he and his representative can change. This is possible only, if his invention is of any use at all, its usefulness would be much increased by such a plan.

The Action of Creosote on Chimney Flues. — Attention has lately been called to the peculiarly corrosive, and consequently destructive, property of creosote. It has been inferred that the fact that the creosote thus formed from the slow combustion of wood contains so large a proportion of pyrexiculous and crude acetic acid; this acid being formed in large quantities when the combustion of wood is slow, many quarries, in fact, being condensed in cold weather where a large wood fire is very much checked, only a few hours being required for such condensation. The acid in question dissolves lime readily, carrying it away in solution, and in this manner the mortar is frequently entirely removed from the tops of chimneys in the cold weather resulting in the stone being numerously the top courses of brick in chimneys only two years old have become entirely without support than that afforded by the sand with which the line was mix. — Philadelphia Press.

Animal Life in Well-water. — The fauna of well-water, as shown by Professor Vezzoli's, strikingly like the key in the usual way, really writes other letters than those in his copy, forming a cipher copy, which can be reproduced by his machine in opposite directions and written from the cipher copy, and his machine records the letters of the original copy. The principle is very simple, says the Mechanical News, and yet has not been anticipated by other inventors. How the process works is by the coincidence of the keyboard combination lock to such a contrivance for all typewriters, so that each owner of a machine can set it to any combination, which only he and his representative can change. This is possible only, if his invention is of any use at all, its usefulness would be much increased by such a plan.

The Babylonian Expedition. — Since the beginning of February, the excavations of Professor Vezzoli's, strikingly like the key in the usual way, really writes other letters than those in his copy, forming a cipher copy, which can be reproduced by his machine in opposite directions and written from the cipher copy, and his machine records the letters of the original copy. The principle is very simple, says the Mechanical News, and yet has not been anticipated by other inventors. How the process works is by the coincidence of the keyboard combination lock to such a contrivance for all typewriters, so that each owner of a machine can set it to any combination, which only he and his representative can change. This is possible only, if his invention is of any use at all, its usefulness would be much increased by such a plan.

Ancient Tombs Discovered at Naples. — A subterranean chamber has been discovered under a house on the hillside at Naples. Along the north side of the house, and on that side only, there is a row of sepulchral hewn in the rock, the fronts of which are stucced and painted and decorated with terra-cotta and marble reliefs. Within the tombs of the chamber, one of the ancient objects, the antiques lamps being in such good condition that when the new find was inspected, one of them was actually lighted. The workmanship of the objects is exquisite, and the use of them to light up the vaults. The many well-preserved inscriptions are chiefly in Greek, with some Latin, and prove that the epoch of their construction was during the days of Augustus. The tombs have not yet been excavated. Similar catacombs have heretofore been found in this locality. — Pall Mall Gazette.

The Egypt Exploration Fund. — Few educational enterprises have yielded larger results for the amount invested than the Egypt Exploration Fund. Expending annually since 1885 between $7,000 and $8,000, and growing with the interest on the amount invested, by the late Sir Flora, Vezzoli's, strikingly like the key in the usual way, really writes other letters than those in his copy, forming a cipher copy, which can be reproduced by his machine in opposite directions and written from the cipher copy, and his machine records the letters of the original copy. The principle is very simple, says the Mechanical News, and yet has not been anticipated by other inventors. How the process works is by the coincidence of the keyboard combination lock to such a contrivance for all typewriters, so that each owner of a machine can set it to any combination, which only he and his representative can change. This is possible only, if his invention is of any use at all, its usefulness would be much increased by such a plan.

A vast amount of projected work depends upon the establishment of new, or the restoration of old, trading, investors, native and foreign. Five years ago, the bulk of railroad construction in America was to be done by local capitalists, and the European capitalists, swayed by the inevitable results from it. Of the 3,440 vessels which passed through the canal last year, 1,084 went through during the darkness of night. — Engineering.

The earnings on seventy-three roads for third week of May show a slight decrease over same week last year. Last week 90,000 tons of steel-rolls were sold, and there are inquiries for about seventy thousand tons, for new roads mostly. Creode-iron production is maintained throughout the country, but the Northern furnaces are restricting while Southern are expanding output. The month of June will be the critical test of the new tariff. The Southern lines road building is to be a test of the old, and the Northern lines are to be let to help build new roads, and then be kicked out, with a dime on them.

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1885</td>
<td>$7,000</td>
</tr>
<tr>
<td>1886</td>
<td>$8,000</td>
</tr>
</tbody>
</table>

The Liverpool, England, market is calling for heavier supplies of American lumber, soft and hard; poplar, walnut and Southern pine are particularly wanted. The American dealers are carrying more abundant supplies. In manufacturing circles on this Continent the demand for coarse redwood, and spruce and finished markets. The most important observation fails to develop the frequency of the argument in support of the system. Viewed in their entirety, the statements brought about a cooperation of effort that makes the graphing of trade channels next to impossible. These years ago there was no machinery for such and they are the key in the usual way, really writes other letters than those in his copy, forming a cipher copy, which can be reproduced by his machine in opposite directions and written from the cipher copy, and his machine records the letters of the original copy. The principle is very simple, says the Mechanical News, and yet has not been anticipated by other inventors. How the process works is by the coincidence of the keyboard combination lock to such a contrivance for all typewriters, so that each owner of a machine can set it to any combination, which only he and his representative can change. This is possible only, if his invention is of any use at all, its usefulness would be much increased by such a plan.

While on the subject of news, it is interesting to learn that the New York, N. Y., Board of Trade is getting along very well. It is a small board of directors, and it is known that the conditions are being filled out by the old rats. These schemes assert that speculative capital must have employment, and that there is no more levelling field for its existence than in an annihilation of the old and the construction of new ones. The effect of such a policy would naturally be to bolster the capitalization of active speculators, and on the outside public the results would be rather beneficial. Wild as such a scheme may appear to be, its conception is natural and logical, and its outcome would probably be a consolidation in greater or less degree of the existing competing lines. In fact, this very result has more than once been foreseen by leading railroad men, and as the inevitable arrives, the mob spirit has animated capital thus far in most of the construction that has been done. Scientific or economic considerations have played a minor part in the work. The result has been a withdrawing of small investors on one hand, and a precipitation of tariffs of one kind or another, and a limitation of new building on the other. This last in turn means that the mob lacks of opportunity, and to build roads before they are needed to that end. The new roads now built in the new territory of 50,000 miles. It is said in financial circles there is enough money to build them. It is demonstrated that labor, material, machinery and equipment for $250,000,000 as they are for $250,000,000 is not enough. The building of the new roads is now certain to be a test of the old, and the Northern lines are to be let to help build new roads, and then be kicked out, with a dime on them.

<table>
<thead>
<tr>
<th>Year</th>
<th>Known</th>
</tr>
</thead>
<tbody>
<tr>
<td>1885</td>
<td>$412,500,000</td>
</tr>
</tbody>
</table>

Considerable gold shipments have been made lately, and the English banks now hold fifteen million dollars more than they did a year ago.

The earnings on seventy-three roads for third week of May show a slight decrease over same week last year. Last week 90,000 tons of steel-rolls were sold, and there are inquiries for about seventy thousand tons, for new roads mostly. Creode-iron production is maintained throughout the country, but the Northern furnaces are restricting while Southern are expanding output. The month of June will be the critical test of the new tariff. The Southern lines road building is to be a test of the old, and the Northern lines are to be let to help build new roads, and then be kicked out, with a dime on them.
This is a peculiar combination of indestructible gums with an oily solvent which prevents the penetration of water into either bricks or mortar: it greatly improves the appearance of brickwork, giving it a rich effect, free from gloss; the white efflorescence of salts on the surface and the formation of fungus is prevented; as it is much more impermeable to water it is far better than linseed oil, and it is not destroyed by the lime of the mortar: we can recommend it for use on chimneys as it will prevent their disintegration by driving rains, while superior to the best paint for this purpose, it is also more economical.

Address orders and inquiries to:

SAMUEL CABOT, 70 KILBY ST. BOSTON
Also manufacturers of Creosote Stains & Antipyre-
BY special authority from the legislature, the city of New York is to be allowed the sum of four million dollars, or more, to be spent in renewing and repairing pavements during the next three years, and some of the daily papers are indulging in what appears to us very rash expectations as to the result of the expenditure of so much money. It is not that there is no one in New York who understands the art of paving streets, for from New York have come some valuable contributions to the literature of the subject: but an American who supposes that the lavish distribution of municipal funds implies the elevation of citizens to the heights of liberal generalities and the ignorance of "practical politics" which we should hardly look for in a metropolitan journal. In other countries, the object of paving city streets is usually the diminution of the noise, dust and labor of traffic through them, and the systems which accomplish this result most effectually are those most favored by the municipal authorities. With us, on the other hand, the primary object of pavements appears to be the furnishing of employment to as many voters as possible, and for as long a time as possible, and that pavement is the most favored which provides this with most certainty. Next to the political value of a pavement, the most important point, according to the testimony of the people of the city, to which we ought to know, best, is the prospect of financial advantages which it offers to the persons who decide whether it shall be used, and in this respect the patented pavements offer attractions which are generally in inverse ratio to their value to the public. The proprietors of these patents, it is true, usually make brilliant promises about their good, and it is hardly necessary to public opinion, but as the promises are not fulfilled, and the people in authority are quite willing that they should not be, the result to the public is simply the continuation of the costly and miserable system under which it has suffered for so many years. It is not so very long since we saw, for some days before an election, the watering-carts banished from Broadway, and their places supplied by a horde of men with watering-pots, for the avowed purpose of gaining votes for the party in power, and the inner history of the paving-departments of our large cities would probably afford more details of this sort of political management than any other branch of our public administration. Of course, it is useless to expect any real service to the public from such a system, and experience shows that the greater the amount of money to be distributed, the more shameless is the impudence with which it is stolen, or used to keep thieves in office. If the people of New York, or rather the interests of the people, were to be consulted, it would be possible to carry the city from its disgrace as the worst-paved city in the civilized world, they can easily do it by authorizing a commission of men who understand something about the matter, and who will not under any circumstances steal their fellow-citizens' money, to find out what is best, and have it applied to the streets in the best way, and at an honest price. It is hardly necessary to say that every other town that has tried the experiment thoroughly has come to the conclusion that natural rock-asphalt, on a concrete foundation, is the best pavement yet devised. In this country asphalt has been sedulously disparaged by persons interested in other pavements, and discredited by the example of multitudes of pretended "asphalts," consisting of coal-tar and sand, but the fact remains that in certain places in New York and Boston, where the natural asphalt has been laid by private enterprise, it has resisted for years the heaviest traffic, while stone pavements around it have been ground into dust. With such examples constantly before them, joined to the experience of other parts of the world, the contemplation of a testimony of expert writers, it would be incredible, if it were not for the exigencies of politics, that the municipality of Boston should go on, year after year, shovelling soft sand and pebbles on its most fashionable streets, to be immediately reduced to a mass of filth, through which ladies wade and carry on their plod, for the assurance that it will be replaced the next year by another dose; or that New York should be content to receive its foreign guests into the unspeakable mire of West Street, with the cool explanation, to people fresh from Piccadilly or the Rue de la Paix, or the grand Genoa, that the two sides of Beacon Street or Sixth Avenue renders it impossible to maintain in the horses of them but a pavement of soft mud. It is often alleged, as an argument against the use of asphalt-pavements in this country, that when wet they are slippery, and, therefore, dangerous to horses, but General Gillmore found this notion quite unfounded, that statistics show asphalt pavements were no more frequent or more serious than on stone blocks, while the labor of traction, and the danger of distressing and overstraining horses, is far less. It would be well worth while, even if the benefit to the nerves of the citizens which would follow from the adoption of smooth-pavements, over which the carriages, perhaps, with rubber tires, like those now being introduced in Berlin, would roll almost noiselessly, were considered of no importance, for some one to reckon the saving to the New York express companies and teams of time and horseflesh incident to the substitution of a good asphalt roadway, kept clean, for the present pavements. Very little can be accomplished in the city or in the country good in the abstract, but the mention of dollars would cause the express companies to pick up their ears, and such a demonstration as might be easily made of the unnecessary tax which they pay every year as a tribute to the ignorance and dishonesty of paving-departments would convert them into zealous friends of a reform which has been too long delayed.

W E all know something of the "brick-veneer" buildings so common in some parts of the West, and by no means unknown in the Eastern States, in which a frame covered with boarding is caséd with a four-inch wall of brick, held to the boards by nails driven in the joints of the brickwork, but every one may not be aware that this, so far from being an invention of our own degenerate times, is a revival of a somewhat similar practice of, perhaps, the sixteenth century. In a lecture delivered some time ago by Mr. Lacy W. Ridge on the English half-timbered houses, the lecturer said that on the advent of the real Queen Anne style, which was nothing more nor less than the "lath" of the buildings in Holland belonging to the Dutch friends of the Prince of Orange, the English proprietors of half-timbered houses who wished to conform to the new fashion very frequently veneered the fronts of their buildings with a brick façade after the Amsterdam pattern, leaving the half-timber work substantially intact behind it, where it may still be found by the curious architect. In the southern part of England a still simpler method of converting the antiquated wood framing into the new brick style was in vogue, consisting in the veneering of the wood and plaster work with narrow tiles made to imitate the face of a brick, and rebate at the upper and lower edges, so that they lapped over the others. To this, red brick was added, perhaps with tile still are, so that they could be nailed through the upper edge, and the rebate of the tile above covered the heads of the nails. How the stone window-sills were managed in this case we are not informed. With our veneered fronts, the stone sills and lintels, if any are used, can be made four inches thick, and will place tolerably well; but the art of making a stone sill half-an-inch thick, and nailing it to a timber construction, if it ever flourished, has been lost.
H CURIOUS scheme has been started in New York. Some one, who wishes, apparently, to combine the pleasures of being cremated and being buried proposes to build an immense “mausoleum,” containing cells for forty thousand bodies, which are to be “desiccated” by a current of dry air, and pretends the advantage of this system is that a person does not happen to be dead when he is placed in the cell, the desiccation does not hurt him, as cremation or being buried would, and he can lie there comfortably, breathing the dry air, until some one comes to let him out. Another alleged merit of the system is that the faces of the people treated by it will remain “without discoloration or material change,” so that their friends may have the satisfaction of seeing them at any time. The building is to be constructed of concrete, with a facing of stone, and might at least be made an imposing architectural object, whatever may be the success of the chemical processes involved.

M. Félix Narjoux has published a little book, containing his observations, during a tour of professional inspection. Among other things, M. Narjoux gives some particulars in regard to building speculations in modern Rome which are curious, even to an American. In 1870, Rome was a quiet papal city of one hundred and forty-five thousand inhabitants, full of beauty and wealth. On the twentieth of September in that year the Italian national troops took possession of the town, after a few hours’ bombardment, and its rejuvenation began. The Italian court first took up its quarters there, the King and his family occupying the Palace of the Quirinal, while the members of the suite accommodated themselves as best they could among the dirty rooms whose owners were willing to take the invaders as tenants. With the court, however, came a multitude of merchants, working people, and others who had been dependent for their living upon the court patronage, and these found themselves almost without shelter. A demand for houses arose immediately, and buildings went up all directions. The increase of population often reached twenty thousand in a year, and the new comers found houses for themselves, according to their rank and wealth, in various portions of the town. The northern suburb of the town, comprising the high region of the Quirinal and Esquiline hills, usually the site of the most exclusive residences, was now occupied by Government offices as were found necessary; while the poor immigrants were obliged to content themselves with the territory around the Colosseum and the slope of the neighboring Celian hill, or seek more distant quarters. On the western side of the town, beyond the Baths of Caracalla, was taken up by manufactories. The region of the Quirinal and the Esquiline, which contained the best houses, was the first to be built up. A wide street, the Via Nazionale, was laid out to connect it with the old portion of the city, and the parks and on this street increased enormously. Lots which were worth in 1870 about twenty cents a square foot soon advanced to six or eight dollars a foot, and, even after the speculation had got well underway, a building which was completed in 1880, at a total cost of sixty thousand dollars, was sold for eighty thousand, resold for one hundred thousand, then sold again for two hundred and twenty thousand to its present owner, who offers it for one hundred and sixty thousand, and is sure of finding a purchaser at that price. As usual in such cases, the best property has proved to be that used for retail business. While the large apartment-houses, which were of great numbers, and of which the majority have of late been unoccupied and valuable, the shops on the Via Nazionale grow every year more crowded with customers, and, therefore, more valuable to their owners and tenants; and even the old business streets, like the Corso, have revived, so that a lot on this street, which is to be occupied by a new dry-goods store, after the fashion of the present, will cost forty dollars a square foot. It is curious that these new structures, which reoccupy the site of the busiest part of ancient Rome, are in many cases rendered very costly by the difficulty of obtaining a good foundation in the vast accumulation of débris which covers the ruins of the ancient city. It is not unusual to find a distance of sixty feet between the present surface and the natural soil below, while the foundations of many buildings have been carried down seventy feet, so that the cost of the foundation often exceeds that of the entire superstructure.

The Louvre has just come into possession of the tomb of Philippe Pot, one of the great Burgundian nobles of the fourteenth century, which has for a long time been one of the principal curiosities of Dijon, and, with its eight monks, with deep hoods, carrying the figure of the dead knight on a horse, is known from photographs and drawings to many of our readers. The tomb, which is one of the best existing specimens of the remarkable Burgundian school of sculpture of the thirteenth and fourteenth centuries, has had a rather singular history. It was originally set up in the abbey of Citeaux, of which Philippe Pot was prior, and was supposed to contain the remains of the monks of the convent. In 1791, as we learn from the account given in La Semaine des Constructeurs by M. Rivoalen, it was taken from the monastery to one of the churches of Dijon, which had been officially set apart as a repository of public property. Some time afterwards, in a way which is not explained, the tombs appeared in the hall of the residence of the Count de V., at Dijon, and here it remained without objection until 1886, when the descendant of the Count who first exhibited it as his own expressed a desire to sell it. When this was announced, the archaeologists of Dijon took alarm, and resold the tomb to someone who proposed preventing the Count from carrying out his intention. The first step was to persuade the prefect of the Department of Cote-d’Or to bring suit for the recovery of the monument, on the ground that it was public property, which had been unlawfully removed from the State depository, and was subject to reclamation at any time. The first court did not favor the claim of the prefect, but the Count appealed to a higher tribunal, which reversed the judgment of the court below, holding that the undisturbed and unquestioned possession of the tomb by the Count and his ancestors for eighty years or more was an absolute bar to any suspicion of having obtained it wrongly, entitled him to the protection of the right of prescription granted by the Code. The Count, however, having established his right to the property, offered it at a reasonable price to the Administration of the National Museum, which immediately purchased it, and put it in the Louvre, with the rest of the fine collection of medieval sculpture which is stored there.

The wooden-nutmeg industry seems to have fled from Connecticut to establish itself at Cologne, where a manufacturer announces that since 1884 he has devoted himself exclusively to the construction of machines for making artificial coffee, and is now prepared to furnish these useful articles in any quantity. As an inducement to purchasers, he offers to present with each machine a recipe for preparing the material, and adds that although the sale of adulterated food is forbidden in several countries, many of these countries where such obstacles to trade do not exist, and where the enterprising possessor of one of his machines may enjoy the liberal profits due to the exercise of his skill, without fear of having his career interrupted by criminal proceedings. The material used in these machines is roasted Indian corn, or some other nutritious cereal, which, on turning a crank, is cranked into grains so closely resembling those of the roasted coffee bean, after the usual grinding, that they cannot be distinguished from them, and can be sold for them without fear of detection, unless the buyer applies some chemical or microscopic test which considered the case decided beyond all doubt. Of the many grains on the market, the best are those from the “Miraculous Carbon-Soda Stove,” which he had had set up in his office for a thorough test. The memory of what he went through at that time in the pursuit of knowledge seems to have rankled in his mind, for we find in a recent number a note showing the “universality” of the “soda” in the phrase “Miraculous Carbon-Soda Stove,” saying that the Vienna authorities, in a special meeting, had ordered that the sale or use of the apparatus called by that name should be forbidden, on account of its dangerous properties.
OLD COLONIAL WORK OF VIRGINIA AND MARYLAND.—I.

WILLIAMSBURG.—THE TOWN.

The ancient quiet of this old place, the residence-town of the royal governors and officers of the crown in His British Majesty's colony of Virginia, has been little disturbed by the irreverent onslaught of nineteenth-century progress, and as the English traveller, Burnaby, wrote of it in 1759, "a pleasant little town with wooden houses and unpaved streets," so will the modern wayfarer find it—an eminently respectable and highly conservative old borough, proud of its vanished greatness and of its years. The railroad, which sets one down from Richmond or Hampton, merely skirts the outer edge of the town, and, being out of sight, obtrudes itself upon the general quietness and age of the place only by the infrequent rush and clatter of a passing train. From the veranda of the inn one has a very agreeable first impression of a long stretch of wide "dirt-road," bordered by two rows of trees, and having a struggling, broken line of rather low and small old brick or wooden houses on either hand. This is Duke of Gloucester Street, a pleasant, high-sounding old name, which invokes in the mind of the tourist in search of picturesque interest a sense of lively gratification toward the old burghers for not having christened their single important thoroughfare in the more usual commonplace way.

Williamsburg was founded, under its original name of Middle Plantation, in 1632, through an order granting fifty acres of land and exemption from general taxation to any one settling there.

In August, 1676, when General Bacon and his victorious army of rebels encamped there, it was only a small village of straggling little houses.

Bacon had driven Governor Berkeley to refuge in Acomack, defeated the Indians, and made himself master of Virginia. He now called a great convention together at Middle Plantation, and after a powerful harangue and a stormy debate, which lasted from noon to midnight of August 3, persuaded those present, among whom were several members of the royal council, and many "prime gentle men" of the colony, to sign a declaration of their determination to stand by General Bacon, to "rise in arms against" Berkeley, who was denounced a traitor and a rebel "if he with armed forces should offer to resist the General; and not only so—if any forces should be sent out of England at the request of Sir William or otherways, to

his aid, that they were likewise to be opposed."—and much more of a like revolutionary tenor. The scene was one of the most striking and significant in the early history of the colony.

In 1698 Governor Nicholson removed the seat of government from Jamestown, then "containing only three or four good inhabited houses," to Middle Plantation, where he planned a large town, whose streets were designed to form the letters W and M, in honor of their Majesties, William and Mary of England—a conceit never carried out.

Williamsburg was thenceforward the scene of the most important incidents in the growth of Virginia, and, though never attaining any greater importance as a town than it now has, was ever thought a pleasant place to live in, and has numbered among its residents or visitors many great and famous men.

A WHEN COURT-HOUSE.

In the immediate foreground, as one looks westward up the long, wide street, lies the old "bowling-green," a generous, unpaved square of smooth, close-cropped turf, on one side of which, and fronting upon the street, stands the court-house, a quaint little bit of architecture commonly accredited to Sir Christopher Wren, but really the work of his successor. The building is a simple oblong in shape, and of one story in height. The walls are substantially built of small English brick of a very pleasing dull-red color. The windows, high above the ground, are tall and narrow, and all the openings are crowned by semicircular arches, the dark, glazed brick used for header voussoirs accentuating them in a simply effective way. The spandrils are now filled-in with painted boards, which have doubtless taken the place of the original round-headed sash and fan-lights.

Where the thickness of the walls is reduced, at the floor-level, the off-set is covered with a rounding moulded brick. There is a wide stone platform, with three steps to the ground, before the doorway, over which projects the roofed pediment of a portico, of which the columns are wanting. There is no evidence that they were ever in place, nor does the eye miss them greatly after it has had time to become a little accustomed to their absence, which is, at first, strikingly conspicuous. A wooden cornice, composed of a few simple mouldings, is carried around the balustrading on either side of the doorways, an effort to imitate the classical cornices of the ancient temples. The building, with a restored pediment, is crowned by a tall octagonal lantern of graceful form, terminating in a wooden finial surrounded by a wrought-iron vane of rich workmanship. On the stone steps are grouped some idlers, listlessly talking and chewing as they bask in the faint November sunshine. Court is in session within, and, as we pass, the crier comes out upon the platform and calls aloud in booming tones a string of names.

The trees which stand beside the walk up and down the street are very beautiful and effective in shape, and all the more interesting when one learns that they are mulberry trees, the relics of a craze which from time to time played a not insignificant part in Colonial Virginia, and, in fact, throughout all the thirteen colonies. Attempts to grow the silkworm were renewed again and again in spite of failures, and the successive trials were continued over a period of about one hundred and sixty years, reaching down to the beginning of the Revolution. Mulberry trees were planted everywhere, and one finds them in numbers about the grounds of old and new colonists' houses on the river, and here they picturesquely adorn the Duke of Gloucester Street in the capital itself. The craze came over from England, as did everything else in those days, and there it originated in an effort of the merchants to escape the paying of good English gold for shining silk,—that coveted product of fair France. The
Jamestown people had a try at the mulberries, and sent some silk to England, creating a tremendous excitement among the enthusiasts "at home," and so encouraging the hopeful that, in 1620, a lot of France was sent out to try the experiment in Virginia. Nothing seems to have come of this enterprise, and the stirring times of the Indian massacre of 1622 doubtless drove the skillful "monseers" away to sunny France again.

Chapman was always interested in the silk-growing, which he encouraged in his own ineffectual way. It went on under the Commonwealth, and we find good Edward Digges, in 1655, turning out 5000 mulberry leaves in a hothouse.

Meanwhile, our planters were not idle. Sir John Harvey, of Burgess passed a law requiring the planting of one mulberry tree to every ten acres of land. Great rewards were promised successful growers. In 1668 we hear of three hundred pounds sent out to South Carolina to encourage the planting of mulberry trees. There was another mulberry revival when the Hugenot refugees came over, and in 1669 more mulberries were sent home to England; but in his cold climate it all at last, except the grand old girdled and knotted bolls and spreading branches of the trees, which we find composing effectively into foregrounds in these ancient places.

CHRIST CHURCH, BRUTON PARISH.

Not far beyond the court-house is the ancient Bruton Parish Church, standing within the walled enclosure of its "God's acre," and rearing its graceful, Wren-like tower amid the spreading branches of the ancient trees. Our eighteenth-century Englishman, Mr. Burnaby, has set down old Bruton as "an indifferent church," but then it was comparatively new in his day, and had scarce yet felt the beautifying touch of time.

The vestry-book of the parish of Middlesex in the year 1665 contains an entry directing the building in Middlesex of a church similar to the church of Bruton Parish. That this was a wooden building seems likely from an entry in the Bruton records of 1678 giving the list of donors to a new brick church, headed by John Page, who gives twenty pounds in money and the land for church and churchyard. The name of Bruton seems to have been originated by Mr. Sudwell, who so related the parish in memory of his birthplace at Bruton, in Somerset, England. He also gave twenty pounds toward the new building, and Philip Sudwell twenty pounds, and many others gave five pounds.

John Page was allowed to put up a pew in the chancel, where there was also one for the minister.

As soon as the church was dedicated, the vestry made it known in the community that it was intended to enforce the penalty of so many pounds of tobacco against those who failed in their attendance at church, and it is to be presumed that delinquents were few thereafter.

There seems to have been from the first a great struggle between the royal governors and the church people as to the induction of their ministers. The Governor, as representative of the King, was the nominal head of the church, and, as such, claimed the right of the appointment of ministers, and was the more inclined to be associated with the functions of another great personage, the Commissary of the Bishop of London. There was much unceasing squabbling over this matter by these rival powers. In 1656 the salary of ministers was fixed at fifteen pounds, a sum which, considering the godliness of deportment and improved the odor of sanctity in these reverend gentlemen.

By all odds the most distinguished churchman of colonial times, in Virginia, was James Blair, Rector of Bruton Parish, from 1710 to 1743. He was the founder and first president of William and Mary College, and Commissary to the Bishop of London. His parish of Wakefield and Middle Plantation was thôi to the Bishop of London, in 1723, as ten miles square. His ministry "commenced," says Meade, "under the administration of Governor Spotswood, and with a tender from the Governor to the church not to be established without the concurrence of the Governor." The Governor to offered to build twenty-tw0 feet of the length himself.

Blair was the most energetic of men, and always foremost in the affairs of Church and State. He kept up an endless warfare against the royal governors in matters relating to the church, and he defeated them in succession and single-handed. Even the genial and cultivated Alexander Spotswood, that distinguished soldier and most accomplished gentleman, did not long live in amity with the staunch and invincible old polemic, and, as the Governor himself admits, it was not the person who was worried.

Blair's quarrel with Sir Edmund Andros was a famous one, and the quarrel he fairly drove the successor of Andres, Sir Francis Nicholson, from the colony.

