As Important As Light and Heat

It is just as important to provide for proper refrigeration facilities in a residence as it is to provide for artificial light and heat.

Perhaps even more so—for the sanitary and proper care of food stuffs is a necessity every minute of the day, every day of the year.

Lorillard Refrigerators

Since 1877 Lorillard Refrigerators have been selected for the most prominent residences, hotels, clubs and institutions throughout the country.

The J. P. Morgan, Jr., residence, the Judge E. H. Gary residence, the W. K. Vanderbilt residence and the George Gould residence are fitting examples of the class of construction with which Lorillard Refrigeration is associated.

Send for Description Circular

The Lorillard Refrigerator Co.
25 West 32nd Street
New York City

ARCHITECTURE, and many other high grade magazines, catalogs, and booklets are printed with

DOUBLETONE INKS

Made only by the
SIGMUND ULLMAN CO.
Main Office: 1406th St. and Park Ave., New York
Factory Heating and Ventilating

Modern factory management recognizes that good heating and ventilation makes the worker comfortable and increases his production. Provision is now generally made in all modern factories for the installation of the most practical and successful heating and ventilating equipment.

**IDEAL SMOKELESS Down-Draft Boilers and VENTO Heaters**

have earned the right to be classed as A1 equipment. Thousands of new and remodeled factories in the country are so equipped. Architects everywhere have learned from experience that an iron-clad specification for **Ideal Smokeless Down-Draft Boilers and Vento Heaters** means that the one most vital and important feature of that building is assured of success.

"Factory Heating and Ventilation" catalog gladly sent

**AMERICAN RADIATOR COMPANY**

Branches in most large cities
Are you interested in a door check that is entirely out of sight when the door is closed, one that can be applied without defacing the finest door?

If so, write us for complete information regarding the RUSSWIN CONCEALED DOOR CHECK.

RUSSELL & ERWIN MFG. CO.
SAN FRANCISCO
RUSSELL & ERWIN MFG. CO. of New York
94-98 Lafayette St.

NEW BRITAIN, CONN.
RUSSELL & ERWIN MFG. CO. of Chicago
73 East Lake St.

RUSSELL & ERWIN MFG. CO.,
The American Hardware Corp., successor
LONDON, ENG.
This is an illustration of one of our reproductions of a Chinese carpet of the Kien Lung period. The medallions, containing Fu Dogs, Kirins and Storks, follow faithfully those symbols as woven in the ancient rugs of China. The two and borders represent the Sacred Mountain rising from the Sea of Eternity. The hatchings on the ground of the carpet give that pleasing softness of color so characteristic of the old Chinese Rugs. Size 18 ft. 3 in. x 12 ft.—Price, $80.

An Unequalled Opportunity

The difficulty of transportation from most of the Eastern Rug weaving districts has resulted in materially lower prices for rugs at those places. We have succeeded in effecting several large shipments, and offer today a stock which, in excellence, range of size, and variety, exceeds that of any former season. The prices are as reasonable as in normal times.

The weaving of Eastern Rugs to required designs is a specialty which our facilities make unexcelled.

We shall be pleased to give you detailed descriptions of such rugs as may answer your requirements.

Inquiries invited from Architects, with whom we gladly co-operate.

W. & J. SLOANE

Direct Importers of Eastern Rugs

Interior Decorators  Floor Coverings and Fabrics  Furniture Makers

FIFTH AVENUE AND FORTY-SEVENTH STREET, NEW YORK
A typical Adam mantel. The carved central plaque and frieze of boys playing with goat is one of the subjects which the brothers Adam often employed, and the delicacy of the carved husks and paterae in the pilasters adds much to the beauty of the whole.

This mantel was recently removed from an old Adam mansion at Kew Green, now demolished, and is one of a number of Genuine Antique Mantels in our showrooms.

Wm. H. Jackson Company
2 West 47th Street, adjoining 5th Avenue
New York City
Also 902 South Michigan Boulevard
Chicago
Shops, 335 Carroll Street, Brooklyn, N. Y.
BIG VALUE FOR THE MONEY

Corbin hardware for moderate-priced houses has the same artistic merit, the same excellence of finish and the same attention to detail as the most expensive. It makes the use of poor hardware inexcusable. Ask your hardware dealer or write us for particulars.

P. & F. CORBIN
The American Hardware Corporation Successor
NEW BRITAIN, CONN.

NEW YORK  CHICAGO  PHILADELPHIA
Erected in 5½ months

Gray & Davis, Inc., wanted a factory in a hurry. They also wanted economy, fire protection, plenty of daylight and the least possible vibration. They chose reinforced concrete and 5½ months later, in spite of winter weather and difficult foundation work, they had a building that met their requirements.

Besides these advantages, reinforced concrete factories afford many opportunities for good architectural treatment in economical and simple mass effects.

Atlas Service to Architects

We shall be glad to furnish architects with statistics and data, and to co-operate in the development of reinforced concrete designs. Information regarding this service, and our book on Industrial Buildings, will be sent upon request. The coupon is for your convenience.

The Atlas Portland Cement Company

Members of the Portland Cement Association

New York Chicago Philadelphia Boston St. Louis Minneapolis Des Moines Dayton
"THE FOUNDATION BUILDERS"

The congestion of modern cities necessitates building heights unknown a generation or even a decade ago. These towering structures cannot rest on the surface of the earth as did the buildings of old; they must be rooted into the earth.

The foundation builders of today—those men who are building for the present and future—prefer RAYMOND CONCRETE PILES to build their structures on.

Get some of our figures on speed and you will see that this process, far from being complicated and time consuming, is both correct and expeditious.

Raymond Concrete Pile Company
New York Chicago
140 Cedar Street 111 W. Monroe Street
Branch Offices in all Principal Cities
Raymond Concrete Pile Company of Canada, Ltd., Montreal, Canada

A form for every pile— A pile for every purpose.
Architectural Terra Cotta of superior quality.

COMEDY, Music, Tragedy: panels for a photoplay theatre in Omaha, Nebraska—Harry Lawrie, Architect.

Modeled in the studios of The Northwestern Terra Cotta Co., and executed in Northwestern Cream Enamel Terra Cotta.

THE NORTHWESTERN TERRA COTTA CO.

CHICAGO
Varnish in Architecture

Deviltries

When a job of wood finishing turns out badly, whether it does not dry properly or whether it cracks, peels, chips, blooms, pits, sags, wrinkles or does anything else it should not do, it is a common thing among wood finishers to attribute the trouble to one of the “deviltries” of varnish.

Sometimes this is true, but the right varnish properly applied develops no “deviltries.”

Given the right varnish for the right use and a competent finisher the right results are infallible, and a satisfactory finish can be had in no other way.

One of the most certain means of avoiding varnish troubles and ensuring a finish that will satisfy completely is the specification of Berry Brothers Architectural Finishes.

LUXEBERRY WHITE ENAMEL—whitest white, stays white. Makes permanent snow white finish in either gloss or dull effects.

LIQUID GRANITE—floor varnish. Makes smooth, satin finish. Lasting, waterproof, nongreasy, especially adapted for bathrooms, window sills and casings, and all interior work where great durability is desired.

LUXEBERRY WOOD FINISH— for general interior work. Develops and preserves the grain of all woods, and makes a handsome and lasting finish. Rubs perfectly.

LUXEBERRY SPAR— for exterior work. Especially adapted for durability under extreme exposure—front doors, store fronts, marine work, etc. Makes handsome finish and will not turn white under the severest conditions of wear.

Scrap Book Item

Cypress

While cypress has the beautiful grain and other essentials that make it a desirable wood for interior trim, it is more sappy than other woods, which is a handicap from the finisher’s standpoint.

One or two coats of shellac is the most effective sap biter, care being taken to sand down close so that no shellac film remains on the surface.

It is claimed by some finishers, that undercoats of shellac have a tendency to cause the varnish coats to crack. A close sanding down as suggested will obviate all danger of this.

Ordinary liquid fillers will not keep in the sap. If the wood is to be stained, stain first and follow with the shellac coats.

Berry Brothers, Varnish Mfrs., Detroit, Mich. (194)
Batterson & Eisele

Importers and Workers in
Marble, Onyx and Granite

Roman and Venetian Mosaics for
Floors, Walls, Mantels, Etc.

Office: Architects Building, 101 Park Ave.
New York
Works: Edgewater, N. J.
ORIENTAL RUG DEPARTMENT
Persian, Turkish and Chinese Carpets

CONTAINING 200 SQUARE FEET AND UPWARD
ARE SPECIALLY FEATURED

THE STOCK INCLUDES SOME HIGHLY INTERESTING ANTIQUE AND
SEMI-ANTIQUe ORIENTAL RUGS, AS WELL AS A NUMBER OF EXCEL-
LENT MODERN CARPETs MADE IN THE ORIENT UNDER THE IMMEDIATE
SUPERVISION OF B. ALTMAN & Co.'S REPRESENTATIVES

"ARDSLEY"

A WIDE PLAIN CARPET FOR MAKING TO MEASURE IN RUG
OR CARPET FORM

"ARDSLEY" IS A HEAVY, WOOL-BACK CHENILLE FABRIC, IN WIDTHS OF
3, 9, 12, 15, 18, 24 & 30 FT., AND IN BLACK AND 11 COLORS

SAMPLES (FOR QUALITY) AND PRICES MAY BE OBTAINED UPON REQUEST

RUG DEPARTMENT, FIFTH FLOOR

Fifth Avenue - Madison Avenue, New York
Thirty-fourth Street          Thirty-fifth Street
ALL woods have certain uses for which they are especially adapted by reason of the peculiar qualities and characteristics which nature has given them; and on their proper selection for these uses, hinges the whole problem of economy in wood construction.

Three centuries of experience in this country have demonstrated that no other wood lasts as long or gives such satisfactory service as

**WHITE PINE**

for outside finish lumber—siding and corner boards; window sash, frames and casing; outside doors, door frames and casings; outside blinds; all exposed porch and balcony lumber; cornice boards, brackets, ornaments and mouldings; and other outside requirements, *not* including shingles.

If the lumber dealers supplying your clients are at any time unable to furnish it, we should appreciate the opportunity of being helpful to you in securing it.

**WHITE PINE BUREAU,**
1934 Merchants Bank Building, St. Paul, Minn.

Representing
The Northern Pine Manufacturers' Association of Minnesota, Wisconsin and Michigan, and the Associated White Pine Manufacturers of Idaho
Architects everywhere are securing great help from our service department

Are you making use of this department that is conducted solely for the benefit of the architectural profession?

Here is one phase of our service: Suppose you are planning a fine home, a modern hotel, or other building where the woodwork must be finished with rare judgment.

You can send us specimens of the actual woodwork to be used. We will not only give you our suggestions for finishing, together with complete specifications, but actually work out ideas for you on the specimens submitted and render this service without expense to you.

This service enables you actually to show your recommendation to your client, and be absolutely sure, by following specifications, of securing exactly same results.

In specifying Lowe Brothers Varnishes, you insure a finished job not only of deep lustre and brilliancy, but of lasting beauty. They are famous for durability.

Write for a copy of our booklet, "Varnish and Varnishing." It gives the kind of information you want.

The Lowe Brothers Company
487 East Third Street, Dayton, Ohio

For service and information on wood finishing
you have only to consult your local Lowe Brothers dealer, write the nearest Lowe Brothers office, or if you wish, communicate direct with our special Architect's Service Department, 101 Park Ave., New York City.
All of the plain and ornamental Plastering throughout the Astor Court Apartments, Broadway, 89th to 90th Street, New York, Charles A. Platt, Architect, was executed by

H. W. MILLER, Inc.

Plain and Decorative Plastering and Cement Stucco Contractors

654 West 51st Street
New York
The building illustrated above shows the splendid range of color and the rich effect produced by our STAR COLONIAL face brick. The real beauty of these brick cannot be shown in an illustration. To be fully appreciated they must be seen in the building itself.

O. W. KETCHAM

Manufacturer of
Architectural Terra Cotta—Brick—Roofing Tile
Master Builders Exchange, 24 South 7th St., Philadelphia

WASHINGTON
Home Life Building

BOSTON
4 P. O. Square

BALTIMORE
Baltimore American Building

NEW YORK
1170 Broadway
"FISKLOCK"—"TAPESTRY" BRICK
Hardoncourt—Fiske Patents

Here is an 8-inch brick wall, to all outside appearances, built of "Tapestry" Brick, with its regular unit size, beautiful colors, texture and mortar joints.

It is fire-proof, vermin-proof, repair-proof, moisture-proof and is stronger than walls of either hollow tile or solid common brick.

Yet it is a hollow wall with 2-inch horizontal air spaces, giving maximum insulation against heat, cold and moisture.

Most remarkable of all, it is cheaper than any other form of face brick construction, whether solid or brick veneer. It costs less than terra cotta hollow tile covered with stucco and about the same as first quality stucco-on-frame. It costs only 3½% to 5% more than frame-clapboard.

"Fisklock" is the "perfect building material," at last.

It is sold under the "Open Price Policy"—the same price to all.

Send for catalogue and full information to either office

FISKE & COMPANY, Inc.
Sole Manufacturers of "Tapestry" Brick
25 Arch St., Boston, Mass. Arena Bldg., New York
Unique Vestibule Glass-In

As a floral greeting, preceding the host's welcome, this conservatory-vestibule idea sounds interesting. This particular one of Mrs. Jewett's was constructed in demountable sections so it could, if desired, be easily removed in the Summer.

We were recently privileged to co-operate with Architect Thomas B. Lippincott of Philadelphia, in carrying out a similar idea, only in a much more extensive way. For considerably over half a century we have been building greenhouses and enclosures of glass.
The Capitol Smokeless Boiler applies an old, thoroughly established method of combustion widely used in modern power plants and approved by all combustion engineers to low pressure heating boilers.

The Capitol Smokeless Boiler is a single grate boiler, simple in operation and of astonishingly high efficiency. Its efficiency is high because the volatile gases are not cooled in the boiler until combustion is completed.

*Let our representative tell you about it.*

**United States Radiator Corporation**

*General Offices: Detroit, Michigan*

*Branch Offices in Principal Cities*
In addition to permanent efficiency, genuine Detroit Packless Radiator Valves have an unusual pleasing appearance, giving a smooth, satin finish never before equalled in radiator valve construction.

They are finished with the definite purpose that they shall harmonize with the most beautiful surroundings and retain that appearance always. The large, easy-turning handle has a beautiful mahogany finish. This handle will not crack or split, and as a further precaution in keeping it cool there are ventilating holes in the handle follower.

Send for catalog V.

Specify Genuine Detroit Packless Valves

DETROIT LUBRICATOR COMPANY

DETROIT, U. S. A.

Largest Manufacturers of Radiator Valves in the World

Carried in stock in all sizes in all principal jobbing centers.
THE increasing demand for Atlantic Terra Cotta Shop Fronts has found our several departments organized for the prompt and efficient handling of this branch of our work.

Our Designing Department is ready to prepare exclusive designs or offer suggestions that may be of assistance; our Sales Department to discuss prices and service; our Factories to execute orders promptly; and our Construction Department to erect your front with entire satisfaction.

Information as to colors, surface treatment, or methods of manufacture will be gladly given and literature or photographs sent on request.

