THE ARCHITECTURAL FORUM
IN TWO PARTS

PART ONE
ARCHITECTURAL DESIGN
MARCH 1928

SCHOOL BUILDINGS REFERENCE NUMBER
PRICE $3
Announcing

The Common Brick
School Building Competition

for PHOTOGRAPHS and PLANS of SCHOOL BUILDINGS
Having Exteriors Constructed of Common Brick*

Competition Closes November 6, 1928

PRIZES

This Competition and its Prize Awards are divided into two classes, as follows:

**GRAND PRIZE $500
for the best building in either class

CLASS A
FIRST PRIZE $500
SECOND PRIZE 250
THIRD PRIZE 100
FOUR HONORABLE MENTIONS 50 EACH

CLASS B
FIRST PRIZE $500
SECOND PRIZE 250
THIRD PRIZE 100
FOUR HONORABLE MENTIONS 50 EACH

*DEFINITION: A common brick, as defined by the Common Brick Manufacturers' Association of America, and for the purposes of this competition, is a solid building unit of burned clay having a natural surface not treated to produce special effects in color or texture of the individual brick but including "skinner," "overburnt," and "cell" brick. Types of common brick construction and finish admitted in this competition are explained in the following conditions and in the accompanying booklet.

**This grand prize will be awarded by the jury after selecting the first prize winner in each class. It will be awarded in addition to the first prize, making a total prize of $1,000 for the best entry in the entire competition.

The first and second Common Brick House Competitions, held during 1926 and 1927 developed such widespread interest that architects in all parts of the country submitted photographs and plans of many of the finest common brick dwellings that have been erected in recent years. The response from the architectural profession has definitely proved the popularity and value of these competitions.

These two competitions have for the time being quite thoroughly covered the field of house design. It has been decided to conduct a competition in 1928 which will cover the very interesting field of school building design.

All types of school buildings in which the majority of rooms are used for class-room purposes may be entered in this competition, provided 75 per cent of the exterior walls is surfaced with common brick. Small or large school buildings have an equal chance to win the award in this competition for the prizes have been divided into two classes, as given below, Class "A" calling for buildings of limited volume, and Class "B" permitting the entry of the larger buildings which necessarily offer the architect a broader opportunity for fine treatments of mass and detail than is generally accorded the designer of small structures. A grand prize is offered, which will be awarded to the first prize winner in either class whose entry is judged the finest submitted in the entire competition.

Send for Complete Announcement and Program Containing All Conditions of the Competition

This competition closes NOVEMBER 6, 1928 and is conducted by

THE COMMON BRICK MANUFACTURERS' ASSOCIATION of AMERICA
Guarantee Title Building, Cleveland, Ohio
These reference books, worthy of any library, have been compiled for your personal use:

"Brickwork in Italy," an attractive and useful volume of 298 pages, especially for the architect, profusely illustrated with 69 line drawings, 300 half-tones, and 20 colored plates with a map of modern and XII century Italy. Bound in linen, six dollars postpaid. Half morocco, seven dollars.

"English Precedent for Modern Brickwork," a 100-page book, beautifully illustrated with half-tones and measured drawings of Tudor and Georgian types and American adaptations; sent postpaid for two dollars.

"Industrial Buildings and Housing" treats in detail the factory, with examples of architectural beauty. Restaurants, rest rooms and employees' communities come under its scope. Bountifully illustrated. Sent postpaid for two dollars.

**American Face Brick Ass'n**

2151 City State Bank Building

Chicago, Illinois

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**THE Distinguished School • • IS BUILT OF FACE BRICK**

Schools, standing as declarations of community character, are so generally constructed of Face Brick as to make further suggestion of this material for school construction almost superfluous. That its dignity and distinctive beauty, made possible by an unlimited variety of colors and textures, have given it the place of preference among Architects is evident everywhere. And many of these Architects avail themselves of the service this association and its members are prepared to render. Inquiries concerning Face Brick usage are invited.

**FACE BRICK**

— requires no paint or whitewash
COMPETITION FOR A TRAVELLING SCHOLARSHIP

Announcement is made this month through the architectural press of a competition open to architects and architectural draftsmen for the award of a scholarship to be known as the A. W. BROWN TRAVELLING SCHOLARSHIP

Believing in the importance to the architect of a thorough knowledge of the various materials which go to make up a completed work of architecture, Ludowici-Celadon Company is establishing this scholarship with the hope that it will offer advantages for detailed study of the uses of materials and especially of tile roofs.

The scholarship has been established in consultation with the American Institute of Architects and, through its president, a member of the Committee on Education and a member of the Committee on Allied Arts have been appointed to act with the architectural adviser as a special committee to conduct the competition and to have charge of the scholarship.

Ludowici-Celadon Company has made an agreement with the American Institute of Architects to provide the funds necessary to conduct the competition for the selection of a worthy and deserving beneficiary and further to pay to them the sum of two thousand dollars to be used in defraying the expenses of the beneficiary during a year of travel and study in Europe.

While there will be no restrictions as to the type of architecture which the holder of the scholarship shall study or the exact places which he shall visit, he will be required to prepare at least two envois consisting of measured drawings of two buildings on which burned clay has been used for roofing. It is hoped, by thus emphasizing in the work of this student the particular craft which the donors represent, that this scholarship will prove a real aid in establishing a better understanding of the use and necessary qualities of burned clay.

Details concerning the competition will be found in the editorial pages of this magazine. All those desiring application blanks should communicate with the secretary of the committee, Wm. Dewey Foster, 10 East 47th Street, New York City.
Eagle Soft Paste Pure White Lead comes broken-up to shop-lead consistency, thereby saving the painter's time. It is ready to be taken out on the job unopened and thinned as needed.

Soft Paste, like our regular grinding, is Pure Old Dutch Process White Lead, only with more linseed oil ground in—15% instead of 8%. Sold in 100, 50, 25, 12½ pound steel containers.

BROKEN-UP!

Write for free folder containing new mixing formulae for use with Soft Paste. The Eagle-Picher Lead Company, 134 North La Salle Street, Chicago.
For ANY Building

While from their very nature Sheldon's slates may be considered the *ne plus ultra* roof for buildings of the highest class, they are equally suitable for buildings ranging from $10,000 to $25,000; speaking particularly of our—

Commercial Type of Semi-Weathering Green and Gray Slate

Although far superior to any of the various forms of artificial roofing, the cost of such a Sheldon Slate Roof is well within the reach of every home builder. In fact, if there be any difference in cost, that will be far less than the unequaled permanency and other advantages of slate would lead one to expect. See this roof in its natural colors on Page A-459 of Sweet's Architectural Catalogue, and consider us at your service for any further information you may desire. Also, turn the page and see Sheldon's Olde English Architectural Slate Combination No. 12; consider our Unfading Arabian Red Slate, as well as the fact that all our slates are available not only for roofs, but also for underfoot purposes, such as flooring, flagging, etc.

F.C. SHELDON SLATE Co.
General Offices, Granville, N.Y.

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Detroit, Mich.
115 Francis Palms Bldg.

New York City
101 Park Ave., Room 514
Saint Paul, Minn.
364 Rice St.

Cincinnati, O.
35 Poinciana Apt.
Columbia, S. C.
17 Carolina Bank Bldg.
Has Indiana Limestone Company Proved Itself?

Below we list a few of the outstanding projects, contracts or orders for which have been received since the formation of the Indiana Limestone Company, May 28, 1926. The list speaks for itself.

<table>
<thead>
<tr>
<th>Project/Building</th>
<th>City/Location</th>
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<tr>
<td>Detail of Pier Capital, Consolidated Gas Co. Bldg., Boston</td>
<td>Parker, Thomas &amp; Rice, Architects.</td>
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<td>New York Life Insurance Co. Building, New York City</td>
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<td>Central Savings Bank, New York City</td>
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<tr>
<td>Cathedral of St. John the Divine, New York City</td>
<td>(all interior work only)</td>
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<td>Temple Emmanuel, New York City</td>
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<td>Central Library, Brooklyn</td>
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<td>New York Athletic Club, New York City</td>
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<td>Cook County Criminal Courthouse, Chicago</td>
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<td>McKinlock Memorial Campus, Northwestern University, Chicago</td>
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<td>Rockefeller Memorial Chapel, University of Chicago</td>
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<td>333 North Michigan Ave. Bldg., Chicago</td>
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<td>Consolidated Gas Co. Building, Boston</td>
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<td>Industrial Trust Bldg., Providence, R.I.</td>
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<td>Greater University of Rochester, Rochester, N.Y.</td>
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<td>U. S. Post Office Bldg., Syracuse, N.Y.</td>
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<td>Cadet Mess, Store and Academy, West Point, N.Y.</td>
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<td>Provident Life Insurance Co. Building, Philadelphia</td>
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<td>Fidelity Trust Building, Philadelphia</td>
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<td>Atlantic City Convention Hall, Atlantic City</td>
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<td>Masonic Temple, Scranton, Pa.</td>
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<td>Soldiers and Sailors' Memorial Bridge, Harrisburg, Pa.</td>
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<tr>
<td>Public School Administration Building, Pittsburgh</td>
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<td>Washington Cathedral, Washington, D.C.</td>
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<td>City College, Baltimore</td>
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<td>Municipal Office Building, Baltimore</td>
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<td>Federal Reserve Bank, Baltimore</td>
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<td>Buncombe County Courthouse, Asheville, N.C.</td>
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<td>Union Terminal Tower, Cleveland</td>
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<td>War Memorial, Louisville, Ky.</td>
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<td>Museum, University of Michigan, Ann Arbor</td>
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<td>Chapel for Hope College, Holland, Mich.</td>
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<td>General Hospital, Iowa City</td>
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<td>Medical Arts Building, Oklahoma City, Okla.</td>
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<td>Masonic Temple, Topeka, Kan.</td>
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<td>Central Lutheran Church, Minneapolis</td>
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<td>Sears-Roebuck Co. Bldg., Minneapolis</td>
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<td>Courthouse, El Dorado, Ark.</td>
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<td>Convention Hall, San Antonio, Texas</td>
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<td>Administration and Records Building, Dallas, Texas</td>
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<td>Courthouse, Grand Junction, Colo.</td>
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<td>Masonic Consistory Bldg., Cheyenne, Wyo.</td>
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<td>Royal York Hotel, Toronto, Canada</td>
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(Indiana Limestone Company is a consolidation of 24 of the oldest and largest companies in the Indiana Limestone district. With assets of over $46,000,000.00, this Company has facilities for handling any number of large contract operations.)
Old English Tile

Here is a tile, fresh from the kiln, that faultless artistry has given all the mellow charm of age—the softened, broken lines, the warmth, the soothing tones, the very warp and twist that marks Old England's tile, the gently modulated coloring that comes with generations of exposure to the weather.