Bruton Church is really very beautiful. The gable on the east end is densely covered in ivy, and the sun and storms of many years have so mellowed and harmonized the whole that one is incapable of criticizing the church in detail. No doubt it is, after all, but an indifferent affair, as our friend, the Archdeacon Burnaby, insists, but the softened, warm, yellowish-red tone of the old bricks, the simple dignity in the lines of the building and the fair proportions of the old holl-tower, the clinging ivy, the background of fine old trees, of gray and mouldering mossy tombs, all so eloquent in the tender loveliness of age, unite in a picture which has in it a good bit of old England, and is full of quiet charm. The tin roof which replaced the ancient shingles was an unhappy mistake, and we may hope that the better taste which now controls the parish will, some day, restore the nobler covering. Going in through one of the large iron gates which surround the churchyard, one wanders among the tombs in that subdued enjoyment of the solemn beauty of the place found only in an ancient garden of the dead. Here are some quaint old stones, rich in sculptured heraldic device, and bearing, in graceful, antique letter, stately tribute to the deeds and virtues of the sleepers beneath.

Here, under a twisted mulberry in the southeast sunny angle of the wall, lies "Barradali, arniger," beneath a tomb blackened and seamcd with age, but very good in design, and bearing a splendid head-stone, erected by the executors of his worthy jurat of the colony, upon the flat top stone. And not far from the tower, at the western end of the church, among a group of the larger tombs, is the very noticeably handsome monument erected by a grateful colony to the memory of Edward Nott, late their Governor, "a lover of mankind and bountiful to his friends," who died August 28, 1706, at the age of forty-nine. The lettering of this inscription is particularly good, and the annular bearings carved above it are rich in original foliage. At the head and foot and on the sides of the tomb are reliefs in white marble carved by a well-skilled hand. These handsomely carved marbles were, of course, brought over from the mother country, the work being of such too fine a quality to have been executed in the colony. Edward Nott was the first deputy of the Earl of Orkney, who was made Titular-Governor of Virginia, in 1704, but never came out to his province. Nott's administration lasted only two years, and he died in office, having won the affection of the colony by his wise and beneficent government.

The large white marble monument of the Bray family, close by, is also very imposing. The larger tombs are being cleaned and restored in a very satisfactory and intelligent way under the auspices
of the lady parishioners of Brutton. Those of Nott and Bray have been lifted out of the ground into which they had partially sunk, and their carvings have been cleaned so as to reveal the beauty of the work, without, however, losing the inimitable mellow tones with which hold their force and their spirit.

In another part of the yard, lying half-fallen among the long grass, is a plain gray slab of stone setting forth in eloquent simplicity that "Here lies the corps of Hugh Orr, harnarmer in Williamsburg—
1764," and the legend, the alleged, and doubtless precisely authentic.

The interior of Brutton has little to reward the eye of the curious. There is, of course, the alleged, and doubtless perfectly authentic, Powder House, in which they baptized the wild princess after she had talked her into becoming a Christian, and the wife of John Rolfe. There is, also, some interesting communion-plate belonging to Brutton. John Rolfe to the old Jamestown Church, is of heavy silver, rather crudely fashioned, and probably made in Jamestown, where there were capable artificers, sent out among the original companies. The "Queen Anne" service is of gold, and richly chased with the arms of Beachamp, and of another family. The work is said to have been done by Harache, a French émigré, who had been in the employ of the great Marlborough. The third, a heavy silver-service, was presented to Christ Church, Brutton parish, by George the III; it bears the royal arms handsomely chased on flagon, chalice and paten, and is delicately wrought upon the edges with a shell design. Drawings of these pieces, and of many others, are exhibited in Burke's "Old Plate." Architecturally, the interior of the church contains very little of interest. It is, however, rich in historical associations, and the imagination easily peoples the old place with the phantoms of departed greatness.

Upstairs, in the building, where they came in their grand state-coaches to church from their plantations on the York or the James, a few more rooms of interest remain. Rosewell, over on the York, came in, to the great joy of the family, the descendants of Colonel John Rolfe, who, it is said, have been, was one of the original patrons of Brutton. Rosewell was a splendid house of Rosewell, and on their estate of Shelly, the Pages lived like the grand seigneurs of France. The old Indian name of Shelly was Weronommacanset, and there was here that grim old Powhatan, who, as the pages were sent to court, and feasted in royal state upon the luxurious food of the York. The Pages were great churchmen, and staunch upholders of the Establishment. Their estates were of vast extent, and Matthew Page, adding to them the great adjoining tract of Tium-Neck, in 1629, by his marriage with Mary Mann, broadened the family acres into a princely domain. Mann Page, his son, built Rosewell-house, in 1729, having brought the bulk of the material from England, as was usual in that time. Rosewell is not broad feet square, an imposing pile, and the interior was finished in all the elegance of wainscoted walls, mahogany stairs and carved mantels.

In the building, these splendid and costly manor-houses in the infant colony, as yet hardly more than the unregulated wilderness, was a curious instance of the ostentatious grandeur of the period, exaggerated as it was among these lordly planters of Virginia who outnumbered the population of England. Without, desolation; within, the greatest profusion of the times, we have, also, the amnestest testimony. Then, in the church, the reputable wayfarer in the Old Dominion found every door open to him, and warm-hearted entertainers eager to house and feed him on his journey; in the taverns and shops, he saw and heard the true Virginian hospitality.

The plantations were isolated, and, as there were few roads worthy the name, communication between them was mainly by the river. There were in each, the market place. The communicative tree, the old mossy oaks, were in the service of the forest, and the river was in the pasturage. The plantations were located, and, as there were few roads worthy the name, communication between them was mainly by the river. There were in each, the market place. The communicative tree, the old mossy oaks, were in the service of the forest, and the river was in the pasturage. The plantations were isolated, and, as there were few roads worthy the name, communication between them was mainly by the river. There were in each, the market place. The communicative tree, the old mossy oaks, were in the service of the forest, and the river was in the pasturage.

The plantations were isolated, and, as there were few roads worthy the name, communication between them was mainly by the river. There were in each, the market place. The communicative tree, the old mossy oaks, were in the service of the forest, and the river was in the pasturage.
AUTUMN JOURNEYS IN MEXICO. — V.

TO TOLUCA AND BEYOND.

The chief feature of which is the patio or open court, and the Roman arch is extensively used. In one case, however, a Grecian temple has served as a model for a building. It is the Municipal School near the Church of Our Lady of Carmen. It is a perfect little gem of architecture, save that it occupies a site below the level of the street upon which it fronts. A little filling in of the lot (it stands a hundred feet or so back from the street), would have made it the most satisfactory building of its kind in Mexico. The new market is an exception to the prevailing style of architecture in the new Toluca: it is Pompeian, the interior painting especially. It is beautifully neat and clean, a great rarity in Mexican markets, and is worth a visit. But Toluca is a remarkably clean city throughout. It has a good natural drainage and its streets are so constructed as to allow the water to run off without obstruction. But it must not be supposed that in their efforts to renew the

To Tolucans have lost all reverence for antiquity. Not so. Witness now a spate of old architecture to be seen in and about the city. Witness more particularly a passageway leading from a street to the parish church of San Francisco, not at all conforming to the plan of that church as it now stands, but nevertheless preserved, as we are informed by an inscription upon one of these archways there- in, that they may remain as relics of the first Catholic temple ever erected in Toluca. Among the new public buildings in the centre of the city are the foundation walls of what is to be a large and magnificent church. It is magnificent enough, as the work was begun. Elsewhere in Mexico there are scarcely any churches in process of erection, and only of late years have any been restored. It may be significant of the decline of the Roman Church in the State of Mexico of immunity from the oppressive attitude which the Government has assumed towards the Church else- where. Toluca is not especially a city of churches as most Mexican cities are, but the few churches which the city possesses are worth visiting and contain some good paintings. The Church of Nuestra Señora del Carmen, has a rococo interior, but its chief interest lies in its curious old furniture, and its small organ which is probably the first organ made on this continent.

Toluca is situated in a valley of the same name, over eight thousand six hundred feet above the sea-level and dominated by the extinct volcano, Nevada de Toluca, from whose top a view of Toluca, and the rich valleys of the town, is of greater altitude. Its population is about fifteen thousand. It is reached by the Mexican National Railway from the City of Mexico, distant about forty-five miles. The railway has recently become a highway between the cities of the United States and the Mexican capital.

The journey up from the City of Mexico is delightful. Leaving the valley of Mexico the road enters the mountains on the west and winds around among them in making its ascent to Cima, which is exactly ten thousand feet above the level of the sea. Thence the road gradually descends but in the samecircumstances, affording magnificent views all along the way through pine forests, pure, worth- visiting, and wild mountain gorges. The train runs along the side of the mountain directly over Ocoyoacan, so that the passenger may obtain a bird's-eye view of that curious town.

Beyond Toluca the Mexican National continues its way to other interesting cities, and through a country where the retention of Indian names, such as Tlapozahuana, Tetepango, Chiapatania and Zintantun, is to be desired. It is said that the native races still exist there. This region was the seat of the Matlatzincas Indians before the advent of the Aztecs. Morelia, two hundred and twenty miles from the City of Mexico, is the beautiful capital of the State of Michoacan. Being too far off from the City of Mexico to have suffered very much from the terrible earthquake of 1866, or to be influenced by the anti-Catholic tendencies of the leading men of the Mexican metropolis, Morelia remains a stronghold of Romanism. Its claims upon the attention of the tourist is based upon its having furnished birthplaces to two of Mexico's revolutionary heroes, Iturbide and Morelos, and a suitable place for the execution of the patriot Matamoros, in 1814. At Morelia it is said that republics are not always open, for it is related that Morelos first saw the light and that in which he lived for a time, are each marked with a suitably inscribed tablet; and it was to perpetuate his memory that the name of the city was changed in 1826, from Valladolid to Morelia. The cathedral is in the style of the Spanish Renaissance, occupying an entire block, is well worth seeing. Its interior decorations of carved wood, Mexican onyx and some silver are especially interesting.

Still farther off toward the northern terminus of the Mexican National is the town of San Miguel Allende, interesting in many particulars, but principally on account of its recently restored church. It is the only approach to the Gothic, so far as I know, in Mexico. The strangest thing about it is that the restoration was the work of a native of San Miguel who had no architectural training whatever, and traced all of his working-drawings upon the ground where his masons were at work. The only comment to be made upon his success in such an undertaking is, that it is greater than would naturally be expected.

Arthur Howard Noll.

(To be continued.)

Illustration.

[Contributors are requested to send with their drawings full and separate descriptions of the buildings, including a statement of cost.]

CHRIST CHURCH, BRUTON PARISH, WILLIAMSBURG, VA.

(Gelatine Print, issued only with the Imperial Edition.)

See article on "Old Colonial Work in Virginia and Maryland," elsewhere in this issue.

MINERS' HOSPITAL, HAZLETON, PA., MR. BENJAMIN LINFOOT, ARCHITECT, PHILADELPHIA, PA.

This is a State Institution for accident cases only and comprises a central administration building, running north and south, and two large general or so-called "open wards" connecting with the same.

(Continued from No. 673, page 299.)
Commonwealth of Pennsylvania
Board of Public Charities.

Miners Hospital,
Hazleton, Pa.

Benjamin Linfoot, Architect and Pen & Ink,
729 Walnut Street, Philadelphia.
ALTERATIONS FOR
N.W. TAYLOR.
CLARENCE O. AREY, ARCHT.

Branch Bank of America.
Lehigh and Germantown Aves
and running east and west. The administration building contains on the first floor to the right of the entrance a patients' reception-room and the apothecaries' office and bedroom, the apothecaries' office being connected by a private stairway with the basement, where the hot-water supply for bandages and other purposes will be kept. To the left of the entrance is the board-room. The bay alcove leading from the same will be occupied by the superintend-ent's desk. Next to the board-room comes a private stairway, leading to the residuum of the patients' apartments in the second and third floors of the patients' dining-room, with a pair of dumb-waiters connecting it with the kitchen and pantries in the second story. Back and to the right of the cross hall is the receiving and operating rooms and to the left the kitchen entrance and stairway, hose and conveniences for the working staff. In the cross halls connecting the wards with the central building are located the patients' sitting-room on the one side and the pantries and, on the other, the remaining space being devoted to nurses' rooms, linen-rooms, patients' wardrobes and dirty-linen sluices, these latter connecting with the basement. In the extreme ends of the large wards are situated the patients' baths, wash-rooms, water-closets and two glass-enclosed porches to be used in the winter as sun-parlor.

The second floor front is to be occupied by the resident physicians, and comprises a sitting and bed room for each and a dining-room common to both sides of rooms; a corner's jury room and the back portion of the floor to the kitchen, scullery, pantries, store-room and servants' dining-room. The third floor is devoted entirely to the help, the front portion to bedrooms and the back to the new office of the superintendent.

All the internal constructional walls are of brick and the stairways of iron, the exterior foundation walls up to the water-table all being of local stone and the superstructure will be of brick and terra cotta. The iron staircases and Indian pillars, the iron facing of the stair well and of Cleveland buff brick. The roof will be covered with the best Lehigh slate, the ridges covered with terra cotta creasting and the tower with galvanized-iron and copper finials.

The floor area of the open wards is 2,430, or 101 square feet to each bed, and the wards being 18 feet high, the patients have each 1,101 cubic feet of air. In the isolated wards the quota will be a little less. The rooms show simple figures.

The heating and ventilation will be accomplished by means of two Blackburn dice-fans, one for driving the heated air into, and the other for exhausting the vitiated air out of the various wards and other apartments. All these fans will be driven night and day, winter and summer, in the latter instances of course forcing and changing the air at the outside normal temperature. The plant is designed to be capable of changing the entire atmosphere in all the first-story rooms and wards once in every twenty minutes and all the second and third story rooms once in every thirty minutes and in zero weather to maintain a steady and continuous heat throughout the interior of the building. The boilers are contained in a separate building in the rear of the main structure, but connected with the same by means of a duct underground all walled up and arched over. This annex also contains the deck-house and the plant engine house.

The steam power will be furnished by two thirty horse-power horizontal tubular boilers, one for supplying the heat and the other for operating the engines, driving the fans and laundry-machinery and heating the water. One of the latter will be a Deane double-acting fire-pump, with ten-inch cylinder, three-inch suction and two-inch discharge. This is to be arranged for filling the tank in the fourth story for supplying the building with water and also for sprinkling the lawns and, and, in case of fire emergency, propelling water. The laundry will have a complete outfit of rotary washers, centrifugal dryer, starch digestor, blue-tubs, drying-room, French mangle, etc.

The total accommodation is fifty beds (all males) and the cost $60,000 or $1,200 per bed without furniture.

SKETCHES AT WILLIAMSBURG, VA., BY MR. A. B. BIBB, ARCHITECT, WASHINGTON, D. C.

See article on "Old Colonial Work in Virginia and Maryland," elsewhere in this issue.

BUST OF MM. MOLLA. PORTION OF THE DOOR FOR THE MUSEUM OF DECORATIVE ART. AUGUSTE RODIN, SCULPTOR.

BEACH BANK OF AMERICA, PHILADELPHIA, PA. MR. CHARLES W. BOLTON, ARCHITECT, PHILADELPHIA, PA.

ALTERATIONS FOR N. W. TAYLOR, ESQ., CLEVELAND, O. MR. CLARENCE O. AKEY, ARCHITECT, CLEVELAND, O.

COMPETITIVE DESIGN FOR CITY-HALL AND LIBRARY, LOWELL, MASS. MESSRS. WAIT & CUTTER, ARCHITECTS, BOSTON, MASS.

AUGUSTE RODIN—X.

[The following comments on Rodin were furnished by the writer of the one of the ablest of the younger French sculptors.]

RODIN'S life, since he came to fame in 1877, has been an amazing story in the history of French art, but none the less interesting because it has been so often the result of some original and living artist, from Delacroix down, had the same opinion. He is now opposed against. They are in human nature. It is the way things go.

The Age of Brass, when it appeared about 1877, was such an astounding piece of modelling even to the best sculptors, that we were all convinced of Rodins' genius.

Those who could not explain its existence by the ordinary process of making sculptures, were obliged, in spite of themselves, to say that it must be a cast from nature, a trick by no means rare in these days. I don't think that the men who made this observation knew very much about Rodin's art, for they were saying it, or were conscious of the gravity of the charge. They had to say something. I don't think so now. The appearance of this statue, and what its immediate successor, "The St. John," was the lowest clasp of art-thunder that has ever fallen in France for a hundred years. Usually it takes about fifty years, in France, for a real work of art to get a hearing. Such statues are too much for the general average of artists, and those who occupy themselves with art.

"It is curious to observe that but very few of the historical writers on art have said anything about Rodin. He must die first. Rodin came by an unnatural route. He is not a graduate of the School and his work must first be hated. Every master and every real masterpiece that we have got in Paris has passed through the same experience. When Rodin's great bas-relief on the Arch of Triumph was first shown to the public, the Emperor told him to take his statue of Marshal Ney, more especially by the sculptors of the School. The same was true of Carpeaux's groups on the Tuileries, and if Lefuel, the architect, had had his way, Carpeaux' groups would have been taken down. Carpeaux went to the Emperor and complained against Lefuel's intentions, and the result was that they were preserved. The sculptor's group on the Opera was generally condemned, and every architect and sculptor of importance liked it. It took seven years, and the death of the sculptor, before his group of the 'Four Quarters of the World,' for the fountain of the Luxembourg Garden, was accepted by the city. Fremiet's equestrian 'Joan of Arc' had no more bitter opponents than the artists of Paris, who thought that they talked of petitioning the Common Council to take it down.

"Great art in France has had a strange history, especially in modern times. All of that group suggests a martyr to her voluntary neglect, instead of children of her care. Barye, Corot, Millet, Rousseau and many others are examples. These men owe nothing to their country. Courbet, the greatest artist of modern times, was prevented from going to exile and death by his own country's government. A mighty spirit, who, though going out in disgrace, left a wake of glory behind him for future ages to glory.

"Barye received the accustomed marks of distinction from art authorities, but they neglected to encourage his genius. The personality of Barye, as shown in his works, was repellent to all prevailing art interests, and the principles upon which those works are made are almost wholly ignored.

"It was a personal, not a national influence that recognized Rodin. A few artists saw his merits and had the courage to extol him. It was an unusual independence. It came from the part of Turquet to have anything to do with Rodin, as he ran the risk of offending all of our art authorities. Turquet was an independent in all art matters, and acted for the interests of the best art. He did an immense deal of good; was a valiant friend of Rodin. There was no compromise. The Salon jury would only give Rodin a third class medal, while he ought to have had the Medal of Honor when he exhibited 'The Age of Brass' and 'The St. John.' And Turquet bought the statues all the same. It is perhaps not too much to say that Turquet created Rodin. The commission for the door is the most important one of this century. Rodin made himself. His life has been a very hard one. I know by experience what it is to work for commercial sculptors. Nothing is more menial for a proud, sensitive, independent and simple nature. Rodin is all that, besides being a great artist. These sculptors move in a set, and I can't imagine anything worse than for a man who has made such a mark, or capable of making, a figure like 'The Age of Brass,' to be obliged to earn his bread by working for such employers. Yet Rodin was not alone. Brian, who made the finest piece of modelling in French sculpture, worked for commercial sculptors all his life. I remember when Rodin had only ten years and what with a meal to eat. But
it is in this way that much of the greatest French art has been produced. Belleuse was the most capable of Rodin’s employers, but he had no idea of the latter’s ability. The few, the sculptors, contents. "The Age of Brass," in 1877, and while Rodin was working for him, he not only neither expressed any interest or sympathy for Rodin, but said, when asked what kind of a fellow Rodin was, ‘Oh, he is a good workman, but he copies anything that he sees.’ After Belleuse saw that Rodin was making friends, he got him to work at Sèvres, and asked Rodin to make his bust, which Rodin did, and gave it to him. But even his greatest sympathy and interest for the subject of working did not please Belleuse, and the latter used to exclaim in half-indignation, ‘Sacred name of Rodin, he has worked for me for ten years, and I have not been able to print myself upon him. He will never be able to model as I want him. He is a very curious creature. He is the only human being of working for ignorant employers, there is the degrading influence of bad methods. How Rodin lived through it all, and escaped its demoralization is indeed a wonder to see. Many like him in his power, with immense individuality, and a taciturnity of purpose unpassed. The best half of his life was passed under these conditions. Night and Sunday work saved him from artistic and intellectual depression."

"Barye and Fremiet were both more fortunate, for they got clear of this servitude much sooner."

"France is desirously renowned in art, not by reason of a general art interest, but because of a few individuals. It is the same with Italy. The Renaissance represents centuries of Italian existence, yet it was made by a few men."

"France has never made her Debureaux, Baryes, Millet, Rudels, Fremiets and Rodins. They have made her, and in spite of herself. They have made the sky of French art luminous—by suffering."

"What is sweeter than human sympathy. These men had to wring it from the most inconsiderate. It is slyly, negatively, and with a steady intensity. They seem to me more than mortal.

"Some, they would, of course, be Rodin’s enemy; it was at the start, for he could not get into it. Seriously speaking, it can’t be blamed, for no school or art organization can do much for personalities like his. It is beyond their scope. Each must hunt it out for itself. Men like Barye, Millet, Rodin and others of similar nature, cannot be identified with any art organization, nor can the latter reach them. The purpose of a school of art, and all art societies, is to care for the average. They live, and are powerful for the day, but these men are forever. Schools are never sincere, sincere only with intentions."

"Genius has no worse enemy than those who assume to be learned. They nauseate others, either by schools or themselves; they observe, are inspired and grow. The growth and development of individuality is a personal matter. Our greatest men were not graduates of the School."

"Rodin has many enemies who say that his things are tortured shapes, without art, reason, logic, and as if all of the original minds. He is the only one of our sculptors who has a real understanding of the nude. His power of execution is prodigious. There is no one like him."

"The times, fortunately, have changed since forty years, more especially in regard to the writers on art. Then, there were but a very few who were not opposed to the great artists. Now, there are many who are on the look-out for, and are quick to recognize everything. That is the fashion. They found Rodin, they supported him, and did not hesitate to proclaim his surpassing merits, as well as to protest against the injustice done him by the Jury of the Salons."

"Millet had lived for three days. He had been for hard times, and had been said of all original minds. He is the only one of our sculptors who has a real understanding of the nude."

"We have never had a sculptor who is so intense as Rodin. Barye is often heavy, in spite of his power; perhaps, because of it. Carpeaux, though he has been called the most naturalist of the sculptors, and Fremiet, though the most distinguished mind in sculpture of modern times, and perhaps since many centuries, is sometimes almost dull."

"Do I think Rodin has had influence on the art of his country? Yes, a great influence, but in a quiet, though important way. He has already begun to cut a deeper mark upon his age than any other artist, and for these reasons: All the tendencies of his nature and work are natural and inspiring, just what all young and many old artists need, and have been long looking for. His work is nature, and that can be followed without fear or danger. It is the chief encouragement that students need, and it brings them the most joy in their labor. His work has an endless and safe attraction, a healthy stimulant."

"He was immediately felt and admired by the young artists and students of the School. He has been a great many quiet followers. Barye, for one reason or another, did not care for everything that he did. He does Fremiet. I don’t speak of the School, for no great sculptors have come out of it. Great artists, like Barye, Fremiet, Chavannes and Barye, never have. Rodin is an exception. He has given an impetus, in the urging to a regard for individuality and the more serious study of nature, that no other of our artists has been able to give. He is very human and sympathetic, and free of all conventionalism. He is the only sculptor talked about by the students, and thought about by older men. He is an encourager to individuality."

"The audacious life and truth and Rodin’s modelling has opened a good many eyes, of painters as well as sculptors. The fertility of his genius has been an inspiration to many."

"If Rodin’s influence was quiet, it is also slow, in a certain very significant sense. Slow, because his example is heartily acknowledged, his work is regarded, by many, as almost too strong and intense, and it will take a long time for it to be fully accepted. To any but very strong men his things are so great that they are demoralizing. The figures on the door are almost incredible. He is certainly one of the most varied and original sculptors in all art history."

"Rodin is original, without limit, clear and penetrating; generative and dramatic in his conception, delicate in sentiment, and rapid and powerful in execution. These qualities, pushed into art by an unsurpassed intensity, have enabled him to produce a new world of sculpture. A new and strange one, a beautiful, fertile, and emotional world; startling, authorizing its own existence."

"Rodin recognizes no filtered formula, however poetic or beautiful, but lives in the proofs and fruit of the observer’s mind. This is the high element of his personality is only equated by his loyalty to what he has lived."

"Not a decorative artist, like Michael Angelo, or Carpeaux, but the human thing, which makes them different. The last, the deepest seer of nature since Donatello. A terrible worker and a night worker. Among rude men by day, at night a companion of the stars. Reflecting no influence, and carrying the mark of no master. He corruscates himself, and is self-coruscating."

"If it is necessary to classify him, it would be among the Gothics. With him, as with them, it is life, first and last. He is an elemental force, a flow of new and reviving blood."

"He is a romantic, elements that the great composer has exceeded all moderns in joining music to words in their highest relationship, then the comparison is just, for Rodin’s passion and emotion and fancy are such as he has exceeded all modern artists. By his knowledge of the human form he has gained the right to revel with the imagination in unrestrained liberty. He knows the sensibility of the nude, and adores it in all its details. His modelling is correct, expressive and rich."

"With him art has no age. Excuses he does not need, his faults, necessary runs, have been his needed supports."
Rodin has been called "the greatest living sculptor of modern times," because his work has hitherto confined to single figures. He has also composed any images like that by Rodin on the Arc de Triomphe, or those by Carpeaux on the Opéra, and Palace of the Tuilleries. Great sonnets he has written in sculpture, but no epic poet in this is not complete. Because of this, and in face of all that he has done, cautious critics suspend conclusive judgment. "Wait until the door is done," they say; "then we will determine his place and destiny;" the fact, that every one of the hundreds of figures made for the door are complete compositions of themselves, often representing all there is of a given sentiment, and that as a whole, they comprise the entire range of feeling, critical and sarcastic, and can not have been forgotten by these timid friends of art. Even if these images were never put together in any composite correspondance, they would still form a logical, unique, though unconventional, poetic sequence of events in which the circumstances have surrounded them during the past ten years, that to-day, in the full possession of his powers, his sole ambition is to re-live the time in history of this year, and see the clouds and to come from the assembly of the immortals. He looks at you with two large, soft, yet piercing blue eyes that excuse the necessity of an introduction. He is a small man, blonde, with a fluvial beard, short hair, and fine hands with very simple fingers, and direct in all his movements. His voice is low, very agreeable, and he uses the simplest language.

In length Rodin stands about five feet and seven inches, and weighs one hundred and forty pounds. His head is large, passive, and his eyes are almost pure Greek, prominent nose, and projecting well out. The forms around the eyes are large and fine, strong chin, and firm mouth. He is slightly short-sighted, and wears glasses as he makes it.

Though living all his life in the studio, he is a keen, correct and large observer of men and things, and has gathered in the inevitable conclusions. He judges human nature as absolutely as he does art, on principle, mercilessly; on the score of sympathy, with the tender-ness of a warm and considerate heart. Fortunate in having neither taste for luxury, love of society, nor care for the world's applause, he has been all the better able to endure the monstrous necessities of his early life, and the prostitution of every art-sensibility that he desired to keep pure while working for his bread. Though tormented by a turbulent imagination, his eyes are tenaciously carried him安全 enough. Matter of art, he never violating his own nature, he has preserved himself. He has escaped the turmoil and complexities of modern life, and enjoyed to its full the best of encouragement, the invaible censure of every one.

Fortunate, also, in escaping the falsities of any regular system of art-education, he has not been obliged to unlearn that which bad sysytems have taught. His mind is of serious and pleasing character; confident in himself, he went ahead, blindly, as he knew, but always ahead, surrendering nothing, contiolling none.

If the memory of the misery of the first forty years of his life has left so bitter an impression that now, when he is fairly content, he can hardly realize the change, he makes no complaint nor finds fault with any. The philosophic healthfulness of his nature, the world of art, and the possession of the best of wives have long since confirmed him in the love of peace and work as the truest of earthly comfort. Never dreaming of attaining any great excellence in his profession, or occupying a high position in the world, he has submitted to his fate, and is content with the even chances of good and bad as they have happened. Professional slight are never disheartened, nor misfortune or abuse frustrated him. He has run his race, thinking of and seeing nothing but his god. Though he has found the highest happiness, and, as he joyfully says, "My years have been thus spent in pure delight. Happiness is found in one's self; work brings it." With these reasons, Rodin is, in the largest sense, the best of luck. Such a life is an ideal realism.

Rodin is bold, proud and simple. He has had something to say, and the good fortune to say it. Of nothing does he speak with so much force as to his own advantage. He is of a keen eye appreciative of results. One of his first art friends, who gathered around him in 1877-78-79. Those who have helped him when he needed help are "men of gold." Rodin has always been a great reader, not of novels, but of English and French poets. Always when he has a book in his pocket. He cares nothing for dates, knows little as to when exhibitions of his works took place, and rarely saves a catalogue. Never Agues anything before he is the most and most complete letters of business or friendship. It is extremely difficult to decide these matters, and as faithful and generous to his friends as he is to his art. He has little respect for the average art-intelligence, but believes in individual effort. He views with no mild concern the increasing prevalence of the younger generation. He has had more time; its disposition to cater to everything that is opposed to truth, serious study and good taste; its cowardly subservience to baste, love of money and vulgar of art.