Atlantic Terra Cotta Company
1170 Broadway, New York

Copyright, 1916, Atlantic Terra Cotta Co.
No fire disaster or panic can occur through failure of exit doors to open, in buildings equipped with

Von Duprin

Self Releasing Fire Exit Latches

They insure safe exit, reduce liability to injury in case of panic, put the smallest child on equal footing with strongest man.

No strength, no knowledge of their mechanism, required to operate. Either a push or pull on inside cross-bar frees the door instantly and always.

Beware of the many flimsy devices sold at a price in keeping with their cheapness. You and your clients want, and the public is entitled to, exit devices that assure unfailing action. Price is a secondary consideration.

Von Duprin patented construction assures lightning responsiveness.

Von Duprin quality will outlast the average building.

Specify Von Duprins by Number

and see that your specifications are complied with. You cannot afford to permit substitutions that may prove terribly costly. If you do not readily obtain Von Duprin Devices, write us. Ask for list of new buildings protected by Von Duprin service; also Catalog 12-O.

See Sweet’s Catalog, pages 597-601 for full specifications and prices.

VONNEGUT HARDWARE CO.
INDIANAPOLIS, IND.

Manufacturers and Distributors
Reaching up to this Skyline
and bringing its highest points within a few seconds’ distance from the street level, there are, as indicated here by the arrows, those safest of all transportation lines,

OTIS ELEVATORS

What is true of Pittsburgh’s skyline is equally true of every other city's skyline.

The Architect's elevator problems are but problems of type and number, in the solving of which can always be had the free co-operation of Otis experience through the local Otis office.

OTIS ELEVATOR COMPANY
Eleventh Ave. and Twenty-sixth St., New York
Offices in All Principal Cities of the World
ARCHITECTURE

VENTILIGHTER SYSTEM
LIGHT-AIR NO GLARE
Keeps Out Heat—For Skylights, Windows and Sleeping Porches.

The illustration at the right shows the Indoor Tennis Court of

MR. VINCENT ASTOR
Rhinebeck, N. Y.

after VENTILIGHTER was installed.

This covers the entire glass surface of the roof, closing out the intense rays of the sun, permitting the ideal circulation of air and distributing the light in such manner that no shadows are cast.

VENTILIGHTERS are framed in cold, rolled steel and consist of a number of movable cloth louvres permitting light to be deflected to any part of room desired. It has been pronounced as a thoroughly successful installation.

COMPARE

the illustration to the left, showing the makeshift of shades and awnings. Note the strong spots of light and the heavy shadows. The application of VENTILIGHTER SYSTEM was the only solution.

VENTILIGHTERS may be applied to skylights, windows and porches and are so constructed that they may be removed entirely to the sides or tops of openings.

SIMON VENTILIGHTER CO., INC.
101 Park Avenue New York City
Rookwood Faience counters, wainscoting, vault and floor in the Lafayette South Side Bank, St. Louis, Mo.

Widmann and Walsh, Architects

**THE ROOKWOOD POTTERY COMPANY**
CINCINNATI, OHIO

New York Office: Architects' Building, 101 Park Avenue
A group of new and notable buildings where the need of the most efficient service has made advisable the installation of

WILSON Blinds and Awnings

They provide a permanent and adequate system of controlling light and furnishing free circulation of air—add to the appearance of buildings—are safeguards against fire—are right in principle, practical in use, perfect in construction and of moderate cost.

Wilson offices and Wilson services are located in the principal cities. For illustrated literature or further information, address

J. G. WILSON CORPORATION
8 West 40th Street New York
THE WROUGHT IRON STAIR RAIL AND MARQUISE SHOWN IN THE AC-
COMPANYING ILLUSTRATIONS WERE EXECUTED BY US FOR THE ASTOR
COURT APARTMENTS, NEW YORK. MR. CHARLES A. FLATT, ARCHITECT.
WE ALSO MADE FOR THIS BUILDING THE GARDEN FENCES AND GATES
AND THE WINDOW GUARDS.

ADDITIONAL ILLUSTRATIONS SHOWING OUR WORK CAN BE SEEN IN THE
MAGAZINE SECTION.

JOHN POLACHEK BRONZE & IRON CO.
DISTINCTIVE METAL WORK
480-494 HANCOCK ST. & 577-591 BOULEVARD
LONG ISLAND CITY, N.Y.

Improved SECTIONFOLD Partitions
   (Patents applied for)

The Modern School
The up-to-date Y. M. C. A.
The properly equipped Church
The Business Office
The Club
The Gymnasium

Need SECTIONFOLD partitions to economize space, to get the greatest
efficiency at the least expense. Both wood and metal doors. Sound and
fireproof. Floor action only, no overhead to get out of order. Can be put in
old as well as new buildings.

"Simple of construction—easy of operation."

Write for Particulars

See Sweets

Manufactured by

THE FOLDING PARTITION CO.
200 Broadway, New York, N. Y.
Architects today are Demanding the Individual, the Distinctive, in Wood Finishes.

The tendency among architects to prefer the beautiful new soft-toned wood finishes is very marked.

These finishes are not only pleasing to the architect, but they afford him the opportunity to furnish the client with something individual and distinctive at a very moderate cost.

Everybody is familiar with the conventional finishes, and while these will always be in demand, their very conventionality often fails to excite even ordinary interest.

We have all of the standard finishes, of course; but the new finishes, with the beautiful soft tones which we have developed, have the decided preference. Really wonderful effects are obtained on inexpensive woods like pine and cypress—combining great beauty with great economy.

We call special attention to the following

\[ \text{BRIDGEPORT STANDARD} \]

Wood Finishes
in these beautiful soft tones:

Satin Gray on Pine
Satin Brown on Pine
Smoked Pearl on Cypress
Silver Gray on Cypress
Standard Gray on Birch
Fumed Oak on Oak
Taupe on Pine and Gum,
the latter being a particularly fashionable finish.

All of these new finishes are shown by our Service Departments at the addresses given below, also at the permanent exhibits in the hands of leading distributors at important centers throughout the country. Ask for the name of the distributor nearest you—or write us for sample panels, which will be cheerfully sent without cost or obligation.

The Bridgeport Wood Finishing Co.
New Milford, Conn.

NEW YORK
6 East 39th Street

CHICAGO
76 West Lake Street

PHILADELPHIA
12th and Sansom Streets

BOSTON
8 Portland Street
“Gateshead” a Yale Period Design

For Colonial houses, or rooms treated in the Adam style, the Gateshead design in Yale hardware is at once distinctive and fitting as a unit in the decorative scheme.

“Gateshead”, examples of which are illustrated, has fine proportions, good lines, and the motif is strongly incised. The elimination of the long escutcheon and the use of the knob, knob rose and key plate is another attractive feature of this design.

In artistic fitness, decorative value and mechanical excellence Yale locks and hardware meet the exacting standards of the architect—the result of co-operative understanding with the architectural profession in all that tends to approved, authoritative practice.

Yale Products bear the name Yale.

THE YALE & TOWNE MFG. CO.
9 E. 40th Street, New York
Chicago London Paris Hamburg
A BOSSI MANTELPIECE FROM RATHFARNHAM CASTLE DUBLIN COUNTY IRELAND

This is an authentic example of the work of Bossi the great Italian sculptor. It was executed for the Earl of Rathfarnham at the time of the restoration of the castle in the year 1771.

The mantelpiece is of carved statuary marble with grounds of old Connent Siena. The inlaid freeze panels depict local scenes. The side blocks, consoles and pilasters are ornamented with birds and flowers.

Bossi worked by a secret process which is practically a lost art, so carefully and successfully did he guard it from imitation.

The mantelpiece was brought to America by and is now in the possession of Arthur Toothn Hunter, New York.
Robert Adam and His Brothers
Their Lives, Work and Influence on English Architecture, Decoration and Furniture

By John Snowbrick, Assoc. R.I.B.A.

THE story of the lives and work of Robert Adam and his brothers forms a significant episode in the history of English Renaissance architecture. The character of their work is distinctive, and consequently easily recognizable, so that it has come to be popularly described as the "Adam style."

The delicacy and refinement of Adam interior decorations are so marked, and the work has such individual charm, that it has always evoked interest and admiration, and has exercised a definite, and of late, an increasing influence on the trend of English architectural art.

In the year 1754, Robert Adam left Edinburgh in order to study architecture on the Continent. He was then twenty-six years of age, and had spent some time upon architectural work with his father and brothers, after studying at the Edinburgh University. Abroad, he visited France and Italy, and finally returned home down the Rhine, on account of the hostilities in which England and France were then engaged. Like most travelers, Adam appears to have spent a considerable part of his time in Rome, where he made the acquaintance of Piranesi, the distinguished engraver. He also met his subsequent friend, Charles Louis Clerisseau, an architect who had been awarded the Grand Prix de Rome. The most remarkable incident of Adam's sojourn was the expedition which he conducted to Spalato, where he contrived to make the survey and obtain the drawings of Diocletian's palace, that were published after his return to England. In this undertaking he was assisted by Clerisseau and Antonio Zuchi, in addition to another artist. Shortly after Robert Adam's return, in the year 1760, his younger brother, James, traveled in Italy in company with Clerisseau, Zuchi and others, in order to enjoy similar facilities for study, and also with a view to conducting special research in Southern Italy or Sicily, and, if possible, in Greece, the Levant and Egypt. An adequate impression of the nature of the task undertaken by James Adam, and the thoroughness with which it was conducted, may be formed from the extracts from the "Journal" of his tour, which appear in the text of the present book.

Whilst abroad James purchased, on behalf of George III, the large collection of drawings and prints in the possession of Cardinal Albani, and it is not improbable that, at this time, he may have made the acquaintance of Winckelmann, who was then the librarian of the cardinal. In addition to effecting this purchase, James Adam also acquired for personal use a considerable quantity of drawings of Roman and Cinquecento work, which had not previously been illustrated. By these and other means the brothers contrived to make themselves familiar with the architecture and other artistic work of Roman and Renaissance periods, to a degree that few earlier architects had been able to do. The sources of influence that are traceable in their work were largely, if not mainly, to be found in Roman remains and in the decorative work of the Cinquecento period, yet they were proud to acknowledge the assistance that they derived in various ways from their knowledge of French work, which they doubtless acquired, knowing that it was requisite that they should be intimately informed of the requirements and fashions of polite, social life in France.

Immediately upon the return of Robert Adam from the
Continent, he commenced to practice in London, where he was subsequently joined by his brothers, James and William, the eldest surviving brother, John, remaining in Scotland. The time was one of great political significance. The two great efforts of the House of Stuart to regain the British throne had failed, and failed so hopelessly that even their most earnest supporters realized that further effort would be unquestionably futile. So thorough had been the final defeat that even the most rebellious realized that nothing could be gained by continuous civil commotion. Prosperity lay in loyal adherence to the Union, and in the conversion of suspicious neighbors into valuable partners for the advancement of mutual aspirations. The greater opportunities that England afforded, moreover, proved a powerful agent in inducing Scotsmen to cross the border, and so gradually break down the barrier that had hitherto prevented the attainment of mutual confidence and loyal co-operation.

The new king was young, and owing to the death of his father, and the neglect of his grand-
in fact, the fashionable architects of the day, and among their clients were the king and queen; Augusta, Princess of Wales; William, Duke of Cumberland, and many of the peerage. Commissions came to them from all parts of the United Kingdom and Ireland, and so great was the demand for their services, that it was with difficulty that they sought to fulfill their engagements, with credit to themselves and with satisfaction to their patrons.

After his return from the Continent, Robert Adam was assisted by the Earl of Bute. His Lordship appears to have been ever ready to exercise his personal influence for the benefit of any of his fellow-countrymen whom he considered to be worthy of encouragement. Adam came to be almost immediately regarded as a scholarly architect with new ideals, and gifted with judgment that rendered his opinion upon all questions relating to his art of the greatest value. Commissions were speedily entrusted to his care, while his advice on questions of taste came to be in great request. Indeed, so highly was his opinion esteemed that his advice was sought, even in cases where other older architects had been already engaged. For example, Lord Coventry requested Adam to visit Croome Court to see the work that was being completed by Launce-lot ("Capability") Brown, in the capacity of architect and garden designer; Sir Nathaniel Curzon (afterwards Lord Scarisbale) solicited his views with regard to the scheme for Kedleston, which Matthew Brettingham had commenced, and which James Paine was then about to continue; while Mr. Ed- win Lascelles (afterwards Lord Harewood) consulted Robert}

Adam about the work of Carr of York at Harewood House, in Yorkshire. Almost as soon as he began to practice he commenced to prepare designs for furniture and the various appointments of private houses and other buildings, as at Harewood House, Yorkshire; Syon House; Osterley House; Kedle-ston, and Nostell Priory. He realized that an interior could not be pleasing so long as the furniture and fittings bore no relation to the architectural treatment. He perceived that there must be consonance throughout, and that if the work was to attain to true excellence, one scheme of effect must govern the treatment as a whole, and that the carpets, ceilings, walls and fittings, together with the smallest pieces of furniture and sundry features, must all be designed in accordance with the general scheme. The variety of subjects that it became necessary to design, in order to apply this principle, was very considerable. Not only was it necessary to design cabinets, upholsteries, carpets, tapestry and embroidery, but also mirrors, lead fanslites, fire-grates, door furniture, girandoles, epergnes, torchères, and many other details too numerous to mention. Though the designs so made have afforded, and will perhaps continue to afford, material for critics to discuss, none can deny that in the majority there are certain qualities that withstand even severe criticism, and that it is these qualities that modern designers in the so-called "Adam style" seek to secure. These pervading, indestructible characteristics, which are to be found in the best of Robert Adam's work, have survived and are appreciated today no less than were the original designs, from which later artists have derived their general ideas.
of treatment. In order to form some conception of the depth of the impression created at the time, by the originality and innovations of Robert Adam, it is necessary to realize how widely different were the schemes to which the country had hitherto been accustomed; indeed, to use the words of the brothers themselves, it may be truly said that they produced "a kind of revolution in the whole system of this useful and elegant art."

Though the original suggestions were derived by the brothers from Roman work direct, or borrowed from it through the work of the Cinquecento artists, the credit that is due to them is in no wise diminished on that account, for to them we owe an application of the ancient treatment that expresses a distinct individuality of a widely different type. The contemporary popularity of the designs of Robert Adam speedily produced innumerable imitators, who executed work so closely resembling the style of the brothers that it is now, to say the least, not infrequently a matter of considerable difficulty to distinguish between their work and that of their imitators. Though some of those who designed in the new manner strongly resented the imputation of imitating anyone, the fact remains undisputed that work of this kind was unknown in England until it was introduced in the designs of Robert Adam and subsequently in those of his brother, James. Probably few contemporary designers adopted schemes similar to those of the brothers in a more extensive manner than James Wyatt, who is known as the restorer of the cathedrals, and as the only architect who has occupied the presidential chair of the Royal Academy of Arts. Apart, however, from Wyatt's ecclesiastical work, he was responsible for designing a considerable number of residences in various parts of the country, and the treatment of these buildings, in most cases, so closely resembles the work of the brothers that they are usually either attributed to them, or else described as being in the Adam style.