Subdued and restful, the delicate nuances of coloring almost escape the eye, and yet, on close inspection a wonderful variety of tints and tones appear—warm hues of burgundy, faint lilacs, dusky purples, grays of bewildering variance, browns, greens, straw yellows, salmon reds—all softly blending as if washed by centuries of gentle rain.

If you desire a roof of authentic aged appearance, as did the architect whose work is shown above, you should by all means see Old English "Plymouth" Tile. Samples will be sent or we can arrange for you to inspect a roof complete. We know you will be impressed with the rare warmth and beauty, the variety and blend of this inimitable Old English "Plymouth" Roof.
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The excellence of Beaver American Plasters is most deeply appreciated in the fine buildings that represent the architect's best efforts... A typical example is the handsome new Neil House, Columbus, Ohio, where wall plans called for the finest kind of plaster work—and specifications called for Beaver American Plasters.

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BEAVER
AMERICAN
PLASTER
Only stock shapes and colors of Enameled Brick have accomplished this suggestion for an administration building in a factory group. For economy in construction and maintenance and for interesting decoration they have no superior.

AMERICAN ENAMELED BRICK & TILE CO.
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New York City

Copies of these plates in folio will be mailed upon request
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The Modern Curing and Protecting Film
Applied over the surface 36 hours after troweling. Stainproof dries to a tough, air-proof film that prevents staining and marring and insures perfect curing of the concrete. Easily removed after all danger of staining is passed.
All new Colormix Floors are protected with Colormix Stainproof.

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This splendid home is faced with Acme "Mission Blend" Ruff Texture Brick from our Perla Kilns. Their colors range from an ivory white to ivory and mellow flash grays. The wall effect therefore simulates time-mellowed charm in a permanent and colorful weather-resistant burned clay product so suitable for this Italian-type design.

We specialize in blends that are correctly expressive of all period types of architecture.

No other material so successfully lends itself to natural surroundings as brick—they are permanent and everlastingly beautiful.

Let Us Help You Solve Your Color Problem in

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"A Brick for Every Type—A Color for Every Color Scheme."

Thirty-seven years in the art of brick-making, and ten Acme-owned-and-operated plants enable us to offer you "a brick for every type—a color for every color scheme."

BUILD FOR THE CENTURIES WITH ACME BRICK
What Do You Mean

"Consult Without Obligation?"

The question comes in a recent letter "You say you render all this service free to architects. How come? You must get paid. Can I afford to discuss my planning with you?" Lest others be hesitant in similar measure, let's have the understanding clear.

1. Ramp Buildings Corporation exists to further the use of its patented d'Humy Motoramp System of Garage Design.

2. It does not design garages nor have garage plans for sale.

3. To assist the architect in developing an embryo project, the Company offers without cost or obligation, a well-rounded advisory service—including the preparation of miniature sketch plans to demonstrate the car storage possibilities in a multi-floor garage of specific dimensions. This free service carries to the point at which a project is ready for the preparation of architectural plans.

4. Then a license agreement is negotiated with the building owner (generally through the good offices of the architect) covering the use of the patented d'Humy Motoramp System.

5. This then places at the disposal of the owner's architect, without any added cost, a complete advisory engineering service, the scope of which is scheduled on page 19 of our publication "Building Garages". (Sent on request).
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Complete information on Clinton Mortar Colors and their use will be sent upon request.

Clinton Metallic Paint Co.
438 Clinton Road
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The ZONE OF QUIET

The most modern Architects now specify HAMLIN methods of segregating noise.

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Terminals Tower
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Graham, Anderson
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Architects

"Hamlinned" is a combination of sound-deadened doors, light door jams and floor and—perfection in building and mechanisms.

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"GUNITE" STUCCO

at
Montauk Beach, Long Island, N.Y.

The use of "Gunite" Stucco on the walls of the workingmen's houses on the Carl Fisher Development at Montauk Beach, N.Y., Designed by Robert Tappan, Architect, insures permanent weatherproof and fire-resisting results. "Gunite" Stucco can be used over any base. Architectural details are accentuated, economies are effected in first cost and maintenance cost reduced to a minimum. Any desired finish can be obtained.

The "Cement-Gun" is not restricted in use. It can be purchased and used by anyone.

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CEMENT-GUN CO., Inc.
Allentown, PA.
The strikingly beautiful McKinney hinge straps and handle shown here are representative of the "Alhambra" design, one of a number of McKinney patterns fashioned in Forged Iron. The inspiration for this graceful design comes from the masterly examples of ironwork found in southern European architecture of earlier centuries, notably that of Italy and Spain.

For dignity and rugged strength of character alone, the Alhambra, the Warwick and other pieces of McKinney Forged Iron warrant the wide-spread acclaim with which architects have received them.

But consider in addition these facts: standard pieces for prompt delivery, accurately gauged for application, texture reflecting the rugged character of the metal itself, a rust-proofed finish in Relieved Iron or Colonial Dead Black Iron, and prices which make your door "possible" when despair at costs seems hovering too close for comfort.

RUSSWIN advertisements reach an audience who are appreciative of better building. And Russwin in their advertisements are calling particular attention to noteworthy architectural accomplishments throughout the country where the requisites were—beauty of design, future security and continued usefulness. In their promotion of better building, Russwin have the realization that for over a period covering the last three-quarters of a century, they have promoted better hardware.

RUSSWIN advertisements are appearing in colors and in black and white throughout the year in these magazines:

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- COUNTRY LIFE
- ARTS AND DECORATION
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- NATIONAL GEOGRAPHIC
- ELKS MAGAZINE
- SUNSET
- SMALL HOME
- ASIA
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Russell & Erwin Manufacturing Company
The American Hardware Corporation, Successor
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Zouri introduces to Havana American display methods

The imposing Zouri copper Key-Set Sash installation recently completed in the J. Z. Horter Building in the Cuban capital demonstrates American progress to the erstwhile easy-going inhabitant. Zouri alone assured maximum display — maximum structural beauty — minimum worry over glass breakage.

Zouri is proving every day worthy of the recommendation of particular architects, builders and contractors. It practically does away with distortion. It makes installation easier by correctly distributing the setting pressure. For real beauty and safety against unequal pressures of setting, wind and shock, Zouri is the best solution.

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Names on Request

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We know that many of the first Von Duprins are still serving—but it will be many years before we can determine the length of life of the better and sturdier ones we are making today.

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Indianapolis, Ind.
THESE PLATES ARE DESIGNED TO DEMONSTRATE THE ECONOMIC AS WELL AS THE ARTISTIC POSSIBILITIES OF EXTRUDED BRONZE. NUMERALS REFER TO SECTIONS FOR WHICH DIES ARE AVAILABLE. MANY OTHERS, FROM DESIGNS BY LEADING AMERICAN ARCHITECTS, ARE ILLUSTRATED IN OUR BOOK "ANAconda ARCHITECTURAL BRONZE EXTRUDED SHAPES."

THE AMERICAN BRASS COMPANY
GENERAL OFFICES WATERBURY, CONN.

Complete sets of these plates may be had for the asking
Good Buildings Deserve Good Hardware

From Olympus to Olympia

In mythology, the gates of Olympus, the home of the gods, were guarded by the Hours. There were no locks. There were no keys, no door checks, no butts.

But in modern Olympia, the State of Washington depends on more tangible protection for its new legislative building—built to defy the hours, planned for permanence, equipped with Good Hardware—Corbin.

Washington's new legislative building, part of its capitol group, is built of enduring stone. Even the magnificent dome is of cut stone—one of the few of its kind in the United States. Plumbing and metal work of all kinds have been chosen with permanence in mind. Corbin Unit Locks, with master cylinder, guard the doors. Corbin door checks close the doors—quietly and surely. Corbin is on guard against the hours as it is in many important government buildings. Good Hardware—Corbin—is no mythical protection.

P. & F. CORBIN since 1861 NEW BRITAIN CONNECTICUT
The American Hardware Corporation, Successor
New York Chicago Philadelphia
BEAUTY is combined with utility in this Storage and Service Building for William Filene's Sons Company.

STONE & WEBSTER INCORPORATED BUILDERS

BOSTON, 49 Federal Street
NEW YORK, 120 Broadway
CHICAGO, First National Bank Bldg.
PITTSBURGH, Union Trust Bldg.
SAN FRANCISCO, Holbrook Bldg.
PHILADELPHIA, Real Estate Trust Bldg.
WHILE your building plans are yet in the preliminary stage let one of our partition specialists cooperate with you—
gaining thereby the most practical and efficient division of space, likewise the most economical; a style of partitions best adapted to the purpose (many styles and colors in the Hauserman line); competent erection by trained men with service on changes and additions whenever needed.

Just phone or write—no obligation.

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MOVABLE STEEL PARTITIONS
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made by the mile
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STANDARD SINCE 1893

Our "Mount-Lockt" Partition
Appeals to Architects

It is simply constructed; but being of excellent design and built of such beautifully finished woods, it is in demand for partitioning fine offices. Our catalogue in Sweet's shows how few parts are handled in the erection of the "Mount-Lockt" partition and how easily partition layouts may be changed.

Our "Bank" partition, being more elaborate, is suitable for interiors of public monumental buildings, and harmonizes with special cabinet work.

Bank Fixtures, Special Cabinet Work — Directors' Rooms, etc. Patent Stock Boards and Ticker Stands

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Tel. HANover 3727
Lacquered Walls Of Any Color Practically Scratch And Chip Proof

Not Affected Like Paint and Varnish by Soap, Water, Ammonia

Circle A Partitions can be obtained in genuine Lacquer Enamel. This finish gives them practically a scratch-proof surface, that can be washed without fear of bleaching or checking. These Circle A Partitions will stand up and give service indefinitely—and keep up the good appearances while doing it. Moreover, these new Lacquer Enamel office walls are obtainable in any color. Choose the color desired to suit your office equipment. Circle A Partitions in this new finish can be stored and handled without the danger of scratching or chipping. Should they be scratched—Circle A Partitions can be refinished right on the job. There is no enamel to bake on. No need to send these Circle A Partitions back to the factory for refinishig.