He thinks that the world is easily pleased, and that the day for great things in art has passed; that the nerves and heroism displayed by such men as Millet, Barye and Rodin find little place in the souls of modern artists responsible for the art of the future. We have been of the latter, fully understanding the sculptor's merits, immediately transferring to us the most modern virtuosity, and the conditions, at his own studio, at his own pleasure, and at his own price.

In the same year, 1887, Rodin was appointed by the Minister of Fine Arts as one of the four sculptors who were to form a part of the State Art Commission for the great exposition of 1889.

In January, 1888, he received the long-delayed decorated of the Legion of Honor, through the influence of his old and ardent friend, Antonin Proust, former member of the Fine Arts. Two barquets were given in memory of this event: one by a select community of artists, and the other by eighty of the more distinguished artists and writers of Paris. The sculptor's praises were sung by no less than four poets of these occasions, and it is well believed that he has not lost all its taste, and that, with proper effort, a great future of art awaits it.

The private appreciation of Rodin has been rapidly on the increase during the past few years. In 1887, his old opponent, Sevres was discharged, and M. Deek was appointed in his stead. The latter, fully understanding the sculptor's merits, immediately transferred to himself the most modern virtuosity, and the conditions, at his own studio, at his own pleasure, and at his own price.

The nature and use of iron and steel.

The introduction of the use of iron into architecture has made possible a practically revolutionized modern architecture; the introduction of steel promises to make equally great changes. The cost of these materials is comparatively so much greater than the ordinary materials used, such as brick and wood, and, again, the uniformity of the steel is the cause of its great strength and the cost, that is, in use the smallest factors of cost are used; that is, the size of material used is very much more nearly equal to its ultimate strength than is the case with either other or less uniform materials. Where, therefore, we "run so closely to the wind," it is essential that the nature and use of the material shall be thoroughly understood by the architect, to avoid different kinds in building; namely, wrought-iron, steel, and cast-iron. Each has its uses and merits, and its disadvantages. All have their place in iron in different combinations. Their differences depend mainly on the amount of carbon they contain. The more carbon, the more brittle, harder is the iron. The less carbon, the more flexible and elastic, but softer is the iron. Wrought or rolled iron is the softest, that is iron in its purest form. As it combines with itself a small amount of carbon, it becomes soft steel. The absorption of more carbon makes harder steel, till finally it becomes cast-iron. Pure or real metallic iron does not contain carbon, and is a mixture of iron and carbon; it is of two kinds, cast iron and wrought iron.

Irons Ores.

Iron is derived from the various ores of iron, the chief of which are known as magnetite, red and brown hematite, limonite, siderite, etc. Various combinations of iron with oxygen, forming oxides; of carbon and oxygen forming carbonates; and of iron and oxygen forming hydrates. Other minerals, rich in iron ore, are found, but cannot be used in the manufacture of iron, on account of the large amount of sulphur which they contain as they contain, which, if present in the finished product even in the smallest extent, render it unfit for most uses.

In the manufacture of pig-iron, the ore—or preferable an intelligible iron—produced above a high temperature is reduced to iron by means of coke, or a mixture of both, as fuel, and limestone, or some substance like them. The reduction of iron takes place in blast furnaces, which are constructed of clay and bricks. The blast furnaces are about 60 ft. high, and about 14 ft. in diameter. The temperature of the blast is about 1600° F. It is stirred by a fan, and the hot blast is blown through the tuyeres at the bottom of the furnace, the air and smoke being removed up the chimney at the top. The iron is melted in the furnace, and flows down the sides of the furnace, into a cistern or reservoir, from which it is taken out. The blast furnace is a very ancient invention, and has been used for many centuries. The blast furnace is a very ancient invention, and has been used for many centuries.
eight cast or wrought iron columns, some 10 to 20 feet in height. These sustain a plate-iron casing enclosing the whole furnace from bottom to top, and are placed base to base over each other, with a short cylinder at the bottom, being thus somewhat narrower at the top and bottom. The bottom of the furnace is called the "thrust" or "bosh," some 20 feet to 30 feet above the hearth, some 12 to 18 feet high, and usually some 14 feet to 20 feet diameter, sometimes even 25 feet diameter. From here to the "throat" which is the extreme top, the furnace narrows down again, being some 10 feet to 15 feet deep or rather, the reduced area is inside with the lining of fire-brick, and the charging of ore, flux, and fuel is kept up constantly, and of course the fire and smelting process kept going, without stop, barring accidents, for many months at a time, and until the "cinder" or "slag" is completely cast out. The height of the furnace from the bottom, it is therefore, of a size that the state furnace iron of ferrous oxide.

The ensuing reaction in the furnace is, therefore, for all practical purposes, the reduction of this ferrous oxide (Fe₂O₃) when red hot by the union of carbon dioxide (CO) produced by the incomplete combustion of the fuel farther down the furnace. The iron gives up its oxygen to the carbonic oxide leaving metallic iron (which then takes up some carbon) and carbon dioxide, or CO₂, which passes away in the waste gases. It should be noted here that pure metallic iron is fusible at the temperature obtainable in the blast-furnace. Its combination with carbon, however, to the extent of from 2 per cent to 5 per cent renders it easily fusible, and constitutes the pig or cast iron. Were it not for this fact the blast-furnace would be impracticable, as can be readily imagined.

The micaceous silex, or other fluxes, is mainly, when melting, to effect the ready fusion or separation of the early ores of iron when oxides or "gangue" in the ore and to take up the ash remnants of the fuel. It is found that the earthy bases are most fusible to an extraordinary degree when they are present together in numbers. Further, the addition of lime takes care of the silex present in the ores, which otherwise would unite with the iron, forming silicates of iron, which, though fusible, are difficult of reduction, and further prevents to a certain extent the taking up of carbon by the reduced iron, thus entailing a waste in two ways. The ordinary gage or matrix of iron ore itself is clayey (argillaceous) or quartzose (siliceous). The addition of lime or limescale (or (pomolite) results in the formation of a "slag" which is readily fusible at the existing temperature. This slag, which cold somewhat resembles bottle-glass, is much lighter than the molten iron, and as collectives over it, is drawn off just before casting from the surface of the melted iron in the hearth in openings placed at the proper level, just below the crucible.

To undertake to enumerate all of the brands of pig-iron used in the United States is an almost insuperable task. A few, however, are more than usually prominent in the New York market are:

<table>
<thead>
<tr>
<th>Brand</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colden</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Shaleton</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Dallmington</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Steel</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Egerton</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Hillsgrove</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Gertshaber</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Clark</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Spears</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Cramer</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Strong</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Alice</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Clay</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Chastain</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Hazlehurst</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Cold Spring</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Leipsic</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Brier Hill</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Newhouse</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Poughkeepsie</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Gleenon</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Andover</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Taylor</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Bethlehem</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Stanhope</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Allentown</td>
<td>Used in blast furnaces</td>
</tr>
<tr>
<td>Eagles</td>
<td>Used in blast furnaces</td>
</tr>
</tbody>
</table>

All pig-irons are graded in three kinds, namely, Mill Iron, Foundry Iron and Bessemer Iron. Each of these is again sub-divided into the following six grades:

1. This slag forms the basis of the "mineral wool," largely used for various pur-poses.
3. Any foundry iron which is sufficiently low in phosphorus (not over 0.1 per cent) and silicon can be used in the Bessemer process.
The American Architect and Building News.

No. 287.

June 15, 1889.


"No. 1" is the best and strongest, "No. 2" the next best, and so on to the "White," which is the poorest quality. Grey irons contain more graphite and hence are fusible than white irons, which contain more combined carbon, and are much harder and more brittle.

If the pig-iron on fracture is dark grey with spots it is soft and will run freely into the mould, making a good casting but not a strong one. Black specks, if present, mean carbon. If the carbon in the iron is chemically combined, it will show white metal, with no spots, on fracture, in which case the iron is very hard and brittle and will not flow easily into the mould, but will make a very strong casting.

For rolling or mill work the most used are the Nos. 2 and 3, Grey Forge and Mottled. For castings the most used are the Nos. 1, 2 and 3 and Grey Forge of foundry irons; the Mottled and White being usually sold for cheap mill-work.

For steel from the iron should be as free as possible from phosphorus and sulphur, and the same, so far as possible, for rolled-iron. The presence of these makes iron fluid and soft and good for fine castings, but unsuitable for rolling or forging.

Iron for mill and steel work are usually much stronger than for foundry work.

Scotch irons are used in castings to make the melted iron more fluid, to soften it; but they greatly weaken the castings and are not used for ordinary architectural castings, such as columns, lintels, etc., or in the construction of the American iron mill. The strongest iron is usually used, and is the American iron, Nos. 1 and 2 of the latter in equal proportions.

Sloss (American) iron is now frequently used by manufacturers as a softerner in the casting of Scotch iron.

For good and yet strong castings, use Thomas, Crane, Copley, Strong, and Seamen's Scotches.

### Pig-irons.

Sloss or Scotch for extra fine castings. Or add Glendon, Secaucus or Castle for extra strong castings, using the Nos. 1 or 2 for the strongest work.

For rolled iron-work use Glendon, Andover, Taylor, Thomas, Stanhope, Allentown, Cornwall or Bethelhem. The latter two being used for steel.

There is a very strong and tough charcoal iron from South Carolina, but it is used mainly for car-wheels, being too expensive for ordinary work, other tough charcoal irons are made in many places in the South.

In every case the better qualities (Nos. 1 and 2) will, of course, give the best results.

Unwin compiles (from a paper published by Mr. Turner in the Transactions of the Iron and Steel Institute of 1883) the following tables of percentage, density and weight of cast-iron:

<table>
<thead>
<tr>
<th>Analysis of Cast Irons.</th>
<th>Combined Carbon</th>
<th>Graphite Carbon</th>
<th>Silicon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatest softness</td>
<td>0.15</td>
<td>0.1</td>
<td>2.5</td>
</tr>
<tr>
<td>hardness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>general strength</td>
<td>0.50</td>
<td>0.2</td>
<td>1.2</td>
</tr>
<tr>
<td>stiffness</td>
<td></td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>tensile strength</td>
<td></td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>crushing strength</td>
<td>over 1.0</td>
<td>under 2.0</td>
<td>about 0.6</td>
</tr>
</tbody>
</table>

### Mastications of Cast Irons.

<table>
<thead>
<tr>
<th>Material</th>
<th>Density</th>
<th>Weight per cubic feet in Bob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark-grey foundry-iron</td>
<td>1.60</td>
<td>405</td>
</tr>
<tr>
<td>Grey foundry-iron</td>
<td>1.70</td>
<td>450</td>
</tr>
<tr>
<td>Mottled foundry-iron</td>
<td>1.75</td>
<td>458</td>
</tr>
<tr>
<td>White iron</td>
<td>1.70</td>
<td>414</td>
</tr>
</tbody>
</table>

For wrought-iron Unwin gives this analysis:

- Carbon 0.02 to 0.25 per cent; Manganes 0.0 to 0.3 per cent; Silicon 0.0 to 0.2 per cent; Sulphur 0.0 to 0.015 per cent; Phosphorus the same, and Pure Iron 99 to 99.6 per cent.
- For steel, of course, the proportions vary greatly with the amount of carbon it contains.

Louis De Coppet Berg.

(The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; they hold themselves responsible for opinions expressed by their correspondents.)

THE HORSES OF ITALIAN STATUES.

Washington, D. C., June 10, 1889.

To the Editors of the American Architect:

Dear Sirs,—Your contributor in your admirable and interesting papers upon "Equestrian Monuments" remarks upon the family resemblance of the animal figures in the statues of Aurelius the Emperor of the Roman Empire. I have a curiosity as to whether you would not be interested in a question relating to the horses of the last emperors of Rome, or to the horses of the Horses of the Middle Ages under Colleoni and others. I remember that the Aurelius charger seemed to me very unsatisfactory till, seeing the monument itself at Rome, I was the opportunity to compare it with Roman horses used by Pliny in his carriage and for mounting the Papal guard. I think it clear that these black horses are of the same stock as the one which served the sculptor of the Aurelius as a model. They are greatly from the English blood horse, derived from the Barb by careful breeding. Yet it is to be remembered, in discussing the question, that the Romans of the Empire conquered and controlled for years the country of the Barb and of the Arab.

M. C. Merig.

AN EMPIRE TEST FOR LEAD.—The minutest quantities of lead in potable waters may be detected by a simple method. The apparatus needed is an ordinary tumbler and two perfectly bright and clean knife-edge needles fastened firmly in their handles. Fill the water to be tested up to a line marked, add eight or ten drops of acetic acid, and, in its absence, a teaspoonful of vinegar. If the water be quite turbid, double or even triple this quantity may be used. The water should be kept as temperature. If lead be present in the minutest quantity, in the course of a short time dark or black spots will appear upon the needles, and in the course of six or eight hours the entire surface in contact with the water will be covered with a gray coating, the depth of color of which will depend upon the amount of lead in the fluid. From time to time a deposit should be withdrawn and examined with a magnifying glass, if necessary, to determine whether or not a deposit is being formed. The same needle should be withdrawn each time, and one needle should be served for contact with the fluid. Cover the needle with a silk cap. After removal they should be placed in a dust-free box and left for twenty-four hours, as in cases where the amount of lead is exceedingly small a deposit may be formed which cannot be immediately detected, but which after standing for twenty-four hours becomes very perceptible, the color being a yellow or reddish yellow.—National Druggist.

SOAPSTONE AND ITS USES.—Attention is being called to the unpregutects used and preservative qualities of soapstone, a material which possesses what may be regarded as extraordinary qualities in withstand-ing atmospheric influences, those especially rich in minerals. An idea of the gigantic character of the work may be obtained from the fact that the amount of lumber consumed was more than that of the millions of feet, or, allowing the very considerable yield of 1,000,000 to each tree, not less than 9,000 trees were required. In the course of the fire there were 515 trees, the longest of these being 1,700 feet long, eighty-five feet high, and containing one-quarter of a million feet of lumber. Another tree is of the same height, and 1,200 feet long, the main timbers used in both of these being cut into 11 and 12 inches thick, together on the ground and raised to their position by horse-power. The number of trees in the course of the flame is eight, the longest of which is 3,100 feet, the timbers having a square section of 27 inches. In China, soapstone has long been largely used for preserving structures built of sandstone and other stones liable to crumble from the effect of the atmosphere, and the covering of powdered soapstone in the form of paint on some obelisks in that country composed of stone liable to atmospheric deterioration has been the means of preserving them intact for hundreds of years. —Exchange.

THE SAN DIEGO, CAL., FLUME.—It is claimed that the recently completed San Diego flume is the most stupendous ever constructed in the world, being only a little less than 36 miles long. An idea of the gigantic character of the work may be obtained from the fact that the amount of lumber consumed was more than that of the millions of feet, or, allowing the very considerable yield of 1,000,000 to each tree, not less than 9,000 trees were required. In the course of the flame there are some 315 trees, the longest of these being 1,700 feet long, eighty-five feet high, and containing one-quarter of a million feet of lumber. Another tree is of the same height, and 1,200 feet long, the main timbers used in both of these being cut into 11 and 12 inches thick, together on the ground and raised to their position by horse-power. The number of trees in the course of the flame is eight, the longest of which is 3,100 feet, the timbers having a square section of 27 inches. In China, soapstone has long been largely used for preserving structures built of sandstone and other stones liable to crumble from the effect of the atmosphere, and the covering of powdered soapstone in the form of paint on some obelisks in that country composed of stone liable to atmospheric deterioration has been the means of preserving them intact for hundreds of years. —Exchange.

288

THE EGYPTIAN ENCAUSTIC PROCESS. - In the older Egyptian mummies the face of the outer casing is usually modelled in relief, in a partly dry state, on the surface of the body. In the Roman Empire a portrait of the deceased was painted on a very thin piece of wood and then fixed over the dead face. It is very remarkable to find such coloring and skillful drawing in work of this late date, which must have been turned out of an ordinary undertaker's workshop. The portraits, both male and female, are most vivid and life-like; the ladies are mostly dressed in a purple garment and the men in white, with a red orphrey. The modelling of the flesh is very skilful, and in some cases the coloring reminds one of the Venetian school. It is quite evident that the artist of the small amount of interest in these paintings is their technical execution in the hot wax, or encaustic process, as it was called. The pigments were mixed with melted wax, and applied to the wood. The appearance of the surface of the painting, as is described by Vitruvius. The somewhat lumpy impuertos of the surface is due to the hardening of the wax in the air. The thickness of the surface of the painting, owing to the non-absorbing nature of the wood, the subsequent application of heat was not able to drive the wax below the surface, as was the case with oil. The process exactly like that which was so often used to decorate medieval pictures on panel, especially retables, or aonse, as the Venetians called them. - The Saturday Review.

THE OLD EGYPTIAN ENCAUSTIC PROCESS. - In the older Egyptian mummies the face of the outer casing is usually modelled in relief, in a partly dry state, on the surface of the body. In the Roman Empire a portrait of the deceased was painted on a very thin piece of wood and then fixed over the dead face. It is very remarkable to find such coloring and skillful drawing in work of this late date, which must have been turned out of an ordinary undertaker's workshop. The portraits, both male and female, are most vivid and life-like; the ladies are mostly dressed in a purple garment and the men in white, with a red orphrey. The modelling of the flesh is very skilful, and in some cases the coloring reminds one of the Venetian school. It is quite evident that the artist of the small amount of interest in these paintings is their technical execution in the hot wax, or encaustic process, as it was called. The pigments were mixed with melted wax, and applied to the wood. The appearance of the surface of the painting, as is described by Vitruvius. The somewhat lumpy impuertos of the surface is due to the hardening of the wax in the air. The thickness of the surface of the painting, owing to the non-absorbing nature of the wood, the subsequent application of heat was not able to drive the wax below the surface, as was the case with oil. The process exactly like that which was so often used to decorate medieval pictures on panel, especially retables, or aonse, as the Venetians called them. - The Saturday Review.

THE OLD EGYPTIAN ENCAUSTIC PROCESS. - In the older Egyptian mummies the face of the outer casing is usually modelled in relief, in a partly dry state, on the surface of the body. In the Roman Empire a portrait of the deceased was painted on a very thin piece of wood and then fixed over the dead face. It is very remarkable to find such coloring and skillful drawing in work of this late date, which must have been turned out of an ordinary undertaker's workshop. The portraits, both male and female, are most vivid and life-like; the ladies are mostly dressed in a purple garment and the men in white, with a red orphrey. The modelling of the flesh is very skilful, and in some cases the coloring reminds one of the Venetian school. It is quite evident that the artist of the small amount of interest in these paintings is their technical execution in the hot wax, or encaustic process, as it was called. The pigments were mixed with melted wax, and applied to the wood. The appearance of the surface of the painting, as is described by Vitruvius. The somewhat lumpy impuertos of the surface is due to the hardening of the wax in the air. The thickness of the surface of the painting, owing to the non-absorbing nature of the wood, the subsequent application of heat was not able to drive the wax below the surface, as was the case with oil. The process exactly like that which was so often used to decorate medieval pictures on panel, especially retables, or aonse, as the Venetians called them. - The Saturday Review.

THE OLD EGYPTIAN ENCAUSTIC PROCESS. - In the older Egyptian mummies the face of the outer casing is usually modelled in relief, in a partly dry state, on the surface of the body. In the Roman Empire a portrait of the deceased was painted on a very thin piece of wood and then fixed over the dead face. It is very remarkable to find such coloring and skillful drawing in work of this late date, which must have been turned out of an ordinary undertaker's workshop. The portraits, both male and female, are most vivid and life-like; the ladies are mostly dressed in a purple garment and the men in white, with a red orphrey. The modelling of the flesh is very skilful, and in some cases the coloring reminds one of the Venetian school. It is quite evident that the artist of the small amount of interest in these paintings is their technical execution in the hot wax, or encaustic process, as it was called. The pigments were mixed with melted wax, and applied to the wood. The appearance of the surface of the painting, as is described by Vitruvius. The somewhat lumpy impuertos of the surface is due to the hardening of the wax in the air. The thickness of the surface of the painting, owing to the non-absorbing nature of the wood, the subsequent application of heat was not able to drive the wax below the surface, as was the case with oil. The process exactly like that which was so often used to decorate medieval pictures on panel, especially retables, or aonse, as the Venetians called them. - The Saturday Review.

THE OLD EGYPTIAN ENCAUSTIC PROCESS. - In the older Egyptian mummies the face of the outer casing is usually modelled in relief, in a partly dry state, on the surface of the body. In the Roman Empire a portrait of the deceased was painted on a very thin piece of wood and then fixed over the dead face. It is very remarkable to find such coloring and skillful drawing in work of this late date, which must have been turned out of an ordinary undertaker's workshop. The portraits, both male and female, are most vivid and life-like; the ladies are mostly dressed in a purple garment and the men in white, with a red orphrey. The modelling of the flesh is very skilful, and in some cases the coloring reminds one of the Venetian school. It is quite evident that the artist of the small amount of interest in these paintings is their technical execution in the hot wax, or encaustic process, as it was called. The pigments were mixed with melted wax, and applied to the wood. The appearance of the surface of the painting, as is described by Vitruvius. The somewhat lumpy impuertos of the surface is due to the hardening of the wax in the air. The thickness of the surface of the painting, owing to the non-absorbing nature of the wood, the subsequent application of heat was not able to drive the wax below the surface, as was the case with oil. The process exactly like that which was so often used to decorate medieval pictures on panel, especially retables, or aonse, as the Venetians called them. - The Saturday Review.
This is a peculiar combination of indestructible gums with an oily solvent which prevents the penetration of water into either bricks or mortar; it greatly improves the appearance of brickwork, giving it a rich effect, free from gloss: the white efflorescence of salts on the surface and the formation of fungus is prevented: as it is much more impermeable to water it is far better than linseed oil, and it is not destroyed by the lime of the mortar: we can recommend it for use on chimneys, as it will prevent their disintegration by driving rains, while superior to the best paint for this purpose, it is also more economical.

Address: orders and inquiries to:

Samuel Cabot, 70 Kilby St, Boston
Also manufacturers of creosote stains & antipyre
TOWERS.
JUNE 22, 1889.

Entered at the Post-Office at Boston as second-class matter.

S U M M A R Y:
The Use of Structural Steel.—The Electric Current and the Death Penalty in New York.—Tests of Roofing Slates.—Theatrical Machinery.—The Ethics of Competitions as understood in Bueno Ayres.—A Private Electric Railway in Scotland.—Attendance at the Technical High School at Berlin.—A Large Naval Steam Engine.

B U I L D E R S' H A R D W A R E. — XXVIII.

L E T T E R F R O M C H I C A C O.

I L L U S T R A T I O N S:
Extension to the Adams House, Boston, Mass.—Bretton Hall, Cheshire; Bramshill, Hampshire; Moreton Hall, Cheshire; Crew Hall, Chesire.—Dining-hall at L'Hommeaux.—The Tombs of the Scaligers, Verona, Italy.—Portion of the Tomb of Can Signorio, Verona, Italy.—Monument to the Duke of Brunswick, Geneva, Switzerland.—House at Manchester, Vt., for E. F. Isham, Esq., Chicago, III.—House of George M. Jones, Esq., Greensburgh, Pa.—House of J. E. Jones, Esq., Boston, Mass.

L E T T E R F R O M W A S H I N G T O N.

L E T T E R F R O M C A N A D A.

L E T T E R F R O M Y O N K E E.

E G R E S T I A N M O N U M E N T S. — XVII.

B U I L D I N G L A W.

S O C I E T Y N O T E S.

T R A D E S U R V E Y S.

A QUESTION of extreme importance to architects in this country has recently been raised in Europe, and seems to be of some interest to us. The Government of Roumania, having occasion to build two great bridges over the Danube, procured designs from native engineers, and had them worked out in detail, and then found itself confronted with the question whether it would be better to use steel or iron in their construction. The Roumanian engineers, who are mostly educated abroad, do not lack skill, and in this case they showed in a signal manner that they possessed, what is, if possible, better than skill, modesty and common-sense, for, instead of evolving from their moral consciousness an opinion as to the relative merits of the two materials, they frankly confessed that they did not know, and that very few men did know, which one was the safer. It is true that iron, steel would be the safest and best for the purpose. The Roumanian Government, therefore, sent to the General Council of the great French semi-military corps of the Ponts et Chaussées, asking for its advice on the subject, on the ground that the French engineers were more familiar with the question, and had better opportunities of judging, and that their opinion would, therefore, be of more value than that of the native professional men. In response to this request, the Council of the Ponts et Chaussées appointed a commission of three members, who not only prepared a careful opinion, based on French experience, but made a number of original experiments, to determine obscure points, and consulted foreign engineers known to have had exceptional opportunities for forming opinions which would be of value. The result of all these investigations was presented in a report, which has been printed in the Annales des Ponts et Chaussées, and is certainly the most important contribution to the literature of construction which has appeared for a long time. After recalling the disastrous failures which followed the early attempts to substitute steel for iron in construction, and which are familiar to architects, the report says that the manufacture of mild steel has of late been very greatly improved, so that the lack of homogeneity, which led to most of the early accidents is now not much to be feared, while the methods of rolling and working, and particularly of riveting, have also been modified to suit the peculiar qualities of the material, with signal success. At the same time, the price of steel has been lowered until it is now in Europe about ten per cent more expensive, weight for weight, than rolled-iron. Under these circumstances, the commission says that "both for naval and civil constructions steel of good quality may, in a great number of cases, be used with perfect safety of rolling. Case presented to it, of the bridges across the Danube, the conclusion says that for the wide spans, which are crossed by girders more than five hundred feet long, it would be particularly desirable to use steel, not only for economy of money, since the necessary strength could be obtained with forty per cent less weight of steel than of iron, and even at the European price of steel would cost considerably less; but because the load on the piers, which stand on very soft ground, would by the use of steel be considerably diminished. For the short side spans the gain by using steel would be much less, and here it advises that the option should be left with the contractors to obtain the required strength with either iron or steel, but it remarks that even for these the steel would be more reliable, if not cheaper, since the manufacture of rolled-iron has, in its opinion, deteriorated about as fast in Europe as that of steel has improved. With us, it is probable that the manufacture of iron in the best mills is still kept up to the high American standard, and we are not sure that the steel-mills here have improved their processes as much as those in Europe, but the prices fixed by the rolling-mill combination are here the same for steel as for iron, for equal weights, and we can afford to allow a considerable margin for uncertainty as to the quality of the steel, and still save a good deal of money by its use. The subject is so extremely important that we hope it may occur either to the revived American Institute of Architects, or to the Society of Civil Engineers, to collect some reliable information of the kind in regard to American structural steel, before another year has gone by. If we are not mistaken, some tests have been recently made of steel manufactured at the Massachusetts Institute of Technology, under the direction of Professor Lanza, and the results of these will certainly be of the utmost value.

A CURIOUS matter of jurisprudence is under discussion in New York. A law went into operation there on the first of January, abolishing executions by hanging, and ordering the substitution of death by electric shock. The first person who has had an opportunity of trying the new plan is one Klemmer, who murdered somebody, probably without taking a great deal of trouble to do so, and in a most pitiful and painless way, and has in consequence been condemned to lose his own life by the least unpleasant process that science has been able to devise, as a means of deterring others who may be contemplating the slaughter of their fellow-men. Fortunately, the law, for Mr. Klemmer, who was found guilty of murder by a jury. Unfortunately, for people who do not wish to murder any one else or to be murdered themselves, a powerful influence is, it is said, being exercised to have the sentence commuted, or the method of execution changed, the plea urged being that the Constitution forbids the infliction of "cruel or unusual punishments"; but the fact that a poor and friendless murderer is able to command the services of some of the ablest and most expensive lawyers in the State in defending such a worthless and ridiculous plea indicates, to the mind of experienced persons, that some wealthy corporation has found it for its interest to obstruct the course of justice, and public opinion points to the electric-light companies, which are said to fear that the connection of electric currents and judicial executions in the public mind may injure the sale of electricity. Whether this idea is well founded, we cannot say, although one would think that the almost weekly deaths of innocent persons by the electric current might tend to prejudice the public against it, and thus create the danger of that of a condemned criminal; but if Mr. Klemmer should save his life by a lucky chance, or, rather, we suppose we should save his, his nerves by this interference, we hope he will be placed on exhibition as an example of what the electric-light companies can do in the way of saving life when they find it for their interest to exert themselves in that direction.