In the preface to the "Works of Robert and James Adam," the first part of which was published in the year 1773, the brothers wrote: "The novelty and variety of the following designs will, we flatter ourselves, not only excuse, but justify our conduct in communicating them to the world. We have not trod in the path of others, nor derived aid from their labors. In the works which we have had the honor to execute, we have not only met with the approbation of our employers, but even with the
imitation of other artists, to such a degree as in some measure to have brought about in this country a kind of revolution in the whole system of this useful and elegant art." After making some further introductory remarks, the brothers proceeded: "We by no means presume to find fault with the compositions or to decry the labors of other authors, many of whom have much merit and deserve great praise. Our ambition is to share with others, not to appropriate to ourselves, the applause of the public, and, if we have had any claim to approbation, we found it on this alone: that we flatter ourselves we have been able to seize, with some degree of success, the beautiful spirit of antiquity, and to transfuse it with novelty and variety through all our numerous works." In order to elucidate their meaning more clearly, they add in one of the footnotes of their preface, "Nothing can be more noble and striking, when properly applied, than a fine order of columns, with their bases, capitals, and entablatures: nothing more sterile and disgusting than to see forever the dull repetition of Doric, Ionic, and Corinthian entablatures, in their usual proportions, reigning round every apartment where no order can come, or ought to come, and yet it is astonishing to think that this has been almost invariably the case in the apartments of every house in Europe, that has any pretensions to magnificence, from the days of Bramante down to our time. In smaller rooms, where height is wanting, the architrave has sometimes been omitted, and sometimes

both architrave and frieze, but their places were ponderously supplied by a cornice of the most ample dimensions, fit for the Temple of Jupiter Tonans, from which it was imitated, perhaps, or, more probably, copied." In another footnote they also explained the reason why they generally avoided the use of the more massive and weighty type of compartment ceilings in the interiors of the buildings they designed. "These absurd compositions," they wrote, "took their rise in Italy under the first of their modern masters, who were no doubt led into that idea from the observation of the soffits used by the ancients in the porticos of their temples and other public works. These the ancients, with their usual skill and judgment, kept of a bold and massive style, suiting them to the strength, magnitude and height of the building, and making an allowance for their being on the exterior part, and adjoining to other great objects, all which served to diminish and lighten the effect of these compartments. But on the inside of their edifices, the ancients were extremely careful to proportion both the size and depth of their compartments and panels to the distance from the eye and the objects with which they were to be compared, and, with regard to the decoration of their private and bathing apartments, they were all delicacy, gaiety, grace, and beauty." The brothers then cited as instances "the Rotunda, the Temple of Peace, the ruins of Hadrian's Villa, the Palace of the Emperors, and other Cryptæ at Rome, with the inimitable remains on the Baian shore."
Referring to the modeling of Syon House, Robert Adam writes: "A proper arrangement and relief of apartments are branches of architecture in which the French have excelled all other nations; these have united magnificently with utility in the hotels of their nobility and have rendered them objects of universal imitation.

"To understand thoroughly the art of living it is necessary, perhaps, to have passed some time amongst the French, and to have studied the customs of that social and conversable people. In one particular, however, our manners prevent us from imitating them. Their eating rooms seldom or never constitute a piece in their great apartments, but lie out of the suite, and in fitting them up little attention is paid to beauty of decoration. The reason of this is obvious; the French meet there only at meals, when they trust to the display of the table for show and magnificence, not to the decoration of the apartment; and as soon as the entertainment is over they immediately retire to the rooms of company. It is not so with us. Accustomed by habit, or induced by the nature of our climate, we indulge more largely in the enjoyment of the bottle. Every person of rank here is either a member of the legislation, or entitled by his condition to take part in the political arrangements of his country, and to enter with ardor into those discussions to which they give rise; these circumstances lead men to live more with one another, and more detached from the society of the ladies. The eating rooms are considered as the apartments of conversation, in which we are to pass a great part of our time. This renders it desirable to have them fitted up with elegance and splendor, but in a style different from that of other apartments. Instead of being hung with damask, tapestry, etc., they are always finished with stucco, and adorned with statues and paintings, that they may not retain the smell of the victuals.

"But leaving a digression, which perhaps may appear not uninstructive, as it points out the necessity of varying the style of architecture so as to accommodate it to the manners and habits of different nations, we shall now return to a more regular inspection and explanation of the plan before us.

"The hall in both our houses and in those of France," Adam continued, "is a spacious apartment, intended as the room of access where servants in livery attend. It is here a room of great dimension, is finished with stucco, as halls always are, and is formed with a recess at each end, one square and the other circular, which have a noble effect and increase the variety."

The brothers Adam exercised a remarkable influence, that extended even to the merest details of internal treatment. The task was so great that only those who held the foremost places in their professions, and were supported by the confidence of wealthy clients, could be expected to achieve any appreciable measure of success. But in the case of the brothers these two essential conditions were fulfilled, and it was due to this circumstance that they were able to exercise a great controlling influence when architecture and the minor arts showed signs of drifting into affairs of fashion, in consequence of the decline of Palladianism, and the resulting disposition to throw off all control. The brothers did not exercise their influence by adhering to the rules and formulae of the old authorities, but though conscious of their value, tried by the application of the principles of composition to execute designs that were based upon wider knowledge of classic work that they had been able to gain by extensive personal research. The principles are, as they well know, the primary consideration, and Robert Adam was doubtless thinking of this when he wrote, in a letter to Lord Kames, "the detail of our profession comes naturally to the man who understands its great principles, in the laws of beauty and grandeur." "The architect who begins with minute," he continued, "will never rise above the race of those reptile artisans who have crawled about and infested this country for many years." The brothers, also, at a later date, clearly explained their position in the preface of the "Works," where
we read: "We, by no means, presume to find fault with the compositions, or to decry the labors of other authors, many of whom have much merit and deserve great praise. Our ambition is to share with others, not to appropriate to ourselves the applause of the public; and if we have had any claim to approbation, we found it on this alone, that we flatter ourselves we have been able to seize, with some degree of success, the beautiful spirit of antiquity, and to transfuse it, with novelty and variety, through all our numerous works."

Among contemporary architects, few came to be held in such high regard as Robert Adam. Honored by the foremost learned societies of England and Scotland, esteemed by the men of learning and discernment, and revered by his colleagues and by the young men of his profession, he occupied a place that was accorded to him on account of the services he had rendered as an architect, designer and scholar. "Mr. Adam," declared an Eighteenth-Century writer, "produced a total change in the architecture of this country, and his fertile genius in elegant ornaments was not confined to the decorations of buildings, but has been diffused in almost every branch of manufacture. His talents extended beyond the line of his own profession; he displayed in his numerous drawings in landscape a luxuriance of composition, and an effort of light and shadow, which have scarcely ever been equaled."
XIV. Engineering for Architects

By DeWitt Clinton Pond, M.A.

Mr. Pond has charge of the practical course in Architectural Engineering at Columbia University. He is the author of "Engineering for Architects" recently published in book form. This series, started in July, 1916, ARCHITECTURE, is a continuation of the previous series concluded in the issue of June, 1915.

There are three types of columns commonly found in reinforced concrete construction. The first is simply a steel column bedded in concrete, as shown in Fig. 90a, the second is of concrete reinforced with vertical steel bars which are held in place by ties as shown in Fig. 90c, and the third is of concrete reinforced by vertical steel bars and also with spiral reinforcing. The advantage of the first type is that it takes up but little room and is therefore used in places where ground or floor space is valuable. The disadvantage of this column is that it is expansive, there being considerably more steel in it than in either of the other two types. The second column is used in exterior walls where the shape of the column is made to conform to architectural requirements. This type is usually rectangular or has a cross section that makes it difficult to wind the spiral form of reinforcing advantageously. The column reinforced by vertical rods and spirals is the cheapest and is used for nearly all interior columns.

The law allows from one-half of one per cent. to four per cent. of the cross-sectional area of a column to be made up of vertical steel reinforcement secured against displacement by one-quarter-inch steel ties placed not more than fifteen diameters of the vertical steel on centres. It is apparent that much less steel will be required for this type of reinforcing than will be used in case the ordinary steel column section is made up of, consisting of plates and angles, or in case an "H" section is employed. However, for buildings over twelve stories in height, and where space is valuable, the structural column is the best type to use. There must not be less than four inches of concrete surrounding the steel, according to the law, and this concrete acts as fireproofing and as a brace to the steel. The bracing action of the concrete makes it possible to consider the steel in direct compression, with no tendency toward bending. When, however, the column is of such a height that the ratio of the length to the least radius of gyration is more than 120, the section must be increased as such a column is not allowed by law. For the ordinary unsupported lengths of columns, however, the steel in the built-up section can be given its full value of 16,000 pounds, which is the maximum allowable stress per square inch for steel in compression with the usual factor of safety of four. The concrete itself must be reinforced, however, with not less than one per cent. of steel. Not more than one-half of the reinforcing steel shall be placed vertically, the other half being used for ties.

The rules given above may be made clearer by an example. Suppose that it is necessary to support a load of 800,000 pounds on a column 14 feet high. In order to find the area of structural steel that will be needed it is necessary to divide the load by 16,000 pounds. 800,000 ÷ 16,000 = 50 square inches. In the "Pocket Companion" published by the Carnegie Steel Company, 1913 Edition, on page 274 can be found a table giving the safe loads for plate and angle columns and the areas, moments of inertia, radii of gyration, and weights of various sections. A section made of a 14-inch by 3/8-inch web plate, four 6-inch by 4-inch by 3/8-inch angles, and two 14-inch by 5/8-inch cover plates is shown to have an area of 49.69 square inches which will be considered as large enough.

Around this steel there must be a casing of concrete which must be 4 inches thick. The total over-all dimensions of the column will therefore be 22 inches by 24 inches as shown in Fig. 91. This concrete must be reinforced with one per cent. of steel, the percentage of reinforcement being the volume of the reinforcing steel divided by the volume of the concrete enclosed by the reinforcing steel. This means that the area of concrete to be considered must be that enclosed within a rectangle that measures 18 inches by 20 inches, in the present case. Out of this rectangle must be taken the area of the structural steel column, or 50 square inches. The area of concrete will be $20 \times 18 = 360$ square inches, minus 50 square inches, which will equal 310 square inches. One per cent. of this area will be 3.1 square inches which must be made up by ties and vertical reinforcing. The vertical reinforcing can be made of four 3/8-inch square bars having a total area of 1.56 square inches. The ties or hoops must next be considered and the volume of the concrete that is to be replaced by the steel must be investigated. The area of the reinforcing steel was found to be 3.1 square inches. One-half of this amount must be supplied by ties or 1.55 square inches will be the area that must be furnished by the ties or hoops. In a height of 12 inches the volume of steel to be supplied will be $1.55 \times 12 = 18.60$ cubic inches. A 3/8-inch square bar has a sectional area of .1406 square inches. A hoop made of this size bar will have a total length of 76 inches as it encloses a rectangle 20 inches long and 18 inches wide. The volume of steel in this hoop, or tie, is .1406 \times 16 = 10.68 cubic inches. If there are 18.6 cubic inches of steel needed, and there are 10.68 cubic inches of steel in each hoop, there will be 18.60 ÷ 10.68 = .1436 hoops needed in each foot of column, or if the hoops are spaced 12 ÷ .1436 = 85.9 inches on centres the necessary number of ties will be supplied.
ASTOR COURT APARTMENTS, BROADWAY, 89TH TO 90TH STREET, NEW YORK. Charles A. Platt, Architect.
ENTRANCE, ASTOR COURT APARTMENTS, BROADWAY, 89TH TO 90TH STREET, NEW YORK.

Charles A. Platt, Architect.
DETAIL OF ENTRANCE, ASTOR COURT APARTMENTS, BROADWAY, 89TH TO 90TH STREET, NEW YORK.
Charles A. Platt, Architect.
DETAIL OF MARQUISE, ASTOR COURT APARTMENTS, BROADWAY, 89TH TO 90TH STREET, NEW YORK.
Charles A. Platt, Architect,
TYPICAL DRAWING ROOM, SHOWING WALL TREATMENT, ASTOR COURT APARTMENTS, BROADWAY, 89TH TO 90TH, STREET, NEW YORK.

Charles A. Platt, Architect.
THIRTEENTH FLOOR PLAN AND DETAILS OF 90TH STREET HALL, ASTOR COURT APARTMENTS, BROADWAY, 89TH TO 90TH STREET, NEW YORK.

Charles A. Platt, Architect.
Actually these hoops will be spaced even fraction on centers, such as \( \frac{3}{4} \) inches. Fractions less than one-quarter of an inch are not often found in concrete work.

In order to fulfill the conditions required by the building department, the column must have the ratio between the length in inches and the least radius of gyration less than 120. The least radius of gyration is given in the “Pocket Companion” for the section used above as 3.17, and the height was assumed to be 14 feet, or 168 inches. The ratio will therefore be \( \frac{168}{3.17} = 53 \) which is well within the limit.

It will be noticed that in the above case the steel is not supposed to buckle or bend and its strength is determined on the basis of the crushing strength of a block of steel divided by a factor of safety of four. The process that a designer has to employ is simply to divide the load on the column by 16,000 pounds and the area of the structural steel will be obtained. The next step is to determine the area of concrete enclosed within the reinforcing, and this area is the net area, the space occupied by the structural steel being deducted. One per cent. of this is next determined, and this area must be made of vertical reinforcing and ties or hoops.

When the rectangular column, such as shown in Fig. 90b, is used, the ties consist of \( \frac{3}{4} \)-inch square or round bars spaced in such a manner that the distance on centres shall equal the diameter of the vertical bars multiplied by 15. This distance, however, must never be more than one foot. This means that where one-half-inch bars are used the ties must be spaced 7\( \frac{1}{2} \) inches on centres, and where five-eighths bars are used they must be spaced 9\( \frac{1}{4} \) inches on centres. The spacing of ties for three-quarter inch vertical bars must be 11\( \frac{1}{2} \) inches, and for all bars larger than this the spacing must be one foot.

These ties are not supposed to restrain the concrete in case there should be a tendency toward failure, but are used simply to hold the steel in position.

Of course, all the columns having ties need not be rectangular. They can be circular similar to the one shown in Fig. 90c, but as circular columns can be made more economically with spiral reinforcement, it is not advisable to use ties except for rectangular exterior columns.

As has been stated, the building department will allow from one-half per cent, to four per cent, of vertical reinforcing with ties. It is the custom to use the smallest percentage on account of the relative cheapness of concrete. Suppose that architectural requirements were such that the column is 16 inches square. Then the area of the column will be 256 square inches and, if one-half per cent. of this area must be steel there will be 128 square inches of vertical reinforcing. It will be noticed that the smallest allowable percentage of steel is used. It also be remembered that when the compressive value of steel in the upper layer of a concrete beam was determined in Article XIV, this value was found on the basis of the relative elastic properties of concrete and steel. The same reasoning holds good in deciding the compressive value of steel in columns. According to the Building Code, section 337 of Article 16, for columns with longitudinal reinforcement only and having the percentage of steel and the ties as given above, “the allowable load shall be five hundred pounds per square inch on the concrete, plus seven thousand five hundred pounds on the vertical reinforcement.” Also, according to the code, for the above values of steel and concrete the concrete must be mixed in the proportion of one volume of cement to two volumes of sand, and four volumes of stone.

It has been found that there will be needed 1.28 square inches of steel. This steel is actually allowed to be stressed to 7,500 pounds per square inch, but for purposes that will be explained later, it simplifies the design of the column to consider this steel as having a compressive value of 7,000 pounds per square inch. The area of steel will be made up of four \( \frac{3}{4} \)-inch bars which will actually have a total area of 1.56 square inches. This steel will have a total compressive value of \( 1.56 \times 7,000 = 10,920 \) pounds.