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New York Office: Farmers Loan & Trust Bldg., 475 Fifth Ave., New York

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This Book—
Our book tells how attractive offices are built in two days. This coupon brings it.
The Circle A Products Corporation
650 S. 25th St., Newcastle, Indiana

Name
Address
City
State

Walls on Wheels—Almost
With Circle A Partitions, offices can be entirely rearranged overnight. There is no messy plastering—no workmen tramping in and out—no excessive noise.
GENERAL SHERRILL is an indefatigable glass pilgrim, an intrepid student of stained glass, who haunts the cathedrals of Europe for the sheer joy he finds in studying the parti-colored light that streams through their stained glass windows and in reading the stories written thereon in the universal language of picture. Already he has traversed England, France, Italy and Spain on intensive stained glass tours, each journey recorded in a volume on that land; and now he has completed his quintet of volumes with his “Stained Glass Tours in Germany, Austria and the Rhine Lands.”

So thoroughly has he traversed these countries that one pictures him traveling on foot, or, most luxuriously, on bicycle! Surely the railroad and the motor car could not find their sophisticated way to the obscure villages and hamlets whose cathedrals he has included in his route! In fact, it is this very thoroughness which saves his volumes from monotony. The less careful tourist who reads them is continually amazed at the beauty spots he himself must have overlooked, and he might well peruse these “Stained Glass Tours” with pencil in hand to jot down places for future investigation, or to note elements of beauty he failed to discover in those cathedrals he fancied he knew. For instance, in Notre Dame, did he stop to realize that the indescribable purple light which pours in from the north rose window is due to the fine juxtaposition of tiny pieces of red and blue glass?—or was he aware of the constant changes of light with the advance of the sun in its cycle that make the same interior quite different in the afternoon from what it was in the morning? The play of light through color forms a charming study, and the stained glass pilgrim enjoys it as keenly in the interior of a cathedral or castle as when he is among the blossoming trees of the highway.

General Sherrill makes all this clear in his book, for he is a connoisseur of glass. He knows the era to which each piece belongs,—whether to early or late Gothic, to Romanesque or to Renaissance,—and he can identify its nationality; for to him glass has nationality; the glass of England, France and Germany all have racial traits on their faces, and color and design that stamp it as the national art of England, France and Germany all have racial traits on their faces, and color and design that stamp it as the national art of...
GRADE SCHOOL BUILDINGS; BOOK II

IN no department of architecture have the last ten years seen quite the progress which has been made with schoolhouses, a class of buildings of the first importance, since they exert a strong influence upon their communities, and by their architectural excellence or the lack of excellence they elevate or lower the architectural standards of entire districts. Study of school structures, particularly at the hands of a group of well known architects, has resulted in their being given a high degree of architectural distinction and dignity in the way of design, while study directed toward their planning and equipment has led to their being practical and convenient far beyond what was regarded as an advanced standard of efficiency even a few years ago.

This volume, a companion to another published in 1914, records the results of endless study and experiment in different parts of the country, summed up and presented. By illustrations of exteriors and interiors, by floor plans and carefully written descriptions and articles by well known architects and educators the present high standard of schoolhouse design is made plain, and these results which have been achieved by a few architects and school boards are thus made possible to all architects who are interested in schoolhouse design.

The compiler has selected from almost 1000 exteriors, and floor plans the school buildings to be illustrated, and the volume records "a process of innovation and elimination, namely, the introduction from time to time of features which have been deemed desirable and practical, and the elimination of things which, owing to changed school methods, are no longer required."

400 pages; 7½ x 10½ inches
Profusely Illustrated; Price $10

ROGERS & MANSON COMPANY
383 MADISON AVENUE  NEW YORK


It is the intention of the writer of "The Walnut Collector" to give the reader a comprehensive knowledge of the characteristics of walnut furniture made in England between 1660 and 1730, so that the collector may be armed with definite information when he buys from a dealer or explores out of the way haunts. This the author does in elaborate detail, first giving a general picture of the times,—how oak furniture was used by the more primitive people, while the new mode of living for the educated classes required walnut. Later chapters take up each piece of furniture in its development, and point out its distinguishing features. Up to the beginning of the walnut period, the usual method of joining the parts of furniture was with mortise and tenon. During the latter half of the seventeenth century, this method was almost entirely abandoned for court furniture, and the "dove-tail" joint came into use. Glue was used to attach veneer, and strength was obtained by a close fitting of balanced parts rather than by massiveness, as it formerly was. In about 30 years more advance was made in the shaping of legs and stretchers than in the previous two centuries. Stretchers were in use until about 1700. The French leg or inverted cup turned came into vogue about 1690. With the exception of introducing use of springs and seats, there has been no great improvement in the comfort or convenience of furniture during the last 230 years.

Walnut is an ideal wood for chair making. Many interesting chairs were designed, the Charles II with the caned backs, the William and Mary, and the small Queen Anne chair with the cabriole leg. Tapestry coverings were popular during all that time. Black chairs, chairs of painted woods, and those of ebony veneer are interesting examples that can often be picked up easily, due to their being unfamiliar to the smaller dealers. All day-beds are rare. The usual type of the seventeenth century day-bed is a long, narrow couch, with a caned seat, having a supported back at one end. This is frequently arranged as a movable panel, adjustable to the convenience of the user. The ornament and construction are quite similar to those of chairs and stools of the time, and without doubt day-beds were designed to be used "en suite" with chairs and stools to match. The "drop-in" seat settle was introduced late in Queen Anne's reign; both back and legs on the best of these are beautiful examples of the chair-maker's art. The frames, while following the general lines of two armchairs side by side, sometimes have only four legs; six however, are more common, and there are a few three-back settles having eight legs. Stools were used by women who by reason of their rank were entitled to sit in the presence of royalty. During the walnut period, they were mainly in the nature of survivals, being made in most instances for great houses or royal palaces, and they were generally of fine workmanship. Genuine old stools are rare and in great demand, and the prices are higher than for chairs. It is no wonder that so many stools are copied by those specializing in antique models. The buyer should exercise caution.

The canopy bed was popular among the richer classes and was hung with magnificently embroidered silk, linen or chintz. Chintz, while not as expensive as silk, was very popular and was considered suitable for the "best
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residences, and presumably of those of moderate size and differed very little throughout the period. A chapter devoted to brasses gives examples of the pear-drop handle, of ornate escutcheons, and practical advice on original and reproduction hardware. In concluding, the author discusses the preservation and care of walnut furniture, giving a formula for furniture polish along with much useful information and advice on the problems that confront the average collector. He also tells of his own interesting experiences in hunting for furniture. There are short paragraphs on the more important furniture designers and clock makers, and an excellent and useful glossary explains the terms used in the book.


CURRENT publications which deal with architecture, decoration, furnishing and like subjects supply a rich and varied record of the standards which just now obtain in those spheres of effort, and the importance of their illustrations gives them a value sufficiently great to cause regret that their preservation in some other form is not more frequently attempted. It is a cause for satisfaction, therefore, when there appears a volume made up largely of illustrations which have already seen the light of print in some periodical, accompanied, now that they appear in volume form, by text dealing with the subjects which the cuts illustrate. Such is the present volume, devoted to illustrations of American interiors, entirely of residences, and presumably of those of moderate size and cost. The text which accompanies them deals with topics likely to interest architects and particularly valuable to decorators, in addition to being useful to home owners.


THOSE whose sphere of effort lies within the province of any field of art are often likely to miss something of the message which the art should convey—to lose, in a sense, vision of the forest because the view is shut off by the trees close at hand. Particularly is this true when one is an architect, absorbed by matters of designing and questions of actual construction, the demands of clients and the intricacies of dealing with contractors and builders. Only when the routine of the office is out of mind and when there comes an opportunity for obtaining a proper view of the forest, do the mystery and beauty and the splendor of its verdure become evident and visible. Only then can they be enjoyed.

These interesting essays or chapters upon different phases of architecture are probably the fruit of interludes in the work of a busy architect. They prove that exercise of the critical faculty is by no means confined to the composition of facades or to the drawing of floor plans, nor to details of fenestration or designing interior woodwork, but that this faculty is perhaps even more properly and effectually exercised when it is devoted to emphasizing or underscoring certain passages in the message which architecture is quite ready to convey to those who have but the patience to give heed. Many of these passages have been emphasized again and again, but just as the Gospels have provided texts for discourses for 20 centuries and are not yet exhausted, so the teachings of architecture still provide matter for teaching when one starts out to present architecture's message in terms which are fresh and new, which the world really needs.

This is what Mr. Greeley has done. Much writing on architecture fails of fulfilling its mission, or else falls short somehow of complete success, because of vague or perhaps indefinite treatment,—much use of metaphors not readily understood and of language which is vague and indefinite, the result being the discouraging of precisely those most in need of enlightenment. Many writers might object to one's demanding the pointing out of the wholly obvious to those who have—or should have—mastered the fundamentals; but unfortunately many people who are quite willing and even anxious to learn are unfamiliar with even the elements of architectural appreciation, and it is necessary to point out the obvious to those not yet able to see—or rather to discern—for them. Unless this is done,—and Mr. Greeley does this and far more,—it is merely like preaching to the already regenerate—to those not in need of the message. There is probably no art more in need of easily understood interpretation. Because this has been to so great an extent lacking, the enjoyment or even the understanding of architecture is still a sealed book to many. The headings of some of the 14 chapters indicate the scope of the work and suggest the definite terms in which the subject matter is treated:—The Arts; The Fine Arts; Architecture; Elements in Architectural Composition; The Background; The Purpose; The Medium; Architectural Personality; Unity; Balance; Emphasis; Proportion, etc. The work might well be studied by anyone interested in obtaining knowledge of what architecture really is, and its teachings are most worth the attention of even the advanced student. Most fortunate has been the selection of the illustrations which explain and elucidate the text pages.
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THE student of domestic architecture finds that certain of the old buildings of New England derive their characteristics from far back in English architectural tradition. True it is that many of the later buildings reflect all the changes that the fluctuations of custom and fashion brought to England during the Queen Anne period and the Georgian era, but the older houses of the colonists were closely akin to the homes they had left behind in England,—not of stone, to be sure, and not often even of brick, but wrought of the materials easily and quickly to be had in the new land, materials which beneficent Nature had placed at their convenient disposal.