THE Wiener Bauindustriezeitung, one of the most useful technical journals which comes to our office tables, contains some tests of the quality of roofing-slates, which are new. It seems that an important lawsuit against a contractor turned
to some extent upon the quality of the slate used on the roofs of a row of houses, and an expert chemist was appointed by the court to examine the slate, and give testimony concerning their quality, and concerning the properties of roofing-slate in general. About thirty or more, and builders knew, much with certainty. The result of his investigations is well worth remembering by every one who has to do with roofing-slate. He found that, as a rule, all slates contain fine lines, running parallel with what may be planes of secondary stratification or of crystallization. By holding a roofing-slate a little below the eye, and inclined from it, these lines may be seen. If they run parallel with the long side of the slate, this is properly cut, and, if of good quality, will keep its place in the roof. If the lines run across the slate, or at an angle with its sides, it is likely, whatever the quality, to break across, or lose a corner, at a very early period. The yellow chemical, contrary to the usual belief, gives no reliable indication of the quality of a slate. A better test consists in striking them together, or tapping them with a hard substance. If they ring clearly under this treatment, they are likely to be good, and a dull sound on percussion generally shows a poor slate. The familiar experiment of setting the slates upright in a dish of water, and noting how far the water ascends by capillary attraction in the substance of the slate, is still one of the best tests that can be made. In a good slate the water should rise only slightly above the surrounding surface. A slate which draws the water up to a considerable height should be avoided, as likely to be destroyed by frosts and weathering. Some slates, apparently hard and non-absorbent, decompose on exposure to the air, by chemical action. These are best detected by placing samples in test-tubes, and covering them with a solution of sulphurous acid. The slate will begin in a few days to crumble away, while a good sample will resist the action of the acid for weeks, or even months. If a portion of the slate to be examined, when powdered, and covered with muriatic acid, effervesces strongly, the presence of carbonate of lime is shown, and the slate should not be used. When a powder sample, when powdered, and heated in a test-tube, gives off a yellow sublimate of sulphur, with a smell of sulphuric acid, the slate contains iron pyrites, and will not be durable on a roof.

MAMY gives, in La Construction Moderne, some more detail of theatrical machinery, which may be of use to architects who have theatres to build and furnish. Speaking of the snow and rain of the stage, he says that the imitation of the natural phenomena is not usually very perfect. For the snow, employ a long wooden box, packed with cotton-wool, which is crumbled at intervals by partitions of wood or sheet-iron, through which small pebbles or dry peas are allowed to descend, with a noise faintly resembling that of a shower. Snow, on the stage, usually consists of bits of paper, thrown down from above. The illusion is anything but perfect, but the better substances, such as portions of wool or cotton batting, are too expensive for use. One would think that wood-fibre, as prepared for paper-making, and bleached, might be a cheap and good material, but we do not know that it has ever been tried. Great improvements have recently been made in stage artillery. The old fashion was for the actors to fire blank cartridges at each other, but occasionally a ball-cartridge would get into the guns, to the detriment of the person happened to be standing in front of them, and one actor was killed on the stage merely by the wad of a cartridge supposed to be perfectly innocent. For this reason, in well-regulated theatres, the actors are not now allowed to fire blank cartridges at each other, but must fire in the air, and the guns are all loaded by the stage armourer, and are only fired once, for fear of some mischance, so that a large number of guns is required. By the new system, invented by M. Philippe, Secretary of the Bouffe-Parisiennes, the guns are loaded on the stage, before a gun is fired, which carries a needle at the end. The piece is loaded by compressing the spring, which is retained by a simple mechanism, and inserting in the muzzle a cork, which contains a charge of fulminating mercury. On pulling the trigger, the spring is released, and the needle strikes the fulminate, which explodes the powder and the cork. They can be used for the protection of each screw, but one screw can be stopped altogether if the vessel is to be turned around, or, for ordinary sailing, one engine only may be used for each screw; but, in case it should be necessary to increase the speed, the other engines can at once be connected and the full power exerted. As usual with naval machinery, the work is done by putting in more wood at the bottom. On the "Sardagna" there are less than twenty compound auxiliary engines for feeding the boilers, keeping up the draught, and so on, besides a great variety of single-cylinder machines.

It is rather a comfort to think that there is one place in the world where the ethics of competitions are as little understood, or regarded, as in this country. This benighted place is Buenos Ayres, where a competition was invited last year for the most perfect window-blind, and the Goverment was to hand in, on the first of January, and on the appointed day three architects submitted designs. All these, on examination, were pronounced unsatisfactory, and a new competition was called for, to close on the first of April. Eleven architects responded to the second invitation, and, after a suitable time had elapsed, they may not have noticed that the Goverment was not interested in nothing more about the competition, but to have its plans drawn by the official architect, and they could have their drawings back by sending for them. The Deutsche Bauzeitung thinks that this is a warning against engaging in foreign competitions, and that architects, if they have to compete for a prize, and are being beaten by us, who are much worse off than the German architects in this respect, to make up our minds quickly not to submit any longer to the South American method of conducting such affairs, and take steps to enforce our decision.

HOUSE in Scotland has been provided with a private electric railway, to convey its inmates to and from the railroad station, which is about a mile and a quarter away. Power is obtained from a waterfall some three miles off, by means of a turbine wheel, attached to a dynamo, and giving a current of forty amperes, at four hundred volts pressure. The conductors are bare copper wires, making a complete metallic circuit. The conductors along the line consist of soft-iron rods, supported above the sleepers, and insulated. The line is of thirty inches gauge, and a handsome car is provided, which can be run at the rate of thirty-five miles an hour. Although the railway is principally used for communication with the station, they have been arranged so as to give a view of the purposes of the farm. One would think that a line of this kind might be advantageously employed as an addition to the conveniences of our own mountain hotels. There are places where the transit from the station to the hotel is made by crowded and uncomfortable vehicles, which could be replaced by an electric car, driven by water-power, at a great saving of expense, and with increased satisfaction to the public.

ONE of the most famous technical schools in Europe is, as was lately shown in the American Architect, the Technical High-School in Berlin, which graduates architects, as well as engineers, mechanical engineers, designers in constructive engineering, three hundred and twenty-three were mechanical engineers, eighty-four studied naval engineering, and one hundred and five took the general courses in mathematics and natural philosophy. For the instruction of these students there were sixty professors, twenty-seven tutors and eighty-eight assistants. The students appear to come from all parts of the world, one hundred and twenty-three being foreigners. Eleven of these were from England, ten from Romania, thirty-five from Russia, two from Siam, two from Japan, twenty-five from Norway, and nine from North America.
BUILDERS' HARDWARE.—XXVIII.

HOO.KS.

Besides the hooks described in the last chapter, there are other forms which cannot be classed as closet hardware. Figure 417 illustrates several varieties of brass screw-hooks. A is made in nine sizes, from 1/2 to 2 inches long. The same form is made with a sharp-pointed shank instead of a screw, intended to be driven into the wood. B is known as a cup-hook, intended to go on strips to receive cups, which are hung by the handle over the hook. This form is made in five sizes, from 1 1/2 to 2 1/2 inches long. C is termed a looking-glass hook. D is an acorn-hook, made in six sizes, from 2 to 4 1/2 inches long. E and F are both picture-hooks. The former is made in six sizes, from 3 inches to 1 1/2 inches. Figure 418 represents a hook similar to the preceding, but with a longer shank, being made in seven lengths, from four to ten inches; it is designated as a bird-cage hook.

Picture-moulding hooks are made in quite a variety of shapes, a few of which are shown by Figure 419. The most common form is the second one on the upper row, it being made to match the common stock picture-moulding. A very serviceable hook, not illustrated here, is made with flat brass, with the ordinary contour, quite broad at the top where it fits over the moulding, but narrowing at the bottom to receive the cord or wire. Moulding-hooks are usually made in three sizes, and are always of brass or bronze. Chandelier hooks, Figure 420, are intended to screw through the lath and plaster into the ceiling beams or the furring, the screw part being 2 1/4, 4, 6 or 8 inches long. Figure 421 shows a chandelier-hook provided with a catch, so that nothing can slip out when once hooked. Hammock-hooks, Figure 422, are made of 3/4 inch galvanized or tinned wrought-iron. Clothes-line hooks, Figure 423, are also sometimes used for hammocks, though less suitable on account of the friction of the rope in the hook. A lighter form of clothes-line hook is made to be attached by two screws. These hooks are made in three sizes.

Awnig-hooks, Figure 424, are made to drive into the wood, and be caught in eyelets in the awning. They are manufactured in sizes from 1 1/2 to 6 inches.

BRACKETS.

Shelf-brackets have been previously discussed. Some form of inclined bracket is often desirable to support the side-rail of a flight of stairs. One of the simplest consists of a bent plate, Figure 425, screwed to the wall on an angle, so as to bear against the under side of the rail. A better form is screwed to the wall in a vertical position, and has a swiveled bar or plate which adjusts itself to any angle of the stair-rail. Figures 426 and 427 illustrate two styles. Similar brackets are made with fixed rail-plates, and there are a number of varieties in the market differing from those described chiefly in regard to finish.

Bar-rail brackets, Figure 428, are intended to support a round rail such as is usually carried across the front of a bar-room counter. The first form shown is sometimes used to support a round stair-rail, and when made of plain bronze, presents a very good appearance. A bracket like the second form is sometimes used to support an iron foot-rail at the base of a bar or counter.

All these brackets can be had in either bronze or bronzed iron.

LETTERS AND PLATES.

Very few styles of letters and numbers are kept in stock by hardware dealers. Plain, Roman characters, Figure 429, are usually the only ones on hand. They are in seven sizes, from 1/2 inch to 3 inches high, and are secured to the door or the woodwork by bit-tacks, soldered to the back of the pieces. They can be had in either bronze, brass or nicked-plate.

Letter-plates are often used to cover the letter-slot through office-doors. Figure 430 shows one style, with a recessed slot protected by a hinged flap. This is essentially what is commonly employed. On fly-doors some form of plate is desirable on each face of the door to prevent the paint from being soiled, and such plates are often marked "push"
or “pull.” They may be of porcelain, iron, bronze, brass or nickel-plate, the first material being the cleanest and most easily cared for. They are made in all varieties of design, but are in principle too simple to require any illustration.

Label-plates are made to order in porcelain quite extensively for druggists’ drawers. There are also plates manufactured to go on drawer-fronts and receive card-labels, the upper part of the plate being thinner than the rest, so that the card can be slipped in from above. Figure 431 will illustrate the general form of a label-plate. The neatest style has a plain, rectangular outline in bronze. Label-plates are made in several sizes from about 1 x 2¼ inches to 2 x 4 inches.

Figure 432 shows a plate a little foreign to the present topic, it being used to stiffen the joints of light screen-doors. It is provided with tongues which enter firmly into the wood in each direction, and prevent any sagging or settling. The plates are sold in sets, each set including six-corner irons and a knob or handle, with the necessary screws. The list-price is $5 per dozen sets, in bronzed iron.

**FOOT-SCRAPERS.**

Foot-scarpers are used much less than formerly. A simple form, consisting of a thin-plate supported by one or two plain drive-shanks is always advisable, however, for the piazza of a country house. Figure 433 shows a more elaborate scrapper, intended to be screwed to the floor or step. A form often seen in some parts of the country, Figure 434, is set in a pan or dish, intended to collect the scrapings. The other varieties found in the market differ only in design or finish, but not in principle. Foot-scarpers are usually of japanned cast-iron.

**BELL HARDWARE.**

The subject of bell-fittings is too extensive to be considered very fully in detail, especially as bell-hanging is a trade by itself, and the house-carpenter has usually very little to do beyond hanging the simplest kind of kitchen-bell or fitting a gong to the back-door. The front-door is fitted with a bell-pull, as explained in the chapter on knobs. This is connected with wires which usually are carried down to the cellar-ceiling, and across and up to the kitchen. The corners are turned by the aid of bell-cranks. Figure 435 shows the form of crag generally fitted just inside of the bell-pull, and Figure 436 shows a complete set of bell-hanging fixtures, including the bell, which is secured to the wall by a spike driven through the centre of the spiral coil. The elasticity of the coil and the connected spring is so great, that when the fixtures are properly set, the least pull at the front-door will cause the bell to ring. Figure 437 illustrates a different form of bell-carriage, made by the Russell & Erwin Manufacturing Company.

For the back-door it is customary to use some form of gong which can be screwed to the inner face of the door. In the cheapest makes the bell-strike is operated by a handle on the outside, which on being drawn down, releases a spring-hammer. Some gongs are made so as to give a double-stroke. Figure 438 illustrates a double-stroke bell which works with a pull instead of a lever. There is, also, in the market a bell provided with a spring escapement which is set by pulling the handle, and gives a continuous ring like that of an electric-bell, lasting about five seconds. This is known as “Bushby’s Escapement Bell.”

**GATE-FIXTURES.**

Ordinary strap-hinges are sometimes used for gates, and there are a few forms of heavy wrought-iron butts which also answer for the purpose; but there is in the hardware market quite a variety of fixtures especially devised for gates, and the
special forms are usually preferred. Gate-hinges are always arranged to be self-closing, generally acting by gravity. Shepard's St. Louis pattern, Figure 439, has the bearing-surfaces of the lower hinge made on a sharp incline, so that when the gate is opened, it is lifted bodily, and descends in closing. This principle is embodied in several different patterns. It, of course, permits the gate to open only in one direction. With

"Seymour's" hinge, Figure 440, the gate is practically suspended from the upper pivot, and bears laterally against two pivots at the bottom, so spaced, that when the gate is open, the bottom is thrown out more than the top, and its own weight is sufficient to close it. Figures 441 and 442 are variations of the same principle, a simpler application of the idea being shown by Figure 443. All of these will open both ways.

GATE-LATCHES.

A very common form of gate-latch is shown by Figure 444. It consists of a bent lever which is mortised through the gate-frame, the bolt catching in a strike on the post. A spring keeps the bolt thrown out, and the beveled strike permits the latch to be self-closing. With a strike which is beveled each

way, this latch can be used for a double-swing gate. Figure 445 shows a latch which is very commonly used with gates swinging only one way. The catch acts by gravity alone. Figure 446 represents a gravity, mortise catch. The latch shown by Figure 447 is planted on the face of the gate-frame, and works with a spring. The latch, Figure 448, is planted on the edge of the gate-frame, which has to be kept cor-

respondingly away from the post. The Yale & Towne Manufacturing Company has a somewhat similar gate-latch, Figure 449. Both are opened by pressing down one of the arms. "Seymour's" cylindrical gate-latch, Figure 450, is mortised through the gate-frame, and opens when the handle is depressed.

There are many other styles of gate-hinges, but few which differ materially from those we have considered.

[To be continued.]

PARADOXICAL as the remark may appear, it is at this moment difficult to guess whether the era of very high buildings in Chicago has ended, or whether it has just begun. From the old-time four-story office-building, the number of floors slowly crept up to six, then eight, then ten, and now thirteen and fourteen stories seem about to be abandoned in the proposed new gigantic structures of sixteen. However, on the other hand, the city fathers have been revolving in their minds if they shall not take a hand in the matter and stop such "sky-scrappers," so that as this letter is written an ordinance is pending, which, if passed, will practically end the construction of general office and commercial buildings over nine or ten stories in height. Since the completion of some of the high buildings there has been some complaint and many newspaper articles relative to the absence of sunlight in some of the streets and offices lined by these huge constructions. Between the shadows cast by these buildings and the pall of black smoke continually hanging over us, the sun has been almost banished from some of the business portions of Chicago. As a result of the lamentations, the matter has been under consideration by the Common Council for some time, and several schemes have been proposed, notably one, that no building should be erected whose height exceeded the width of the street upon which it was situated. This, however, has been somewhat modified, so that the ordinance, as it will be presented to the Council for action, while taking into consideration the different widths of the streets, does allow a slight excess over such width. But in no case

Fig. 441. Gate-latch, Shepard Hardware Co.

Fig. 442. Gate-latch, Shepard Hardware Co.

Fig. 443. Gate-latch No. 20, Shepard Hardware Co.

Fig. 444. Mortise Gate-latch, Ireland Mfg. Co.

Fig. 445. Broad's Patent Gate-latch, Ireland Mfg. Co.

Fig. 446, Gate-latch No. 2. Fig. 447. Seymour's Gate-latch. P. & F. Corbin, Shepard Hardware Co.

Fig. 448. Gate-latch No. 20, Shepard Hardware Co.

Fig. 449. Leeds's Gate-latch. Yale & Towne Mfg. Co.

Fig. 450. Seymour's Cylindrical Gate-latch. P. & F. Corbin.

SIXTEEN-STORY BUILDINGS.—PROPOSED ORDINANCE TO RESTRICT THE HEIGHT OF BUILDINGS.—THE TACOMA BUILDING.—A PATENT AND CLAIM FOR ROYALTIES.—THE OWINGS BUILDING.
can any building (towers, spires, etc., are excepted) extend over 312 feet above the sidewalk line without the written consent of one-half of the property-owners on both sides of the street in which such building is to be erected? Within a few days this question will undoubtedly be decided, since (however questionable the act may be) a permit for one of these new high structures has been refused by the Common Council. What the decision will be is a very uncertain matter, as both sides claim that they are sure of victory; but, should the ordinance be passed, there is no doubt but that the question of its legality would very shortly be before the courts. Now that the camera has been four or five of these gigantic structures shooting up sixteen stories into the air. Should the promoters of these buildings be unable to obtain the requisite permits, or, should the property-owners decide to insist on their rights, the case would probably, in the event of a trial, be concluded in favor of the city, and in the event of a trial, they would be forced to give up without a struggle.

For the past few years many conservative people have been asserting that no more office-room was needed in Chicago, but each year larger and more magnificent buildings have been thrown up, taken to be by desirable tenants, and still the work continues without any apparent abatement. Not only are new and magnificent buildings constantly going up, but, except for the ground-floor, many of the older buildings are finding it necessary to add additional stories put on. Offices that are either dark or difficult of access are a drug on the market, and owners of old buildings are, to their sorrow, beginning to recognize this fact even more than ever since the first of last May, when two more new, large and well-arranged buildings were thrown open to the office-renting public.

The Tacoma Building, thirteen stories high, at the corner of Madison and La Salle Streets, has probably been the subject of more comment (both intelligent and unintelligent) than any building lately erected in that district. The construction of the front of the two-story portion is of brick, and, therefore, an architect in Michigan for the building. An exact copy of the iron framework, the exterior and floor, and throughout every story to the cornice. This method of construction is said to be such an easy and practical one that has been employed here and probably in other cities for many years. An account of a special piece of such construction was published in one of the Eastern engineering papers some six years ago, but lately an architect in London has repeated the same. The iron columns, it is said, have been used in Chicago, although in this case it would seem as if it had been reduced to its last expression, since most of the piers have only one thickness of either brick or terra-cotta around the iron core. The window-space is thus increased to its utmost. Large bay, also of iron framework, covered by terra-cotta, project from the second floor and extend through every story to the cornice. This method of construction is said to be so frequent and widespread, that it has been feared there is to be frightened into paying a royalty. The owners of the Tacoma Building duly received notice that it was an infringement on this patent, and that they would have to pay a royalty. At last reports, however, the patentee has not considered it advisable to press his claim.

The rooms of the building in question are extremely irregular in shape, but every portion of the building is well lighted and without a dark corner. As is well known, the exception of the elevators, being too small, the method of planning has been a great success. Built avowedly as a money-making scheme, and every consideration of looks made entirely subservient to that of utility, it is likely to be a failure in its exterior looks as well as its uses. It is exactly what it purports to be—straightforward construction repeated story after story, and covered with brick and terra-cotta, with a little artistic treatment in the upper stories. In place of the loggias are introduced. Apropos of this building and another of somewhat similar character now being erected, one of the city papers remarked: "Beauty and prominence were the high aims of ancient architecture; for this the labors of many men for many years were thrown into a single structure. From the modern economic standpoint such labor was buried, since it never became self-aggrandizing in the form of capital. Chicago utilitarian are not given to applauding the shades of the Greeks or Romans, or to make burnt offerings to bygone ideals. Chicago is notably fireproof, and, although lines of beauty in arches and columns are all very well, the thought is to be determined from getting his money's worth by any frivolous objections made by devotees of the aesthetic... These buildings, in justice to the builders and architects, must be viewed as nobler more or less than huge modern building schemes in what may be called common municipal architecture, where space, light, convenience and safety are essential."

This is really the key-note to all of these huge buildings already built or about to be built. They are specimens of "commercial architecture," and as such they are unquestionably a success; but, when viewed in any other way, it takes the most deceiving drawing from impossible points of sight, and with impossible sunlight and shadow, too, such a drawing upon within hailing distance of the artistic. The interior of "The Tacomas" is plainly finished in oak, with a high white marble wainscoting in the halls. Nearly every room or suite of rooms has its vault, and all are furnished with ceiling covered with embossed and painted designs in color, and which are light, and not so great cumber-son things, have the styles and rails covered on both sides with light bronze-work, making a pretty effect in a manner as yet new here. At one time it was not being to utilize the attic, except for pipes, tanks, etc., but eventually it was decided otherwise, and the heavy iron water tanks, although in place nearly two hundred feet above the sidewalk, were bodily raised eighteen feet and placed on the roof—a feat which the contractors declare to be the highest job of raising ever done in the world. It may be interesting to note that the average price of rental per square foot of floor-space (above the second floor) is not far from $1.45.

The other new building, "The Owings," has already gained, even outside of Chicago, a notoriety on account of an accident that occurred there a few months ago. This building presents much more claims to the picturesque than "The Tacomas," and, moreover, it has been fortunately so placed, on a corner, that its best feature can be seen from a distance, and to the very greatest advantage. It has a steep roof, gables and a corner-tower, but the eleven stories of "commercial architecture" before arriving at the cornice are a severe strain on artistic effect. However, architecturally, it is probably the most satisfactory building yet constructed of its kind. The exterior is a combination of stone, brick and terra-cotta, but all in a gray tone which has nothing bright or pretty about it, and materially detracts from the general effect. The best feature of the building is the main entrance, with a large Gothic pediment extending up through two stories, and elaborately carved.

The ground-plan of the building is small, scarcely larger than the auditorium tower, but the rooms seem to have been economically arranged.

---

**Illustrations**

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

**Extension to the Adams House, Boston, Mass.** MR. W. WHITNEY LEWIS. ARCHITECT, BOSTON, MASS. [Heliochrome, issued only with the Imperial Edition.]

BREReton HALl, CHEShIRE; BRAMShill, HAMShIRE; MOREton HALl, CHEShIRE; CREWE HALL, CHEShIRE. [Issued only with the Imperial Edition.]

_AGE_ FRANCIS I. THE DINING-HALL, CHENONCEAUX. [ Issued only with the Imperial Edition.]

**The Tombs of the Scaligers, Verona, Italy.** See article on "Equestrian Monuments" elsewhere in this issue.

**Portion of the Tomb of Can Signorino, Verona, Italy.** See article on "Equestrian Monuments" elsewhere in this issue.

**Monument to the Duke of Brunswick, Geneva, Switzerland.** M. J. FRANCI, ARCHITECT. M. CAIN, SCULPTOR. See article on "Equestrian Monuments" elsewhere in this issue.

**House at Manchester, VT.*** For E. S. Isham, Esq., CHICAGO, ILL. MR. F. W. STICKNEY, ARCHITECT, LOWELL, MASS.

**House of George M. Jones, Esq., Greensbrough, Pa.** MR. J. A. DEMPWOLF, ARCHITECT, YORK, PA.

**House of J. F. Sinnott, Esq., Rosemont, Pa.** MESSRS. HAZLEHURST & HUCKEL, ARCHITECTS, PHILADELPHIA, PA.

---

**WASHINGTON**


**Some** eight or nine years ago the first apartment-house or flat building was erected in Washington. It was an innovation as an investment, and I heard many business men express doubts as to its being a paying investment in a city where there was still an
Bramshill, Hampshire.
Residence of W. George M. Jones

Greenburg, Pa.

York, Pa.

1200 feet south

American Architect and Building News, June 22, 1869
UPPER PART OF EXTENSION TO ADAMS HOUSE, BOSTON, MASS.

W. WHITNEY LEWIS, Architect.

The growth of Toronto.—"Justification" pleaded to a libel suit.—Street paving.—Paving in Toronto and Montreal.—The Canadian Royal Academy.—Art associations.

The City of Toronto is at present in a state of transition from boyhood to manhood—from a village to a great commercial centre—the greatest commercial centre of the Dominion. At the beginning of this decade the population numbered about 100,000, and was entirely made up of English county town, not of the manufacturing kind, but more like the cathedral cities, without, however, the prominence of the cathedral and its adjuncts. The streets, mostly avenues of shade-trees, with grassy margins and plantings, the houses, the nestled in gabled-villa and occasional small three-story buildings, as a rule, its warehouses pokey and dingy, and not up too much. But though its appearance was that of a cathedral town, there was none of that delicious sleepiness and quiet about the movements and doings of its inhabitants that characterize these places, and to-day we see the result of the steady progress that was quietly proceeding, only outwardly manifested by the continual growth of private houses. The population now close on 125,000, of whom, at least 29,000 are dwellers in their own houses, is of the most go-ahead kind, and progress is the watchword of the day. A by-law has recently been passed by a large majority of the people, the city raising $500,000 towards the clearing and completion of the Court-houses and City-hall building, in addition to the sum already in hand, which brings up the total cost of the building to a million and one-third. The building, together with the city hall, is to be raised on a site of 12 acres, and the land covered by a contract, for which contracts are now being let, brings up the amount being laid out on these ten buildings to nearly four-and-one-half millions of dollars; and, in consequence the streets present a curious appearance: six-story building steps next a three-story, adjoining which is a frame tenement a story-and-one-half in height. A little inn will be suddenly transformed into a great hotel, and the occupants of a turn-of-the-century, creaky old house are in the teeming city of a miniature palace. Vacant land existing is not sufficient for its spreading energies, and a slice has to be taken off the Bay and turned into solid ground for the accommodation of its railway systems, while at another part water-meadows are being reclaimed and transformed into building-lots for warehouses and factories. There is one little matter that bothers both people and Corporation externally, and that is the material for road-paving. A libel suit has just been decided in favor of the defendant who put in a plea of "justification" on the subject of cedar-block pavements. The defendant was the proprietor of a daily paper, and in an article attacked the system under which the block-pavings were laid. This naturally resulted in a libel suit, the contractors being the plaintiffs, but the plea of justification saved the defendant, and a great victory for the Corporation was won, the paper having paid $350 a week for months, and the paper is now paying $25 a week. The Engineer's Department. As one of the immediate results, the contractors have petitioned for an additional price, declaring it to be impossible to obtain the wood of the material at prices, and offered a contract. These block-pavements are simply short cedars laid on end, and the interstices filled in with gravel. They form fine receptacles for ordure and dirt which naturally sinks into the vertical fibres and pores of the wood, while frost or heavy rain causes them to rise sometimes completely out of the ground, at which times the block-paved streets are worse than corduroy-roads. A kind of ashphalt, laid in blocks a few inches thick, has been tried, but has not been a success, and now a few streets are to be laid with asphalt, floated on hot, and in a liquid state, which, while new, makes a beautiful roadway, but it is doubtful whether it has been designed from the dwelling-house standpoint. The entrances, windows, treatment of columns, and other details convey the impression of a number of very tall, elongated structures, designed to give any idea of its purpose and is devoid of unity. "The Arlington" has commenced the erection of another extensive addition to cost about $150,000, for which contract to Survey L. Page. From newspaper accounts the front is designed to conform with the front of the old building,—a monotonous, flat, brownstone front pierced by numerous small windows, and topped off with an ugly mansard roof. The addition will be proportioned to the old building.

The large building, well-planned, well-designed, well-constructed, well-lighted, well-ventilated, with proper stairways, halls, and other necessary conveniences, a line is still a thing of the future so far as Washington is concerned.

There have been many rumors that such a hotel would be built in the near future, but they are apparently only rumors.
will stand heavy traffic. It has been successfully tested as to the effect of frost upon it, and appears not to be injured at all by the weather.

Montreal, for many years, has been content with the old-style maecanum-road which the Corporation went on laying down this kind of road and repairing them with cartloads of stones dumped over holes, left to be levelled and trodden in by the ordinary traffic was worthy of the Middle Ages. Sowing gravel with granite to the fearfulest of thoughtful people who inhabit the offices on either side of street, but asphalt has been introduced and successfully experimented on in one or two streets.

The people are always attempting to compare Toronto and Montreal — a very impossible feat — for as I have remarked before, the two cities are of an entirely different nature. But there is one point which is very characteristic of the two cities, and that is a certain impossible and legitimate. I have already alluded to it with regard to Toronto. It is that while Toronto with its population of 175,000, has 20,000 people living in houses they own themselves, Montreal, out of its population of 200,000, has only 11,000 dwellers under their own roofs. In Montreal private wealth is concentrated; there live Canada's millionaires, Canadian Pacific Railroad magnates, while in Montreal, where there is, I believe, but one solitary millionaire resident, money is far better distributed. This affects individuals, and has no reference to companies and societies. Canada is not often visited by such calamities as so unfortunately occur so often in this country, and on one scale there is the almost becoming proverbial throughout the world, and it is some time since we have had any great configuration. But the recent fire in St. Sauveur, a suburb of Quebec, described in detail in the district paper as to all such events, and having nothing to do with shutting the stable-door when the horse has escaped, as is so frequently to be met with on this continent. No water-supply up to that point and our honorable friends, who have compared the Corporation instantly sets about a water-system which it would never have dreamed of but for the fire. But all disasters pale before the awful calamity of the Conemaugh Lake. A water-spout, a part of the same storm which burst the dam, swept away a part of the small town of Cobourg, on the north shore of Lake Ontario, doing half-a-million of damage, and destroying the lives of about a dozen people.