As concrete, in direct compression, is allowed to be stressed to the extent of 500 pounds per square inch, and, as the area of concrete is 256 square inches, the total compressive value of the concrete is \( 256 \times 500 = 128,000 \) pounds. 10,920 pounds added to 128,000 pounds will give a total allowable compressive value for the column of 138,920 pounds.

The value of 7,000 pounds per square inch allowed to the concrete instead of 7,500 pounds is accounted for by the fact that in determining the compressive value for the concrete the total area of the concrete is used and the 500 pounds which might have been allowed to the steel is given to the concrete. The sum of the two values is the same in either case, no matter whether the steel is allowed 7,500 pounds and the net area of the concrete used, or if the steel is allowed 7,000 pounds and the gross area of the concrete is made use of.

It was stated above that the mixture of concrete was in the proportions of one volume of cement to two volumes of sand and four of stone. This is known as a one-two, four mix. A richer mixture, known as a one, one-and-one-half, three mix may be employed, and in this case the concrete may be considered as having a compressive value of 600 pounds per square inch, and the allowable stress on the steel is considered as 7,200 pounds. If the gross area of the concrete is to be used in determining the value of the concrete in compression, then the allowable load on the steel can be considered as \( 7,200 - 600 = 6,600 \) pounds per square inch. The allowable stress in the steel is always reduced by that in the concrete in order to simplify the calculations.

Engineers who have reason to figure a great number of columns have tables in which these stresses are worked out, and once the dimensions are known the safe load on the column can be taken from the table. In case the loads that the columns must support are known it is possible to select the columns that will support them.

From the information given above it should not be difficult for the architect to work out a table of his own, in case he is unable to obtain one from some friendly engineer, and if there is a considerable amount of concrete work done in his office, such a table will be of great use. Columns are never made less than twelve inches square, and in some offices the minimum dimension is one foot and two inches, or fourteen inches. For the purposes of computing the bearing power of columns the dimensions of the first should be taken as one foot square. The area will be 144 square inches, the allowable load on the concrete for the total area will be 144 \( \times 500 = 72,000 \) pounds if the stress is considered to be 500 pounds per square inch, and 86,400 pounds for a stress of 600 pounds, and the area of the vertical reinforcing must not be less than .72 of a square inch if the smallest allowable percentage of steel is used.

The results may be arranged in the form of a table and determined for rectangular columns measuring from twelve inches to sixty inches square.

It is usually the case that the loads are determined first, and then the column may be selected from the table to carry these loads. In former articles it has been shown that the live loads may be reduced for different floors, according to the rules of the building department. The roof, and the first floor beneath the roof, are considered as bringing the full loads—both dead and live—to the columns, but for floors under this the live loads are reduced 5% at each floor, for buildings more than five floors in height.
The last and most common type of column used in reinforced concrete construction is that type which is designated in the building code as columns "with longitudinal and lateral reinforcement." These are described as having not less than one-half nor more than two per cent. of hoops or spirals spaced not further apart than one-sixth of the diameter of the enclosed column nor more than three inches, and having not less than one per cent. nor more than four per cent. of vertical reinforcement. On the concrete in such a column the unit allowable stress is 500 pounds for the ordinary mixture, or 600 pounds for a "rich," or a one, one-and-one-half, three mix. As a rule the richer mixture is used.

The allowable stress in the vertical steel used in connection with this rich mixture is 7,200 pounds per square inch, as has been stated, but this is reduced not only by the allowable unit stress on the concrete but by the stress allowed to the concrete because of the spiral reinforcing. This spiral steel is considered as restraining the concrete in case there is a tendency toward failure. It may be considered as holding the concrete within the spiral. For this reason the stress on the concrete may be increased by a load per square inch equal to two times the percentage of lateral reinforcement multiplied by the allowable tensile stress of the steel in the lateral reinforcement. As stated above, the allowable percentage of spiral, or lateral reinforcement, may vary from one-half per cent. to two per cent. As a rule, the largest percentage is used—or 2%. There are two allowable stresses on steel. The first is 16,000 pounds per square inch, which is the allowable stress on mild steel.

Steel used for spiral reinforcing is usually cold drawn steel wire and the allowable tensile stress of this is given in the code as 20,000 pounds per square inch.

The increase in the unit stress of the concrete can be considered as $2 \times 2\% \times 20,000 = 800$ pounds per square inch. The total stress in the concrete, which must be deducted from the 7,200 pounds allowed on the steel, will be $600 + 800 = 1,400$ pounds. The vertical reinforcing steel will therefore be considered as having an allowable unit compressive stress of $7,200 - 1,400 = 5,800$ pounds.

These figures may seem a bit complicated, but an example may make them clearer. Suppose that it is necessary to carry a load of 800,000 pounds. A rule, that will give good working results for the diameter of the column, is to divide the load by 1,146 and take the square root of the result. In the present case this rule may be expressed as follows: $800,000 \div 1,146 = \sqrt{\text{D}}$. D will be found to equal approximately 27 inches. This is the effective diameter of the concrete or the area included within the spiral. The actual diameter of the column must be 4 inches larger than this—there being 2 inches of fire-proofing over the steel—or 31 inches.

The minimum amount of allowable vertical reinforcing, and the maximum amount of lateral reinforcing, are used. In other words there will be 1% of vertical, and 2% of spiral steel.

The area of the concrete within the spiral will be $27 \times 27 \times 3.1416 \times \frac{1}{2} = 572.5$ square inches. One per cent. of this will give 5,725 square inches of vertical steel.

This can be made up of eight 1-inch round bars having a total area of 6.28 square inches.

The concrete will support $572.5 \times 600 = 343,000$ pounds.

The vertical steel will support $6.28 \times 5,800 = 36,000$ pounds. $343,000 + 36,000 = 379,000$ pounds that the concrete and vertical steel will support. $800,000 - 379,000 = 421,000$ pounds that must be supported by the additional stress in the concrete allowed because of the spiral.

If the full 2% of spiral should be used the additional strength that can be allowed will be $572.5 \times 2 \times 0.02 \times 20,000 = 458,000$ pounds which will be too much. By mathematics it can be found that a percentage of 1.85 will give about the proper amount of steel in the spiral.

In order to find the actual size of the steel bars in the spiral there must be some assumptions made. The actual percentage must be decided upon. In this case 1.85 should give the proper result. The size of the bars used in the spiral must then be assumed, and the distance on centres determined—which distance usually being known as the pitch—or the pitch decided upon and the sectional area of the spiral steel determined. As the pitch is the most easily varied the size of the rods will be assumed in the present case, and the diameter will be taken as 9.16 of an inch, the area being .248 of a square inch. It will then be possible to substitute in the following formula to find the pitch.

$$P = \frac{4 \times \text{Area of Spiral Steel}}{\text{Percentage} \times \text{Effective Diameter}}$$

$$P = 4 \times 0.248$$

$$P = \frac{4 \times 0.248}{.0185 \times 27}$$

If 9.16-inch round bars are wound with a pitch of 2 inches there will be enough spiral reinforcement. The method of proceeding to determine the pitch as given above is somewhat lengthy and as a rule engineers have tables, which must necessarily be comprehensive, that simplify the calculations.

With regard to the pitch of the spiral, it might be stated that the law limits the pitch to one-sixth of the effective diameter or to three inches. In the case of the column designed above, one-sixth of 27 inches will be 4.5 inches and so the limiting dimension will be 3 inches for the pitch. As this was found to be 2 inches it is well within this limit.

---

**How New York City Now Controls the Development of Private Property**

*By George B. Ford*

Mr. Ford is Consultant to the Commission on Building Districts and Restrictions

The city government of New York has just put into effect by a virtually unanimous vote of the Board of Estimate and Apportionment the radical and much-talked-of Zoning law. All future buildings will be restricted as to their height, size and use and the restrictions will be different in different parts of the 327 square miles of the city.

In general, the law will limit the height of the buildings in proportion to the widths of the streets on which they face all the way from two and a half times the width of the street in the financial district, through two times the width of the street in central Manhattan, with one and one-half times in the balance of Manhattan and in small portions of the other bor-
thoughs, down to once the width of the street throughout all the rest of the city. A future Equitable building could only be a third as high because it faces on narrow streets, but a tower in the center of it, half as large again as the Woolworth tower, might rise to any height. The Woolworth building, on the other hand, if facing on a park, might be very nearly duplicated. The shopping district on Fifth Avenue will consist of buildings not much higher than Tiffany's, but along 42nd Street buildings may rise about as high as the Hotel Manhattan or Knickerbocker. Twelve and fourteen-story apartments will continue to go up on the main avenues and eight and nine-story apartments on the side streets, but no building of any kind can go any higher except by setting back from the street. Throughout most of the city, however, four or five stories will be the limit. Towers may be built to any height but they cannot cover more than a quarter of the lot. Mansards, dormers and terraces are encouraged; anything that will open up the streets and bring light down into them by making the upper part of the buildings set back from the street above a reasonable height.

The size of buildings will be controlled by the fact that the law requires just so much open space on each lot. This again ranges all the way from the warehouse districts along the commercial waterfront and along the freight railways where a building may cover the whole of its lot, through the B, C and D districts so called, in each of which in succession a building has to provide for larger and larger yards and courts, down to the villa districts where a house can cover only 30 per cent. of its lot and must be widely separated from its neighbor on at least one side. Throughout Manhattan and the densely built-up portions of the other boroughs, yards and courts in office buildings, factories, lots, hotels, apartments, in fact all buildings, would have to be as large as those that have been required for the last fourteen years in tenement and apartment houses. Everywhere the yards and courts have to be increasingly larger at the top as the building goes up in height, so much so that these requirements tend to limit the practicable economic height of buildings even more effectively than do those directly affecting height. This is particularly true in the outlying boroughs. One important feature of the law is the encouragement it gives to playgrounds for material concessions are allowed to anyone who will provide adequate recreational space in connection with his buildings.

Right here it is desirable to sound a note of warning. It would be most unfortunate if the law were applied as it stands to other cities for it is full of unduly liberal provisions in the way of height and size that tend strongly to defeat the object of the law but which were necessitated by the exceptional economic conditions of New York.

As to the use of buildings there are only two general classes of restrictions: first, the districts which are restricted against business and industry of all sorts, the so-called “residence” districts, and second, the tracts which are restricted only against manufacturing and public stables and garages, the so-called “business” districts. In the former almost any kind of building that people live in is allowed, also churches, schools, hospitals and various institutional buildings. In the business districts any residence use is allowed and even a certain small proportion of the objectionable types of manufacturing. The use districts have been laid down street by street and, in fact, block by block, depending on existing conditions and tendencies. The result has been that about two-fifths of Manhattan and about two-thirds of the whole city has been set aside for all time for strictly residential use, while the main thoroughfares, the transit streets and all other streets that are or might be appropriately used for stores or show rooms are set aside as business streets. Many streets which are now seriously invaded by factories or garages are restricted against them from now on because it was felt they were a distinct harm to the street. On this ground all of the central part of Manhattan above 23rd Street was made a business district despite the fact that there were already hundreds of factories employing in all upwards of 30,000 operatives within the district. This law will not touch the existing factory lots as it is in no sense retroactive, but the “Saving New York” movement, in which most of the merchants along Fifth Avenue combined to oust the factories in the neighborhood, has already succeeded in persuading almost all of the manufacturers to move away. It was a remarkable and timely vindication of the economic need of this law.

It is interesting to see how the unbroken residence districts have been becoming larger and larger at the insistence of the property owners themselves so that in some cases of their own volition they must walk at least a mile to the nearest store of any sort. These restrictions do not interfere in any way with existing or future private restrictions placed on any property except that if this law happens to be more drastic than the latter in any particular this law would govern.

All of the balance of the city which is not in one or the other of these two kinds of districts is left unrestricted. It includes all of the land appropriate for industry along the navigable waterfront and along the freight railways, as well as most of the territory which is now given over to manufacturing. It includes also scattered throughout the city a number of blocks which are already invaded by public garages or which are appropriate for that use. Certain other areas, especially around Jamaica Bay and along the shores of Staten Island are left entirely undetermined in their use pending the working out of the plans for the port and terminal facilities of New York.

In the various reports of the commission nothing whatever has been said about the effect of the new law on the appearance of the city, and yet within the next 25 or 50 years it is bound to make the city far more orderly and even more beautiful. It has been said that it would spoil the glorious sky line of New York and rob the city of its “crowning glories.” But so far from doing that, I am convinced that the sky line of New York some 25 or 50 years from now will be more wonderful than anything we have yet dreamed of, for the law is full of special provisions which are bound to encourage the erection of towers, mansards, dormers, terracing roofs of a variety far different from anything which this country has yet seen. More immediately, it will put order and harmony into the streets of the city, particularly the residential streets. It will tend to prevent the streets from being broken up as they are now.

Ultimately one of the greatest effects of all will be the effect which it is bound to have on family life and citizenship, for as the character of neighborhoods become assured families will begin to settle down in one place instead of constantly shifting about as they do now. Local ties will be formed, neighborhood spirit will grow; social and community consciousness will develop and people as groups will take more and more interest in affairs, both social and civic, of their neighborhood.

The result is bound to be, as it always has been under similar conditions, that just in proportion as people do take more interest in their surroundings they contribute more to the direction of the control of these surroundings. In that way a civic spirit and citizenship is built up and in that way this new law is bound to contribute to better family life and better government.
The Growth in Architecture

By Halsey Ricardo, F.R.I.B.A.

On nearly the last page of that amazingly able little book by Professor Lethay on architecture—a book that all interested in architecture ought to possess and study with close attention—there is this pregnant statement: "No art that is only one man deep is worth much; it should be a thousand men deep." It has been much the fashion—especially from the time of the Early Italian Renaissance onwards—to accentuate the names of the architects of the famous masterpieces, and to regard them—the architects—as the sole creators and originators of their works. I do not mean that they regarded themselves, or that we regard them, as independent of tradition and experience; but that we look upon such men as Brunelleschi, Bramante, Peruzzi, Michael Angelo, Sir Christopher Wren, and so forth, as creative ends in themselves, as independent phenomena who individually affected and controlled the tendency of their time. But from another point of view we may look upon them as resultants rather than causes; the environment has produced them, they have not constructed the environment. Samuel Butler—the author of "Erewhon"—puts it aphoristically in this way: An egg is not the means by which a hen contributes to produce another bird; the hen is the contrivance by which an egg enables itself to produce another egg. The stream of life—which is the cardinal thing—is immortal, and the various mortal shapes in which it manifests itself to our eyes are the outward sign of its current, and owe their characteristics to the actual composition of the stream at that moment of their appearance, its structure being the synthesis of effective individual influences resolved into a kind of general quality and direction. To come to our own particular tributary of this stream, we may take the building instinct in mankind as immortal—that is to say, as co-existent with mankind itself. Its manifestation at any particular period of the world's history depends upon the ideals prevalent at that time, and the structural resources—in the matter of technical abilities and materials—of the builders. The dominant factor determining these manifestations is the main stream of life carrying the aspirations and voicing the ideal of the nation, the constructive instinct being secondary and tributary to the greater stream. With the egg the simple ideal is, no doubt, the preservation of the endless chord of life, without attempting much control over the intermediate phenomena which serve as carriers. It deplores celibacy naturally, and resists violent endeavours at crossings; species are, comparatively, fixed, and hybridization is only permissible within defined limits. Subject to these conditions, the hen may do what she likes, and mate with whom she pleases—it is her egg that is the justification of her existence.