There are, of course, countless works on the old buildings of New England, and yet each of the many possesses certain qualities which render it valuable. In this particular volume the quality might be said to be primarily architectural, for the author has dwelt not so much upon the historical side of these old houses nor even upon the social life for which so many formed the setting as upon the architectural charm,—the charm inherent in rigid simplicity, huge and cavernous fireplaces, brick ovens, rough-hewn beams, and "overhanging" upper stories, or the later and more refined and sophisticated charm which is given by paneling, traceried transoms, and delicate woodwork and stairways. One element of the volume's value to the architect lies in its illustrating old homes in many parts of New England, for the old houses at Duxbury or Ipswich differed considerably from those around New Haven, New London or Providence. The

Architectural Design in Concrete

By T. P. Bennett, F. R. I. B. A.

THE great utility of concrete as a material for building lends importance to any work which deals with its use. Already centuries old, with its splendid durability and permanence amply demonstrated by structures of many kinds which have already been used for ages, concrete is one of the most valuable of all the substances used in building and engineering of every kind. Its very adaptability and workability give it a value possessed by few if any building materials, and its value is often enormously increased by the use with concrete of steel reinforcing which adds a strength which it never possessed before. "Reinforced concrete has earned its front rank position among materials for permanent construction because of its intrinsic merits. Its fireproofness protects life and property; its strength and safety are increased by its monolithic nature; and its permanence is proved by long use."


Study of Japanese color prints is one of those subjects which beguile and lead one into interest unawares. Long scorned by the upper classes of Japan, the color print was beloved by the masses of the common people; it was indeed a "popular art," a "mirror of the floating world," and in the print there were portrayed the happenings of the day,—the life of the crowded city streets, or in some of the most beautiful prints, the mystery of gorges or mountains under snow. In common with the rest of the discriminating world, the Japanese now value these characteristic expressions of their national art, and they are buying back, often at high prices, the prints which a few years ago they parted with for a song.

This work seems likely to widen if not to greatly deepen interest in Japanese color prints. The author in preparing her text seems to have leaned rather heavily on Mr. Fenollosa and Mr. Ficke, though possibly there is little which could be added to the knowledge which the researches of these writers have made possible. One useful detail is the inclusion of a glossary; defining terms used.

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**PARKER MORSE HOOPER, A.I.A., Editor**

KENNETH K. STOWELL, A.I.A., Associate Editor

Contributing Editors:

Harvey Wiley Corbett; Aymar Embury II; Charles G. Loring; Rexford Newcomb; C. Stanley Taylor; Alexander B. Trowbridge

Published Monthly by

ROGERS & MANSON COMPANY

333 Madison Avenue, New York

Howard Myers, Pres.; James A. Rice, Vice-Pre.; Paul W. Hayes, Vice-Pre.; Robert Sweet, Sec. and Treas.

Yearly Subscription, Payable in Advance, U.S.A., Insular Possessions and Cuba, $7.00. Canada, $8.00. Foreign Countries in the Postal Union, $9.00

Single Copies: Quarterly Reference Numbers, $3.00; Regular Issues, $1.00. All Copies Mailed Flat

Trade Supplied by American News Company and its Branches. Entered as Second Class Matter at the Post Office at New York, N. Y.

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THE EDITOR'S FORUM

A NEW TRAVELING SCHOLARSHIP

ANNOUNCEMENT is made of a competition for the selection of a beneficiary for the A. W. Brown Traveling Scholarship, this competition to be held under the direction of a committee of the American Institute of Architects. Programs will be mailed to approved applicants about March 19, drawings to be delivered on May 7, 1928. This scholarship is the gift of the Ludowici-Celadon Company and is a memorial to the late A. W. Brown, who was for many years the president of that company and a leader in the manufacture of roofing tile. The value of the scholarship is $2,000, to be used toward defraying the expenses of a year of travel and study in Europe by a worthy and deserving architect or architectural draftsman. Traveling expenses between the winner's place of residence and the port of New York will be paid in addition to this amount. An award of $250 will be made to the competitor whose design is placed second.

Under the terms of the gift, the selection of the beneficiary of this scholarship is to be made by means of a competition to be held under the direction of a committee, the drawings to be judged by a jury of from three to five practicing architects chosen by that committee. The general requirements of the problem given for the competition shall be similar to those of the Class A problems issued by the Beaux Arts Institute of Design, but the jury shall give due consideration to the personal qualifications of the competitors as well as to the excellence of the designs submitted in the competition. It is further stipulated by the donors that the competition shall be open to any architect or architectural draftsman who is a citizen and resident of the United States, who has never been the beneficiary of any other European scholarship, who has passed his 22nd but not his 32nd birthday on May 1, 1928, and who has been in active practice or employed in the offices of practicing architects for at least six years, or if a graduate of an architectural school has had two years since graduation. The beneficiary will be required to complete, during his European study, at least two envois, which shall consist of measured drawings of buildings on which burnt clay has been used for roofing. Other than this there will be no restrictions as to the type of architecture that shall be studied or the type of work that shall be done, except as the committee may deem it necessary to advise from time to time in order that the intention of the establishment of the scholarship may be realized. Those wishing to compete should secure application blanks from William Dewey Foster, at 10 East 47th Street, New York.

A GUY LOWELL SCHOLARSHIP

IN memory of the late Guy Lowell there has been instituted an annual scholarship of the value of $1000 for the benefit of architectural draftsmen desiring foreign travel and study. The competition is open to draftsmen between the ages of 21 and 29, who are also citizens of the United States, who have had at least three years' experience in architects' offices, and who have not been beneficiaries of other traveling scholarships. The competition for 1928 is in the nature of a week-end sketch problem to be conducted April 28-29. The program will be given out at the same time throughout the country, and will be issued at five o'clock on a Friday afternoon, the drawing to be completed by nine o'clock the following Monday morning. In each case the work will be conducted under the supervision of an architect, and is to be performed without outside help or criticism, in an attempt to secure work that shall be in every way representative of the individual applicant's own capacity. A jury of award will be appointed by the committee in charge to consider the drawings submitted, and the final award will be made on the basis of the judgment thus rendered. The committee which is governing the competition consists of Edward S. Hewitt, Henry P. Richmond, and William Emerson, chairman, Mr. Richmond being in active charge, at 12 West Street, Boston.

PRINCETON ARCHITECTURAL PRIZES

TWO competitive prizes of $800, in the School of Architecture, Princeton University, are announced. The prizes will be awarded to the winners of a competition in design to be held from May 21 to May 31, 1928. The candidates shall be unmarried male citizens, not less than 21 nor more than 30 years of age on September 1, 1928, and shall have been employed as draftsmen for not less than three years. Applications to compete for the prizes must be filed on or before April 18, 1928.

ROCH SCHOLARSHIP COMPETITION

PRELIMINARY examinations for the annual Rotch Traveling Scholarship will be held this year on April 2 and 3. The candidate chosen will be awarded the scholarship for a term to be determined by the committee, but not for more than two years. The scholar will receive $2,000 for one year or $3,000 for two. The Boston Society of Architects has yearly offered a prize of $100, which has been awarded to the candidate placed second, on the recommendation of the committee. Further information regarding the details of the scholarship may be had of C. H. Blackall, 31 West Street, Boston.
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QUARTERLY REFERENCE NUMBERS

In August, 1922 The Architectural Forum published the first of its Quarterly Reference Numbers. Since then 22 of these numbers have appeared, and the first cycle has been completed. The subjects starting with the present issue, devoted in its entirety to Schools, will be repeated, thus bringing the architect up to date on the major developments which have taken place in the intervening six years.

The classes of buildings to be covered are Banks; Country Houses; Hospitals; Industrial Buildings; Hotels; Churches; Shops and Stores; Office Buildings; Apartment Hotels; Golf and Country Clubs; Motion Picture Theaters; Apartment Houses; University Buildings, in two parts; Small Houses; Club and Fraternity Buildings; Memorial Structures; Automotive Buildings; Public Buildings, in two parts; and Libraries and Museums.
ENTRANCE PORTICO AND TOWER
COMPLETE SCHOOL, LONGVIEW, WASH.
WILLIAM B. ITTNER, ARCHITECT
FROM A PENCIL SKETCH BY A. L. MARTSOLL

The Architectural Forum
PRESENT-DAY educational objectives,—health, the fundamental operations, citizenship and worthy home membership,—constitute the initial considerations and the all-important fundamentals in present-day school house planning. These objectives have been generally accepted as goals of education, and school communities of the country have reorganized and expanded their curricula in order that these objectives may be brought to realization. Concretely stated, city and town schools are offering physical education and health activities, expanded science courses and social studies, a variety of workshop activities, diversified music and art courses, and many kinds of work that relate directly to home enrichment. Yet, although practically all school communities have expanded their educational programs in line with the comprehensive objectives, no two curricula are alike. Some schools, especially in industrial communities, stress vocational activities; some give far more time and attention to health and physical education than others; some place emphasis on music and art and the formal classroom work. City and town schools are offering physical education and health activities, expanded science courses and social studies, a variety of workshop activities, diversified music and art courses, and many kinds of work that relate directly to home enrichment. Yet, although practically all school communities have expanded their educational programs in line with the comprehensive objectives, no two curricula are alike. Some schools, especially in industrial communities, stress vocational activities; some give far more time and attention to health and physical education than others; some place emphasis on music and art and the formal classroom work.

School building policies, as well as educational programs are variable. In many communities, the tendency toward centralization, viz., the building of larger and fewer schools, prevails; in other words, the policy of combining all grades in one school is dominant. For instance, Gary, Indiana has pursued this complete school plan for the past 20 years. Greenfield, Ohio and Longview, Washington have recently adopted the policy. In most cities and towns, however, there is still much segregation of grades into elementary, junior and senior high schools.

The Test of the School Architect of Today. The real test of an architect’s ability to plan schools rests principally on his skill in adapting a building plan to a particular program, so that the building will give 100 per cent educational service. The variation in curricula, in methods of school procedure and in building policies, makes every school building an individual problem. Every building plan is or should be the result of the creative thought of the architect. An attempt to standardize a school building plan is as absurd as an attempt to standardize painting and sculpture. Standards have been developed as guides to safety, lighting, ventilation and sanitation of schools. These are of service to the less experienced architect. To the master school house planner, however, the mechanical elements are incorporated in the plan almost unconsciously. He knows them so well that they are really in the background of his thought, just as proportion, balance and symmetry are automatic with the skilled artist. If a school building plan is successful in meeting the diversified educational program, if the building gives maximum educational service, safety, good lighting and ventilation, economy and beauty should follow as a natural outcome. On the other hand, a building may conform to every rule for the mechanical elements and be a failure as an adaptation to the educational program.