The fine idea of being practised and encouraged just now in Canada, as they have not been heretofore. Art-schools and art-associations are springing into existence everywhere, while both the Government and corporations are giving encouragement to sculpture, by orders for statues of public men. A great deal more might be done than is at present, and the fine arts do not receive the encouragement they deserve; but that is a thing that will come; a country has to be educated to the appreciation of art, and to the knowledge that the fine arts are necessary to it for its thorough civilization. The Canadian Royal Academy, whose headquarters are at Montreal, has, unfortunately, admitted into its membership men who are not artists proper, who have very little spark of the artist in their composition, as well as a few who are not artists in any sense of the word, who do not even understand the first principles of art, but, who, for aught we know, are neither artists nor interested in art; and it is sufficiently strong to make them subscribe the small admission subscription.

It has thus become a kind of mongrel society, the result of poverty, which, in the desire to accumulate funds, caused the promoters of the association to admit “artless” men. The disadvantage to the association shows itself principally in the working of the sub-committees, upon which often these inartistic members get seats, and the result of the deliberations is often — as indeed, one could only expect — very distressing to artists. The small gallery at Montreal is hard to keep up, but the Academy does itself really more harm than good by admitting such men to full membership. A recent photographic group of about a dozen members of “R. A.’s” contains, at least, two figures who know about as much about art as an ordinary stonecutter. Patience is a hard thing to practise, but it is patience alone which will make a success of art-associations in this country. The President of the Academy, Mr. R. O'Brien, has a very fine gift for landscape-painting, Mr. R. O'Brien, has gone to England for the summer to make further studies of English country-scenery. He has recently had on view a collection of his paintings of views in the Rockies, made during a tour there last summer.

The Ontario Society of Artists is now holding its seventeenth annual exhibition of paintings, and is greasy and how rapidly art is progressing in Canada in the hands of students; if only the wealthy could be induced to patronize art to a more generous extent, it should soon be its turn of.” It is not the talent that is wanting nor the will to study for its development, but its development depends entirely upon the encouragement extended to it by the public. No greater mistake was ever made in this country than the imposition upon most works of art. Our students need examples badly for their study.

The late competition for the proposed CATHEDRAL OF ST. JOHN THE DIVINE — MONUMENTS FOR THE DISINCLINATION WITH THE RESULT — THE DIFFERENCES BETWEEN LIMITED AND OPEN COMPETITIONS.

The results of the Cathedral competition have been published in a manner not uncommon, not unmixed with disappointment, that in a competition of such importance and fraught with such far-reaching possibilities for good or evil to our art, the prizes have gone to men, for the most part inexperienced and unknown, or known only as clever draughtsmen. And this whilst others, of wide experience and tried ability are known to have taken part in the competition.

This unexpected result, together with a certain air of mystery that has seemed to shroud all the the details of the programme and all the acts of the committee, has inspired an amount of newspaper comment and criticism, that, whilst in a way flattering, as seeming to show the wish to make the Canadian public aware of the competition, has in many instances, it is feared, given an unseemly character to the affair. It has tended to befog the real issues, has given our zealous correspondents a chance to air their grievances or their hobbies and has disseminated a deal of misinformation which not always being incorrect came perilously near at times to being impertinent. As for instance, an article published while the drawings were in the hands of the committee, and before they had had time to come to any conclusions, which the桂-cathedral manner took up the cudgels in favor of a certain style and a particular disposition of plan. This article, or editorial, was, without a doubt, honestly and innocently written, it showed more than a passing acquaintanceship with architectural styles, and was correct and readable, but in the face of the obvious intention to offend, probably much to the writer’s surprise and disgust, it was, and it seems to read it, to many readers the appearance of an attempt to influence the minds of the jury, as had also the doubtless equally innocent publication in one of our dailies, of a reproduction of one of the competing designs, with appropriate reportorial elucidation.

After the names of the four selected competitors were made public, the newspaper comment took an even wider range, and all the picturesque aspects of the contest were brought out and made the most of. Without a shadow of reason, without a shred of reliable evidence it was affirmed or insinuated that all the participants were ignorant or biased, while little or nothing was brought out tending either to explain the feeling of disappointment that existed very generally or to remove the cause.

To-day that feeling still persists in all its force and I should not be surprised if it had even infected the committee itself, and made the gentlemen who compose it, feel, individually and collectively, that it might as well be an artistic committee. The whole time and of money on the part of all concerned, was destined to produce commensurate results.

There is one fact, as I have been able to see, that more than any other single one has tended to bring about the present state of dissatisfaction and that is the action of the architects most immediately concerned. I mean the originally invited competitors.

In order to try to overcome the opposition in the chain, I shall have to go back to the first steps taken and follow the competition through all its stages, and I would say here that I put forward an arrangement of the profession in all its fullness, having found the greatest difficulty in getting reliable information upon many important points.

It was generally understood when the programme was first sent out, that Professor Ware had drawn up the programme, and that he had reviewed and imposed upon the committee their conditions of competition in general. No one was in the position of the committee to discuss the programme or to comment on the subject amongst such of the architects as they sought

1I am transcribed later that Professor Ware while discussing with a member or members of the committee the conditions of competition in general was in no wise responsible for the programme of this competition in particular.
guidance from. The resulting programme seems to have been a paean of praise, but part of a defensible compromise.

The first of these difficulties, while forcing them to leave their instructions vague in important particulars, was unavoidable, and seems to have been judiciously met by the proposed selection of four squares for the same design. The other objection, that of the indefiniteness of the remit, seems to me, by concerted action on the part of the invited competitors, who had a splendid opportunity to render a most valuable service to their country, which would have been felt in all future competitions. A protest against such of the conditions as seemed objectionable would, if properly undertaken, have increased the respect of the community for them and for their profession, while the present status is harmful to us all, and diminishes our power for good.

Of course, whether it is an unloaded gun, an innocent live wire or a subway manhole, it is much easier for the unlooker to explain the case than it is to combat it, unless, for example, by past experience. One cannot say, "I told you so," or use the ex post facto argument in any form without feeling a little mean, and my only excuse for doing it now, is that the weaknesses I see now, I did not see before, and they are not isolated instances but part and parcel of our development as a profession. The full discussion therefore of any short-comings there may be in the competition, one phase of which has just all been watched by us all, will help to clear the way for more intelligent future action, whether this particular complication ever recurs or not. The programme for the Cathedral competition seems to me to be badly defective in the following particulars:

First. In trying to unite a paid competition amongst invited competitors, with an unpaid competition open to all comers. Either one may be brought to a successful issue, but only under entirely different conditions. In the former the selection of a certain limited number of competitors presupposes that any one of them would become the architect of the building to the satisfaction of those inviting it, and that his work and his attainments have satisfied them upon that point. All the competitors start fairly and equally and the sending of designs under a cipher is meant to continue that fairness and equality up to the moment when one competitor is chosen. There is no more reason in competition for holding a public exhibition of the designs than for choosing the competitors by public ballot. A public exhibition after the selection of the design or the award of prizes is interesting and justifiable in the case of public buildings.

In the other, the open-to-all competition, there is no guaranty whatever that the originator of the design selected will be qualified to undertake satisfactorily all the duties of architect. The design may be the unquestioned best, the indications of construction, or the estimates, or specifications may be all that could be desired and yet the designer himself not satisfy the requirements of the responsible committee: whether he be his youth or inexperience or the color of his hair, they will not and should not be asked to accept him, unknown and unsought by them, just because after a careful competition and full opportunity for investigation they have chosen his design. The open competition, naturally, if its conditions are fair, and the prize important will be liable to attract a large number of competitors, a large proportion of whom will be comparatively young and inexperienced. If everything is fair the chances are in favor of a certain number of unknowns being chosen. The public exhibition before the award in such a case would seem to be a most excellent safeguard against the dissatisfaction which is otherwise almost sure to come in some quarter. I am assuming that the open competition we are discussing is for a building of sufficient importance to attract public attention. If the public interest centres on one or more of the designs, their preference is worth knowing and weighing, if it does not, that fact alone may give any general complaint impossible. The cipher is of but little use where there is a public exhibition as the favourites are sure to be known, on the other hand, it is not nearly so valuable a safeguard as favouritism is much less to be feared in the face of public comment.

The building cannot, in an open competition, be unreservedly given to the author of the successful design, and that is the weak point of the system, it is just as true in this country where the recognized standard of professional proficiency. Perhaps safeguards could be elaborated, such as examinations or the right to associate himself with him, which would make it reasonably safe and sure to appoint the successful designer. Second. The pledging of the committee not to exhibit the designs without the consent of all the invited competitors. This question should have been left open, but should have been handled by the common action of the architects themselves before getting to work. As it is, being, I believe, about equally divided, both sides feel that they are hardly used. Whether to exhibit now or not is, as I have indicated above, dependent upon the other conditions. In this instance it has certainly been unfortunate and the direct cause of much of the dissatisfaction, that the committee have felt that they were placed in an embarrassing position by the unanimous action of the invited architects, to the prejudice of their action. It is obvious that a great competition in which every intelligent person was interested has been and still is shrouded in mysterious gloom.

Third. There seems to have been an intention on the part of the committee to get from the architects the slightest sort of sketches giving motives only with but a hint of detail, and from amongst these

to select a limited number for further elaboration. This intention, as I say, was obvious, but it was not made binding and there was plenty of time; the result was that each competitor used all the time he could, feeling sure that some at least amongst them would have carefully worked-out drawings and not wanting to be left at too great a disadvantage in point of rendering. An architect could have made this part of the programme so as to obtain more equal results, and consequently a fairer chance for comparison. The moral of it all is, that we should all of us put our shoulders to the wheel and not spare ourselves; whenever we have a chance use it to bring about collective and united action in such direction as seems best. Let us act through the Institute, the Chapter, the League or through fortuitous groups brought together through the prospect of engaging in competition, but let us always act together.

With full liberty of discussion, in constant intercourse with men of the most diversified callings, in a quasi-judicial position between our clients and their contractors, we are in no danger of becoming narrow and can surely, if slowly, build up that necessary body of traditions and precedents which will be recognized and accepted by the public as soon as we learnto live up to them ourselves.

EQUESTRIAN MONUMENTS—XVII.

Bracketed by a bullock at the top and a pigeon at the bottom, sentiments that are like those of a modern sculptor of the head of a horse, of course,

A BOUT all that is known of the equestrian statue of the Emperor Zeno which once crowned the Palace of Theodoric, the foundations of which to-day bear the Castel San Pietro at Verona, is that it was so large that pigeons flew through its wide-dilated nostrils to their nests in the lolly of the horse. But Verona claims attention here not by reason of what is no longer there, but because it possesses a famous group of sepulchral monuments which bear equestrian statues and which are the type of a small number of statures of a later day which may be considered together with them.

Crowded together in a little square at the side of S. Maria Antica, enclosed within a high grating of exquisite trellis-work in wrought iron, interwoven in which are inaccessible ladders—the symbol of the family—stand the monuments of the Scalas, for more than a century the rulers of the territory. Descended from a plebeian ancestor named Villani, who made a fortune by dealing in ladders, the family boldly avowed its origin, adopted the ladder as its token and is commonly known in history as the Scaligers, or ladder-bearers. The tombs of the earlier members of the family are lowly in form and unpretentious in design, but like the actual sarcophagi of the more elaborate monuments their sides bear in very low relief sculptured scenes of not a little artistic value. It is not unnatural that

1 Continued from No. 705, page 272.
the first one of imposing character should be that of the most noted member of the family, the famous Can Grande, who was not only a capable leader and ruler but also a patron of the arts and as such deserved a monument erected to his memory, a monument which Ruskin characterized as the "consummate form of the Gothic tomb." This monument (1829) is built over the entrance doorway to the little grand room and adjoins the example followed by the two other equestrian monuments of the group by representing the prince both in life and in death, for above the recumbent figure which lies upon the sarcophagus is reared a steep pitched canopy upon the summit of which is borne the more than life-size equestrian figure of Can Grande, with his winged helmet slung to his back. There is a well-studied simplicity about this monument which makes it stand out in several respects above the florid exuberance of the latest of the three monuments, the one which Can Signorio was caused to be erected during his own life-time and, after the manner of Louis XI of France, who as a safe-guard against future torment used to wear about his body a small leaden saint, adorned the structure with the effigies of saints and virtues whom he had totally disregarded during his life. The tomb of Mastino II (1851), by Perino of Milan, stands as a perfect imitation of the immediate successor of Can Grande. The possessor of a larger income than was enjoyed by any potentate of the day, it was not unnatural that Mastino should be able to procure the pleasures which wealth, power, and the lax morality of the Italian society of the day placed within his easy reach. Success in the lists of love, which he was prone to enter at every chance, secured him many enemies and involved him in many contentions which caused the loss and absorption of much of his wealth and power, so that though his court was the largest and most famous for rank and quondam power of its attendants — at one time there were not less than two-score dethroned princes who had sought haven at his court — the reckless license of his life had greatly diminished the patrimony which passed on to his successor Can Signorio. Still Mastino was in many ways an able ruler and the internal condition of the Veronese territory never before touched so high a mark, and if it is ever proper to commemorate the existence of a ruler without reference to moral or political perfections, Mastino indeed can be held to have exerted his influence during the period of his lifetime. Of the entire group, Street says: "What either Cologne, or Ratisbon or the Wiesen Kirche at Soest is to Germany, that is the Cemetery of Mastino's Abbey on the Charter house at Southwell to England, Amiens Cathedral or the Sainte Chapelle of Paris to France, that is the Cemetery of the Scaligers in Verona to Italy, the spot, that is, where at a glance the whole essence of the system of a school of art is evident, and comprehended, lavished on a small but most stately effort of their genius." Of the monument of Can Signorio by Bonino da Campione, the latest (1875) and most elaborate of these monuments, Street says he is "very worthily executed." It is said that the bishop, who at first seemed likely that the only existing statue that could be credited to the Dark Ages was that of Otho I at Magdeburg, which has some times been ascribed to the tenth century, and, in such case, would possibly have been erected during Otho's life or shortly after his death. The evidence of historic facts and the internal evidence afforded by
the statue itself, however, refute this theory, though they do not deprive it of the honor of being one of the oldest portrait statues on horseback of the medieval period. When the monument was re-
paired in 1828 by a Herr Holheim it was found not to be a non-elastic, stone, as had been supposed, but one built up out of seventeen pieces of sandstone held together by iron dowels, and an analysis of the stone showed it to be of the same composition as that with which the thirteenth-century portions of the cathedral were built; this, taken in connection with the evidence afforded by the style and workmanship of the group, makes it probable that the statue was cast at that time, and probably by some of the sculptors who were employed on the cathedral. The fact that the entire town was twice destroyed by fire, once in 1180 and again in 1207, while the monument bears no signs of injury, is testimony, also, against a very early date, though, as the monument was restored in 1649 and in 1651, as well as in 1858, there is no reason why the wounds of both fire and time should not have been healed over and over again. Although of stone, the statue is gilded, and when its surface was renewed traces were discovered of an earlier red coating, which was supposed to be merely a coat applied to prepare the stone surface for gilding. But the fact that Otho the Great, as did Charlemagne and Louis XII, took a leading part in the actual administration of justice, connects him intimately with the history of everywhere symbolize Art, Commerce, Industry and Science for the figures that in a less sophisticated age stood in similar positions for the cardinal virtues. It was only a fashion, to be sure, and probably often hypocritically followed, but it is certain that they must have been able to produce noble work when they were habitually trying to typify some ennobling Christian virtue, as Justice, or some more savage one as Courage, or as the gods glorify Trade — with its suggestions of greatness and evil smells.

The monument, seventy-seven feet high, Gothic in style and suggesting in general the Eleanor's crosses, was designed by Kranz, and the statues were those of Joseph Max, father of the well-known painter of to-day, Gabriel Max.

CAN GRANDE. — Can Francesco della Scala, called the Great, was the most renowned of his family. He was the subject of an unfortunately cast bust by Veronese, Mantua, Brescia, and other towns against the Marquis of Este, Lord of Ferrara, whom he defeated in battle in 1288, and subsequently became the head of the Ghibelline party in Lombardy. In 1290, he died, but was a few days afterwards able to make himself one of the seven nobles of the city. A liberal patron of literature and the arts, and his house was the centre of learning and poetry, artists and scholars met together under his roof.

Duke of Brunswick. — Charles, eldest son of Duke William Frederick of Brunswick, was born in Brussels, and was educated by his brother William, but displayed such frivolity of character, that his guardian, the Prince Regent, delayed putting the government of Brunswick into his hands until, at the age of 29, he had attained his majority. In 1800, his subjects, weary of his extravagance, rose against him; he fled, and in the following year was deposed by the German Diet. During the remainder of his life he resided chiefly at Paris and Genoa, and was invested with various small titular offices, but his immense property to the latter city.


Jean Franel. — A Genevois sculptor died in 1886. Besides the Duke of Brunswick Monument he was the architect of the University in the same city.

AIME MILLET. — Born at Paris about 1856. Pupil of David d'Angers and Viollet-le-Duc. He made his début as a painter at the Salon of 1849 and continued exhibiting pictures until his death. He is noted for portraits, and though his chief fame has been gained. His plastic works include "Alexis" and "Cassandre playing with his dog." He designed the "Habitation of the Basque" in the "Vergennes," erected at Alise-Sainte-Reine; the tomb of Mürger; "Apolo and the Muses of Poetry and Daubigny," in the Grand Palais; "L'Empereur de France," "Orientals," erected at St. Malo; etc., etc. He died in 1893.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

JUNE 22, 1889.

The American Architect and Building News.


To the Editors of the American Architect:

Dear Sirs,—A building block of tenement-houses, and employs B, an architect, to prepare plans, let and superintend the works, C is contractor and D a sub-contractor. The specification has this clause: "The contractor or sub-contractor, as the case may be, must agree (and this writing is the agreement) that they shall remove from the building any work or material not in accordance with the plans, details, specifications, all drawings, ..." It must agree, that the opinion and decision of the architect is binding to them, as well as it is to the proprietor. The sub-contractor D signs a contract with the main contractor C, to the same effect, that is, that the opinion and decision of the architect is binding to all, etc.

The specification further reads, that it must not be understood that the sub-contractors will receive certificates direct from the superintendence of the works, which sub-contractors, only, are to receive these, assigned for the special benefit of the sub-contractor.
Now D, the sub-contractor, quarrels with C, the main contractor, as to certain works to be done and which he (D) tries to avoid: finally he is compelled to do them, and gives final receipt for all his work. Having settled matters between him and D, the sub-contractor, calls on the architect with a bill of extras, one-fourth of which the architect acknowledges as correct, and three-fourths as incorrect, and then because there is no doubt that he (D) is the principal, A, for a number of items and damages in which all the disputed matters settled with the main contractor C, figure again.

The question before the architect B, is this:

Question. 1. Shall the specifications and contract, stand good before the law, where it is shown that the main contractor shall only get certificates to be assigned to the sub-contractor? 2. Shall the agreement of A with the main contractor and his subcontractor, be interpreted as if the design of the architect is binding to them, as well as to the proprietor? remain valid in law?

As you have a legal gentleman attached to your editorial staff, we will be pleased to see the American Architect's answer to these questions as it is the only case which every building or the making of a contract for the construction of a building, is interested.

Respectfully,

V. & S.

Answer. — We do not find anything in the contracts and other facts referred to in the above communication to prevent D, the sub-contractor, from collecting his claim from A, the owner, providing he can satisfy a jury that the work which he claims as an extra was ordered by the owner or by the architect, and in the latter case that the architect had authority to give the order. The terms of the contract and the fact that there was any contract at all between all parties (and this is a fact) with the main contractor, would not amount to a written agreement between the owner and the main contractor, making the contracts between, D uses the fact that the owner and main contractor entered into a separate arrangement for the work in question they will find for the plaintiff.

The clause in the sub-contract subjecting all matters of dispute to the decision of the architect will have no binding force in any action between one of the parties to the contract and a third party. The owner not being a party to the contract could take no advantage of the clause.

Whether the receipt given by the main contractor to the main contractor would be a sufficient proof of the work in question would also be a question for the jury; if the work was outside the sub-contract and undertaken under a direct arrangement with the owner, of course a receipt given to the main contractor would not bar the sub-contractor from recovering the price agreed upon with the owner.

We are therefore compelled to answer both of the questions which our correspondent puts at the end of his communication in the negative; to say that the specifications and contract would not "stand good before the law," nor would the decision of the architect be binding, at least in the sense which our correspondent means. This whole question like most of the disputes that are continually arising in this trade are more likely to be decided by the furnishing of facts and of law, than to avoid them is for the architect not to get a general authority from the owner to order extras, but whenever anything is needed that is not covered in the contract the architect is to write either with the main contractor or some other person.

The Syracuse Sketch-Club.

AT Syracuse a sketching-club has just been formed, to be known as "The Syracuse Sketch-Club," and to be composed of the draughtsmen (both architectural and mechanical) and a few others interested in art matters of our city. This is a subject that has been long thought of and talked about, and now that we have made a start it is our purpose to make a success of it. These gentlemen are: Mr. John James; James H. Lord, President; James A. Johnson, Vice-President; William H. Lord, Secretary and Treasurer. You will confer a favor on the draughtsmen by noticing this architectural artist club in your columns.

WILLIAM H. LORD, Secretary and Treasurer.

BOSTON ARCHITECTURAL CLUB.

The Boston Architectural Club held its fortnightly conversation this evening in the offices of the Boston Architectural Club, the Rev. Mr. C. Howard Walker gave an informal talk on Italy, illustrating his remarks with stereopticon views. Speaking at first of the impressions he gained from modern Italy, he passed on to Rome. Dividing the architectural into three periods: Classic, Gothic and Renaissance, he dwelt at length on each. He showed views of the Roman Forum, explaining the modern excavations and discoveries, and discussing the columns and arches, related their history and explained their architectural characteristics. Passing to Pompéii, and showing the principal buildings of that city, he took up the Gothic period and illustrated by views of the principal cities where this period reached its highest development.

The principal works of the architects of the Renaissance were their efforts to restore the works of ancient Rome. His admiration for Venice and Sienna. The views were well arranged and admirably selected.

Another exhibition is being held at the club rooms of water-colors made by Mr. Dwight Blaney, while on a front trip to the Bermudas.

TRADE SURVEYS.

The success of the American Bankers' and Merchants' School for the past six months has been unexpectedly better than had been anticipated, and the opinions of the students, as well as the satisfaction of the Board of Managers, are very high. The two last months have been particularly successful, and the Board wishes to express its deep appreciation of the able and unselfish work of the professors.

The Board of Managers has made arrangements with the most eminent architects and contractors in the city to give lectures on their respective subjects, and the board has been informed that they will be able to address the students in a way that will be of great benefit to them.

The Board of Managers have been advised by the faculty that the school is in excellent condition, and that it is rapidly becoming a leading institution in the field of architecture.

The Board of Managers have also been advised by the faculty that the school is in excellent condition, and that it is rapidly becoming a leading institution in the field of architecture.
The exterior of this house is stained with

**CABOT'S CREOSOTE STAIN**

for Shingles, Fences, Clapboards Etc.

ARTHUR HOOPER DOOD, Arch.

These Stains are very durable and give a much more artistic effect than paint, while they are cheaper, and very easy to apply:

**Our Stains contain no water and are the only exterior Stains that do not contain kerosene.**

**PRICES** are 40, 60 and 78 cents per Gallon according to Color.

**SEND** for Samples on Wood, and Circulars.

**SAMUEL·CABOT**

70 KILBY·ST··BOSTON·MASS
HALF-TIMBER HOUSES.
SUMMARY:


I ILLUSTRATIONS:


PARIS EXHIBITION.


COMMUNICATION.

An Owner's Right to give Orders. — Notes and Suggestions. — Trade Surveys.

A SCHEME which has long been discussed in New York has finally taken definite shape, in the incorporation of the American Fine Arts Society, which includes representatives of the present League of American Artists, the Architectural League, the Art Students' League, the Society of Painters in Pastel, and the New York Art Guild, and is to be maintained under the joint patronage and control of these societies, and of such others as may join the movement hereafter. The object of forming the new corporation is to give the members interested a better opportunity than they have yet had for combining their efforts and influence for the purpose of promoting the good of the fine arts, in whatever way may seem advisable, and the first step toward that end which has occurred to the managers of the new society is to consist in the erection of a building, which is to contain rooms where works of art may be exhibited, as well as permanent accommodations for the various societies represented in the new federation. The rents have been fixed at the moderate rate of fifty cents per annum per square foot of floor-space occupied, for the portion permanently taken up by the societies, and twenty-five dollars a day for the use of the galleries. The New York daily papers say that this small sum pays for the use of all the galleries together, and that they are to be arranged to be used for concerts and other entertainments, as well as for exhibitions, so that we imagine that there must have been some slip in the original report, which we leave our readers to correct according to their own judgment. The capital to be used for carrying out this modest plan is fixed at fifty thousand dollars, and is to be raised by subscriptions of one hundred dollars each. Besides the stock, coupon bonds are to be issued, the interest on which is to be paid, if earned from rents, but if the rents should not be sufficient to pay the interest, the holders of the bonds, by surrendering their coupons, may obtain free tickets to the various exhibitions to be held in the building during the year. Besides the stock-holders and the bond-holders, there is to be a class of Fellows, who, by the contribution of one hundred dollars, are to be entitled through life to five season tickets to all the exhibitions given by the Architectural League, the Society of American Artists, and the Society of Painters in Pastel. The proceeds from the sale of such fellowships is to be devoted partly to extinguishing the bonded debt of the corporation, while the rest is to be distributed among the constituent societies in equitable proportion.

THE Brockton Enterprise makes some suggestions in regard to obtaining designs for a new city-hall for that town, which are open to objection, in the interest of Art. It suggests that a competition among architects has been proposed, but says that the fear has been expressed that "an open race of the kind would only be entered by second-class architects, and that the big firms would not submit any plans." As the people of an ambitious and prosperous town like Brockton naturally want something better than second-class professional service, the Enterprise proposes to meet the difficulty by having the City-hall Committee do "as a similar committee has done in Haverhill," that is, "to advertise in the Boston papers that at a certain hour of a certain day they will be in session at the present City-hall to consult with architects who will submit plans for the proposed building." We should say that it would be well for the people interested, before following this advice, to find out what such a course has had in Haverhill. Among responsible architects the idea of dancing attendance on "a certain day" upon a committee that does not know what it wants, and has taken no pains to find out, and can think of no better way of exciting itself than to let a lot of builders' clerks and draughtsmen talk to it for an hour, all at the same time, would be about as uninspiring as anything that could be proposed, unless, perhaps, it should be surpassed by the next piece of counsel offered by the Brockton enterprise, which ought to reject any or all, and not to pay for any not accepted, could be reserved," and it adds, as if it could think of nothing more enchanting to the professional mind than this prospect, that, "The more architects that compete, the better for Brockton."

W e had supposed that this way of thinking and talking about architects and competitions was obsolete in any civilized community. To show how absurd and ridiculous it seems to any one who knows anything about plans and buildings, we will suppose, that, instead of a city-hall, the people of Brockton want a map of the town. They appoint a committee, which sets an hour on which all its members shall be at leisure from their respective avocations, and invites engineers and surveyors to meet it. The first surveyor asks whether the town requires a topographical survey, or one showing merely boundaries. The committee reflects. None of its members have thought of a topographical survey, and the second inquirers has a different idea, and all the ideas seem to the committee, which comprehends few of them, to be excellent. The intending competitors go back to their offices, each with a different notion of what is required, and set at work. At a given time a mass of plans, of the most diverse description, and of enormous magnitude, is presented to the bewildered committee. Even then, the idea of asking for advice from some of the persons interested in art, intended to promote, by the number and character of its members, and the influence they may exert, the repel the unjust, ridiculous and injurious laws in regard to the importation of foreign pictures and statues which have so long annoyed our artists. The names of the officers of the League are in themselves sufficient to show the seriousness of the movement, and the energy with which it is likely to be carried on. The President is Mr. J. Carroll Beckwith, the Vice-President is Mr. William M. Chase, the Treasurer is Mr. Henry Marquand, and the Secretary is Mr. Kenyon Cox. Besides the officers, more than five hundred Art Societies in this country and lower art are enrolled as members, and many applications for membership are daily received. There are no membership dues, and persons interested in the purposes of the League are invited to send their names to the Secretary, Mr. Kenyon Cox, 145 West Fifty-fifth Street, New York, upon which they will be enrolling in sign. Articles of Association, and will be kept informed, from time to time, of the progress of the movement, and the success of the work undertaken by the League.
one who understands the subject does not occur to them, and after looking at the drawings, with a feeble pretence of understanding them, for a few hours, they adjourn. On reassembling, they find that a member has brought a friend along with him, and told over nothing, towers appear for use, and the streets dashed in with a bold hand. The author of this "design," which represents about half-a-day's work, explains that he is "no hand at making pretty pictures," but "looks to the common-sense of the thing," and stands, wreathed in smiles, while the delighted committee examines his production. As one after another discards their worst-looked plan, the expressions of the members increases, and without ado, the chairman puts the vote, all the other plans are rejected, and the new comer is unanimously selected to prepare a map, which is only found to be incorrect and valueless after he has got his pay.