With a nation the issues are more involved. The chord of life consists of many strands, closely and loosely interwoven, and beside it are many supplementary and contributory threads, running parallel, running crossways, obstructing, blending, confusing, or accentuating the main issues of life. "Sports" occur: "throw-backs" to some predominant or persistent strand in the main cable—diversions into new or reactionary channels—accelerations and slackening of speed; the seeming tangle now clearing itself and again shrouding itself indecipherably. It has its nodes, its pulsations; at times it is lyrical in its outcry, at others solemn in its vibration, mysterious in its silence. It voices the passions, the hopes, of a thousand hearts, for it is the pulse of the nation and the nation's ideal is in its utterance. This history of the world is shown by its art, with a faithfulness that no other record can approach—for it is not consciously a record, and has no side to take in politics or in government, beyond ministering to their requirements. By their skill in engineering—especially hydraulic engineering—Mesopotamia was a fruitful and verdant land; they had mathematics enough to be land surveyors and astronomers, and in a country where the nights are clear, and a considerable portion of life is carried on beneath the starry splendor of the firmament, astrology takes a prominent place, in religion and in the details of daily life. But their art shows them to have been a cruel people, yet with a great capacity of suffering born stolidly and without resistance. With the Egyptians it was otherwise. The bulk of the population were devoted agriculturists. They hated war, and had no delight in the pomp and circumstance of military display. The Arab delight in the horse of war—as witness the Book of Job—spelt misery and physical pain to them, as evidence of their conscription and servitude—and in their pictures of animal life the horse appears rarely as a beast of burden or traction. But with the animal life about them the Egyptians show an exceptional sympathy. Think what it means to have acquired the ability to draw those hieroglyphics, to have seized upon and reduced the vital characteristics of bird and beast to such simple formulae, and yet so instinct with the individuality and power of the thing represented.

In mediaeval times the constitution of society was quite different; instead of one vast empire regulated by an oligarchy of aristocracy, under the direction of a field marshal, we get a feudal system of government, side by side with independent communes. Cities were virtually republics in the Thirteenth or Fourteenth Centuries, and life was fiercely competitive, full of expansion—and the enthusiasm following it—engendered by the new forces and sentiments in peoples hitherto quasi-nomad, and predatory rather than gregarious, outside the tribal connections. Their architecture was the architecture of equipoise—the architecture of the mason in exclaims—and of the craftsman, as a builder, whether he worked in stone, timber, or metal. Different from the decadent Roman architecture, the early mediaeval—i.e., to the middle of the Fourteenth Century—was integral in all its features. Columns and pilasters were not applied for effect, or to mask the facts of construction; they sprang from the constructional necessities of the case. And while the Romans (under the empire) could afford to be lavish both with their materials and their labor, the builders during the Middle Ages had to be as sparing and resourceful, on both these particulars, as their ambitions would permit. Roman art was the outcome of the Roman ideal—his outlook and point of view upon life. This is the main point. His materials and methods of workmanship were of only secondary importance. Relying on his cement to achieve his daring constructions, he often had to build in stone countries, where the
which, in later times, both painter and sculptor originated, and from where they got their training. The glazier, with his tinctures, raved the heraldry of dress and shield, and he drew apart also, to supply his wares to whom should call for them. He did a considerable trade overseas and in foreign parts. So did the tombsmakers, with their images in marble and alabaster, the craft organization was gradually splitting up. The standard of technical achievement, always rising, had reached such a point that it was impossible for an "all-round" man to distinguish himself unless he specialized in some particular branch of his craft, and devoted all his power and technique to giving it some individualistic excellence. The name of the craftsman—an artist—begins to appear, and he cultivates his special faculties to justify his reputation. His own craft is to him paramount; he is careless of its contributory function, and he pushes the capabilities of his material to the extreme of its endurance. His sculptured figures are not part of a reverent chorale, they are each solo singers, almost—like the nightingale—requiring the hush of night to be fully appreciated. The revival of learning followed on as an easy consequence with these experimenters in the possibilities of technique in their craft; they not only tried after the utmost that could be done with their material, they looked back into the past ages, to see what had been done, and were surprised at the consummate excellence of the ancients. The mastery of the Greek workman, of the Roman architect, as well as the writers of story and philosophy stood confessed. Greek literature, hitherto unknown, opened out vistas upon a world of acute reasoning and of intensified poetry. The fall of Constantinople helped the movement by precipitating upon Europe the collected stores of Greek manuscripts there and in Asia Minor. Greek gems circulated profusely, and full of the uncritical admiration of whatever belonged to classic times, the grounds of Rome and its environs were ransacked to discover what statuary had escaped the destructive fury of Goth and Christian, and what lessons in architecture and detail the perversely and ruined buildings could yield to these ardent revivalists. Their admiration was uncritical, their knowledge of the past was small, and they fell upon their treasure trove with undiscriminating appetite. They took it as it stood, without inquiry as to its genesis or understanding it. Roman architecture was a composite affair—engineering construction veneered with Greek architectural upholstery. When the Italians in the Fifteenth Century attempted to revive the magnificence of classical architecture, they met the problem in the converse way to the ancients. The architecture of Rome was a grandiose massing of concrete structure, poured and moulded into and over forms, like so much viscid lava, which eventually hardened into a homogeneous monolith, requiring for appearance sake to be faced with stone or marble or metal. This was the material backbone of Roman architecture; and it had the advantage that it could be made of quite simple accessible materials and by quite unskilled labor. It was this faculty of execution, as well as the surpassing strength of the construction, that enabled the Roman architects to conceive and execute their vast projects. Every facility was pressed upon them; all the space they could desire was given to them. They had the command of unlimited supplies of labor, the cement lay actually beneath their feet, and the aggregate for their concrete was readily procurable. They had not the fear of contractor before their eyes. Under such conditions grew the monuments of Rome in the imperial days. They were vastly different in the days of Papal Rome. It is true that by the end of the Fifteenth Century Popes, Cardinals, and some few princes had accumulated enormous wealth, and were spending huge sums in the building of palaces, strongholds, and churches; yet such expenditure bore no comparison
ARCHITECTURE

Will Steel Be Any Cheaper?

By S. M. Fechheimer, Editor Modern Building

It is advisable to postpone building operations in the hope that steel will be lower in price later on? This is the big question that is having the serious consideration of architects and owners throughout the country. A study and understanding of the present steel situation are of vital importance to everyone connected with the building world.

What are the conditions in the steel industry today? What are the prospects for the future? The steel mills are running maximum capacity and yet are unable to cope with the demands. Every report from the steel companies indicates record business with increasing volume of unfilled orders. We are informed that practically all the mills are booked with orders which will keep them busy well into 1917, and yet their regular customers are clamoring for the privilege of entering more orders.

In our own country business conditions have never been better. Our foreign trade for months has been surpassing all records. Our exports for twelve months ending February, 1916, are reported to have been $3,720,000,000. Money is plentiful and new building construction can be readily financed. What does it matter if a new building does cost slightly more than it would in dull times? The new building is rented almost before it is completed and at attractive rentals. The savings which might be made in dull times would be readily consumed in loss in rentals. It is useless to postpone construction, as there is no prospect of lower cost for some time to come and in the meantime the interest charges and taxes on vacant property continue to accumulate.

Supposing the war were to stop, what then? Records show that although the war has been a powerful stimulus in our present business conditions not over 25% of the present activities are represented by war supplies. It will take months for European industries to properly organize their manufacturing, and the steel mills abroad will be busy for years afterwards in supplying their own needs and repairing the enormous damage done by the war. A single bridge crossing any one of the important streams requires thousands of tons of steel. Steel ships in great number have been destroyed and must be replaced. Building activity abroad has been at a standstill and must be resumed as soon as the war ceases. These conditions point clearly to the fact that for a long period after the war there will be no European manufacturer able to export steel to America or any other country. In the meantime our steel manufacturers will not only have to take care of their domestic trade but will also be compelled to export to South America and many other countries.

Remember also that the uses for steel are increasing enormously. Articles which formerly were made of wood and other materials are now furnished in steel. The automobile industry alone consumes millions of tons. New uses are being brought forward every day; besides there is the normal increased demand for steel. Our own government has already started its program of preparedness. This will consume large quantities of steel for ships, guns, coast defense, ammunition, etc. Our railroads simply must expand as well as take care of replacements. This means tremendous tonnages of steel for new cars, rails, bridges, etc.

These conditions point clearly to the fact that no matter what effect the close of the war may have on business generally, the steel industry cannot help but advance, and there is no prospect of lower prices for a long time to come.

Conditions unquestionably recommend immediate building with no prospects of lowered cost for a long time to come and with an actual danger of the inability to secure the building at all if too long delayed.
Legal Decisions of Interest to the Architect

These decisions appear monthly and are edited by Mr. John Simpson, the well-known lawyer.

COMPENSATION FOR SERVICES RENDERED.

Architects who had contracted to build a bank building for a fixed sum wrote to the bank, suggesting that the work desired should cost more than the amount limited, and stated that, if the bank insisted on keeping within that limit, the architects would prefer not to do the work. The bank replied that they considered the matter off and would begin negotiations elsewhere. The architects telegraphed that they were ready and anxious to begin the work. In an action for services rendered and expenses disbursed, the Circuit Court of Appeals, Eighth Circuit, holds that the statement that they would prefer not to do the work was not an absolute refusal to do it, which alone was sufficient to authorize rescission by the other party, and they could recover under their contract for their services and disbursements theretofore made and rendered.—Hoggsom Bros. v. First Nat. Bank of Boswell, 231 Fed. 869.

WHEN NON-PERFORMANCE OF CONTRACT EXCUSED.

Action was brought by an owner against a contractor for breach of a contract to erect a garage of specified dimensions. The contractor insisted that he was at all times willing to perform, but that the plaintiff insisted upon the construction of a building of different character and of larger dimensions than that required by the contract, to which the defendant refused to accede. The New Jersey Supreme Court held that it was competent for the defendant to prove his willingness to perform, and the refusal of the owner to allow him to do so, excepting under new conditions not contemplated by the contract, and at variance with its provisions. When the owner prevents the contractor from performing or repudiates his obligations under the contract, communicating such repudiation to the contractor, the latter may treat the contract as abandoned, and thus excuse his non-performance.—Ferber v. Cona, 97 Atl. 720.

ACTION ON CONTRACTOR’S SURETY BOND.

An owner was compelled, on default of the construction company contracting to construct a building, to complete it at a cost exceeding the contract price. It sued the construction company and a surety company on its bond to indemnify it from any loss by the failure to complete. The defendant’s affidavit of defense failed to deny that the construction company made the building at the amount sued for, but averred that a copy of the plans and specifications was not annexed to the copy of the contract referred to in the bond. No question arose as to these plans and specifications. The affidavit also denied that one of the plaintiff’s exhibits was formally served on the date of the statement, but did not deny that it was received or subsequently came to the knowledge of the parties. It was alleged that certain alterations were made, the extent and value of which the defendants did not know. The contract, however, permitted such alterations. It was also alleged that the plaintiff had made payments to the contractor before they were due, though forbidden by the bond, but that not damage resulted from such payments. The Pennsylvania Supreme Court held that the affidavit was insufficient to state a defense. The defendants set up a claim of set-off for the value of certain property belonging to the construction company which the owner took possession of. The contract provided that when the building should be taken over to be finished by the owner, all materials, goods, chattels and effects in or about the building should be forfeited to the owner, and might be employed or sold or disposed of as he might direct. It was held that it must be presumed that the architect gave credit for the tools and materials so taken.—Loughney v. Huntsman Const. Co., 97 Atl. 178.

ARBITRATION AS TO MATERIAL FURNISHED.

On a sub-contractor’s petition to enforce a lien for materials a stipulation was made that certain parties agreed upon should examine the defendant’s house for which the material was furnished by the plaintiff and report the materials used, and that the price of the materials furnished by the claimant should be estimated at the market price thereof at the time the house was built. The Iowa Supreme Court held that the fixing of the price was committed to the parties agreed upon.—Ft. Dodge Lumber Co. v. Rogosch, 157 N. W. 189.

ENFORCEMENT OF BOND TO RELEASE MECHANIC’S LIEN.

The owner of a building, against which mechanic’s liens were filed, filed a bond to release the liens, conditioned that if the owner paid the oblige any sum for which he might obtain judgment or decree, either against the owner or the property, the obligation was to be void, otherwise to remain in force. In a suit to enforce the lien, the Michigan Supreme Court holds that the sureties might be made parties and a decree rendered against them, instead of leaving the liens to an action at law to enforce their obligations. A decree making the bondsmen liable, as well as the principal, is the most direct method of collection, and denies to the sureties upon the bond no substantial right. As parties delict, they may appear and protect themselves from the establishment of any unjust claim. This is also the law in New York. Morton v. Tucker, 145 N. Y. 244. Grace Harbor Lumber Co. v. Ortmann, 157 N. W. 96.

DAMAGES FOR BREACH OF RESTRICTIVE COVENANT BY RAILROAD.

Under New York Const. art. 1, § 6, declaring that private property shall not be taken for public use without just compensation, rights based on restrictive building covenants are property rights which cannot be taken for a public use without just compensation, and which make direct and compensational damages which otherwise would be consequential and non-compensational. The owner of a tract of land laid it out on a map in lots fronting on streets, and, as an inducement to purchasers, sold them by deeds, covenanted that no building or structure for any business purpose whatsoever should be erected on the premises. A railroad purchased lots running across the entire southern part of the tract subject to such restrictions opposite the lots of one of the plaintiffs and adjacent to the premises of the other, and built its railway across such lands partly on an embankment and partly in an open cut, and operated on its tracks many fast electric trains daily. The New York Court of Appeals held, in an action to restrain the maintenance of such structure and the operation of the road, that the defendant railroad had violated the covenant, and that plaintiffs were entitled to damages, a “building or structure" being in the widest sense anything constructed that is erected by art and fixed upon or in the soil composed of different pieces connected together and designed for permanent use in the position in which it is so fixed, and to "erect,” meaning not only to raise, but also to build or construct.—Flynn v. New York W. & R. Ry. Co., 112 N. E. 913.
ARCHITECTURE

APPLICATION OF PAYMENTS TO CONTRACTORS.

The owner of a building under construction gave the principal contractor a note on account, which was turned over to a subcontractor and by him to a materialman without instructions as to how it should be credited. The Michigan Supreme Court holds that the materialman had a right to apply a part thereof upon accounts owed him by the sub-contractor for material furnished for other jobs, under the rule that a debtor may elect as to the application of a payment, but that if he does not so elect the creditor may elect.—Grace Harbor Lumber Co. v. Ortmann, 157 N. W. 96.

DAMAGES FOR BREACH OF BUILDING CONTRACT.

The rule in regard to damages for breach of a building contract is that where the contract is substantially complied with, and the building is such a one as is adapted for the purpose for which it was constructed, and only slight additions or alterations are required to finish the work according to the contract, the defects being remediable at a reasonable expense and without interfering with the rest of the structure, the measure of damages is such a sum as is necessary to make the building conform to the plans and specifications. But where the defects are such that they cannot be remedied without the entire demolition of the building, and the building is worth less than what it would have been if constructed according to the contract, the measure of damages is the difference between the value of the building actually tendered and the reasonable value of the building as required to be constructed.—Gutov vs. Clark, Michigan Supreme Court, 157 N. Y. 49.