The School Architect and the School Superintendent. A school architect cannot be expected to interpret the curricular offerings and proposed organization of individual schools. He may know in a general way that physical education, the fundamental operations, shop work, music and art are offered. He may know that auditorium work for special groups is desired. But he doesn’t know how classes are to be grouped for the diversified activities, nor about the time allotments. He must depend on the superintendent and his assistants for the interpretation of the curriculum and operating program. The educationists and the architect together must evolve the extent of health and recreational quarters, the number, sizes and correlation of classrooms, laboratories, shops, home economics quarters, auditoriums, music and art rooms. Following this preliminary study, the building becomes almost entirely the architect’s responsibility. His chief problem consists of weaving all the requirements into an ensemble plan that will function educationally and at the same time stand as an engineering and architectural success.

Important Considerations in Plan Development. There are several elements that must be considered in developing a school plan from a list of educational requirements. The first of these is climate. The general type of plan, height of building, lighting and ventilation, size of health quarters and kind of building materials are all affected by climate. In the South and in California, for instance, the plan should be
as open as possible. The building may be one or two stories in height; less window area will be required, and window ventilation may suffice for the entire school year. The health quarters may be minimized, due to the all-year-round out-of-door play. Construction, although durable and fire-resistant, may be lighter. The architecture should exhibit the influence of the traditions of that part of our country. In the Middle West, North and East, school building plans are of a more compact type. As a rule, they cannot be spread out as much as in the warmer climates, owing to the long runs of heating pipes and to the large areas of exposed wall surface. The buildings are usually two or three stories in height, the window areas should be greater than in the South, and full indoor health facilities are essential. Window ventilation, except occasionally, is not practical. The most efficient type of heating and ventilating apparatus becomes a requirement. Construction must be heavier, brick being the preferred material. The architecture in most cases becomes an adaptation of Colonial, Tudor or Georgian.

Site conditions constitute a second important consideration in planning of schools. A restricted site calls for a closely knit plan and additional height. These plan requirements bring about diverse problems in safety, lighting and ventilation aside from the problem of the varied educational quarters. Frequently the site is of sufficient size for an "open plan," two-story building, but it may have peculiarities of grades and an abrupt slope. Such a situation will present an entirely new problem of planning for educational service in addition to the mechanical and architectural features of the building. A consideration which architects are altogether too likely to overlook or neglect is that of plan elasticity and possibilities of expansion. School buildings today are fire-resistant and durable. Most of them will stand the test of a century. Educational thought and practice, however, are constantly changing, and enrollments will increase from year to year. Possibilities for expansion and alterations should be inherent in every original school building plan. Wherever possible within the building, units should be planned so that they can be enlarged or decreased in size. The locations of supporting walls, the arrangement of the classroom units and the grouping of special rooms all have an important bearing on the matter of elasticity of building plan.

Classification of American Schools. American public schools are classified generally as rural, elementary and secondary. There are variations of these. The rural school may be a one-room school or a consolidated school, serving several rural districts. The elementary schools include the first six, the first seven or the first eight grades and kindergarten. Secondary schools include four or six upper grades. If the latter, they are designated as junior-senior schools. There are also secondary schools known as technical high schools and vocational high schools. In several of our largest cities, high schools have been segregated into separate buildings for boys and girls.

The Rural School. The ideal rural school situation is represented by the centralized complete school at Greenfield, Ohio (page 306). Greenfield has a population of about 6,000. It is surrounded by a rich agricultural country. The one complete school, centrally located and with playground immediately adjacent, serves not only the children of the town but the children from 17 rural districts. At this school the children may enjoy an enriched education in a beautiful environment, under the influence of a high type of teacher, and still live in the country and enjoy God's great out-of-doors. Greenfield has set an example which may well be followed by the small towns of our country. The three-building school group at Greenfield serves a district of approximately 100 square miles in extent and has accommodations for 2,200 students from the kindergarten through the high school. The school population is now 1,800. One thousand, two hundred of these students belong to Greenfield; the remaining 600 are transported from the 17 adjacent rural districts in motor busses. There is thus a leeway for growth of 400 students.

For its program of health the schools include:
1. A high school gymnasium (65 x 90 feet) provided with seating capacity for 1,000 spectators, locker and shower rooms and accessory rooms for home and visiting teams.

2. An elementary school gymnasium (52 x 80 feet) for grades three, four, five and six and a playroom for the youngest children in grades one and two.

3. Two tile-paved, open-air gymnasiums, each 90 x 60 feet, and an athletic field with provisions for all major out-of-door sports,—football, baseball, track and tennis.

4. A swimming pool (32 x 75 feet),—the largest ever installed in a public school building,—equipped with ultra-violet ray process for water purification. The pool room expands into a sun parlor at one end, and provisions have been arranged for 800 spectators. A laundry and a full complement of lockers and showers make up the accessories.

5. A home hygiene room and adjacent clinic for examination, first aid, and for instruction in cleanliness, sanitation and home nursing.

6. A cafeteria seating 250 at a time, for those who remain at the school all day.

The accompanying plans illustrate the arrangement of the facilities for the fundamental operations:

1. In the elementary school, the kindergarten, which is a double unit (22 x 50 feet).

2. Eighteen classrooms, each with dimensions 22 x 32 feet. Owing to the organization of the elementary school on the work-study-play plan, only half the usual number of classrooms are required.

3. The ten classrooms in the high school are varied in size, owing to the variation in size of classes.

4. There are two libraries, a small room accommodating 70 pupils at a time in the elementary school, and a large room (42 x 82 feet) in the high school.

The high school library (page 306) is probably unrivaled as a beautiful room for its purpose. The plan, the unusual proportions and the lighting give it charm and an atmosphere of cheerfulness and spaciousness rarely achieved. The walls, a neutral tone, are book-lined on three sides. A number of Caproni casts appear in appropriate settings, and the upper end panels have been embellished by two of Vesper Lincoln George's murals. For the purpose of socializing and integrating the work of the school, two auditoriums are provided,—one for daily auditorium work with small groups is located in the elementary school, and the other, with capacity for 1,000, including a large stage and equipped with motion picture machine, radio outfit and magnificent pipe organ, is located on the main floor of the high school. Two of the three buildings of the Greenfield group,—the high school and the vocational building,—are the gifts of E. L. McClain, citizen-philanthropist of Greenfield. The elementary unit for the first six grades and kindergarten was erected by the board of education. Mr. McClain equipped all three of the schools. His gifts of sites, and athletic field, murals, paintings and sculpture are in addition to the two buildings and equipment. The combined cost of the three buildings without grounds and equipment approximates $950,000, yielding a per-pupil cost of $432, as the school plant will normally accommodate 2,200 students. When consideration is given to the fact that there are schools in the country with $1,000 per pupil costs, not offering the enriched educational opportunities described, the significance of the Greenfield school is apparent.

At Deering, Missouri is an example of consolidation on a small scale. This school is located in a village and serves as the center for the educational and community activities of the district. Although the accommodations of such schools are limited, the quarters may be planned for multiple uses. In the Deering school (page 312) we find a small auditorium which must also serve as the health and cafeteria units, and a limited number of class and special rooms planned and equipped for a variety of uses. The school has a capacity of 360 pupils and was
erected at a cost of $58,200 or about $162 per pupil.

The Present-Day Elementary School. The greatest changes in education have probably taken place in the elementary school field. Elementary schools used to be groups of classrooms with perhaps a basement playroom and occasionally a small auditorium which was used only on rare occasions. The buildings were badly planned, improperly lighted, poorly constructed, and most of them were stiff, unattractive, box-like structures. The country owes a debt of gratitude to Dr. William Wirt of Gary, Indiana more than to any other individual for the enriched education the masses of our children are enjoying today. The work-study-play plan evolved by Dr. Wirt has served as the administrative device in making the enriched elementary school financially possible for all school communities. The curricula of elementary schools organized on the work-study-play plan call for health quarters, auditoriums and special rooms for elementary science, handwork and music, in addition to classrooms, but only half of the usual number of classrooms are required. A large number of cities and towns of the country have reorganized their elementary schools on the work-study-play or "platoon" plan. The cities include Pittsburgh, Detroit, Dallas, Birmingham, Alabama, St. Paul, Greenfield and Dayton, Ohio. One point about this reorganization is interesting. Although all of these cities have used the same administrative plan as a guide, no two schools are alike. At Birmingham, a typical elementary school plan was developed to serve as a guide for the erection of new schools organized on the work-study-play plan. Yet there were no duplicates. Every school situation presented individual problems of site, pupil enrollments, and variation in curricula and methods.

The typical elementary school plan for Birmingham is interesting. After a survey of building needs, Birmingham re-zoned the school city and adopted the policy of having fewer and larger elementary schools. School units of 1,000 to 1,500 pupils became the basis for the re-districting. Consideration was given to 5-, 10- and 15-year growth. In other words, the school enrollment of a new district at the time of the survey may have been but 500. If the prognostication of growth, however, revealed a school population of 1,000 or more in less than a decade, the typical 1,000-pupil school plan was decided upon for that district although only a section of the building was immediately erected. The typical 1,000-pupil school was planned so that it could be erected in three sections; first the center portion, followed by the wings when enrollments demanded enlargements. The 1,000-pupil school contained a kindergarten, 14 classrooms; a small auditorium; a library; a room for domestic arts, drawing and handwork; nature study and music rooms, and a shop for boys. A playroom was arranged for two classes at a time, and the cafeteria opened upon the playground. The cost of the typical building complete was $225,000, at a per capita cost of $225.

With the traditional plan of organization, about 26 classrooms would have been required for 1,000 pupils. A reference to the plans (page 309) reveals the fact that although only 14 classrooms are provided, the total operating capacity of the special rooms is equivalent to about half the enrollment. This fact demonstrates a working principle of the work-study-play plan by means of a departmental operating schedule which rotates classes from classrooms to special rooms at periodic intervals. Approximately one-half the school is studying in classrooms while the other half is working in the special rooms. Only half the usual number of classrooms therefore are required. It is for this reason that the work-study-play schools can offer children an enriched school life at approximately the same cost as that of the restricted, purely classroom school of the past.