Of course, American committees will resent the idea that they are not perfectly capable of giving any instructions as to the preparation of designs for a city-hall, and of judging the designs after they are submitted, but the fact is that they are not capable of doing so, and architects know that they are not, and nearly all the most reliable architects in Massachusetts have agreed to have nothing to do with public competitions which they believe will be judged by committees, and will be submitted not to be made in accordance with a programme drawn up by competent hands, and issued to all alike, in which proper compensation is promised without reserve to the author of the best plan. Nothing else, as they know, can be expected from a satisfactory result, and good buildings for people for whom they build. It ought not to be necessary to say that the essential part of a public building is the plan. With a good plan, a good building can be made with cheap materials; without a good plan, no expenditure of money can make a good building. On the plan of such a building depends not only whether large sums of money shall be buried forever in tortuous corridors, dark courts, useless space where it is not needed, and rooms too small for use, but whether an additional outlay shall be required every year for burning gas in places which "earned out" not to have daylight, and for extra service for overcoming inconveniences of arrangement; and no lay committee-man can judge for such details. Every architect has seen plans which pass muster with lay committees, in which important rooms are supposed to be illuminated by areas marked "Light and Air," in which there would be no more light or air than at the bottom of a well, while partitions stand on both reputation and importance, and the windows, the roof, and the stairs in one story prove to be entirely independent of the story above or below. The only remedy for these inadvertences, after the building is executed, is a very costly process of remodelling. The best means of prevention, which is in this case a hundred times cheaper than cure, is the employment of a first-rate architect. From quacks in medicine a sick man may, with the help of his imagination, and, perhaps, a lucky chance, get relief from his pains, but the architectural quack cannot administer doses of brick and mortar at random with good effect, and he who would have his brick and mortar thoroughly and successfully, economically and beautifully, must apply to persons capable of doing so, and must offer them what they consider fair treatment to obtain their services.

LA SEMAINE DES CONSTRUCTEURS publishes an account of a long-forgotten competition, which took place in Russia in the year 1784, when, we must remember, Russia was an empire, and St. Petersburg was one of the capitals of a powerful government, and it was decided to try to improve it after some definite and well-considered plan. With this view, the Empress Catherine appointed a commission, which announced a competition of a model which might have been familiar then, but has, unfortu-

SOME unfortunate official in England recently took it into his head to improve Westminster Hall, which has long been a sort of neglected corner among the Government buildings, by putting a staircase in it, and, as he might have expected, has brought a storm of criticism and ridicule about his ears by doing so. It is very likely that nobody wanted the first fifteen days in a place where all the others would have made free access to them, and where each competitor was requested to examine them, and write a careful criticism of all the plans except his own, designating particularly the portions of each plan which appeared to him most successful and best adapted for carrying out the end of the appointed period the commission were to consider the designs and the criticisms, and decide for themselves what plans, or portions of plans, should be carried into execution, and it was promised that the authors of schemes, or parts of schemes, selected for execution should be employed, by preference, in carrying them out; while even those whose suggestions most disappointed the commission stood in no less favor, in proportion "in proportion to their labor." Whether this curious competition was ever carried so far as to the actual selection of a plan in the way promised we do not know, but some student of Russian history can, perhaps, inform us.

Mr. A. W. BLOMFIELD, a well-known English architect, has just received the honor of knighthood, to the great joy of a number of his friends and admirers. The honor of knights and D. O. from the hands of the Emperor of Russia is of much greater value, and it is not in the letter of the law, but in the thought of the装饰 that would have been suited to his opponent's taste, if their official positions had been reversed.
OLD COLONIAL WORK OF VIRGINIA AND MARYLAND.—II.

THE WYTHE HOUSE.

JUST north of the churchyard, and fronting upon a grassy open known as "Palace Green," on the upper side of which stood Lord Dunmore’s hospital and the Governor’s Palace—and it was called among the patriots of ’75, stands a fine, old, square brick house which, the insuring stranger would have thought, "was once one of the mansions of the Virginian aristocracy," and had given such offense to him that he had been driven into a place of obscurity. But time or fortunes of war have despoiled the marble baron of his aristocratic nose, and some night-provoking and irreverent undergraduate has recently affixed a gory streak of red sealing-wax across the lowest cornice, leading an ensnagged and hostile look to the benighted features.

Old William and Mary enjoys the distinction of being, after Harvard, the oldest college in America, and she has counted among her sons many very good men. One of the most notable was John Marshall, who was born in 1755.

The colony sent him to England on a mission to King William in behalf of the projected institution, and he returned in 1789 with the charter of the college signed by their majesties, William and Mary, and Queen Anne.

The charter went to a charity for making the Virginia College perpetual. It was liberally endowed with an estate of 30,000 acres of quit-rents, one penny per pound on exports of tobacco, the office-fees and emoluments of Surveyor-General and a seat in the Senate, as well as the income from the 200 houses on the campus, where youths may be piously educated in good letters and manners; a certain place of universal study, or perpetual college of divinity, philosophy, languages, and other good arts and sciences.

The trustees, the Virginia House of Burgesses and House of Delegates, projected to draw up the charter, objected to the expenditure of public funds for making divinity-students while England was at war and wanted soldiers, and to the redoubtable Blair, who urged that Virginians had souls as well as the English, he thundered out, "Souls! Damn your souls! Make tobacco!"

Among the library, many very costly treasures in rare old volumes and prints, are two portions of Parson Blair done at different periods in the stormy and eventful life of that fiery old volanic.

THE POWDER-HOUSE.

There are to be seen at the post-office, in Williamsburg, some very interesting old files of the Virginia Gazette, a journal which was started at Williamsburg in 1736, and was the first and, for many years, the only newspaper published in the colony. In 1768, having been incensed, decided on terminating it, the latest advice from England and the Continent not more than a month or two out of date, the fortunateness mail from the North and the monthly post from the South, directions in the Virginia Gazette, and the entertainment of quixot and curious flavor. Among the locals one about the old powder-house affair is worth reading:

"This morning, between three and four o’clock, all the powder in this magazine to the value of $2,000 was stolen. A report had been carried off in His Excellency the Governor’s wagon escorted by a detachment of marines from the armed schooner "Majesten," now lying at Burwell’s Ferry, and lodged on board a vessel, and it was said that the "poor plank" was carried away on the "Poyey," lying at Yorktown, for troops. A squad of soldiers are marched over to Williamsburg, and mount guard on Palace Green before the Governor’s house, in compliance with his order. Mr. Thomas Nelson, the principal citizen of Yorktown, that in case the Williamsburgers attack his men the guns of the "Poyey" will open upon Yorktown without further warning. The remarkable aspect of affairs finally reached a climax when it became known that the Governor was marching on the capital, at the head of 5,000 men, to demand redress of these tyrannous abuses. In the last chapter of the story Lord Dunmore pays the value of the powder and Mr. Henry of the mill.

The powder-house was built by Alexander Spotswood early in the eighteenth century. This Governor is said to have done more for the general improvement of the colony than any other person. He was the son of a distinguished Scottish cavalier who had died upon the scaffold for devotion to his King. A brave soldier—he served, it is said, on the staff of Marlborough—and a most accomplished gentleman, Spotswood possessed administrative abilities of a high order. His policy of peace with the Indians was eminently successful, and his project of requiring the chiefs of tribes to send their sons to be trained in the schools of the whites was productive of great good.

Continued from No. 760, page 281.
The most picturesque incident of Governor Spotswood’s rule was his leading a party of young explorers from Williamsburg across the Alleghenies and into the unknown regions beyond. It was a royal frolic, and in about six weeks the expedition rode back covered with glory and stocked with romantic stories of the marvels of the wild. Thence to the beautiful Valley of Virginia. Spotswood dubbed his young adventurers “Knights of the Horseshoe,” and before disembarking the company he gave them each a tousled horseshoe to wear upon the capel in memory of the affair. King George hearing of these brave doings intimated his gracious pleasure by sending over to Spotswood a little jewelled horseshoe and a large purse of gold.

On leaving office the Governor retired to his country-seat at Germanna, whither came Colonel Byrd of Westover, in due course, to visit his old-time friend, finding “Colonel Spotswood’s enchanted castle on one side of the street and the widow and a fishwife on the other side; there was also, a chapel about a bow’s-shot from the Governor’s house, at the end of an avenue of cherry-trees, trimmed in the best possible style. The old powdered-house, to return from our little digression, is a tall eight-sided brick tower crowned with a high conical roof. The double wall has fallen in on one side and bulges badly on the other faces, the decaying roof-timbers threaten to collapse, and the handsome wrought-iron finial leans disgracefully. The old “powder-horn” is almost a wreck. Indeed. The surroundings are not what one could wish for so interesting a relic; in fact, the old magazine in a stable-yard, and is partly hidden from the view of the passer-by on Duke of Gloucester Street by tall and ugly unbecoming board-fences. A movement is on foot to purchase the building, with a small plat of ground about it, from the present owners of the place. The top of the tower seems rather unattractive, and when this much may be accomplished, it is proposed to rebuild the fallen wall with the old bricks which lie where they fell, to tie the walls securely, to support the roof with some auxiliary framing, and so arrest the threatened collapse of the tower. But a small sum will be needed to carry out the work.

The subsequent use of the “powder-horn” has not been decided upon, but it has been suggested to use it as a museum of colonial military relics. It would add to its interest if its ancient character of an armory could be preserved, and a collection of colonial and revolutionary arms and munitions of war stored therein. In due course the scheme will be more definitely carried out in this fitting manner, and perhaps, assistance of a very modest character bestowed from its readers who are lovers of things quaint and beautiful.

JAMESTOWN.

The road from Williamsburg to the ancient site of Jamestown, assuredly not among the best of roads, passes out of the town by the campus of old William and Mary, and then leaving behind the glaring houses, bows toward the southwest over a rolling country. Plunging into little valleys, scaling the short hills, winding through the forests of the primeval, or diving into dark, damp places, the graded road, as it was, along the embankments combine with mudholes of amazing muddiness to produce an interesting variety of sensations. The old road meanders rather toward the river, growing ever worse. Descending at last into a redly marsh of broad extent, which is crossed upon a bed of roughest corduroy, bearing evidence of complete submergence at high water, and suggesting being a very uncomfortable place on a dark night and a full tide, and on the further side of the marsh, going over a shaky bridge which spans the inside channel of the river, the road arrives upon the historic soil of Jamestown Island.

From this point there formerly stretched to the mainland a narrow neck of land, where readers of colonial history will remember Sir William Berkeley and his motley troop from Acrecomack making their famous stand against invading armies of the rebel Bacon. But the isthmus is long since sunk out of sight, and now the yellow waters of the James lap all sides of the former peninsula. The island contains nearly seventeen hundred acres, lying in a long, narrow strip of land two-thirds of a mile in width at its narrowest part, and subject to overflow. Near the western end of the island is the crumbling, mossy, Ivy-grown ruin of a brick church-tower, about all that is left of the ancient place. A rope很方便地 around the neck of the tree, the ruined tower is very picturesque, and has an interest in itself apart from that which clings to it as the oldtime place of worship of that wonderful band of adventurers who founded Jamestown, the first permanent English settlement in America. The tower is eighteen feet square, and is pierced on two of its sides by high, round-arched openings. It is built of a small, dull-red English brick laid in the Flemish bond.

Beyond it the remnants of the old church are traceable, covering an oblong square of twenty-eight (28) by fifty-six (56) feet, and close by is a mossy, crumbling wall built in the latter part of the eighteenth century from the ruined wall of the old enclosure about one-third of the original churchyard. Within are some ancient tombs, upon which one生态保护者, the mossy, ribbony vaults, quaint epitaphs of old Amblers and Jacquelines, Sudwells and Lees. Of these, the Jacquelines and Amblers for many generations were the princely owners of the Island, now, however, in the hands of Green Spring, some few miles distant, and famous as the home and place of retirement of that staunch old royalist, Sir William Berkeley. When the worshipped head of his august master, Charles, fell on that dismal morning in 1649 at Deptford, William Berkeley, his governorship given to the hated Roundhead, his idol dead, the faith for which he had lived and would gladly have died, the jus divinum, triumphed under foot by bolts, and beams, and long hunks, found in that peaceful rural life, in the company of his lady and famous Scotsman, and kept house at Green Spring, a balm for all his wounds. Here he waited and watched events, through those long, stern years of the Protectorate, until old Noll was gone, and worlds changed. From this in the centre of the island, until his own again, when the fierce old knight held the reins once more over the young colony. Berkeley died in England in 1677, leaving Green Spring to his widow, who afterward married Colonel Philip Skelton.

"Something special in the way of notice is due to the condition of the tombs of Commissary and Mrs. Blair, the latter being the daughter of Philip Sudwell, and married Sarah Grymes, of Middlesex. The tombs were placed side by side and were very heavy and strong. The platform, sides and ends were of white freestone, and the interior filled with bricks well cemented. The inscriptions were made, are of dark freestone or black marble. A sycamore sprout came up between them. The tomb of Mrs. Blair is bewitched, a third of which lies embedded in the body of the tree and is indelible. All the interior, consisting of the bricks, and two of the side stones, have been entirely forced out of their places by the tree, and lie scattered around, while the dark-brown sycamore has thrust itself in the air three feet above the surface of the earth, fast bound by the embrace of the body of the tree, into which it is sunk between one and two feet, the inscription being only partially concealed. The legible. On the other side, the inscription being only partially concealed, a bone has been forced from its place by the roots and body of the tree, and is broken to pieces in its two parts." This account of the old grave-yard in Mr. and Mr. Blair, and the state of the ruined tower is discussed at some length by the same eminent authority, who says:

"As there are conflicting opinions concerning the date of the erection of this old church—some affirming it is the ruins of that which was destroyed in Bacon’s Rebellion, while others affirm the building of a new one after that event—we will briefly state the facts bearing on the case. The history of the succession of the Jamestown churches is as follows: The first place of worship, as described by Captain Smith, was made of the awning, or old sails, taken from vessels and fastened to trees. The second was a very plain log building, which was burned by the enemy of the body and soul of the third year of the colony, during the ministry of the Rev. Mr. Hunt." In his "History of Virginia," Captain Smith, himself, writes at some length about the church and its pastor:

"The leg church first erected here, burned down the following winter with many other houses. Mr. Hunt lost all his books and everything else but the clothes on his back. Yet none ever saw him regret his loss." Robert Hunt came over in 1606 with the first company, and was by all accounts a most noble character.

"Upon any alarm he was an ready at defence as any, and till he could not speak he never ceased to his utmost to animate us continually to persist." The "Advertisements for the Unexperienced Planters of New England or Elsewhere," a pamphlet published by John Smith in 1624, for the first time described accurately the cold, barren country we stay in the colony:

"When I went first to Virginia, I well remember, we did hang an awning—whic I call sail—to the trees for shade, and there were a number of trees near the sun; our walls were rails of wood, our seats were unhewed trees till we cut planks, our pulpits a bar of wood nailed to two neighboring trees; in foul weather we shifted into an old rotten tent, for we had few better, and this came by way of adventure for not one-third of the colony used to build.

"This was our church till we built a handsome thing like a barn, set up on crotchet, covered with rafts, sedge and earth; so was also the walls. The best of our houses were of the like curiosity, but the most part far much worse workmanship, that could never well
defend wind nor rain; yet we had daily Common Prayer morning and evening, every Sunday two sermons, and every three months the holy communion till our minister died.

Of the further history of the churches, Meade says: "The third was a larger and better one, probably of wood, built during the presidency of Captain Smith, and in a ruinous or neglected condition when Lord De La War arrived, in 1613," who immediately ordered that the church be thoroughly repaired. Strachey, Secretary and Recorder of the colony, gives this description of it: "It is in length three-score foot, in breadth twenty-four, and shall have a chancel in of it, an arch of dore cloth of black walnut, and all the pews of cedar, with fair, broad windows, to shut and open— as the weather shall occasion— of the same wood, a pulpit of the same, with a font bowen below like a canoe, with two bells at the west end. It is so curious, as it be very light within, and the Lord Governor and Captain-General doth cause it to be kept passing sweet, and trimmed up with divers flowers, with a sexton belonging to it. Every Sunday, when the Lord Governor and Captain-General goeth to church, he is accompanied by all the counsellors, captains, other officers and all the gentlemen, with a guard of Halberdiers in his Lordship's livery of fair red cloaks, to the number of fifty, on each side and behind him. His Lordship hath his seat in the Quoïr, in a great velvet chair, with a cloth, with a velvet cushion spread before him, on which he kneelth, and on each side sit the council, captains and officers, each in their place, and when he returneth home again he is waited on to his house in the same manner."

"This was doubtless the same," says Meade, "in which Governor Yeardley, with the Councillors and Burgess, held their legislative session in 1619; and, as we read of no other church being built between that time and 1676, when the town and church were burned down by Bacon, it is most probable that this was the building. In opposition to the theory that the present are the ruins of the old church which was burned in the rebellion, is the fact that the dimensions of the church which Smith built and Lord De La War repaired were different from the one whose ruins are now seen. The dimensions of the former were twenty-four by sixty; those of the latter twenty-eight by fifty-six. Other circumstances there are which render it almost certain that another church had been built since the destruction of the one by Bacon. Not only was there a goodly number of families residing in the place for some time after that, but the porchhouse and House of Burgess were there until the removal of the seat of government to Williamsburg after the year 1705. Although the governors may have lived at Green Spring, yet some of the officers of government being absent, court and legislature were there; and it is not to be supposed that they would live for thirty years without a church." Our reverend author goes on to cite the circumstance of Governor Andros presenting communion-plate to the Jamestown Church in 1694, that silver font was given to it by the Ambler, which is still in evidence, and that no marks of fire are discoverable about the ruins, and he finally concludes "that the ruins which we now behold are those of a church put up since the rebellion of Bacon in 1676." As one sees the old tower standing, dismantled, but beautiful, among the ancient, stately trees, memory almost unconsciously tries to rehabilitate the times and the men who have made the place famous in the world's history. It is all, for the most part, an unsatisfactory and plebeian name of John Smith, the chief actor in the settlement of Virginia. There is hardly in all history a figure more picturesque than that of this indomitable man. His life was a romance, and full of romance: his character was romantic, and yet romantic. He wrote of the little church in London in 1631, he sleeps in St. Sepulchre's, where a stone bearing his arms, his three Turk's heads, and his motto, "Vincere est ouire," is to be seen before the communion-tube. A tablet to his memory, engraved with a somberous epitaph, beginning: "Here lies one conquered that hath conquered kings, Subdued large territories, and done things Which an eight hundred years seem, was destroyed in the great fire of London in 1666."

About the only memorial of Captain Smith, and at the same time the only specimen of the architectural achievements of the first settlers to be found in Virginia, is the chimney of the log-house built by Smith for Pocohantas at Werowocomoco, one of which the chimney is built appears to be a shell rock. There is a great fireplace, eight feet wide, four feet deep and six feet high. Before many years the rapid encroachments of the river will have undermined the ruined tower, and the last relic of Jamestown will sleep beneath Pocohattan's turbid flood.

A. B. Bum.

[To be continued.]

AUTUMN JOURNEYS IN MEXICO. — VI.

QUERÉTARO.

Every one who has heard of Mexico has some idea of Maximilian and that he was in some way connected with the political history of the country. And all who have heard of Maximilian know that he met his sad fate in Querétaro. Consequently, every tourist in Mexico is strongly inclined to make a pilgrimage to Querétaro in the interests of an historical knowledge which, in most cases, is limited to the Spanish Conquest and the death of Maximilian. But for this, few tourists would ever see that city, though once attracted to it by affection for the amiable Austrian whose melancholy end endeared him to the world, a great deal of interest is to be found there. It is a beautiful city, in a lovely situation. As one surveys, from the Convent de la Cruz, (where Maximilian had his headquarters), or from the Cerro de las Campanas (the Hill of the Bells), where he laid down his sword with the sad words, "I am Emperor," and where he was afterwards executed, the city with the picturesque towers of its fifty-six churches, the broad level fields which surround it, all under cultivation, and the beautiful hills which close it in on every side, one may suspect that the Austrian Archduke, who was already tired of the Imperial task he had undertaken, was disgusted with the treachery of his pretended friends, and sorrowing over the loss of his beloved Carlotta, found other attractions in Querétaro than its ecclesiastical strength, and the promises of the Imperialists who thronged the town. For Maximilian was eminently aesthetic. He was a far better judge of scenery than of human character or of political probabilities.

He used a happy expression, however, when he called the place "the mouse trap." After he had established himself in the town, the Republican armies began to gather from every quarter. In a short time they had a line of artillery upon the hills encircling the valley. Then followed the siege with all the horrors which always pertain to a siege: the treachery of Lopez, the surrender, the farcical trial, the heroic death. These are the subjects upon which one reflects as one stands upon the Cerro and looks out over Querétaro. Surely Maximilian left his impress upon the city. It is impossible to dissociate his memory from the place. The Church of the Cross (la cruz) still stands, so does the old monastery in which the Emperor was held a prisoner. And the town is full of stately Imperialists still, who warmly cherish the memory of their fallen chief. Some years ago they petitioned the government for permission to erect a memorial of their unfortunate Emperor. The government would permit only a mark to be placed upon the site of the
of Mexico in the years 1716 to 1722. It was not every Spanish Vicerey who looked out for the requirements of his subjects as well as Zuniga, and the gratitude of the city has been expressed by erecting a monument to his memory in the plaza. Thus Queretaro perpetuates the memory of two men distinguished in the history of Mexico. One was the unfortunate Austrian who undertook to "regenerate Mexico." The other was the thirty-sixth vicerey. It might be suspected that it is not a very loyal republican city; it is one of the Church's strongholds, and the Church and the Republic "agreed to disagree" some time since.

Queretaro is reached from the capital by means of the Mexican Central Railway, which places many and great opportunities at the disposal of the tourist, for making autumn journeys in Mexico. A former correspondent has embraced these opportunities and given the readers of The American Architect the benefit of his basly em-ployed pen and pencil in Guanajuita, Lagos, Chihuahua, and elsewhere. This railway brings to the tourists' especial notice one of the most stupendous works of engineering to be found anywhere. It is the famous Tajo de Nochistongo, or drainage-cut, designed to drain one of the lakes of the Mexican Valley which inundated the City of Mexico.1 It was first constructed as a tunnel four miles in length. Failing to accomplish its work in that form it was subsequently opened as a deep cut. When the Mexican Central Railway sought an entrance through the mountain wall surrounding the Mexican Valley, the Tajo de Nochistongo, having served its original purpose, furnished the desired means of ingress. The railway runs along a shelf excavated upon the side of the cut, and affords an excellent opportunity to examine this interesting relic of the engineering skill of the seventeenth and eighteenth centuries, without leaving the train.

In a short time lateral branches of this railway will be opened, connecting the Gulf with the Pacific, Tampico with the San Blas, and opening up other interesting portions of Mexico for the inspection of tourists, and providing opportunities for other autumn journeys in Mexico, without necessitating roughing it to the extent of employing the primitive modes of travel, the litera, the pack mule, and the diligencia.

Arthur Howard Noll.

[The end.]

1 See No. 60, of The American Architect.
A FAMILY HOTEL, MINNEAPOLIS.

American Architect and Building News, June 29, 1889.
Memorial Library at Acton Mass.

At the foot of the great tower, on the terraces, in the gardens, on the bank, everywhere in fact, is a very apt heap of picturesque constructions, projections, pavilions, towers, pointed roofs and domes, which declare themselves against the clear sky or stand out on the green landscape, and above all, the triumphal arch of the Rotunda, with those of history and hygiene. Passing under the tower without stopping, since it is not yet finished, and the elevators only operate as far as the first story, let us direct our steps towards the central dome, the only one in the town of Nancy, a church altar in goldsmith's work, by M. Poussielgue, and a little panel in porcelain and Limoges faience, by M. Charles Haviard, and finally the spacious rotunda, with a beautiful mosaic, the central panel of which is chessboard pattern of mosaic work, a fine old piano, by Erard, a window of Lyons silk, and marbles from the house of Cantini, of Marseilles.

The exhibit of copper-work made by Laveluiezé occupies a very beautiful place, and contains a number of objects as likeable as those of the other manufacturers, the greatest of whom, M. Marcel Deslugarie, is the most elegant of the three. This is composed of a central grand arch resting on a strong sub-basement decorated with Indian styles, and in my opinion the best executed. This is decorated on each side, with female statues symbolizing "Ceramics," by M. Loriot, sculptor, and "Mosaics," by M. Houssin, sculptor. These two statues, all of chamelied faience, form two superb bits of ceramic work, which is decorated with Indian patterns, a work on a gold background representing "Earth" and "Fire," symbolized by two female figures. The frieze is decorated with rosettes of faience in a succession of small arches, and the whole is crowned by a frieze which stops against a motif of figures, with a decorative vase. On each side of the entrance door is a portion of two arches separated by a central column and surmounted by a frieze with figures of faience forming panels. Two statues resting on cultic lamps, crown the summit of two plinths, which limit this motif of arches, and which are surmounted by a decorative panel with a vase above. A balsastre of enamelled lava completes this generally brilliant decoration. M. Marcel Deslugarie, architect, had as co-laborers in the execution of this doorway our most able ceramicists, Brunet, Boulanger, Gillet, Morreux, Lebouyze, Maller, etc. After the brilliancy of this doorway the furnishing and decoration section is not at all equal, and the Italian Renaissance of M. Marcel Deslugarie, architect, had as co-laborers in the execution of this doorway, our most able ceramicists, Brunet, Boulanger, Gillet, Morreux, Lebouyze, Maller, etc. After the brilliancy of this doorway, the furnishing and decoration section is not at all equal. The last arch is, nevertheless, enlivened by two decorative panels by M. Toché, which are very luminous in effect.

Almost the two doors of the horological section, original enough, but not sufficiently studied, by M. Abel Chancel, and that of the bronze section, which is sufficiently commonplace, we find ourselves in front of the doorway leading to the metallurgical section, designed by M. Derouard. This is the best design, in my opinion. It is entirely made with motives derived from metalurgy and pieces of iron or steel, which are exhibited by the ironworks of Pomped, and in spite of the dryness of which these elements are taken by the whole, who are already rather dry and even amusing. The consoles in iron spiral springs, the curtiances formed of tappings of locomotives of polished steel, the columns, all the decoration, in a word, is of a great originality, which comes from any material to foreign to that which constitutes the exhibit of metallurgy. Another door composed in the same feeling but less successful, is ci-en-aris to it and still belongs to the metallurgical class. It is the work of M. Giraudet.

Passing more rapidly before the door of forest industries, whose originality is too laborious and becomes baroque, and also before that of pottery which, in which is not weary, we reach the centre of the building, a beautiful mosaic on any matter foreign to that which constitutes the exhibit of metallurgy. Another door composed in the same feeling but less successful, is ci-en-aris to it and still belongs to the metallurgical class. It is the work of M. Giraudet.
THE LOTUS IN ANCIENT ART.—VI.

THE ANTHEMION AND THE LOTUS.

In specifying the Anthemion as a lotus motive, it is important to insist on a historic aspect of artistic and decorative development, which is not apparent in a time of eclectic copying like our own. In a time which has imitated and mixed together the decorations of every national style and of every epoch of history, it is not easy to grasp the fact that in the original development of decorative art it has followed a specific course of evolution, in which ornaments of a certain character were confined originally to certain centres, from which they have radiated or travelled in certain directions according to historical causes.

Since the beginning of Greek history, at least, there is one law of development of which there is abundant evidence in the lotus. Each successive style has followed a definite sequence of development from the simpler to the more ornate phases of a given motive. In the architectural decoration of the Renaissance, Gothic and Romanesque styles, every step in the elaboration of the ornamental style argues a sequence in time, and follows a definite development from the simple to the ornamental, from the ornamental to the elaborate, and from the elaborate to the complex, over-burdened and superfluous. This becomes lifeless and fossilized, and finally disappears. The various distinctions in the nomenclature of the English Gothic are simply distinctions expressing this general law. In the ornamental style of the Renaissance and 15th Century, it is sometimes possible for an expert to date the monuments according to the sequence of style in ornament within a given decade. In the Greek vases of the fifth and fourth centuries B.C., similar differences of style enable the expert to fix the dates occasionally within a quarter of a century.

In the case of the Greek anthemion there is a parallel development, and at a certain stage the influence of the Rhodian Greeks from the islands is clearly apparent. This influence, especially leaf decorations, is, however, later than the close of the fifth century B.C., and the later anthemions are always built upon an elementary scheme which remains the same, and which preserved its simpler aspect through that time, at least.

This elementary scheme is that of two scrolls or spirals supporting a palmette. In architecture, the anthemion form of the Parthenon may be cited as an example (No. 37). Nos. 38 and 39 are from Athenian tombs of the later date, and may be quoted as examples of the more ornate subsequent development, which, however, adheres as regards the skeleton of the plan to the original scheme of 37.

In defining the anthemion as a lotus motive, it is this elementary scheme which is in question.

Considering the great abundance of examples of Greek decoration in pottery antedating the fifth century, and the relative scarcity of other material, it is clear why pottery examples will furnish the greatest number of transitions and connecting links in the illustration of this point. To reach this second stage of the later anthemion we turn to the pottery of Rhodes. The first stage is illustrated by the pottery of Cyprus. The third stage and complete illustration of the anthemion, as directly connected with the lotus, is at present writing, and within my knowledge, only furnished by the pottery of Melos.