ENFORCEMENT OF MECHANIC’S LIENS.

The New York Appellate Division holds that a mechanic’s lien cannot be foreclosed under a complaint which fails to comply with section 43 of the Lien Law, by stating whether any other action is pending to recover the lien debt. But although a complaint is insufficient to authorize foreclosure of a mechanic’s lien, yet a personal judgment may be entered under it, although none is demanded, especially in view of section 54 of the Lien Law, which provides that the lienor may recover judgment, although he fails to establish a valid lien.—Prime vs. Hughes, 159 N. Y. Supp. 1041.

NOTICE BY OWNER OF INTENTION TO COMPLETE WORK.

A building contract provided that upon the contractor’s failure to furnish satisfactory labor, the owner, after three days’ written notice, could himself supply it. The contractor entered upon the performance of the contract, employing non-union laborers, which was unsatisfactory to the owner. The owner’s agent wrote a letter to the contractor requesting him to supply satisfactory labor, but not stating the owner’s intention to do so himself after three days. The owner would not permit the employment of non-union men, and furnished its own men, using material which the contractor had delivered on the premises. In an action on a quantum meruit for the value of the material delivered and used, the New York Appellate Division held that the letter to the contractor was not the notice contemplated by the contract. Although the contract authorized the owner to use the contractor’s material without payment upon his default after written notice, yet where the notice was not given the contractor might recover on a quantum meruit for the material used.—James Ackroyd & Sons vs. Fractor, 159 N. Y. Supp. 1038.

“CASUAL” EMPLOYMENT UNDER WORKMEN’S COMPENSATION ACTS.

The owner of a house petitioned for review of an award made by the California Industrial Accident Commission under the Workmen’s Compensation Act. Section 14 of the act excludes from the meaning of the word “employee” as used in the act any person whose employment is “both casual and not in the usual course of the trade, business, profession or occupation of his employer.” The petitioner employed a house painter to paint his house at a rate per day, petitioner to furnish materials. The employment was not for a definite period, but the work could be reasonably finished in two weeks. The Court held that the contract of employment was “casual,” and, not being in the usual course of any business of the petitioner, the employment was of a nature which did not entitle the employee to compensation under the act for an injury.—Blood vs. Industrial Accident Commission, 157 Pac. 1140.

INSUFFICIENT CERTIFICATES PARTIALLY RELEASING SURETY.

Architect’s certificates, upon which the owner of a building under construction paid the contractor as the work progressed, in the absence of fraud or mistake, are conclusive upon all parties, owner, contractor and contractor’s surety. A building contract required that the owner should make payments in current funds, and only upon certificates of the architect, on or before the 15th day of each month, in amounts equal to 90 per cent. of the value of the work in place during the preceding month according to the architect’s certificates. The certificates on which payments were made by the owner contained no statement of the work in place. Only two of them implied that the amount had been determined. Three of them requested payment on account of labor and material furnished “as per contract and other extra work.” Three of them required payment to parties other than the contractor for material furnished, without any suggestion that it had gone into the building. All the certificates in effect stated only the desire of the architect that the money be paid to the contractor. In an action on the surety’s bond the Missouri Supreme Court held that such certificates were not a compliance with the contract, which required the value of the work to appear in the certificates, and that the estimates be founded on the contract price and state the value of the work and material in place relative to the entire amount of the contract. Payment on such certificates was held to constitute a breach of the building contract, so that the surety on the contractor’s bond would not be liable for payments made on such certificates. But the surety was not entirely discharged from liability under the bond. The provision regulating the contents of certificates of the architect on which payments should be made was an independent provision, relating only to the evidence on which it might be found that the payments had become due in the amount stated. The loss, if any, occasioned by non-observance was capable of computation and compensation in damages. Therefore the surety was not discharged in toto on the bond, since where a stipulation does not go to the root of a contract, so that a failure to perform it would not render the performance of the rest of the contract a thing different in substance from what was contracted for, its breach will not authorize an abandonment. Nor is abandonment authorized where non-performance of a condition does not materially impair the benefit from the performance of the others, the loss being capable of compensation in damages.—Southern Real Estate Co. vs. Banker’s Surety Co., 184 S. W. 1031.

LIABILITY FOR INJURY TO FOREMAN.

The Kentucky Court of Appeals holds that the foreman on a building job cannot recover from the master for injuries caused by his injuries, on the ground that the master was negligent in failing to promulgate proper rules, where the work is simple and openly done in such manner that its progress may be easily observed, since, in any event, it was the plaintiff’s duty to make the rules.—Johnson vs. Bates & Rogers Const. Co., 180 S. W. 134.
Doorway of the Norris House
Built about 1824
Rochester, N.Y.
ARCHITECTURE
THE PROFESSIONAL ARCHITECTURAL MONTHLY

VOL. XXXIV  SEPTEMBER, 1916  No. 3

Architecture. Edited by a Board of Architects in the interests of the profession, is published the fifteenth of every month by FORBES & COMPANY, LTD., (A. Holland Forbes, Pres.), 527 Fifth Avenue, New York. Chicago Office: Marquette Bldg. James A. Buchanan, Representative.

Price, mailed flat to any address in the United States, Mexico or Cuba, $5.00 per annum in advance; to Canada, $6.00 per annum; to any foreign address, $7.00 per annum.

Advertising Rates upon request. The writing and displaying of Advertisements is an art in itself, and the publishers will be pleased to give the Advertiser the benefit of an expert's experience in this line at no additional expense.

Entered at the New York Post Office as second-class mail matter.

PLATES AND ILLUSTRATIONS

ARCHITECTURE SERIES OF MEASURED DETAILS.
Detail, Screens, Main Corridor, New York City Hall, Double Plate CXXXIII

ASTOR COURT APARTMENTS, New York.
Exterior, Plate CXXXIV
Detail of Entrance, Plate CXXXV
Detail of Marquise, Plate CXXXVI
Cornice, Plate CXXXVII
Detail, Cornice, Plate CXXXVIII
Entrance Hall, Plate CXXXIX
Typical Drawing Room, Plate CXL

Detail showing Interior Treatment of Apartments, Plate CXLII
First and Typical Floor Plans, Plate CXLIII
Thirteenth Floor Plan and Details, Plate CXLIV
Charles A. Plato, Architect

ROBERT ADAM AND HIS BROTHER; Their Lives and Work.
Twentv-two Illustrations, 185-191

EARLY ARCHITECTURE OF WESTERN NEW YORK.
Doorway and Mantel, McNeil House, Henrietta, N. Y. Plate CXLV
Doorway of the Noris House, Rochester, N. Y. Plate CXLVI
Measured and drawn by Benj. F. Betts

MONTHLY PICTORIAL REVIEW OF OUR CONTEMPORARIES.

Copyright, 1916, by FORBES & COMPANY, LTD., 527 Fifth Ave., New York

Editorial

The American Institute of Architects and its Honor Code—Co-operation of the Architect and Draughtsman

The American Institute of Architects is, to-day, in its superior position because of the energetic labors of its various committees. Its standing in the country and the rules which govern its members are based on the supreme code of honor. It is, therefore, unfortunate that the case quoted below, involving one of its members, and for which a verdict was rendered to the plaintiff, has been made public, thereby injuring much of the good and great work which the A. I. A. has performed. We know, however, that the Institute is capable of protecting its own honor and we hope that the Institute will publish its findings for the benefit of the profession and the public.

"On February 8, 1904, two firms of architects—Reed & Stem and Warren & Wetmore—entered into a partnership. The design and erection of the Grand Central Station in the city of New York and other buildings that were to be constructed in connection therewith. Charles A. Reed, of Reed & Stem, was made executive head of the firm, and the work for which it was organized was undertaken. On November 12th, 1911, Reed died leaving the work unfinished. Shortly thereafter the railroad company canceled the contract with the Associate Architects and signed a new one with Warren & Wetmore, giving them the work in question. The plaintiff, Stem, and William J. Reed, executor of the estate of Charles A. Reed, claim that the cancellation of the original contract and the substitution of Warren & Wetmore was brought about at the suggestion of the latter for the purpose of excluding the plaintiff and the Reed estate from the profits of his work which had been assigned to the Associated Architects to which they were then working as uncompleted business. The question presented for decision is whether the plaintiff is entitled to an accounting, and if so, what is to be the scope thereof.

A consideration of the rule of law governing the relationship and conduct of partners toward one another is of material assistance in working out the rights of the parties hereto. In their dealings with each other partners occupy a position of trust and confidence, and the authorities unanimously agree that there is scarcely any relation in life which calls for more absolute good faith than the relationship of partners. Each is the general agent of the firm with power to affect the interests of all. Hence the law has thrown a protection around the partnership as such by requiring that every advantage which an individual can gain in the business must inure to the benefit of the firm. A purer and more elevated morality is demanded of partners than the common morality of the trade, and the standard by which they are tried in a court of equity is far higher than the ordinary standards of business.
tionable dealings of any kind will not be tolerated. Narrow views resulting in the preference of one partner at the expense of the firm must yield to broad principles of fair dealing and highmindedness."—Extract from decision for the plaintiff by Judge Delehanty.

THE following letter was received with a request for its publication. The draughtsman is in the office of an architect in one of our smaller cities. Certain typographical errors in the author's copy have been corrected, but the matter is otherwise unchanged and we recommend it to the attention of our readers, together with the comment thereon:

Editor Architecture:

Dear Sir:—The following is something that should not only be read, but should make the reader do some thinking on his part, toward suggestions to make things better than they are now.

A young man is taken into an architect's office, promised all kinds of opportunities, advancements, told of the big salaries made by draughtsmen, etc. He is given a salary so small that at the end of three years, his salary is smaller than a common laborer's. He does not equal an apprentice, and in the trades, the poorest workmen get a bigger salary than a good draughtsman.

Once a draughtsman, always a draughtsman, unless you have some relation with more money than brains, who wants to start you in business; otherwise the draughtsman will never get started, because he cannot save enough from his salary. The architect will advise going to college to study, but what for? When your college days are over, you can get a position (I would call it a grind) for six months for practical experience, without pay, then you'll get a big salary.

I suppose that if an architect were to tell you the truth about the chances that a mere draughtsman has, there would be fewer draughtsmen.

Architecture is not a trade; you do not serve a few years and then you have mastered it. No! Have you ever heard of an endless job? If not, try learning architecture: it is a slow, tedious, nerve-racking, grinding business, but when you find this out, it is too late to start in any other business.

Some form of co-operation between architect and draughtsman, probably a percentage basis on all work, would mean more work, fewer mistakes, the draughtsman would be on the lookout for new clients for the architect, perhaps the draughtsman might be taken into the firm and perhaps do away with the old saying, "The only way an architect can get rich is by marrying one of his clients." If you know of any other way, pass it along.

Everyone knows that the draughtsman is the big cog in the big building machine. Who makes the drawings? If a job is behind, who does the hurrying to get it out on time? Now shouldn't he receive more money than the tradesman who is only a minor part of this great building machine?

All trades and professions have organized to increase their weekly allowance, why can't the draughtsmen form an association to better themselves, if the architects won't co-operate with them; it will have to come some day, and why not now?

We have no knowledge concerning the author of the above letter, nor can we believe that his view of his profession is general among draughtsmen. Yet he has conveyed to us the impression that his criticisms, however ill expressed, are thoughtful and sincere, and the complaints he has to make must be due to the circumstances in which he finds himself placed, rather than to a naturally discontented frame of mind.

Architects in general are accustomed to think that the relations existing between the front office and the draughting room, are mutually satisfactory. It is quite possible that the employer of the man who wrote the article printed above, feels that he has working for him an earnest and satisfied body of draughtsmen, and yet from one of them we receive a letter, which, though obviously mistaken in many respects, bears intrinsic evidence of a very genuine discontent, which must be in part justified. That the writer's attitude toward the profession is substantially incorrect, cannot be doubted. He may have been promised, as he suggests, all sorts of opportunities and advancement, which have not materialized, but as to whether the fault is his own, or that of the employer, no one can say. It is not unusual for men to fail to advance because of their own inability, nor is it unusual for men to begin in the lowest possible position in an architect's office and to work themselves up very early into independent practice or into a partnership. One of the most famous architects in this country has as his partner a man who worked for him a number of years ago as an office boy, and who, by his ability and fidelity, made himself so valuable to his employer, that when the time came that he was worth more than he could earn as a draughtsman, his employer preferred to take him into partnership, rather than to lose him, as would have been the case had he struck out for himself. This case is by no means rare and while we have no definite knowledge of just how the men constituting the firm of McKim, Mead and White began their connection with the firm of which they are now members, we understand that the present firm consists of six men, five of whom have been advanced from the draughting room. Surely this is co-operation of the kind which the writer of the above letter desires.

That opportunities for advancement are by no means limited to the large firms, may be proven by the following case of one of the small offices, which we know to be authentic. The office was established some twelve years ago. The first office boy was the son of a mechanic, with a natural taste for drawing. He held the position as office boy for about a year and a half, then becoming a sort of junior draughtsman. He learned readily, advancing steadily in opportunity and salary, and finally left the office to go into partnership with a man who had been formerly employed as a draughtsman in the same office, and had finally established himself independent practice in one of the smaller cities, and realizing his own limited capacity in designing, wanted some one to take care of the draughting room while he confined himself to the practical end.

The office boy who succeeded to his position, was likewise a fellow whose opportunities for school education had been limited in the extreme. He too, was given an opportunity to do tracing and drawing in the office, and supplemented this by a course at the Mechanics' Institute, and later in one of the ateliers of the Beaux Arts Society. His development in every respect was very rapid. He became a superb draughtsman and a capable designer, and his education was not confined to architectural work, but in manners, dress, and general intelligence he showed commensurate improvement.

He went into several of the competitions held under the auspices of the architectural magazines, won one or two, and with the proceeds of these prizes, supplemented by savings from his salary, he made a trip to Europe of about six months. Soon after his return, the efficiency he had shown in the competitions attracted the attention of the manager of one of the real estate development companies and he was given several houses to build on the property controlled by that company,
ARCHITECTURE

Other work followed and now he has an independent practice of as good quality and of great value as that of the office in which he was so long an employee. In the same small office the third office boy is now head draughtsman and has already designed several buildings under his own name and has taken out his state license to practice architecture. He too, is on his way to independent practice although he began his business life with as little training and education as any of the others.

Now, these cases are all direct refutations of the statement the writer of the preceding letter has made, that there is only one way in which to get started and that is to have some relative set you up in business. Of course, we all know that a good connection and good business-getting ability will succeed in procuring work not more rapidly than ability to design alone, but work obtained in this way will not bring to a man permanent and enduring success, unless the quality of his work is so high that he would in any case have succeeded. We could name a half dozen of the most prominent in this country, who began life as office boys or junior draughtsmen, whose training was secured entirely outside of colleges or was supplemented by such brief courses as they could take at night, and pay for out of the sums made by day. Certainly no man whose start in life is due to accident of birth rather than to his own ability and determination to succeed, can contemplate his career with anything like the pleasure and satisfaction that these men experience and that in itself must be a more than sufficient compensation for their laborious efforts in building up their practices.