The Goliad School, Galveston (page 310) is an example of the enriched elementary school, organ-
GRADE SCHOOL, BIRMINGHAM, ALA.
WILLIAM B. ITTNER, CONSULTING ARCHITECT

FIRST FLOOR
SECOND FLOOR

GENERAL VIEW

FIRST FLOOR
SECOND FLOOR

JEFFERSON ELEMENTARY SCHOOL, BATTLE CREEK, MICH.
WILLIAM B. ITTNER, ARCHITECT
GENERAL VIEW

MAIN ENTRANCE

FIRST FLOOR
SECOND FLOOR

GOLIAD ELEMENTARY SCHOOL, GALVESTON
WILLIAM B. ITTNER, D-WITT & LEMON, ASSOCIATED ARCHITECTS
EMERSON ELEMENTARY JUNIOR HIGH SCHOOL, DAYTON, O.
WILLIAM B. ITTNER, GEBHARDT & SCHAEFFER, ASSOCIATED ARCHITECTS
ized on a modified work-study-play plan. The climatic conditions prevailing in this gulf port city find expression in a building erected around two open courts or patios, upon which the corridors open to the fullest extent. The desire for maximum air circulation results in giving the auditorium-gymnasium windows on all sides. Windows on the inner walls of all class and special rooms give maximum air circulation to pupils at study or work. As the educational program did not include auditorium work as a daily performance, a combination auditorium-gymnasium was planned for this school with locker and shower accessories. A cafeteria was arranged in correlation. An elementary shop for boys; a domestic arts room for girls; a nature study room and a library-literature room, complete the educational facilities of this school in addition to the classrooms. Like many other buildings in this section of the country, the exterior is designed in the Spanish tradition in stucco and trimmed with polychrome terra cotta. The building complete, without equipment and architects' fees, cost $220,000. The normal capacity of the building is 830 pupils, making a per capita cost of $265.

The Jefferson Elementary School, Battle Creek, Michigan (page 309), although an enriched school differs fundamentally from the Goliad School at Galveston. The plan is of a more compact type. Here again, the climatic conditions have had an underlying influence upon the plan. The difference in the architectural expression of the two buildings is also interesting. The school is unusual in the fact that six of its classrooms are provided with small auxiliary work or classrooms for use by small groups of pupils in special or project problems. The individual classroom plan at this school shows what effect a variation in classroom method will have on a building plan. Besides the auditorium-gymnasium, with its locker and shower facilities arranged for community as well as school uses, the building provides an elementary shop for boys; a domestic arts room.
The Emerson School at Dayton, Ohio (page 311) was originally planned as an elementary school for 1,462 pupils and for the work-study-play or "platoon" organization. It was discovered, however, that by the addition of three special units the capacity of the school could be expanded to 1,640 and the junior grades could be included and given all the facilities called for by their courses of study. The units added were two general science laboratories and the commercial suite. The physical education, the library, the auditorium, the home economics and shop quarters had already been included in the plan. The Emerson School is a notable example of a building planned to a carefully prepared work-study-play schedule. Thoughtful educational planning on the part of the superintendent, coupled with skillful structural planning on the part of the architect, enabled the board to turn back $165,000 of the amount for girls, and a library-literature classroom. The school accommodates 600 pupils and was erected at a cost of $236,473, exclusive of equipment and architects' fees, or $395 per capita.

Secondary Schools

The Junior High School. This school includes the seventh, eighth, and ninth grades. There is not a great difference in the planning of junior and senior high schools. The difference is really one of scope and emphasis. The health and recreational quarters of the junior school are not as extensive as in the senior. The laboratories are for general science only, while in the senior school they are specialized. As a rule, departmentalization is not as highly developed in the junior as in the senior school. With the advent of the enriched elementary school and the work-study-play plan of organization, the need for the segregated junior high school has materially diminished. A plan of combining the enriched elementary school with the junior high school has been carried out at Dayton, Ohio with signal success.

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Secondary Schools

The Junior High School. This school includes the seventh, eighth, and ninth grades. There is not a great difference in the planning of junior and senior high schools. The difference is really one of scope and emphasis. The health and recreational quarters of the junior school are not as extensive as in the senior. The laboratories are for general science only, while in the senior school they are specialized. As a rule, departmentalization is not as highly developed in the junior as in the senior school. With the advent of the enriched elementary school and the work-study-play plan of organization, the need for the segregated junior high school has materially diminished. A plan of combining the enriched elementary school with the junior high school has been carried out at Dayton, Ohio with signal success.

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appropriated for the building. The plan is interesting from the point of pupil circulation and the location of the special quarters. Site peculiarities necessitated the location of the health quarters on one side of the building and the auditorium on the other, as the plot was long and narrow. The auditorium is arranged with separate entrances, and the stage is planned so that it can be used as a classroom. On the first floor may be noted the unit arrangement of the home economics, small gymnasium and play courts. On the second floor, the distribution of the classrooms and laboratories, the size and location of the library and special rooms are points of interest. The building cost complete was $498,000, exclusive of equipment and architects' fees, at a per pupil cost of $314. Many cities segregate the junior high school into separate buildings. At Jacksonville, Florida two segregated junior schools similar in plan and size have been erected.

Junior High Schools, Jacksonville,—two junior high schools,—recently completed, are representative of various ramifications of buildings of this type. In this case the buildings are three stories in height and are built around open patios. The corridors encircle each building, giving maximum circulation and egress. The auditoriums and gymnasiums find their places at either end of the buildings, convenient for the community use of the one and accessible to play-grounds for the other. The shops, all of generous sizes, are grouped upon the first floors, the study rooms and libraries on the intermediate floors, and laboratories for science and domestic arts, together with the cafeterias, are grouped upon the third floors. Each building accommodates 1,700 pupils and was erected complete, excluding equipment and architects' fees, for $555,000, at a per capita cost of $326.

Senior High School. These schools (grades 10, 11 and 12) represent what might be termed the last word in educational expansion. They cause the greatest per capita drain on the taxpayer, and the reasons are obvious. First of all, the sites must be large, owing to the athletic requirements. Next, it is scarcely possible to plan for definite class groups, owing to the large number of electives and collateral courses. Furthermore, the accessory units for all the various departments are most extensive. In some senior high schools the studies of the first two college years have been absorbed. The college course addition has no particular influence on the plan. Any well planned senior or four-year high school includes all the facilities required for junior college work.

The Senior High School-Junior College, Muskegon, Michigan (page 317) is one of a group of four buildings centrally located. An athletic field and stadium are adjacent to the school grounds. The outstanding features of this building are its auditorium-gymnasium stage and health quarters. The auditorium seats 1,300. With the steel curtain separating stage and gymnasium raised and the suspended bleachers dropped, additional seating capacity is provided for 500. The health quarters, located on the ground floor and readily accessible to the play field, consist of two examination rooms; two clinics; a dental room and two corrective gymnasiums. Together with locker and shower rooms for both boys and girls, the physical education facilities can care for 500 at a time. A supplementary auditorium for music and dramatics is located on the ground floor and in close proximity to the large auditorium. This room is unique in its plan and interior treatment. Two practice rooms and a band and orchestra room are also included in the ground floor plan. A cafeteria with 500 seatings flanks one side of the auditorium-gymnasium and is located under the court and top-lighted. It is supplemented by a faculty dining room, kitchen, kitchen store room and rooms for male and female kitchen attendants. Another feature unusual in schools is the museum. The cost of the building complete without equipment and architects' fees was $704,000,—a per capita cost of $484.

The High School, St. Petersburg, Florida is an outstanding example of planning for Southern climates. In a community of almost perpetual sunshine, the plan has been opened up to the fullest extent for natural ventilation. Provision for mechanical ventilation is conspicuous by its absence. The height is confined to two stories and is built around two open courts or patios upon which the corridors are entirely open as an arcade. Windows upon the inner wall above the blackboards permit of full cross ventilation to the classrooms. The school health activities, being conducted largely in the open, where ample playgrounds and an open air swimming pool are provided, permit the indoor health facilities to be reduced to a combination stage-gymnasium arrangement. Ample indoor locker and shower facilities are also provided. The building executed in the traditional Spanish is of tinted stucco trimmed with polychrome terra cotta. It accommodates 1,700 pupils and was erected complete without equipment and architects' fees for $426 per capita.

The Central Technical High School, Columbus, Ohio forms one of a group of buildings comprising the new civic center of Columbus. Being the first building to be erected, it was executed in monumental design in stone, serving to give the keynote for the buildings which are to follow. It occupies a commanding site on the west side of the Scioto River and is flanked on either side by monumental bridges. Its outstanding features comprise a music-lecture room facing two sunken gardens in the forecourt, the main entrance approach being across its roof. This brings the room into a location where it can be turned over for community uses without entrance to the school building proper. Another outstanding feature of the building is an auditorium to seat 1,500 with a double gymnasium-stage combination. The double combination includes a stage 20 feet deep separated from the girls' gymnasium by a steel sound-proof curtain, the boys' gymnasium adjoining the other side to the rear. It is possible by this arrangement to throw the entire health suite together for
The advocates of this plan are:

1. There is no convenient dropping-out place.
2. The enriched facilities of the high school are available for the younger children when not in use by high school students.
3. The situation is more natural when older and younger students are in personal contact with one another a part of the school day, as, for instance, during recreation and some of the more informal periods of special activities.

The Bennett High School, Buffalo represents the full development of a comprehensive high school. Built to accommodate 2,500 pupils and occupying a commanding site, it comprises one of Buffalo's chief educational assets. The building is the home of the long Bell Lumber Co., is the gift of R. A. Long, president of the company. This school is planned for 2,800 pupils and includes all grades from kindergarten through the high school. The three building units, the elementary, the junior and the senior high, are located on a 39-acre site. As Longview is in the strictest sense an American city, Colonial architecture was chosen. The center building, the senior high school, houses the school and community auditorium with its capacity for 1,000. Directly behind the auditorium, across the corridor, is the double gymnasium divided by sliding door walls. There is a very definite relationship between the gymnasium and the cafeteria (38 x 164 feet). Although separated by a small court, both units are readily accessible to the public.

The two wings that connect the center senior unit with the elementary and junior schools are part of the senior school and house the vocational and home economics departments. The library-study on the second floor runs across the front and commands a view of the landscaping below. It is an unusual room, 24 x 140 feet, with a capacity of 200 students. Most of the classrooms are distributed on this floor.

The junior high school also contains a double gymnasium with complete accessories. There are no shops or home economics rooms in the junior unit, since those provided in the senior high school will serve all students. The library-study overlooks the grounds and has a capacity for 70 students. The art room, 20 x 45 feet, is centrally located on the second floor. A feature of the elementary school is the covered play court in place of a gymnasium.

The climate at Longview permits of almost continuous out-of-door play. The kindergarten is planned with a bay and with its own outside entrance. A music room with a small stage is provided, so that it can also serve as an auditorium for smaller groups.

The two large classrooms on the second floor are the nature study and handwork rooms.