According to the geographical sequence from East to West, and in view of the dependence of the Rhodian Greeks from Oriental influence, as compared with the absolutely dominant Orientalism of Cyprus, we have a right to expect in the pottery of Rhodes and from its earliest examples a more Grecianized expression of the lotus form. On the other hand, the close relations of Rhodes with the Greeks of the Nile Delta from the time of their establishment in Egypt in the eighth century B.C. would explain that dominance of the lotus in its pottery decoration which the most careful examination will reveal, and which is also the rule for the Greek pottery of Naukratis.

Among the various forms, we select that which is clearly a more Grecianized expression of the Cypriote lotus motive, through which we have found one way to an explanation of the Ionic capital. No. 1 shows, for convenience of reference, a repetition of this new familiar form of ornament. With No. 2 we enter on the first stage of the Greek lotus anthemion. Without any sort of doubt this ornament is a Grecianized development of the Cypriote volute lotus. The curling calyx leaves have grown into spirals; the upper portion is a Greek decorative treatment of the simpler basin form, the whole filled-in with conventional decoration. We have pointed out that the Greek-Phoenician pottery of Cyprus can clearly date its typical examples back to the fifteenth century B.C., at least. The Rhodian pottery is in question while the lotus is placed earlier than the eighth century with any certainty. Thus the sequence both in time and in geographical relation is a clear one. No. 3 is a variant showing that we are dealing with a Rhodian type, and not an isolated example, and No. 4 is a related motive from a vase found on the island of Thera.

The palmette portion of No. 4, is part of a lotus-rosette (ovary stigma) and related to the Egyptian lotus palmette as this has been already explained in previous articles.

We are now prepared to take advantage of the Chigri capital No. 5, of the Egyptian-Phoenician ivory details of Nineveh No. 6; above all, of the Egyptian palmettes, to which they are related, and whose derivation from the combination of the lotus-rosette (ovary stigma) with the voluted lotus has been previously explained.

No. 7 and 8 are examples of Egyptian forms are repeated here (Nos. 7-14) from preceding articles in order that the vase lotus, Figures 4 to 6, may be clearly recognized as a Grecianized and more elaborately decorative treatment of the combination 10 to 14, inclusive, and of the motives 5 and 6. The Egyptian lotus is shown on the Rhodian lotus form at 15 as far as the rosette combination is concerned.

Figure 16 offers a typical example of a Rhodian vase of the style from which the details 2, 5, 4, and 15 are taken. These vases belong to a period comprehending the eighth and seventh centuries—probably the sixth as well. The style of decoration in bands of animals—deer, grizzly, etc.—is well recognized as one preceding that in which figured compositions from the Greek myths are represented, although it continued after this later one began. The most archaic vases of this later class were apparently made first in centres far away from our country.

It is from the Island of Melos, or from a pottery centre of manufacture which has so far revealed itself by examples found on that island, that the most archaic class of vases figured with Greek myths derives its examples. Few of these vases are known, but their importance for the history of Greek pottery has been recognized in a special publication devoted to them by Professor Conze, of the Berlin Museum. They are supposed by him to date from the seventh century. The dates of particular pieces, as between the vases of Rhodes and Melos, are not, however, offer cause for anxiety, as it is a matter of general information that in the development of Greek art, local schools were variously formed, and that they frequently perpetuated local types beyond the time of a more perfected art in other quarters. Moreover, the ornaments of the Melian vases are clearly enough lotuses when attention is turned to them, although this has not been noticed in the publication of Professor Conze, or otherwise. In my own observation it was the Melian lotuses which first suggested the lotus form of the anthemion. It occurred to me that vases of the Rhodian style ought, on account of geographical position, to exhibit connecting links with the lotus forms of Cyprus, and these were then found by turning to Salzmann’s publication of Rhodian vases in his "Niceropole de Comines."

In the decorative details from this and other vases of the same class, we meet a development of the lotus form which passes directly over to the Greek anthemion. The transitions are found in details of leaves one and then the other vases are replaced by the ornament 17 a doubled lotus—whose spirals are elaborations of volutes similar to those of 4, 3 and 2—which again have been recognized as more Grecianized forms of 1.

1. Continued from page 226, No. 698.
2. Compare the calyx leaves from nature, Göt, 6, Article 1, "The Ionic Capital and the Lotus."
The general resemblance as regards proportions, and without reference to the spirals, to the Egyptian lotus palmette in gold repeated at 19 is apparent. It is also to be remembered that the Egyptian motives figured at 11, 14 and at 15, are quite frequently found in the ornamented metal-work discovered in Greek, Phoenician and Etruscan tombs, so that a direct influence of such designs on the vase decorators may be easily admitted. The intimate relations of the Greeks, in general, with those of Assyrian, from the Naukratis would, however, be a sufficient explanation for this and all other Egyptian influences.

As regards the general proportions of the lotus and palmette, and without reference to the volutes, a resemblance may also be traced between a Sicilian-Greek architectural lotus palmette figured by Hittorf (20), and the lotus palmettes 18 and 19.

Our next step with the lotus forms of Melos is decisive, especially in view of the fact that 21 and 18 are figured on the same vase. Two points are to be noticed, the free development of the palmette from the stiffer, more formal, aspect seen at 19, and the inversion of the lower scrolls. The Greek decorative feeling, pure and simple, has captured the lotus palmette, and it appears at 22, another motive from the same vase, in a typical Greek form. This motive exactly resembles the upper portion of 21. It may be compared to the more schematic Rhodian lotus anthemion 4, for indication of the sequent steps by which Greek ornamental art developed from its Egyptian prototypes.

The motive 22 is an excellent type of the Greek anthemion, because in it the two component parts of palmette and spiral are equally balanced. The scheme of Greek ornamental decoration, as regards scrolls and spirals, is contained in this one example, or develops from it by simple decorative changes, of which the most important appear on the same type of vases. No. 23 develops from 22 by a simple inversion of one scroll.

By carrying the lower unfinished curves of 22 around and upward till they meet above, we obtain another typical form of the anthemion (24). In this case the balance of dimension between spirals and palmette seen in 23 has given way to an enlargement of the palmette and diminution of the spirals. The same variant appears in union with intermediate palmettes in the detail 25 from a Rhodian vase. Both belong to the perfected art of the fifth century. The contrary alternative of palmette diminution and scroll enlargement is represented by 26, also of the perfected Greek art of the fifth century.

If we add to these illustrations, the detail shown at 27 from a Greek vase found in Italy, we shall have fairly covered the typical case of the anthemion, all reducible to elements which appear in 22 and 23.

We are now prepared to understand that peculiarity of the anthemion borders of the perfected Greek art which permits recognizable lotuses with the anthemion proper, as shown in the detail of metal decoration (Greek-Etruscan art) at 28, and in so many of the borders published by Owen Jones of which a series is shown at 29, Owen Jones's details.

On the hypotheses so far accepted that the recognizable lotus motives of perfected Greek art are Egyptian but that the anthemion is Assyrian, we are required to find some meeting-point where the two foreign forms united before they passed to the Greeks. This meeting-point could only be in Phoenician decoration and have all the indications point to a transmission of an Egyptian lotus palmette to Assyria as starting-point of the Assyrian forms. A reaction of the Assyrian palmette on Greek decoration may easily be conceded and very probably took place through later Babylonian or Persian influence.

To the Assyrian transmission by way of Asia Minor, but at a time when the typical anthemion was already perfected. The main indication that the Assyrian palmette did not influence the early development of the anthemion is the fact that it does not appear on any of the archaic Rhodian and Melian vases which illustrate this development and that the archaic anthemions do not indicate this influence. If the Assyrian form had any influence on the Greek it must have travelled to the Greeks by local stages, and yet the intermediate pottery of Cyprus, and the archaic pottery of Rhodes, are absolutely destitute of any such palmette forms. On the theory of local transmission the influence should be first apparent exactly in these localities. A rare case of Cypriote lotus palmette is shown at 30, the only instance, so far published in the distinctively Cypriote pottery. The upper portion of this design may be conceived as the preparatory or earlier archaic form of 4, but it has no close relations to the Assyrian palmette.

We are forced to conclude therefore that Assyrian and Greek ornamental art are divergent branches of a common tree which was rooted in Egypt and Phoenicia.

As the starting-point of these observations was the Ionic capital, we may return to this starting-point to observe once more that only by the views presented can we unify that form of Proto-Ionic in which the central triangle appears between the volutes with the alternate form shown by the capital of Chiigri (Neandria) Figure 5.

With this we may now unite the capitals recently published by Mr.
which the ultimate Greek form was reached. It is not necessary to assume or demonstrate a graded precedence of time as regards these individual instances. Let them be local or traditional survivals of earlier times, or the same. Such an argument may be demonstrated for the anthemion even in the Greek-Roman art as appears by illustrations 35, 36, motives from terra-cotta reliefs in the Campana collection of the Louvre. Wt. H. Goodyear. (The end.)

Mr. Gillman has rendered an important service to social science in collecting in a convenient little volume 1 authentic accounts of all the experiments, successful or unsuccessful, which have been made in sharing business profits between employers and employees, up to the present time, in regard to which information was available. It is easy enough for persons interested in the subject to find elsewhere glowing accounts of the success of this or that particular scheme; but an unprejudiced review of the whole subject, presenting the bad, as well as the good side, is the only thing that is of real use to people who are disposed to take an active part in social reforms, and this is just what Mr. Gillman has given us. He has himself, naturally enough, a high opinion of the value of participation in profits as a remedy for the antagonism between master and man which has brought so many misfortunes to the community, but he does not allow his prepossessions to color his presentation of the facts, and he deserves our gratitude for his scrupulous fairness.

It is curious that a large proportion of the successful profit-sharing enterprises date from 1841-18, the era of the fever for liberty which attacked the people of so many European countries, and ended in a dozen unsuccessful revolutions. The most famous of all, the Maison Leclaire, entered upon the practice of its system in 1841; but Leclaire lived in Paris, the heathen of socialist ideas, and was an enthusiastic student of social and economic questions, so that it is natural enough that he should have been put in practice the ideas that he had gathered a few years before the propaganda which had affected him began to make its way into the outside world.

It is curious to learn that a theorist was, against his will, the author of the solution of the problem which perplexed Leclaire. From an ambitious and ambitious apparatus he had become a successful master house-painter and decorator, and, being warmly attached to his workmen, he was anxious to devise some way of securing their future, without subjecting them to the degradation of accepting charity. Like a practical philanthropist, however, while searching for the ideal system, he practised an imperfect one, which consisted in encouraging his men to form permanent connections, in lending them money without interest, in promoting the establishment of a mutual-aid society, supported by subscriptions, and in maintaining a strict discipline in a trade which had the reputation of comprising the worst and most reckless of all Parisian workmen. About 1836, Frégerier, then chief of a Government bureau, and fresh from the agitation which ended in the coronation of Louis Philippe, conceived the idea of writing a book on the "Dangerous Classes," who had made themselves so unpleasantly conspicuous a few years before, and went to Leclaire as a man who could probably furnish him with information on the subject. He found in him a social theorist like himself, and the two had many discussions on the questions which interested them both. In the course of these Frégerier propounded the doctrine that there was nothing so far as he could see, which would do away with the antagonism between employer and employed without excluding the participation of the workman in the master's profits. Leclaire, as he says, "emphatically rejected" this idea, which was quite inconsistent with the economic theories contained in his books, and, moreover, there was something also in the scheme which alarmed him. Nevertheless, the novelty of the notion attracted him, and, as he says, it took root in his mind. Five years later, after Frégerier's book was finished and printed, Leclaire was overwhelmed with orders, and, thinking how he could probably receive them all at once a way in which he could apply Frégerier's profit-sharing idea, and at the same time serve his own interests and those of most of his workmen. Frégerier had discouraged it, urging all sorts of objections, but Leclaire was determined to try it, and in June, 1840, he assembled his best workmen, to the number of eighty or ninety, and explained to them his plan, by which he proposed to divide the profits of his business among them. As those acquainted with workmen can understand, the proposition was received very coldly, and it was not until two years later, after a few years of formal and successful experiments, that the plan was actually put in operation. In February, 1842, a circular of rules and terms was issued, by which, in February, 1843, a division was to be made among the members of the négro, or nucleus, consisting of forty-four of the men who had been longest in his employ, of a certain part of the profits of the year's operations. The men submitted, rather than acceded. Many of them thought that some trick was being played on them, and one of the workingmen published a newspaper openly denouncing the scheme to lower wages; but the majority of the members of the négro, Leclaire thought that he probably meant well, and consented to trust his good faith until the end of the year, but without counting much on their dividend.

The twelve months went by, not very prosperously, but sufficiently to so prove something for the workmen, and Leclaire, who had the living genius of a true Frenchman prepared a little sermon for the men. On the 12th of February, 1843, he called together the men composing the négro, and, standing before them, threw down upon a table a bag containing nearly twenty thousand dollars in coined money, opening the bag, he distributed the money equally among the men. Probably few of them had ever had fifty dollars at once in their hands before, and, as might be imagined, from that time the success of the scheme was assured.

Leclaire was of altogether too active a temper to be satisfied with the system he had established. After a year or two, finding that the encouragement which it offered to the men had made them most industrious, he went on to the next step. He leased to them the factory which he was constantly on his own account, to try to discover some substitute for white lead, whose poisonous effects on his workmen he knew only too well. With the help of Chevennet he decided that oxide of zinc presented the most advantages, and after securing some zinc mines, he established a factory for the preparation of this substance which has ever since been exclusively used by him and his successors.

Mr. Gillman has also been fairly started, to his profit-sharing plans, he took up the problem of making the yearly dividend more useful to the men by inducing them to lay it by as a provision for old age instead of spending it. He found his workmen quite averse to devoting any part of their dividends for the prospect of a retiring pension, so, without wasting time in discussion he coolly informed them that unless they agreed to what he had proposed, he could not go on. Without any other way, so many new members that the dividend of each would be very small. The men could not well resist this argument, and concluded to accede to his plan, by which thirty per cent only of the year's profits was divided among the workmen in cash, and twenty per cent was reserved as an addition to the fund of the Mutual Aid Society, from which pensions are paid to superannuated members and to the families of those who die. Until 1874, participations in the profits of the house were confined to the négro, but in that year Leclaire pushed his idea to its complete expression, by procuring the passage of a resolution by the Maison Lozère permitting the admission of additional partners, even to the apprentices and the temporary journeymen, so that now every man who does a day's work with the Maison Leclaire shares proportionately in the year's profits.

When the great man died in his cottage at Herouville, leaving behind him a strong, experienced, and well organized association, which he had accustomed to doing without him by withdrawing formally some years before from the firm, and which has gone on ever since in a course of quiet prosperity. Although he transmitted to his heirs only the comparatively modest fortune of a quarter of a million of dollars, he often said that he could not have devoted so much even to the innumerable friends without the participation of his men in his profits."

Something of the same feeling seems to be common among the masters who have successfully admitted their employees to a share in their profits. In nearly all instances they declare that it has been with them a purely business matter, that it has been profitable to them as well as to their men, and that it has improved their business. However that may be, there is no question that participation promotes good feeling and consideration on both sides. Even the public usually has occasion to remark gratefully the politeness and attention

---

with which it is treated in the profit-sharing establishments, and Mr. Gilman's book gives many instances of mutual good feeling between the parties and the excellent form of the trust deed. However, "satisfaction" is the usual morals and manners of "business.

In fact one of the most interesting things shown in the book to those who believe, as we do, that the prudent and honest man sets aside and turns his property over to a school whose object is the profit-sharing in teaching workmen to be careful about small things. In one establishment described, the men are so business-like that the union hands over another an unfilled check for money of work without getting a receipt for it, and there are many similar instances of a minute care for details in such establishments which would do credit to the more skilful and experienced manager.

WHAT IS MEANT BY WORK SATISFACTORY TO THE OWNER? AGREEMENTS that work or materials to be furnished by one party to a contract shall be "satisfactory" to the other, the purchaser, are of quite common occurrence, particularly in building contracts. The exact meaning, however, of the word "satisfactory" may differ in different cases, and is not always easy to determine.

Some work may be satisfactory and at the same time, say if the work was, in fact, properly done, the owner could not avoid payment by returning it and saying that he was dissatisfied with it.

Sometimes, on the other hand, the word is to be taken in its literal meaning; and, if the owner is dissatisfied with the article and returns it to the manufacturer or contractor, the latter can recover nothing. In such cases, however, if the work cannot be returned, as it is permanent in the owner's premises, it would generally be entitled to maintain an action for the fair value of the article deducting what it would cost the owner to make it satisfactory.

If the architect or owner, or whoever draws the contract, intends to reserve the right to reject the material if personally unsatisfactory to the owner, this intent should be made clear by appropriate and unambiguous language. If the matter is left in doubt, taking the instrument as a whole, the courts will be inclined to construe the contract as meaning to the "reasonable" satisfaction of the owner.

These remarks are induced by the recent decision of the Massachusetts Supreme Court in Hawkins v. Graham, a case where steam-fitters sought to recover a bill for a heating apparatus. Our readers will probably recollect that earlier in the year reference was made in the editorials of this column of this case to somewhat similar cases arising in France, and may be interested to note the extreme diversity of the reasoning adopted by the courts in the two cases. The facts also were different; in the French case the apparatus did not work at all; the French courts declared that it did work properly, though not "to the satisfaction of the owner." In the Massachusetts case the Court lays down the common law as follows:

"The only question in this case is whether the written agreement between the parties left the right of the plaintiff to recover the price of the work and materials furnished by him dependent upon the actual satisfaction of the defendant. If such were the case, the contract was construed not as making the defendant's declaration of dissatisfaction conclusive, in which case it would be difficult to say that they amounted to contracts (Hunt v. Livermore, 5 Pick. 385, 397), laid down in this province, to the effect that if the party did not have the work done in the manner and manner in which he intended to, it was not to be held satisfactory to him. The courts have laid down that it is the duty of the contractor to do work properly, though not necessarily to the satisfaction of the owner."

In the event of the system proving satisfactory and conforming with all the requirements as above provided for, the sum of $1,525, and $1,000 in perpetuity, after such acknowledgment as has been made by the owner or the work demonstrated.

The Court held that the words "or the work demonstrated" qualified the words "satisfactory," so that the contractor, taken as a whole, bound the defendant to pay for the apparatus, if it, in fact, worked properly.

Oftentimes in building contracts it is important for the owner to retain an absolute right of rejection, or, generally, no injury is thereby done the contractor. For instance, it is generally provided that either the owner or architect may reject, absolutely, certain of the materials used in the building (as pliés, foundation stone, etc.), which are "unsatisfactory," this being found to be the easiest way of compelling the contractor to furnish proper material. Here no injustice is done, for of course the material rejected can be taken away by the contractor, he has only the expense of erecting; and there is no inducement for the owner to be unreasonable in his dealings with the material, as such a course would only tend to delay the work.

The above case, however, shows that it is important that the right of rejection should be expressed in unqualified terms.

[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

AN OWNER'S RIGHT TO GIVE ORDERS.

Baltimore, Md., June 18, 1889.

To the Editors of the American Architect:

Dear Sirs,—Please give me an opinion, in the columns of your paper, on the following case:

B is in the building committee and A the architect. A employs B to prepare designs and superintend the erection of a large school-building. The contract containing the usual clause as to ownership of drawings was signed by all parties. After the work had been in progress for some time and all the detail drawings had been finished, A begins to ignore B, and gives orders to contractors directly contrary to those given by B. B monuments with A, and points out the evils that may arise from such a course. A, however, pays no attention to B; but continues to interfere, giving the contractor orders which will ruin the design of the structure, even if it does not jeopardize the safety of the building. B has sent a note to contractor to return all drawings and refuses to give them to A unless A agrees to allow him to finish work his way. Has B any right to pursue such a course, and can he demand a commission for any part of his work?

Yours truly,

C. E. GARDNER.

[Editors: He is engaged to do the work, and is doing it. If he refuses to complete what he engaged to do, he cannot claim any of the promised compensation, unless he has an agreement of some kind by which he is bound to withdraw at pleasure and to be paid for partial service. As to interference with his directions, he seems to forget that the building is to be built to specifications of B, who is the owner. If A interferes with B, he has no choice. It is not likely that the contract requires that the building shall be erected as B wants it, and not as A wants it, and in default of some such contract, B gives directions, and A is to see that they are carried out on the spot, either at his expense or his risk. To complain of his not removing the director's rights, which would be such that it would nearly float, and thus would not be subject to any transverse strains. It is further suggested that the structure may be built to specifications of B, or to specifications of the architect.]

PROPOSED SUBMARINE BRIDGE UNDER THE SOUND.—Under the paradoxical name of a submarine bridge, a design has been put forward by a Swedish engineer, Mr. Rudolf Lillqvist, A. M. I. C. E., for making a tunnel under the two countries permanently connected. The proposed structure, which would join Elsinore to Helsingborg, is a bridge composed of 199 feet spans, and carrying a single line of railway. It is to be submerged to such a depth as to allow ample seaway for all classes of ships to pass over it. To protect the trains against the water the entire bridge is to be surrounded and encased by a tube, composed of an outer skin of iron and an inner skin of steel, with the water being retained by the owner, who can supersede and contradict him at his own sweet will. All that B can do is to make sure that the catastrophes which may follow A's directions are not visited on his head, by giving timely and liberal warnings as to the probable consequences of them. In a French court he might stand some chance of prevailing for his experience by having damages awarded him for injury to his professional reputation through the mangling of his design, but an American jury would not comprehend anything like artistic property.—Eds. American Architect.

PROPOSED SUBMARINE BRIDGE UNDER THE SOUND. — Under the paradoxical name of a submarine bridge, a design has been put forward by a Swedish engineer, Mr. Rudolf Lillqvist, A. M. I. C. E., for making a tunnel under the two countries permanently connected. The proposed structure, which would join Elsinore to Helsingborg, is a bridge composed of 199 feet spans, and carrying a single line of railway. It is to be submerged to such a depth as to allow ample seaway for all classes of ships to pass over it. To protect the trains against the water the entire bridge is to be surrounded and encased by a tube, composed of an outer skin of iron and an inner skin of steel, with the water being retained by the owner, who can supersede and contradict him at his own sweet will. All that B can do is to make sure that the catastrophes which may follow A's directions are not visited on his head, by giving timely and liberal warnings as to the probable consequences of them. In a French court he might stand some chance of prevailing for his experience by having damages awarded him for injury to his professional reputation through the mangling of his design, but an American jury would not comprehend anything like artistic property.—Eds. American Architect.

The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.
tunnels. The advantages claimed for this scheme over a submarine tunnel are the safety and rapidity of construction, and the avoidance of unforeseen difficulties. — Engineering.

FANS OR HOT-WATER.—The entire absence of sanitary arrangements in Chinese towns and villages being well-known, it goes without saying that there is no hygiene, nor what is even more surprising, there is no organized means of dealing with diseases. There is no isolation of infectious diseases, and no attention is paid to causes of death unless there is suppression of violence. According to our own observations and those of our colleagues, the ways and methods of combating diseases have changed very little. The Chinese have long been acquainted with the necessity for disinfection of communal buildings and for the disinfection of bedding, but this has always been due to the prevention of Sbricbeck. The smallpox, which is the most contagious of all diseases, is occasionally transmitted from person to person without any apparent cause, appearing, perhaps, suddenly, causing a heavy mortality for a short time, and then as suddenly disappearing again, thus affording an example of the contagiousness of this disease. The healthfulness of Chinese cities has been ingeniously attributed by some to the universal habit of fanning, a practice which is said to keep the atmosphere in constant circulation. How far this explanation can be deemed satisfactory must we leave to experts to decide, but, so far as a contaminated water-supply is concerned, we believe the real secret of immunity from the plague lies in the universal custom of boiling water intended for drinking. As a matter-of-fact, the Chinese never drink cold water. The national beverage, which, in a true sense, may be said to be carried in the cradle, is tea, and this is always served even in the houses of the very poor. The native aversion to cold water is undoubtedly carried to extremes, and certainly induces diseases which may be referred to the maintenance of an abnormal condition. In the matter of ablations it must, however, be admitted, that the Chinese enjoy facilities which, however little they may be appreciated, are so arranged as to make the rich and the poor classes of our favored land. Every little hamlet in China has a shop where hot water can be bought for a trifling sum at any hour. It is said that in a small fishing village on an island in the Gulf of Pechil, where the writer spent six weeks under very unpleasant circumstances during a severe winter, this was the case, and a great convenience it proved. — The National Review.

AN ELECTRIC INDICATOR FOR LIGHTING-RODS.—A new instrument for determining instantly the condition of a lightning-conductor has been brought out by Mears, Hoyt and Company. The instrument consists of a galvanometer with a long magnetized needle, and a metallic axis, kept horizontal by a small weight. Below the needle is a soft iron core surrounded by a solenoid, which is coupled as a shunt between two points of the lightning conductor. Whenever the other end of the solenoid is attracted, and remains attached by virtue of its own magnetism. The inventor thus hopes that the instrument will indicate not only through which conductor a lightning discharge has passed, but also the direction of the discharge, whether up or down. Instruments would be fixed on the various lighting-conductors, and by means of a diagram of the instrument it would be evident which of the conductors are most likely to be chosen by the lightning, and should therefore receive the most attention to keep in good order. — Inventor.

HISTORIC ILLUSIONS. — No flood so disastrous as that in the Connecticut in 1831 before the public in the history of the country. In the Mill River disaster near Northampton, Mass., in 1874, in which a number of villages were destroyed through the bursting of an embankment, the loss of whose death was below 250, in the year 1888 the deaths were caused by 100,000 people. The order of the Kingdom was drowned in an inundation at Glasgow; at Dorr, in Holland, in 1541, the sea broke in and drowned 100,000 people, and in the most memorable of all inundations which occurred in 1520 was drowned in Holland by a general failure of the dykes — the loss of life was reckoned 750,000 people. The flood of 1888 caused 5,000 persons perished by flood; in Silesia, in 1835, 6,000. The loss of life during the recent floods in Austria-Hungary and China has never been fully reckoned up, and it may be stated that persons are said to have been drowned in the Chinese inundations, the figures are not trustworthy. — New York Commercial Advertiser.

To Protect Wood against Fire.—An investigation has been made by Professors Boudin and Donny, of the Ghent University, at the request of the Belgian Ministry of Agriculture, to rendering wood unflammable. They reported that to deprive wood to a considerable extent of the property of catching and communicating fire, it was necessary to do so as cheaply as possible. The process must not be too expensive nor take too much time, and the substance used must not attack any metal used in connection with the object to be protected. After a long period of experiment, the injection of saline solutions, which appears but little applicable except to small pieces of wood, and may be dangerous in the case of wood of large, solid sections, appeared superior to all others. Although, although expensive, it is undoubtedly the best substance to apply by injection. Certain substances, notably chloride of sodium, should be rigorously excluded, as even small quantities of them leave a disagreeable taste. The method may be applied to small articles by immersion, and the solution should be hot. In the majority of cases, including exuding structures, applying some coating with a brush is the only practicable treatment. The wood thus coated should present a most appearance, and should be capable of receiving a coat of ordinary paint, nor should either coating deteriorate within a moderate time. The best results for such application are cyanide of potassium and arsenous paint. — Fire and Water.

MALLEABLE BRONZE.—A patent has been taken out both in England and France, by Mr. A. Sentex, Mr. C. Machel and Mr. A. Saunier, establishing a process for producing malleable and ductile bronze, which is claimed to be "inordinately," and which may be referred to and drawn with the greatest ease." Moreover, the metal has the appearance and "sonority of gold." One-annum trials of the metal, proved that it added a quality of bismuthate of potassium of equal parts of malleable and cyanide of potassium are added for the double purpose of reducing the cuprate, and an even more valuable benefit, for the result of bismuthate of potassium, with the same quantity of cyanide, are added. After being cast the metal is introduced to "impact mildness," and is grained about ten years. Ten kilos. of copper are melted and 50 grams of equal parts of malleable and cyanide of potassium are added for the double purpose of reducing the cuprate, and another, and the most valuable result of bismuthate of potassium is claimed therefor. Finally, 1 gramme of sodium is added at the amount of casting. The cast in sand, may contain more tin, and if the proportion of tin be increased, the quantity of phosphorus and sodium may be increased. — Iron World.

TRADE/SURVEY

There exists a deep anxiety in business, railroad, and financial circles over the possibility of a reaction from the present hopeful conditions. The development of nearly ten years, coupled with the fact that of some twenty-eight millions since April, the decline in the surplus of exports over imports from nearly twenty-six millions to some nine millions at this time, the organized and unorganized, the growing realization of the narrowing margins in all lines of business, the general upward tendency in prices and wages, and the necessity of finding some means of releasing the pressure that is likely to result from the increasing, and are now almost one million tons. The soft coal trade is about as active as usual, but the mining capacity of the West is away ahead of demand. Lumber operations are made on a large scale, many of the larger companies, and of the largest contracts of the season were placed, not only among the large companies, but in the small. The export of lumber to Japan rose to unprecedented figures, and these and the market to-day for oak and yellow pine. Wood exporters are doing well. By reason of its own competition, and the broadness of a market in lumber, except in Georgia, are maintaining their grip. The manufacturers and retailers are to buy as the trade calls, and to avoid accumulations. It is this that accounts for the general optimism and the belief that no striking transformation is apparent. Steel mills are filling up, and prices are now, for the first time this year, strong at 828 in the East on all except exceptionally large orders. Bridge-iron makers are also better off than for months, and in this statement plate-iron makers may be included. Nail-makers have been getting rid of large accumulations. Crude-iron makers are doing what they can to push prices on full deliveries. There is no panic for speculative movements in petroleum. Wool is quiet, but strong. Textile manufacturers are making excellent progress, avoiding such a production as would threaten to jeopardize prices through an excess of production. Imports and exports are extraordinary. It is proper here to remark again that the fluctuating conditions are strongly marked by the fact that there has been no striking price, the confidence and the optimistic trend of the market.