Nor do we believe that the average architect works less hours, does less during the hours he works, or is less responsible for the design of the work which goes out over his name, than are his draughtsmen. We do not mean to say that every architect can instruct all the men in his office, for there is in this practice as in all others, dilettante who depend upon others, and whose only real relation to the work is the fact that they have secured it and that their names are on the drawings. The draughtsman may be the big cog in the machine, but the architect is the motive power that drives it, and in the proper conduct of business it is as essential that the motive power should be perfect as that the cog should be in its correct position.

The one thing which this article does seem to say to the architect more clearly than anything else, is that he should be considerate of his men and be respected by them. No man who does not run his office on purely business principles can possibly be successful, either in the return he gets from it, or in the artistic quality of his work, but sound business principles will dictate to him considerate and proper treatment of his men. Certainly the employing architects find it difficult enough to obtain draughtsmen whose knowledge of design is not of the most rudimentary character, and the architect who has in his office a man with real feeling for proportion and an ability to subordinate his own conceptions of design to those of his employer, is a man who is blessed indeed. Draughtsmen of this character are those most eagerly sought for and most appreciated, and aside from such men there are few offices which find it necessary to lure draughtsmen into their clutches with gaudy promises and flattering hopes.

One more thing; the man who goes into architecture to amass a fortune had better get out of the profession; he cannot attain his ambition in it, and the profession does not want its practitioners to be possessed of such low ideals.

THE question of advertising the profession of architecture has been the subject of much discussion since the last Convention, at which the Board of Directors was asked to study the proposals which were advocated during the discus-
Target-and-Arrow

You will know good roofing tin by the Target-and-Arrow on it. That trade-mark was created by the old firm of Taylor, in the early days of the tinplate industry, and the Taylors knew what tinplate quality meant. Four generations of sheet-metal roofers have used Taylor roofing tin with success and profit. It is made today like it was made more than fifty years ago. No "modern methods" have changed it from the tin that grandfather's father knew. You can absolutely guarantee a roof of Target-and-Arrow tin, but first be sure it is not one of the many imitations. Look for the Target-and-Arrow.
The above illustrates a floor laid with our TOURAINE GRANITE in an Adam design.

Faience Department
American Encaustic Tiling Co., Ltd.
16 East 40th Street, New York
Zanesville, O. Maurer, N. J.

Specify
Mississippi Wire Glass
The Recognized Standard
and be assured of
Fire Protection
Breakage Protection
Quality Protection
and Satisfaction

Write for Report on Diffusion of Light

Mississippi Wire Glass Co.
Fifth Ave., Cor. 26th St.,
Chicago St. Louis

Country Residence, E. T. Bedford, Green's Farms, Conn.
Montrose Morris, Architect.

The painting on this house was done with
MATHESON WHITE LEAD
Many of the finest buildings in this country bear testimony to the superiority of this lead.

MATHESON WHITE LEAD
Will make a white mark on any other lead, and will cover more surface and cover it better.

IT IS STRICTLY PURE
MATHESON LEAD COMPANY
Corroders
New York
No Upkeep Cost for 20 Years — Absolutely Guaranteed

Here are details of a plan to guarantee your roof for 20 years—at no extra cost.

It's a new feature of Barrett Service. We know from an experience of over half a century that a Barrett Specification Roof, if properly laid by a good roofing contractor, will last at least 20 years. Scores of roofs of this type have lasted almost twice that period.

In order that purchasers may have the benefit of this experience we have arranged with one of the largest Surety Companies in America—the United States Fidelity & Guaranty Company of Baltimore—to issue, hereafter, a 20 Year Guaranty Bond on all Barrett Specification Roofs of 50 squares or more in all towns in the United States and Canada of 25,000 population and over—and in smaller places where our Inspection Service is available.

Our only requirements are that the roofing contractor shall be satisfactory to us and that the Specification dated May 1, 1916, shall be strictly followed.

All you have to do to secure the 20 Year Guaranty Bond is to give the roofing contractors copies of the Barrett Specification of that date, and tell them to figure on that basis. From the buyer's standpoint the arrangement is practically ideal, for under the plan the owner is assured of having an inspector on the roof whose only interest is to make it as good as possible—for it isn't right we alone are the loser.

Do not confuse this Surety Bond with the ordinary "Guarantee." It is something quite different. It is issued, not by an individual or a manufacturer, but by one of the largest and best known Surety Companies in the country and is a legal, workable document that has no loopholes.

When you give the roofing contractor a copy of The Barrett Specification of May 1, 1916, to figure on, you are ordering the very best roof it is possible to construct and one that takes the base rate of insurance. In addition you secure a 20 Year Surety Bond, guaranteeing freedom from upkeep cost for that period.

If you are interested and want any further information, write our nearest office and the matter will have prompt and careful attention.

The Barrett Company

Largest Manufacturers in the World of Roofing and Roofing Materials

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh Detroit Birmingham Kansas City Minneapolis Des Moines Nashville Salt Lake City Portland

THE PATERSON MANUFACTURING CO., Limited

Montreal Toronto Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

This illustration shows a few buildings that carry The Barrett Specification type of roof.
Comfortable Homes

Founders Importers Designers
And Makers of Lighting
Fixtures Grilles Andirons
And Fire Place Fittings Clocks
Desk Table and Mantle
Ornaments, exclusive gifts for
all occasions. Our Showroom is Our
Only Catalogue, We Court Inquiry
And Invite Correspondence

Decorative Metal Grilles
for Radiator Enclosures

Decorative Metal must not be confused with the ordinary Ornamental Iron. Our seventy years' experience in manufacturing flat perforated castings has enabled us to make unusually high grade grilles and register faces in cast iron, cast bronze and brass. These can be painted or have an enameled paint baked on to match any finish. We also design and model them to meet any period of decoration.

Tuttle & Bailey Mfg Co.
New York
Catalogue of special designs sent on request.

Comfortable Homes

Residence of Mrs. Samuel Vandalis, Jr., Rosemont, Pa.
Equipped with the Johnson System.
Dulberg, Oak & Ziegler, Architects.

Comfort and convenience—these are the first requisites of the home, whether it is a pretentious mansion or a modest cottage. Help your clients obtain greater home comfort by specifying

JOHNSON SYSTEM
of Temperature Regulation
And Humidity Control

It automatically regulates the heat—keeps the rooms at an even, uniform temperature. Saves fuel. Promotes health. Requires no attention whatsoever.

Write today for catalog and information of interest to architects.

Johnson Service Co.
Milwaukee
Wisconsin
Prominent Contractor Criticises Floretyle Advertising

Mr. J. S. Shaw of Van Horn-Shaw Construction Co., prominent contractors, criticises the fact that our Floretyle advertising does not lay sufficient stress on the economy of Floretyle construction.

He says: "The writer thinks the big weak point in your Floretyle advertising is the fact that you do not lay more stress on the economical saving in forms, labor and the large salvage of material used in the forms."

Ten Systems Submitted but Floretyle Wins

Nine other systems were rejected on the building because flat ceilings of long span were necessary to assure maximum ventilation and daylight and Floretyle was the only one fully meeting the requirements.

No matter what your building needs you will find Kahn Building Products provide the particular construction exactly meeting every requirement. Write for suggestions and catalogs.

TRUSSED CONCRETE STEEL COMPANY
DEPT. R-22
YOUNGSTOWN, OHIO.

Representatives in Principal Cities

Steel Floretyle Construction, Austin High School, Austin Texas. Dennis R. Welsh, Architect.
Architects

Are requested to call and inspect the finest collection of designs for Wall Hangings ever shown in this country.

W. H. S. Lloyd Co.
105-7 West 40th Street
New York
529 South Wabash Ave., Chicago

We are sole agents in this country for "Parian" Enamel used extensively by the English Architects.
Costikyan & Co.
ANCIENT & MODERN RUGS

SHAHRISTAN RUGS
WOVEN TO SPECIAL ORDER
ON OUR OWN LOOMS
IN THE ORIENT

12 EAST 40TH STREET
NEW YORK

LARGEST STOCK IN THE WORLD
The unsurpassed Dual-Line of
LINCRACTA
possesses Superior Decorative Quality and Individuality in Design.
Ask for Illustrated Booklet.
Samples forwarded upon request.
LINCRACTA WORKS "PALLAS" Inc.
121-123 East Twenty-fourth Street
NEW YORK, N. Y.
Europe makes some things that no domestic manufacturers have equaled. One of them is Ripolin. Its superiority shows in its color, smooth surface and wear.
SPECIFY RIPOLIN and you will earn the gratitude of clients who appreciate appearance, durability and low cost.
J. A. & W. BIRD & CO.
Distributors for No. America
NEW YORK BOSTON CHICAGO
For Valuable Facts, write Dept. A
COSTS LESS BECAUSE IT GOES FARTHER AND WEARS LONGER
Enameled Iron Recess Bath

A beautiful built-in bath equipped with shower and mixer, the curtain running full length of the tub.

This design insures the utmost luxury and comfort in bathing.

L. Wolff Manufacturing Co.
601 W. Lake Street Chicago
Show Rooms: 111 N. Dearborn Street

We would like to send you Catalog "D." May we?

THE TRAYMORE BATH, as illustrated, has fixtures concealed in the wall.

Send for special pamphlet of THE TRAYMORE BATH

THE TRAYMORE BATH

You will find everything in Monument Ware that the words DURABILITY and QUALITY imply.

THE MONUMENT POTTERY CO.
TRENTON, N. J.
STANLEY garage hardware is especially designed to accomplish its purpose. It is on sale by most Hardware Dealers and can be secured quickly and easily by Contractors and Builders.

STANLEY Garage Hardware

is of special interest because it is a necessity for every modern garage. The Stanley Garage Door Holder, illustrated above, is an arm of steel which holds the door open, preventing it from slamming and injuring the car, while entering or leaving.

There is nothing to break or get out of order. A pull at the chain releases the door and permits it to swing shut.

If you are not already familiar with this device and the complete line of Stanley Garage Hardware, we suggest that you send for information.

Write today for illustrated booklet "C" on Stanley Garage Hardware

Stanley Works

NEW BRITAIN, CONN., U. S. A.
NEW YORK: 100 Lafayette Street
CHICAGO: 73 East Lake Street

If the foundation of a skylight is weak the whole structure is liable to failure. Compare the strength of the “Anti-Pluvius” channel with a frame of sheet metal made of light metals. Its strength insures safety. The high carbon, rolled steel resists corrosion, where elements conquer sheet metal.

The deep, wide form of the gutter carries off condensation freely in any quantity.

We will gladly tell you of an “Anti-Pluvius” installation near you and also send Catalog elaborating the points of these advertisements.

THE G. DROUVÉ COMPANY
BRIDGEPORT, CONN., U. S. A.
Is Built for Service.  
Attractive appearance.  
Emphasizing sanitation.  

Its use under the most exacting conditions will prove its **dependability**.

Plumbing fixture experts **acknowledge** its **superiority** and recommend it.

Now installed in Technical Institutions, because it is the best for the requirements.  
Polytechnic Institute, Worcester.  
Pullman School of Manual Training, Pullman, Ill.  
U. S. Bureau Standards, Washington, D. C.  
Approved and used in the best hotels, office buildings, hospitals, schools and clubs.

**Specify Whale-Bone-Ite** for eliminating upkeep.  Your client will thank you.

Types for all regular type closets.  Made by  

THE BRUNSWICK-BALKE-COLLENDER CO  
623 S. WABASH AVE.  CHICAGO
The African Tile Company of Tunis

18 East 37th St., New York
(Near Tiffany’s)

In order to introduce this New Art, we have on exhibition, Mantels, Floors, Fountains, Panels, Window Boxes, Tables, Lamps, etc., and we demonstrate how these tiles can be utilized in innumerable ways.

There is only one family in North Africa who can produce this work in a commercial way. The designs are taken from the Bardo Museum, and from old Mosques and Palaces supervised by the Architect of the French Government.

The colors are those found in old tapestries, and cannot be copied in this country. They are all hand painted and sun-dried, and should appeal to the Architect and to those who are seeking the beautiful in burnt clay for their homes and gardens.

Bobbink & Atkins

Special AUTUMN PLANTING

Evergreens
In quality, variety and extent our collection is unrivalled in America.

Hardy Old Fashioned Flowers
All of the most liked varieties. The blossoms that make the garden.

PEONIES Many Notable IRIS

Spring Flowering Bulbs
Daffodils, Tulips, Hyacinths, and a full assortment of the best miscellaneous bulbs.

300 acres of Nursery, 500,000 feet under glass. We Plan and Plant Grounds and Gardens Everywhere. Write now for illustrated catalog of Autumn Plantings No. 65.

Rutherford, New Jersey

LION OF TUNIS

TRADE MARK

SEPTEMBER PLANTING

Evergreens 6 to 30 ft. high for Immediate Boundaries to Gardens and Grounds.

Evergreens 1 to 6 ft. high for Foundations.

Hardy Garden Flowers.

September is an excellent time for this work. The trees like it and repay you with beautiful results now and next summer. You will like it because you can give it more personal attention than in the spring when you have to see to planting of garden seeds and other necessary spring work.

Now is the time to select large 20 years old shade trees for planting early in October. You can see just what they will do for you. Send for series of booklets and folders showing garden work best adapted for each month.

All stock from the Hicks Nurseries guaranteed to grow satisfactorily or replaced.

I. HICKS & SON
WESTBURY, N. Y.
N. C. & St. L. Passenger Shed—Chattanooga, Tenn.

Where Exposure is Most Severe—

Carey Flexible Cement Roofing

Exposed to sulphurous gases of countless engines; subjected to attack hourly by red hot sparks and cinders – Carey Roofing remains unscathed year in and year out on the great passenger shed shown above. No matter what the condition of exposure, no matter what the kind of roof may be—Carey Roofing is the choice of careful architects and builders the country over.

The Carey Booklet of Specifications is prepared expressly for your use. Have you sent for your copy?

THE PHILIP CAREY COMPANY

General Office: LOCKLAND, CINCINNATI, OHIO 50 Branches

DON'T THROW YOUR CONCRETE FLOORS IN THE DUST BIN!

The expense of repairing and then re-topping your concrete floor is bad enough. But it's the "meanwhile" danger—the concrete dust which is even more costly.

Wherever machinery moves or merchandise is exposed, the sharp, cutting, destroying concrete dust penetrates—unless you use Lapidolith—

the liquid chemical hardener for concrete floors. It's guaranteed. Over 1100 leading firms have used Lapidolith. Their floors are now dust-proof, wearproof and waterproof.

How about your floors—either old or new?

Send for treated concrete block, testimonials and sample flasks.

L. SONNEBORN SONS, Inc., Dept. 9, 264 Pearl St., New York
Solving adequately and permanently all classes of construction problems, concrete holds deservedly the highest esteem of contractor and engineer. The modern builder realizes that as much care must be taken in the selection of material as in the selection of equipment and men.

Lehigh Portland Cement Co.
AMERICAN BRIDGE COMPANY
Hudson Terminal-30 Church Street, New York
Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS

SALES OFFICES
NEW YORK, N. Y., 30 Church Street
Philadelphia, Pa., John Hancock Bldg.
Baltimore, Md., Continental Trust Bldg.
PITTSBURGH, PA. . . . . . . . . . . Frick Building
Rochester, N. Y. . . . . . . . . Powers Block
Buffalo, N. Y. . . . Marine National Bank
Cincinnati, Ohio. Union Trust Building
Atlanta, Ga. . . . . . . . . . . . . . . . . . . . . Candler Building
Cleveland, Ohio. Rockefeller Building
Detroit, Mich. Beecher Ave. R.M.C. R.