Summary. As educational programs and methods of school procedure are variable factors in school communities, and as building policies, climate and site conditions are also variable, every school building becomes an individual problem. Rules and formulas can and have been evolved as guides to safety, lighting and sanitation of schools. The real test of the success of a school building, however, is its working efficiency. Therefore, an intimate relationship must exist between the educational plan and the building plan. If a school building renders maximum educational service, the mechanical elements will exist as natural accompaniments.
ROBERT E. LEE SENIOR HIGH SCHOOL, JACKSONVILLE, FLA.
MARK & SHEFTALL, ARCHITECTS; WILLIAM E. ITTNER, CONSULTING ARCHITECT
MUSIC EXPRESSION ROOM

THIRD FLOOR

AUDITORIUM AND STAGE GYMNASIUM

FIRST FLOOR

SECOND FLOOR

SENIOR HIGH SCHOOL—JUNIOR COLLEGE, MUSKEGON, MICH.

WILLIAM B. ITTNER, ARCHITECT
CENTRAL TECHNICAL HIGH SCHOOL, COLUMBUS, O.
WILLIAM B. ITTNER, ARCHITECT
MAIN ENTRANCE

INTERIOR COURT

FIRST FLOOR
ST. PETERSBURG HIGH SCHOOL, ST PETERSBURG, FLA.
WILLIAM B. ITTNER AND M. LEO ELLIOTT, ASSOCIATED ARCHITECTS

SECOND FLOOR
ENTRANCE TO GYMNASIUM
EVANSTON TOWNSHIP HIGH SCHOOL, EVANSTON, ILL.
PERKINS, FELLows & HAMILTON AND HAMILTON, FELLows & WILKINSON, ARCHITECTS
COST AND CONSTRUCTION DATA

Designed to eventually accommodate 4,000 or more pupils, only a portion of the academic building and the main gymnasium wing have been built as yet. The cost of these units including the power house and the temporary lunch room and manual training shops was approximately $1,800,000, which on the basis of 1,800 pupils now enrolled makes a cost of about $1,000 per pupil. The unit cost of both the academic and gymnasium sections with the cost of separate heating plant apportioned to them was 37.1 cents per cubic foot. The exterior treatment is brick trimmed with terra cotta, and the general construction is fireproof.
MAIN ELEVATION

AUDITORIUM
JACKSON HIGH SCHOOL, JACKSON, MICH.
CHILDS & SMITH, ARCHITECTS

GYMNASIUM ENTRANCE

Photos, Swain

Plans on Back
COST AND CONSTRUCTION DATA

Completed September 1927, this school has a capacity of 2,000 pupils and was built at a cost of $1,130,000 or 33 cents per cubic foot. The cost per pupil is approximately $565.

It is fireproof in construction, and the exterior finish is brick with cut stone trim. The roofs are covered with tar and gravel composition.
GENERAL VIEW

END BAY OF AUDITORIUM
SANTA ROSA HIGH SCHOOL, SANTA ROSA, CAL.
W. H. WEEKS, ARCHITECT

MAIN ENTRANCE

Photos: Gabriel Moulin
Plans on Back
COST AND CONSTRUCTION DATA

Having a capacity of a thousand pupils, this school was completed in 1925 at a cost of $368,305 or 24 cents per cubic foot, making a unit cost of about $368 per pupil. The cost of equipment used in this building was $40,000.

Pressed brick in variegated shades trimmed with cast stone and terra cotta are used for the exterior finish, while the roof covering is of terra cotta tile. The general construction is fireproof.
Photos. John Wallace Gillies

CORRIDOR ENTRANCE

ORANGE HIGH SCHOOL, ORANGE, N. J.
ERNEST SIBLEY AND LAWRENCE C. LICHT, ARCHITECTS
COST AND CONSTRUCTION DATA

The capacity of this school is 965 pupils, and it was completed in 1925 for $781,000 or 41.4 cents per cubic foot.

PLANS, ORANGE HIGH SCHOOL, ORANGE, N. J.
ERNEST SIBLEY AND LAWRENCE C. LICH, ARCHITECTS
WESTBORO HIGH SCHOOL, WESTBORO, MASS.
JAMES H. RITCHIE & ASSOCIATES, ARCHITECTS

GENERAL VIEW

ENTRANCE DOOR

REAR OF AUDITORIUM

Plans on Back
COST AND CONSTRUCTION DATA

Work on this school was completed on May 22, 1926. The total cost was $264,-000 or 39.6 cents per cubic foot. It is designed to accommodate 500 pupils, making the cost per pupil $528. The equipment cost was $16,800.

It is built in the Georgian style of light colored brick with limestone trim. The roofs are covered with tar and gravel.

PLANS, WESTBORO HIGH SCHOOL, WESTBORO, MASS.
JAMES H. RITCHIE & ASSOCIATES, ARCHITECTS
GENERAL VIEW

END BAY

MAIN ENTRANCE

PHOTO: TOBBS & KNELL, INC.

GIRLS' SENIOR HIGH SCHOOL, ATLANTA
EDWARDS & SAYWARD, ARCHITECTS
COST AND CONSTRUCTION DATA

The first or central unit of this building was completed in January, 1926 at a total cost of $500,000 or 40 cents per cubic foot. Its capacity is 1,300 pupils, making the cost per pupil about $384. Equipment costing approximately $45,000 has been installed in the building.

The general construction is fireproof.
GENERAL VIEW

CENTER TOWER
COLUMBIA HIGH SCHOOL, SOUTH ORANGE, N. J.
GUILBERT & BETELLE, ARCHITECTS

ENTRANCE DETAIL

Photos. Drix Duryea
Plans on Back
COST AND CONSTRUCTION DATA
Completed in September, 1927 at a total cost of $1,493,105 or 5 cents per cubic foot, this building has a capacity of 1,630 pupils, making it cost about $916 per pupil.

Slate is used for sloping roofs, and pitch and slag composition on the flat roofs. The exterior walls are of brick trimmed with limestone, and the general construction is fireproof.
COST AND CONSTRUCTION DATA

Exclusive of the equipment which cost $82,913, the total cost of this building was $1,430,685 or 53 cents per cubic foot. It is designed to accommodate 2,100 pupils, which makes a unit cost of about $681 per pupil.

The construction is fireproof, the exterior walls being of brick and stone and the roof covering slate and composition.

CLEVELAND HEIGHTS HIGH SCHOOL, CLEVELAND
WARNER, MCCORNACK & MITCHELL, ARCHITECTS
THE NEW SCHOOL BUILDING, THE ARCHITECT, AND THE BOARD OF EDUCATION

BY

JAMES O. BETELLE

OF THE FIRM OF GULBERT & BETELLE, ARCHITECTS

THERE will always be a demand for new school buildings or additions to old schools as long as our country continues to grow and remains a democracy. At the present time there are hundreds of thousands of school children in the United States housed in makeshift buildings, portable schools, rented spaces and dwellings, stores, annexes, attics and basements. There are an equal number or more attending school only part time, and in addition to this, every city has a greater or less number of overcrowded classrooms. From this it can be seen that crowded school conditions exist today, and they probably will always exist for the reason that like all public work, school accommodations are added slowly and are always behind the actual needs. The demand for additional school accommodations manifests itself in a number of different ways. Its first symptoms are overcrowding in classrooms, then the renting of outside accommodations or the erection of temporary portable school buildings on the school grounds. When conditions have reached such a stage as this, there is not much for the local board of education to do to convince the citizens that additional school accommodations are necessary. The crowded conditions and the part-time classes have probably so upset the daily routine of the homes that the demand for more accommodations comes from the citizens rather than from the school board.

An architect is always interested in the erection of a school building or the development of a school building program. He is interested, first as a citizen and taxpayer, and second as an architect, whose business it is, among other things, to design and supervise the erection of school houses. This article will discuss the various phases of an architect's interest in the new school building, from both a business and a personal standpoint.

After the need for additional school accommodations is recognized, the intelligent thing to do is to ascertain the extent of the need and to decide upon a remedy. If merely an addition to an old structure, or the erection of a single new building is necessary, the situation is comparatively simple. It may happen that the community in question has, for one reason or another, neglected its school buildings, or that the community has experienced unusual growth, with the indications that further increased additions of population are in store for it. In the latter case, it would be wise for the architect to recommend that an educational survey be made to determine the best means of providing the additional school accommodations needed immediately, and to provide a comprehensive future building program, extending over a period of years. It might not be amiss to say here that the making of an educational survey is a special line of work, wherein the services of an educational administrator are of greater value than any that could be rendered by an architect. While it is true that architects at times attempt to make educational surveys, such surveys have not the value of those made by a trained educator, who has specialized in this type of work. It remains for the educational authorities to outline the problem in the terms of buildings to be erected, their sizes and uses, and then for the architect to work out this problem in like terms. It is no more reasonable for the architect to attempt to do educational work than it is for the educator to do architectural work. Both lines of effort are specialties and are of sufficient scope and importance to be made a life-long study, and it is hardly within the realms of possibility for any one person to know both subjects sufficiently to render creditable service.

In a school building program, the architect should be retained early in the proceedings. If there are not sufficient funds or authority available for retaining the architect to design the buildings contemplated, there should be enough money made available by the board of education to retain an architect for special services and advice until the full appropriation has been obtained. In the case of the selection of school sites, the architect can be very useful. The ideal way to make a selection of a site is for the board of education to place before the superintendent of schools several attractive sites for the building, and ask his opinion as to their advantages from a school administration standpoint, and at the same time to ask the architect's views from a building standpoint. What may appear to be an impossible site on account of grades and topographical peculiarities, may develop into a very advantageous site under a skillful architect. What may appear to be a good building site to the layman, may upon investigation by the architect prove to be unsuitable for some such reason as wet soil, underlying rock, or the limited bearing power of the ground. After the question of site has been put up to both the superintendent of schools and the architect, and they agree on the same site, there can be little ground for argument, but should they differ on the site to be selected, it then becomes the duty of the board of education to weigh the merits of the case and come to a decision which will be for the best interests of the community.

The adoption of a building program covering a period of years by the board of education has many advantages. It permits the selection ahead of time, and for that reason allows the purchase of school sites at reasonable prices, thereby often saving thousands of dollars to the taxpayers. The adoption of a building program permits these sites to be selected at proper locations long before those particular parts of the community have been built up, and when large
tracts of land of sufficient sizes for school purposes can be obtained at relatively low prices. It is to be regretted that many communities wait until everything is built up and more school accommodations needed before purchasing sites for schools. This means that the size of the site is restricted and the small piece of ground obtained is very expensive, due to the surrounding improvements.