The merchants report a very successful half-year. Their statements for the coming half-year, so far as made, point to even greater activity. Housebuilding, especially of small houses, has been very profitable, particularly in the newer and smaller manufacturing towns in the country, as against the interior. The distribution of lumber of the last thirty days shows the marked advance in railroads. The larger cities are doing well, and there are no strikes worth noting. The larger cities west of 98° west of the Mississippi have been improving, and are getting good. Chicago lumber dealers have contracts for all the stuff about the city they can get. There are many houses, factories, bridges and of large manufacturing establishments in the region where the theatre of the greatest activity is still in the West, and they can hurry through before cold weather. What has been said of the condition of the Southern States applies equally to the North, where investment is concerned, there are as many as ever, and the inflow of capital continues. Leading financial authorities remark that there never was a time when business was going on as it is now, and commercin.

S. J. FARMER & CO., Printers, Boston.
The exterior of this house is stained with
CABOT'S CREOSOTE STAIN
for Shingles, Fences, Clapboards Etc.

These Stains are very durable
and give a much more artistic effect
than paint, while they are cheaper,
and very easy to apply.

Our Stains contain no water and
are the only exterior Stains that do
not contain kerosene.

PRICES are 40, 60 and 75 cents per Gallon
According to Color.
SEND for Samples on Wood, and Circulars.

SAMUEL CABOT,
70 KILBY ST. BOSTON MASS
THE "PERFECTION" STEAM-RADIATOR.

Recognizing the demand, which is apparently universal, for a direct Radiator for Steam and Hot-Water Heating, which shall be more perfect as regards construction and design than anything hitherto manufactured, we desire to call attention to the "Perfection" Radiator.

After thoroughly investigating all the radiators now in the market, and obtaining reports from experts and consumers in all sections of the country, we have endeavored to produce an article that is superior to all its predecessors, both in appearance and construction.

Our new radiators are manufactured in plain or ornamental style, as preferred, and we have aimed to produce a design upon the ornamental loop which is appropriate and in perfect accordance with the most advanced ideas of artistic decoration of iron surfaces, at the same time avoiding all appearance of clumsiness and harshness of outline.

In entirely dispensing with all forms of removable tops, we think we have made a long stride in the line of improvement. A removable top seems to us to be quite unnecessary, and, if put upon a radiator which has no projecting base, it is architecturally incorrect, and gives the radiator a top-heavy appearance. It is very liable to be broken, and obstructs the free circulation of air through the radiator. It also collects dust and dirt and causes the currents of warm air to impinge against the walls, producing unsightly discolorations. It makes the radiator appear too prominent and bulky as compared with its surroundings. It does not increase the efficiency of the radiator, and we cannot see wherein it is of any possible good except to hide the clumsy joints of poorly constructed radiators; hence our reason for discarding this form.

Our design for the upper portion of the radiator embraces all that is required. It has a graceful finish. It has a flat top. It will not break. It will not accumulate dirt. The decoration of the upper and lower portions of the radiator are in perfect harmony, as may be observed by examining the cut. The result of our efforts is that we have produced a radiator which is architecturally correct and in perfect taste artistically.

Our improved construction secures free, unobstructed and large openings for the passage of steam and water. The loops have the full areas of heating-surface which we claim for them, and our castings are as perfect as the finest irons and the best workmen can make them.

The loops of our hot-water radiators are screwed together top and bottom with right and left nipples made of steel, and by this process the loops are drawn tightly together and held firmly in place, the face of each loop at point of contact being milled perfectly smooth and true. No packed joints are used, nor joints of any kind which require bolts or rods to hold the loops together. The screwed nipple we use makes a permanent joint, and the longer it is in place the tighter it becomes. The loops of our steam-radiators are connected at the bottom only with the same style of nipple as above described for hot-water radiators.

The supply and return openings are adaptable to any of the different systems of piping now in use. We have erected an entirely new plant for the exclusive manufacture of radiators, equipped it with the most perfect special machinery obtainable, and have at present a capacity for producing 10,000 feet of radiation daily. Any letters of inquiry or other communications with which we may be favored will receive our prompt and careful attention, and we shall be pleased to quote terms for large or small quantities.

MICHIGAN RADIATOR & IRON MANUFACTURING CO., DETROIT, MICH.

A POPULAR WINDOW-BLIND.

The Hartman Patent Sliding Window-Blind, advertised on another page of this issue, is rapidly growing into public favor, and has already gained a widespread reputation such as no other blind of the kind has attained.

One of the important features connected with it is its Burglar-Proof Lock, which comes attached with each set of blinds free of charge. This is an advantage that no other blind in the market has; and in these days of house-burglary and robbery, it is an item of no small consideration, and may save the owner and home many times the cost of the blind, and, perhaps, life also. Reader, if you are building, you cannot afford to use any other blinds. They have many other advantages over all other blinds, which, for want of space, we cannot enumerate. The highest recommendation they can have is the unprejudiced and constantly increasing demand for them by architects, builders and the
The delivery promised for June 1. Other large tools will be added. The new shop is rendered necessary by the company's heavy run of orders for large compound engines.

A PROSPEROUS MONTH.

Although the month of May, 1889, will not go down into history as an unusually prosperous one, from a business standpoint, the Westinghouse Machine Company report orders received for the first twenty-one days of the month as follows: Westinghouse Automatic Compound Engines, 17 (1,885 horse-power); Westinghouse Standard Automatic Engines, 19 (745 horse-power); Junior Automatic Engines, 30 (745 horse-power); 21 days' totals, 66 (3,575 horse-power).

If the remaining ten days of the month show the same ratio, this will prove to be a very prosperous month in the company's history.


ORDERS FOR COMPOUND ENGINES.

Among the orders for their new automatic compound engines received by the Westinghouse Machine Company for the first three weeks in May, the following prominent buyers may be mentioned: Baldwin Locomotive Works, Philadelphia, Pa., one 200 horse-power; Southern Cotton Oil Company, Memphis, Tenn., one 200 horse-power and one 200 horse-power; Omaha & Council Bluffs Railway and Bridge Company, Omaha, Neb., three 200 horse-power; L. Delannoy, Barcelona, Spain (for Clariana, Chiro, Pueblo & Co.), one 35 horse-power; Electric Improvement Company, San Francisco, Cal., one 80 horse-power and one 35 horse-power; Pennsylvania Institute for Feeble-Minded Children, Elwyn, Pa., one 50 horse-power and one 35 horse-power.

SUCCESS IN MANUFACTURING.

The question has often been asked: Why does one man succeed in business and another man fail? If one has a due regard for history, it would perhaps be nearer the truth to ask: Why do three men succeed in business and ninety-seven fail? In so far as the manufacturing business is concerned, the agents of the Westinghouse Machine Company have recently been making some investigations that at least afford a clue to the answer. In order to obtain statistics for use in their catalogues, this company sent experts, fully equipped with the necessary instruments, to visit a number of the most prominent manufacturing establishments in the country, where permission was asked to test the consumption of power by each machine. As a rule, this was readily obtained from the owners, they seeming much interested in the results. It is only necessary to indicate a few of the results obtained to make clear the point aimed at. Nearly all were wasting one-half (J) of their engine's power (or one-half of the daily consumption of fuel) before commencing actual work, the product from which constituted the maintenance of the business. One prominent establishment was wasting sixty-five (65) per cent of its fuel and power; another was wasting seventy-three (73) per cent, thus leaving only twenty-seven (27) per cent of the engine's power to earn money with. Another celebrated firm (known all over the West) was using a 60 horse-power engine, of which 55 horse-power was being consumed in dead work, thus leaving 5 horse-power with which to produce goods for sale without overtaxing the engine. It is an "uphill" business to make money in manufacturing under such circumstances. Sensible people should be more economical. What is the use of economizing in wages and in the cost of raw materials when such reckless waste as above indicated is permitted in many of our most prominent establishments? Few people in this country seem to realize the amount of money that can be wasted in a year through the steam-pipe. The proverbial "rat-hole" will not compare with it. The manufacturer who has learned to economize at the steam-pipe has learned one of the most important secrets of success.

WESTINGHOUSE MACHINE CO., Pittsburg, Pa.

DIXON'S SILICA-GRAPHITE PAINT.

A PAINT to give satisfaction should be a protection against heat, cold, the changes of temperature, the wear and tear of storms, and rust. It should be durable, easily laid on, cover well, and economical.

Graphite and Silica stand equally well extreme cold and the changes of temperature; they cannot be touched by rust, and both are a sure protection against the influences of a salt atmosphere.

Graphite is very light. One pound of Graphite is three times the bulk of one pound of white lead, and twice the bulk of mineral paints; hence in use we guarantee Dixon's Graphite Paint to cover fully twice the surface of white lead or mineral paints.

The natural color of a slate, but we can furnish it in all shades from a slate to a jet black, suitable for regular surface painting or trimmings for houses, out-buildings, metal or shingle roofs, bridges, locomotive work,
agricultural implements, and, in short, all exposed wood or metal surfaces needing a durable and economical paint. Graphics is one of the forms of carbon. It is useful in itself and, as it is unaffected by contact with any known substance, it suffers no chemical change and remains the same. All the ingredients of Dixon’s Graphite Paint are harmless. Painters will suffer no cramp or colic in using it, and cistern-water gathered from roofs painted with this paint will be perfectly pure.

A tin or metal roof painted two good coats, with a third coat put on the following year, will not need repainting for fifteen years unless worn by walking on or otherwise abused.

There appears to be no limit to the time that a tin roof will last if it is protected from atmospheric action by means of paint, and is not worn or injured by walking on or other causes. Testimonials we have received show that tin roofs painted with Dixon’s Graphite Paint have not only lasted fifteen years without repainting, but required originally only from one to two-thirds as much paint.

Iron has a tendency to oxidize from the moment it leaves the hammer or rolls, and should be painted to protect it from the rust which attacks the metal and soon destroys it. Bituminous paints, as well as those containing variable quantities of lead, were formerly considered the best, but their failure has been made apparent when the structures to which they were applied have been of sufficient size to be subject to the many changes of the weather as well as constant vibration. Dixon’s Graphite Paint has been found, by careful and practical tests, to be peculiarly suited for iron work.

In 1884 the Trenton City Bridge Company painted their bridge (275 feet long) across the Delaware River with Dixon’s Graphite Paint, and inspection now (1888) shows that after four years’ wear the paint is as good as the day it was put on.

For metal roofs, bridges, locomotive work, agricultural implements, and, in short, all exposed metal surfaces needing a durable and economical paint, nothing can be found that will begin to equal Dixon’s Graphite Paint.

For house-trimmings, out-buildings, shingle roofs, boats, wooden bridges, agricultural implements, fences, etc., Dixon’s Graphite Paint is the best that can be used, for less paint is required, and it is almost everlasting.

It is prepared thick, ground in oil, about the consistency of a stiff paste, in 10, 15, 20, and 50 pound packages, and in barrels of about 450 pounds, or thinned, ready mixed for the brush, in 5, 10, and 25 gallon packages, and in barrels of from 40 to 50 gallons.

JOSEPH DIXON CRUCIBLE COMPANY, JERSEY CITY, N. J.

A large number of Catholic schools on Staten Island, N. Y., have been plastered with King’s Windsor Cement, and we are informed more will soon be plastered with the same material.

The office of J. B. King & Co., the manufacturers, is at 24 State Street, New York. The plastering department is in charge of Mr. Lovell H. Carr.

"PERFECT" HOT-WATER HEATERS.

We show herewith an illustration of the "Perfect" Hot-Water Boilers. These boilers are becoming very popular throughout the country, from the fact that they have the enormous heating capacity which experience has found to be absolutely necessary. They are made with special reference to heating water quickly and economically; and at the same time, are so constructed as to create a quick, positive circulation, which is an absolute necessity in heating by hot-water circulation. They are pronounced by the most experienced experts in the country as having more power, size, or size, and being far in advance of any hot-water heater hitherto made.

First, they present two and one-half times more surface to the direct action of the fire than any boiler made, size for size. This surface is designed and parties can intelligently ascertain the amount of capacity each boiler has.

Second, the construction of the heater is such that each particle of the water is compelled to pass around and over the fire seven different times in its natural course through each section alternately, one after another, discharging the heat effectually, and universally giving the best of satisfaction.

Fourth, the enormous fire-surface which each section exposes to the direct action of the fire, produces great heating results. Eighty-five per cent of the square feet of boiler surface is direct fire-surface, and fifteen per cent comparatively is flow-surface which gives us two and one-half times more fire-surface than any boiler yet constructed, size for size.

These boilers have been used, giving excellent satisfaction, as will be seen by the testimonials which will be sent at request and we respectfully call attention to these popular "Perfect" Heaters of all who are desirous of obtaining a powerful Hot-Water Boiler for heating purposes.

By sending us a rough sketch of the first and second stories of a house, giving size and height of rooms and halls, designating those which are to be heated, and marking which way is north, we can intelligently advise as to the proper size required to heat the house in cold weather; and give also any other information relative to piping radiators, etc.

These heaters are adapted for burning hard or soft coal, or natural-gas. Owing to their construction any of the above fuels can be used with equal success.

RICHARDSON & BOYNTON CO., 232 & 234 WATER STREET, NEW YORK, N. Y.

METAL INTERESTS.

The rapid progress made in artistic metal goods during the past ten years can only be appreciated by a visit to the show-rooms of the large manufacturers. Specially prominent can be mentioned the industry of gas and electric fixtures. A visit to the spacious show-rooms of the Archer & Pancos Manufacting Company, whose principal ware-rooms are at 900 Broadway, New York, with branch stores at 370 and 372 Wabash Avenue, Chicago, and 12 West Street, Boston, will disclose pretty much everything that inventive genius and mechanical skill have been able to produce in the way of artistic illuminating apparatus, while the assortment of fine metal-work is unsurpassed in any city in the world. Here an observer will note that every detail of the architect and interior decorator has been followed, so that harmony may reign supreme when the house is finished.

The illuminating fixtures of to-day are designed with a view of furnishing interiors, being for gas, electric-light or both combined; these fixtures are made of bronze, and finished in many different colors to suit each particular case. Cast-iron is wrought into many curious shapes for illuminating fixtures, its most expensive treatment, being polished.

The magnitude of the above-mentioned company can only be realized by a tour through their factory at Thirty-third Street and First Avenue, New York, where are employed one thousand skilled workmen, under the experienced supervision of Mr. Chas. H. Fischer.

ARCHER & PANCOAST MFG. CO., 808-900 BROADWAY, NEW YORK, N. Y.

The well-known maker of pumping machinery, Henry R. Worthington, has just opened a branch office at 338 Silhby Street, St. Paul, Minn. This is an addition to offices at New York, Boston, Philadelphia, Chicago, St. Louis, and San Francisco.
The best is the cheapest in the end

We desire to call your attention to the Superior quality of Plate Glass manufactured by the

PITTSBURGH PLATE GLASS CO.

The Largest Plates of Glass in buildings in the cities of Chicago, Cleveland, Detroit, St. Paul, Syracuse, Pittsburgh, Philadelphia, Baltimore, and many New York buildings, were manufactured by our Company.

The only fuel used throughout both our works is Natural Gas; which, owing to its superior heating power and cleanliness, enables us to produce an article which cannot be surpassed, besides glass melted and annealed by our process with this gas, is far more durable and not so liable to break.

We make a specialty of large plates of glass, extra large sizes, large and long plates for store fronts, beveled and obscured plates, skylight and floor glass.

With a capacity of 320,000 square feet monthly, we are prepared to execute all orders promptly, and invite correspondence.

WORKS No. 1, CREIGHTON, PA.
WORKS No. 2, TARENTUM, PA.

Western Union Wire and Telephone connection in General Office at Creighton, Pa.

E. L. FORD, Sec.

Bardsley's Patent Wood Door Knobs.

The most desirable medium priced knobs in the market. handsome in appearance, beautifully and durably finished, and pleasant to the hand. Every knob warranted not to come loose or give out in any way. Besides the regular woods which we carry in stock, we make them to match special woods; each wood as by-

camore, Hazel, Birch, Whitewood, Yellow Pine, etc.

The engraving represents No. 116 Knob, list price, $0.20 per dozen pairs. We also have Door Stops and Shutter Knobs, hand-tanned and polished to match the Door Knobs, which cost but little more than the common goods.

Price List on application.

J. BARDSLEY, 59 Elm St, New York, and

The Yale & Towne Mfg Co., New York, Boston, Philadelphia and Chicago.

A. G. NEWMAN, late NEWMAN & CAPRON

MANUFACTURERS OF

Fine Bronze Hardware

Bank, Office and Stoop Railings in Bronze or Brass, Antique Furniture Trimmings. Electrical and Mechanical Bell-Hanging Burglar-Alarm Warerooms, 1180 BROADWAY. Factory, 157-163 WEST 29th STREET, NEW YORK, N. Y.
DYCKERHOFF
PORTLAND CEMENT

Is superior to any other Portland Cement made. It is very finely ground, always uniform and reliable, and of such extraordinary strength that it will permit the addition of 25 per cent more sand, etc., than other well-known brands, and produce the most durable work. It is therefore the most economical to use. 8,000 barrels have been used in the foundations of the Statue of Liberty. Architects and those interested in Portland Cement will please send for my pamphlet, which will be mailed free on application. It contains valuable directions for the employment of Portland Cement, a table of results of the strength of the Dyckerhoff Cement when mixed with sand and broken stone in various proportions, together with tests and testimonials of eminent Engineers, Architects and Consumers.

E. THIELE, 78 William St., New York.
SOLE AGENT FOR THE UNITED STATES.

INVALUABLE TO ARCHITECTS.

Safe Building.

BY LOUIS DE COPPET BERG.
Series I. Square 8vo. Illustrated with numerous formulae, diagrams and tables. $5.00.

"The author proposes to furnish to any earnest student the opportunity to acquire, as far as books will teach, the knowledge necessary to erect safety any building. First comes an introductory chapter on the Strength of Materials. This chapter gives the value of, and explains briefly, the different terms used, such as stress, strain, factor-of-safety, centre of gravity, central axis, moment of inertia, etc. There follows a series of chapters, each dealing with some part of a building, giving practical advice and numerous calculations of strength; for instance, chapters on foundations, walls and piers, columns, beams, roof and other trusses, spires, mansard, girders, inverted and round-arches, blast-furnace, chimneys, etc.

These papers are the work of a practising architect, and not of a mere bookmaker or theorist. Mr. Berg, aiming to make his work of the greatest value to the largest number, has confined himself to the mathematical demonstrations to the use of arithmetic, algebra, and plane geometry. In short these papers are in the highest sense practical and valuable.

TICKNOR AND COMPANY, Boston.

Electrical House Furnishings.
Hazard & Stanley,
32 & 34 Frankfort Street,
New York.

COMPAGNIE GENERALE DES ASPHALTES DE FRANCE, Ld
Sole Proprietors of the Mines of Seysel.

E. H. Wootton, 35 Broadway, N.Y.
General Agent for the United States and Canada, and Importer of Bitumens Dom-Doucet.
THE MARR CONSTRUCTION COMPANY

Some representative electric light plants erected by The Marr Construction Company, showing an important variety of conditions and difficulties successfully overcome:

HOOSAC TUNNEL.

The lighting of this the longest tunnel in the country (41 miles) has for years been regarded as an impossibility. It has now (March, 1889) been successfully completed and contains 1,250 16 candle incandescent lamps.

A central station with an ultimate capacity of 40,000 lamps. All the wires being underground. A marvel of compactness, both in steam and electrical completeness. The light has not been stopped an hour since the dynamos were started.

CHICAGO, ILL.

An isolated plant of 1,300 16 candle power lamps operated on the alternating system. It is remarkable on account of the completeness of the inside (concealed) wiring, the admirable distribution of light, and the economy of its operation.

JUIZ DE FORA, BRAZIL, S. A.

This plant is operated by water-power, the "feeder" lines being of great length. The station is 4 miles distant from centre of distribution of lights, and shows what can be accomplished by even a distant water-power.

UNITED STATES SENATE.

The peculiarity of this central station system is its immense pole line, comprehending more weight of copper than any other built up to the time of its erection.

NEW ORLEANS, LA.

The lighting of this great cave was attended by many difficulties. The arrangements of lights were made entirely by this company, and include many incandescent lamps of 25, 50, 75, and 150 candle power.

WAYER'S CAVE, VA.

The first system ever built in Cuba by an American company. It consists of both arc and incandescent lights and is now running successfully.

HAVANA, CUBA.

The electricity is generated by water-power six miles from the centre of lighting. When the power was first turned on it was found to light successfully. It is operated on 2,000 volts.

SKOWHEGAN, ME.

Many other plants of larger or smaller size might be mentioned. Our work can be seen in all parts of the country. We are erecting plants of from 50 to 40,000 lamps capacity.

INTERESTED PARTIES ARE CORDIALLY INVITED TO SEND FOR ESTIMATES.

F. S. MARR, President.
H. M. DOUBLEDAY, Vice-President and Gen'l Manager.
THOMAS SPENCER, Chief Electrician.
FRINK'S Reflectors

Are used with oil, gas, electric, or daylight light. Strongly endorsed by the leading Architects, and are in use in most of the prominent Churches, Theatres, Art Galleries and Public Buildings in this country.

Among the prominent buildings lighted by Mr. Frink within the past few months are the following:

**ART GALLERIES.**
- Mrs. E. Stuart, 211 5th Ave., New York.
- Fifth Avenue Art Galleries, 335 5th Ave., New York.
- Century Club, 500 E. 15th St., New York.
- W. Lininger, Omaha, Neb.
- David C. Lylil, Brooklyn, N. Y. 

**THEATRES.**
- Nissen's Newark Theatre, Newark, N. J.
- Commonwealth Hall, Orange, N. J.
- Titusville Opera House, Titusville, Pa.
- Academy of Music, Petersburg, Va.
- Opera House, Helena, Ark.
- Park Opera House, Springfield, Mo.
- Opera House, Wittenberg, Penn.
- Opera House, Ameston, Alaska.
- Opera House, Carbondale, Ill.
- Opera House, Paris, Mo.
- Opera House, Los Angeles, Cal.

**CHURCHES.**
- First Baptist, Minneapolis, Minn.
- First Presbyterian, Westfield, N. J.
- Holy Trinity, Hoboken, N. J.
- Central Congregational, New York.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- First Congregational, Cambridge, Mass.
- Second Congregational, New London, Conn.
- Second Congregational, Westfield, Mass.
- First Baptist, Lenox, Ky.
- Methodist Episcopal, Chattanooga, Tenn.
- Universalist, Tell City, Ind.
- Presbyterian, Greenbrier, Conn.
- First Baptist, Hawthorne, Mass.
- Trumbull Ave, Presbyterian, Detroit, Mich.
- Methodist Episcopal, Youngstown, Ohio.
- First Baptist, St. Louis, Mo.
- First Unitarian, Alton, Ill.
- St. Rose, Lima, N. Y.
- St. John's, Brooklyn, N. Y.
- Methodist Episcopal, San Bernardino, Cal.
- First Baptist, Columbus, Miss.
- Methodist Episcopal, Ontario, Cal.
- Church of the Assumption, New York, N. Y.
- Madison Ave, Reformed, New York.
- Centenary M. E., Newark, N. J.
- Woodward Memorial M. E., Church, Providence, R. I.
- South Congregational, Providence, R. I.
- First Presbyterian, Dayton, Ohio, N. Y.
- Pilgrim Congregational, Detroit, Mich.
- First Congregational, Washington, N. Y.
- First Congregational, Columbus, Ohio.
- Methodist Episcopal, New York, N. Y.
- Second Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- Methodist Episcopal, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, New York, N. Y.
- Second Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregational, New Haven, Conn.
- First Congregational, Providence, R. I.
- First Congregational, New London, Conn.
- First Congregational, Williamsport, Mass.
- Methodist Episcopal, Youngstown, Ohio.
- Trinity Church, Portland, Conn.
- First Congregional
DIXON’S
Graphite Paint
Will cover twice the surface of White Lead. Two coats will last on a lin or metal roof ten years, and on a hotter front three years.
Send for Circular and Technical Memo.
Jos. Dixon Crucible Co.
Jersey City, N. J.

Union Spring Hinges
And Simple, Easily Set
Cannot be Put on Wrong.
They work either way, right or left, all doors. Single or double hinging.
For Wire Screen or Light Doors refer to style.
Ask for Price List.
M. & H. H. Robinson, Sole Agent,
79 Chambers St., New York.

Troy Laundry Machinery Co.,
LIMITED.
TROY, N. Y.

The most complete line of machinery for hotels and public institutions. Complete hand-cars for institutions too small to specialize.
Estimates furnished. Send for Illustrated Catalogue.

Something New for the Stable.
Read's Patent Harness Bracket.

An Article long wanted but never before made.
Holds the whole harness, takes no more room than the ordinary lock or peg, can be used for both single and double harness. Gives the harness-case a neat appearance, as it curtails the harness up uniformly in width, with the saddle, beside keeping the bridle and harness-plate in their proper shape. They are neatly japanned, with gift prices. Price 98 per dozen. Are now in use in over five-class private stables in and about Boston. Each bracket lettered "J. J. Read, Boston, Mass." For sale by dealers everywhere.

Held in high esteem and approved by the following named gentlemen, all of whom have them in use:

The public are cautioned against all similar brackets. This bracket with my name on each is a true one, and other brackets are infringing patents held by us. Send for reg. U. S. patent No. 10,318. Price $1.20 each. And whip-rack for English coach and straight whip with chromium. Price $2.50 each.

JAMES J. READ.
13 Tremont Row, Room 10.

ESTEBROOK'S STEEL PENS
FOR SALE BY ALL STATIONERS.
THE ESTEBROOK STEEL PEN CO.
20 John Street, New York, N. Y.

The Smith Hot Blast Apparatus.
For Heating and Ventilating.
No other apparatus has so large and light a running fan wheel by half.
No other apparatus can drive half as large a volume of air over the steam-heating pipes with anywhere near as little power.
No other apparatus handles cold air in the fan and pushes it hot, direct from heater to buildings to be heated.
For further information address.
HUYETT & SMITH MFG. Co., Detroit, Mich.

A great improvement over all other blinds, slide up and down in the window like sash, move easily, and stay where placed. No hinges, hoops or swinging, sagging and lashing with curtains and window drapery. Must be seen to be appreciated. Each any other sliding blind in the market for economy, durability, style, beauty, convenience, etc. Also the most perfect arrangement for Fly Screen, consisting of an additional section which slides same as the blinds; very much admired by all.
They are also made to slide entirely down to the floor, into pockets, out of sight, without any additional expense, 25 per cent. cheaper than the hinged blind, and will last double the length of time.
No more an experiment; tons of thousands now in use. Architects are specifying them. They always give satisfaction.
The only blind that is desirable, is described in a durable Burnard-Proof Lock, free of charge.
Agents wanted everywhere. Send for Illustrated catalogue and prices to
HARTMAN & DURSTINE,
No. 72 Larwill Street, Wooster, Ohio.

WITHROW & HILLOCK, (Toronto, Ont.),
M't's for the Dominion of Canada.

Wigger's Patent Sash Lifters.
A simple contrivance designed to facilitate the raising and lowering of one-light sashes.
A strip of concave-convex metal, with projecting knobs, fitting over the head on the stile.
Readily applied to either new or old work. Furnished in different styles—brass, nickel-plated, white, japanned, etc.—to correspond with painting or other metal trimmings.
Architects, Builders, Carpenters and Painters will be furnished with Circulars by the Hardware trade.

BRAINERD & CO.,
Manufacturers’ Agents,
97 Chambers Street, New York.

ATLANTIC WHITE-LEAD & LINSEED-OIL CO.,
"ATLANTIC"
Pure
WHITE LEAD,—AND—
Pure Linseed-Oil, Raw Refined and Bottled.

The best and most reliable White-Lead made, and unexcelled for Uniform Whiteness, Pinness, and Body.

ADDRESS:
Atlantic W. Lead & Lin. Oil Co.
257 Pearl St., New York.

ESTABLISHED 1818.
MARSHALL BROTHERS,
Iron City Elevator Works
69 TO 75 DIAMOND ST., PITTSBURGH, PA.
The Marshall Positive Safety Passenger and Freight Elevators,
Hydraulic, Steam, Electric and Hand-Power.
Spiral Stairway Fire Escapes, Wire and without Stand-Pipe,
For Asylums, Hotels, Schools and Public Buildings.
SEND FOR CIRCULAR.
American architect and architecture