CONTINENTAL FIBRE BOARDS
Will not crack, split or fall. For interior and exterior uses in Permanent, Semi-Permanent or Temporary structures. Made in various lengths, widths and thicknesses, finished and unfinished surfaces. It is sound-proof and an efficient insulator of heat and cold.

MADe IN U. S. A.

CONTINENTAL PAPER COMPANY
18 East 41st Street, New York
POSITIVELY PERMANENT
AND SATISFACTORY
THE ORIGINAL CONCRETE WATERPROOFING

MEDUSA WATERPROOFING
Has been successfully used in the construction of tunnels, reservoirs, swimming pools, municipal waterworks, United States Government structures, warehouses, basements, elevator pits, concrete block houses, and in many other building operations.

Medusa is manufactured in powder and paste form, the latter being especially recommended for machine-mixed concrete.

Many eminent architects are specifying Medusa Waterproofing exclusively.

Write for "Medusa Waterproofing" booklet.

The Sandusky Cement Co.
Department 23 CLEVELAND, OHIO.

ONE OF TWO BENCHES, ESTATE, Mr. J. J. CHAPMAN, RARETOWN, N. Y.
C. A. Pilt, Architect.

OUR collection of over 1500 models of vases, fountains, sundials, statuary, benches and other garden furniture presents unlimited possibilities in the decoration of your estate.
Mantels and Hall Ornaments for interior use.
Our handsome illustrated catalogue is sent free to Architects on request.

THE ERKINS STUDIOS
The Largest Manufacturers of Ornamental Stone
FACTORY, ASTORIA, L. I.
225 LEXINGTON AVENUE
NEW YORK

WATER GARDEN, H. R. COLGATE, SHARON, CONN.

GEORGE MERTZ' SONS
Contractors, Builders
AND MANUFACTURERS OF
Fine Interior Hardwood Work
PORT CHESTER, N. Y.
The Latest Advance
in
Lighting and Ventilating Efficiency

You know that more light and window ventilation free from draft annoyances are considerations of the greatest importance to your clients.

The Winslow Window
(Austral Balance)

Supplies 15 to 25 per cent more light than the average window, and the ventilation is perfect. There are no expensive awnings, ventilators, or weather strips to buy. You not only gain more light, freedom from drafts, but economy, convenience, better appearance, and weather-tight construction.

Be sure to get Winslow construction points that eliminate all drawbacks common to the ordinary double hung wood sash. Our co-operation is at your service.

Winslow Brothers Co.
Main Office and Works, 4600-4700 W. Harrison St., Chicago
Mailing Address, P. O. Box No. 883

Branch Offices

Central Building
Los Angeles

8 W. 69th St. Building
New York

Ferguson Building
Pittsburgh

The Latest Advance
in
Lighting and Ventilating Efficiency

You know that more light and window ventilation free from draft annoyances are considerations of the greatest importance to your clients.

The Winslow Window
(Austral Balance)

Supplies 15 to 25 per cent more light than the average window, and the ventilation is perfect. There are no expensive awnings, ventilators, or weather strips to buy. You not only gain more light, freedom from drafts, but economy, convenience, better appearance, and weather-tight construction.

Be sure to get Winslow construction points that eliminate all drawbacks common to the ordinary double hung wood sash. Our co-operation is at your service.

Winslow Brothers Co.
Main Office and Works, 4600-4700 W. Harrison St., Chicago
Mailing Address, P. O. Box No. 883

Branch Offices

Central Building
Los Angeles

8 W. 69th St. Building
New York

Ferguson Building
Pittsburgh

The Latest Advance
in
Lighting and Ventilating Efficiency

You know that more light and window ventilation free from draft annoyances are considerations of the greatest importance to your clients.

The Winslow Window
(Austral Balance)

Supplies 15 to 25 per cent more light than the average window, and the ventilation is perfect. There are no expensive awnings, ventilators, or weather strips to buy. You not only gain more light, freedom from drafts, but economy, convenience, better appearance, and weather-tight construction.

Be sure to get Winslow construction points that eliminate all drawbacks common to the ordinary double hung wood sash. Our co-operation is at your service.

Winslow Brothers Co.
Main Office and Works, 4600-4700 W. Harrison St., Chicago
Mailing Address, P. O. Box No. 883

Branch Offices

Central Building
Los Angeles

8 W. 69th St. Building
New York

Ferguson Building
Pittsburgh
THE Model E Hoist with Electric Motor is recommended for buildings where it is desirable to have a power hoist for the removal of ashes.

SPECIAL ADVANTAGES

1. It is moderate in price.
2. It may be operated by one man, unaided.
3. When not in use no part shows above sidewalk.
4. It is compact, easy to erect and no pit is required.
5. Operated from sidewalk—a protection for both public and operator against injury due to open hatch.
6. Raises load of 500 lbs. at speed of 30 ft. per minute.
7. Motor is one-horse power, totally enclosed, with brake, automatic upper limit, and single speed controller, giving one hoisting and one lowering speed.
8. Subjected to thorough working test before shipment.

PRICE—Model E Hoist, G & G Sidewalk Door Opening and Closing Device with Spring Guard Case and Sidewalk Doors to cover opening 4x6 ft. F. O. B. N. Y. City...

$385

See Sweet's Catalog for full description of G & G Telescopic Hoists.

Gillis & Geoghegan
545 West Broadway New York City

STEEL Rolling Fireproof Doors and Shutters and Wood Rolling Doors and Partitions

THE KINNEAR MFG. CO.
COLUMBUS, OHIO, U. S. A.

BOSTON PHILADELPHIA CHICAGO
Sherardized Rigid Steel Conduit has been used in many notable Central Station installations. One, the San Diego plant, is shown here. Note the interior view—the many bends. Sherardizing not only protects both exterior and interior surfaces against corrosion and mechanical injury, but anneals and makes SHERARDUCT easier to cut, thread and bend than any other conduit. Both surfaces are enameled, too—an exclusive feature. Write for samples of SHERARDUCT and complete information.

Plant of San Diego Consolidated Gas & Electric Co., San Diego, California
H. M. Blythe Co., Engineers

National Metal Molding Co
Manufacturers of
Electrical Conduits & Fittings
1123 Fulton Building, PITTSBURGH, PA
Boston, New York, Chicago, Atlanta, Denver, Los Angeles, Portland, Seattle, Buffalo, Detroit, San Francisco

“THE conflagration hazard will hang over every town and village so long as wooden shingles are used for roofings.”—Insurance Post.

This is equally true of all inflammable roofings. Lasting and absolute protection from fire and weather is secured by using

KEystone Copper Steel Terne Plates
Within a short period of twenty-four hours four disastrous fires with tremendous property losses were suffered by Paris, Texas; Tulsa, Okla.; Nashville, Tenn.; and Augusta, Ga. Combustible roofings simply fed the flames. Specify Keystone Copper Steel terne plates for good tin roofs. Grades 8 to 40 lbs. coating—stamped “Keystone Copper Steel” as indicated by the MF brand. Our APOLLO-KEYSTONE Copper Steel Galvanized Sheets are unequaled for exposed sheet metal work. Every architect should have our Keystone booklet.

American Sheet and Tin Plate Company
General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES:
Chicago  Cincinnati  Denver  Detroit  New Orleans  New York  Philadelphia  Pittsburgh  St. Louis
Export Representatives: United States Steel Products Company, New York City
Pacific Coast Representatives: United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle
Cataloged In Our New Catalog

THIS and fifty other greenhouses and conservatories are shown in our new catalog along with a brief but comprehensive line-up of our construction.

It's too expensive a catalog to send broadcast to every architect. But every architect or head draughtsman who wants one is most assuredly welcome to a copy. A request brings it.

Hitchings and Company

General Offices and Factory: ELIZABETH, N. J.

NEW YORK
1170 Broadway

BOSTON
49 Federal Street

PHILADELPHIA
40 S. 15th Street

600 Openings Sealed with

Monarch Metal Weather Strips

This installation includes every window in the building. It is the result of a thorough appreciation of what constitutes weather strip efficiency.

The adaptability of Monarch Metal Weather Strips to openings of any nature places no limitation on design or treatment of windows. Their power of self-adjustment to any displacement due to shrinkage or warping in sash or frame insures continuous contact. The excellence of the material guarantees their durability.

All installations made under supervision of the manufacturers.

Representatives everywhere. Write for catalog and full-sized details, also name and address of nearest licensee, who can demonstrate the Monarch principle.

MONARCH METAL WEATHER STRIP CO.
4126 Forest Park Blvd.

St. Louis, Mo.

Buildings equipped with

MONARCH

Metal Weather Strips

Hotel Jefferson, St. Louis, Mo

Montana State Capital, Helena, Mont. 

Peter Fazell School, Boston, Mass.

Louisville Free Public Library, Louisville, Ky.

(Portland Branch)

Germania Life Bldg., St. Paul, Minn.

The Blackstone Apartments, Detroit, Mich.

St. Louis Children's Hospital, St. Louis, Mo.

Madison & State Bank, Chicago, Ill.


Horlick Malted Milk Co., Racine, Wis.

Tubular Boiler Efficiency.

The Boiler Shell of a Gorton Self-Feeding Boiler is directly over the fire where it gets the full benefit of all the heat generated from the coal. The tubes are placed as thickly in the boiler shell as proper construction will permit, thus subdividing the water space and enabling the heat to act most effectually.

The products of combustion enter the tubes at the highest temperature and passing up through them are returned down around the boiler shell before going to the smoke pipe.

See pages 3, 4, 8, 11 and 13 of Catalog No. 88.

Our New No. 88 Catalog is ready—will be sent upon request.

Gorton & Lidgerwood Co.
96 Liberty Street, New York
All Gorton Self-Feeding Boilers built to the "A. S. M. E. Standard."

"REECO" PUMPS FOR EVERY DUTY

Motor Driven House Pump.
Motor Driven Deep Well Pump.
Rider Hot-Air Pumping Engine.
"Reeco" Centrifugal Pump.
Ericsson Hot-Air Pumping Engine.
RIDER-ERICSSON ENGINE CO.

Our New No. 88 Catalog is ready—will be sent upon request.

Gorton & Lidgerwood Co.
96 Liberty Street, New York
All Gorton Self-Feeding Boilers built to the "A. S. M. E. Standard."

NINE

A. B. SEE ELECTRIC ELEVATORS installed in the ASTOR COURT APARTMENT HOUSE, illustrated in this issue.

These are the A. B. SEE TRACTION, both gearless and geared, representing the highest type of MODERN ELEVATOR CONSTRUCTION.

The A. B. See Electric Elevator Co.
Main Office: 220 Broadway, New York

BOStON
Minot Building, 111 Devonshire St.

HARTFORD
Conn. Mutual Life Bldg., 36 Pearl St.

WASHINGTON
Real Estate Trust Bldg., 14th & H Sts. N.W.

CLEVELAND
Belmont Bldg., 750 Prospect Ave.

FACTORY
Jersey City, N. J.

Baltimore
Market Building, 221 Courtland St.

PHILADELPHIA
Land Title Bldg., Broad and Chestnut Sts.

MONTREAL
70 - 72 Mansfield St.
Established 1857

I. P. FRINK

REFLECTORS FOR LIGHTING BANKS

Stores Windows Showcases Churches Theatres Hotels Art Galleries Private Collections and Public Buildings generally LIGHTING PROBLEMS SOLVED Interior and Exterior, by our EXPERT ENGINEERS.

I. P. FRINK

24th Street and Tenth Avenue

NEW YORK, N. Y.

PHILADELPHIA, PA.

CHICAGO, ILL.

219-221 N. Broad Street

175 W. Jackson Blvd.

100-2 Wood Street

ST. LOUIS, MO.

813 Superior Ave. N. W.

501-5 N. Third Street

DETROIT, MICH.

SAN FRANCISCO, CAL.

SEATTLE, WASH.

2nd and Howard Sts.

1020 First Ave., South

Engravings

There are all kinds of Half-tones. We make the right kind.

The Engravings—both half-tone and line—used in "Architecture," are made by the

Powers Reproduction Corp.

Photo-Engravers

302 West 42d Street

New York
Your Clients Are Sure of
Cabot’s Creosote Stains
They have been the standard for more than twenty-five years. Their colors are soft, rich and beautiful, and guaranteed fast. They are made of Creosote, which thoroughly preserves the wood, and they contain no kerosene or other cheapener. Accept no substitution of unknown stains, because you are sure of Cabot’s.

Special Shades on Request
Cabot’s Quilt, Waterproof Cement and Brick Stains
Conservco Wood Preservative, Plasterboard Damp-Proofing
1133 Broadway, N. Y. 24 West Kinzie St., Chicago

THE PAPER FOR THIS PUBLICATION SUPPLIED BY
Conrow Bros. Paper
114-116 Worth Street
Corner Elms Street
“A GRADE FOR EVERY PURPOSE AND EVERY GRADE RELIABLE”

Koll’s Patent Lock-Joint Columns
Suitable for Pergolas, Porches or Interior Use
are made exclusively by
Hartmann-Sanders Co.
Elston and Webster Aves., - Chicago, Ill.
Eastern Office: 6 East 39th St., New York City
Send for catalogue B-28 of pergolas, sun dial and garden furniture, or B-42 of wood columns.
See also “Sweet’s Index.”

PREVENTS DRAFTS, DUST AND WINDOW RATTLING
Ives’ Patent Window Stop Adjuster
The only Stop Adjuster made from one piece of metal with solid ribs and heavy bed that will not cup, turn or bend in tightening the screw. Manufactured only by
The H. B. Ives Co., New Haven, Conn., U. S. A.
(100-page Catalogue Mailed Free.)

BROOMELL SYSTEM OF VAPOR HEATING

The Broomell System is the original vapor system. It is the most perfect and reliable heating system on the market to-day. Our engineers prepare all plans and specifications. We save the architect work and worry. We give the owner a perfect heating plant at a fair price. We inspect the work as it progresses and help the heating contractor make the best possible job.

Vapor Heating Company
Scriraer Bldg., 507 Fifth Ave., New York
North American Bldg., Philadelphia

ONE MILLION A DAY PRODUCTION
Sayre & Fisher Co
Manufacturers
Brick of All Kinds
261 Broadway New York

Most Complete Plant in World
Works, Sayreville, N. J., on the Raritan River.
Attention to Architectural Details results in BEAUTIFUL FACADES, ENTRANCES AND HALLS
Attention to Sanitary Details results in the use of CLOW PLUMBING FIXTURES

insuring health and comfort in Schools, Industrial and Commercial Buildings, Hotels, Clubs and Residences.

IT INSURES A SAVING IN WATER, REPAIRS AND JANITOR SERVICE

If you have problems in sanitation write to Leo H. Pleins, our Sanitary Engineer.

JAMES B. CLOW & SONS
Established 1878
534-546 So. Franklin St., CHICAGO

Sales Offices:
New York
Los Angeles

Cossenock, Ohio
Newcomerstown, Ohio

Detroit
San Francisco

Minneapolis
Denver

St. Louis

The water flushing this urinal is measured drop by drop.