An element in regard to the erection of a new school building that is of primary interest to the architect is the point of view of the board of education in making a selection of an architect to do the work, and it is probably of equal interest to the board of education to know the points of view of the architects who are being considered in connection with the work. Every owner naturally wants to secure the finest and largest possible school building for the money available, and every architect who is in touch with the school board naturally feels that he should be selected to do the work. With this situation confronting a school board, it is not an easy task to select an architect, as each candidate for the work has his friends and adherents, and they do not hesitate to press the claims of their favorites upon the individual members of the board of education. The board is a public body, and as such is in duty bound to give courteous and patient attention to the claims of the various architects.

The final selection may be arrived at in one of three ways. First, the board may invite a number of architects to appear on a certain evening at a special meeting and then give each candidate a few minutes to tell his story. This is the most unsatisfactory way of any, because after interviewing a few candidates the members of the school board, who are already tired out from a hard day’s work before the evening meeting, are practically exhausted after hearing two or three architects endeavoring to sell their services, and the half-dozen yet to come get but little consideration. Besides this being an unsatisfactory way for an owner to select an architect, it is undignified and almost humiliating as far as the architects are concerned. To wait in an anteroom with possibly ten or a dozen fellow architects, all scrambling for the same commission, and kicking one’s heels together until it is time to be called by the board and given a few minutes to tell his story, is not a very inspiring sight or a dignified position for a capable architect. The selection of an architect made on this basis is sure to end in regrets. The architect is placed in an unfavorable position from the start. He has not the opportunity or sufficient time to tell his story or answer the questions of the board or to discuss their problems with them. He is also placed on a competitive basis very often as to the price of his services, as well as to what he claims he can do for the money available. It then results in the selection of the architect who makes the most extravagant promises and tells them what a large building he can give them for little money, the great amount of services included in his commission, or for how small a fee he will do the work. The average school building is likely to be a relatively large work in the ordinary architect’s office, and inasmuch as the architect is making his living by designing and supervising buildings, he is naturally very desirous of obtaining the commission.

The conservative and reliable architect is not the one usually selected on this basis. He is careful in the statements and promises he makes, and is, therefore, no match for the high powered salesman who agrees with all the demands of the board and describes in flowery language the kind of building he can design for little or no money. If conscientious and upstanding architects would refuse to be parties to such a scramble for work, school boards would soon realize that there are other and better methods whereby an architect can be selected, as the only men responding to their invitation would then be those who were the least desirable to engage. It has been found that reduced architects’ commissions or the inclusion of a clerk of works on the site all the time, or payment of traveling expenses, have very little influence with a broad-minded board of education. They are quite willing to pay the usual 6 per cent fee for architectural services of quality, and such concessions tend to lose a good commission for the architect rather than to win it. An architect who agrees to design a building for an absurdly small fee has but little respect for his services—but then he probably knows what they are worth.

It would seem a fair proposition that if a school board wanted to interview the architect, they should have some process of elimination and select only two or three, and then give each of these an evening to discuss the problem, after which the board can make an intelligent selection. Surely there can be no complaint from the board if the architect agrees to match his time and experience against theirs, with the resultant benefit to both parties. The two or three architects to be given a final interview can be selected and the others eliminated by the issuance of questionnaires, which will set forth the education, office organizations, and past performance of the applicants, together with specimen sets of working drawings and specifications of similar buildings.

The third method of selecting an architect is on the basis of an architectural competition in which drawings are submitted and a judgment made. It is to be regretted that school boards are not more familiar with the fact that the American Institute of Architects has a standard form of competition program which has been prepared for the convenience of committees proposing to hold competitions, that copies of this document can be obtained by simply writing to the headquarters of the American Institute of Architects, 1741 New York Avenue, Washington, or that they can be obtained from the local chapters of the Institute, located in the important cities of the country. The terms of this program are, of course, familiar to all architects, are easily understood by school boards, and are recognized as
The architectural treatment of the stairway towers at either end of the rear elevation is one of the interesting features of the Greenwich High School. Both the auditorium and the gymnasium are located at the back of the building on the first floor level.

GREENWICH HIGH SCHOOL, GREENWICH, CONN.
GUILBERT & BETELLE, ARCHITECTS
fair to both the owner and competitor. It is strongly recommended that school boards, which have in mind architectural competitions for school buildings, obtain copies of this competition circular and program, and they will find that the good results obtained by its use will justify their action.

Assuming that the architect has been selected, he should not only get acquainted with the members of the board of education, but he should get in especially close contact with the superintendent of schools. After all, the superintendent of schools is the executive officer of the owner, and it is to him that the owner looks for guidance, not only in educational matters, but also as to the requirements for the new school building. It will be found that school superintendents are now much better informed with regard to the requirements of an up-to-date school building than they have been in the past. Inasmuch as the school superintendent has a working knowledge of the building requirements and can discuss them intelligently with the architect, it is as little as the architect can do to know the operation of a modern school, to study the educational requirements of the superintendent, and to try to understand his point of view. The best results can be obtained only through this knowledge, mutual understanding, and respect. There are many items of information that the architect will have to know in a preliminary way before starting to make sketches for the new building, such as the kind of school needed, what is to be its capacity, a survey of the site, and other details.

Generally the appropriation has been made before the architect is engaged, but now and then it happens that the appropriation has not been made, and this is a better situation, as far as the architect is concerned, than having a definite sum of money allotted for the new building. As a rule, the appropriation is nothing more than a guess, and the requirements and ideas of the board do not correspond to the amount of money obtained before the bids are received. It should be realized early in the situation that as far as the general plan of the building is concerned, no standardization is possible if the building is to meet the requirements of the particular community in which it is built, and fit the site and be in character with the surroundings. Standardization of detail is possible in large cities or in architects' offices making a specialty of school building design. These standards apply only to such things as stairs, classroom fittings, toilet rooms, equipment of special rooms, etc., but never to the layout or general plan, as this has to be designed to fit the individual needs of the building, the points of the compass, the topography and shape of the lot, and other conditions.

With regard to the proper architectural style to be used in a school building, it is hardly necessary to mention the various elements controlling this, but in spite of fear of repetition, it may not be amiss to mention some of the limiting conditions. In the first place, a school building should look like a school and not like a public library or a city hall. The architectural style adopted should be in keeping with the community; that is to say, if the town is in New England with colonial traditions, a Colonial building would be appropriate. If the building is in a college town adjacent to the college buildings which are of Collegiate Gothic, a building of similar style would be appropriate. If it is in California or the southern part of the United States, a Spanish or Mission style might be appropriate, so that local conditions and good taste should govern the style adopted.

With regard to the materials used in a school, it is hardly necessary to say that these materials should be simple and substantial. Elaborate marbles and bronzes and expensive materials are out of character in a public school building, and the architect must realize that he is not building a state capitol. Elaborate decoration, either inside or outside, not only costs money but is inappropriate. A school building has sometimes been called an educational factory or workshop, and it is on that basis that it should be designed. Cheap imitations and substitutes for more elaborate and expensive materials should also be avoided. These imitations and substitutes have not the wearing qualities of the imitated material, and it is much better to get a simple and substantial building than an elaborate structure built of substitutes.
A school building, while not occupied many hours in the day, is nevertheless subjected to excessive wear. When it is realized that the building houses thousands of pupils and that they change classes every 45 minutes or thereabouts, it can be seen that tremendous wear is received and that only the most substantial materials will stand up under it. A simple, straightforward, businesslike building is looked upon with favor by the taxpayer, who has no objection to paying for the essentials, but who finds fault with what he considers undue elaboration and expense in connection with school buildings.

In connection with the materials to be employed, a word about the use of new materials and appliances might also be in order. The careful architect will go slowly in specifying any new material or appliance for use in a school building. In private work the architect may be a pioneer and, with the consent of his client, try out and adopt any new apparatus or material that strikes his and the owner's fancy, and which his judgment dictates as appropriate. In a school building the situation is different; this is a public structure and every taxpayer is a part owner. If new materials or appliances are adopted and turn out failures, every citizen and newspaper has a right to criticize; whereas if they turn out satisfactorily, no particular credit is given the architect for taking the chance. This is quite different in a privately owned building, as whether it turns out satisfactorily or otherwise is the concern of no one but the architect and his client. High powered salesmen are continually importuning the school architect to adopt new materials and methods and new appliances, and if an architect succumbs to their high powered methods, he may sooner or later find himself in an embarrassing position. It is a good principle to insist that any material or appliance entering into a public building have a background of a number of years of successful use and a number of satisfied users. “Safety first” is a good motto.

In connection with the layout of the plan, it may be found that the demand for space and capacity is more than it is possible to meet and keep within the sum which it is possible to have appropriated. This is where the skill, experience and knowledge of the educational demands, on the part of the architect, are very valuable. It has been previously said that the architect should know something of educational requirements and routine, and he is then in a position to show how economy in space can be carried out and educational demands still met. There are many different types of economy, such as economy in materials, economy in layout, and economy in use,—that is, the school building used to capacity without unnecessary and idle rooms and spaces. Each of these types of economy must be used with discretion and judgment; otherwise they become false economies, which constitute a form of extravagance. Another type of economy, and after all economy must be practical if we are to meet the tremendous demands for new school buildings, is the economy brought about by the duplicate use of rooms and spaces. This duplicate use is where a single room is used at different times for one or more purposes, such as a combination gymnasium and auditorium; the use of the lunch room for school purposes except during the middle of the day; a combination sewing and cooking room; or a combination physical and chemical laboratory. These duplicate uses are not as satisfactory as having separate rooms for each and every purpose, but in a small school where the scholars are not of sufficient number to use the special rooms 100 per cent of the time, such economy is necessary, as spaces which are vacant the greater part of the time cannot be justified.

A school building was never known to be large enough to be adequate for more than a few years, so that it should be made flexible in order that future additions can be readily made; in fact these future additions should be planned and thought of from the start, and indicated on the preliminary sketches. It should also be flexible in that partitions can be moved and altered without affecting the structural features of the building, as this may be necessary as time goes on, inasmuch as educational methods change.

To get full value out of a school building it should be planned so it can be used by the citizens for community purposes. It is not only the auditorium and gymnasium that can be so used, although these are the first thought of. The kindergarten can be used for small social gatherings, dances or meetings of the Parent-Teachers' Association. One of the classrooms which has movable furniture can be used for a men's debating club, and in combination with all these purposes the lunch room is always useful. There are other community uses for our schools that do not interfere with their primary purpose, and if we want the community to stand back of the schools, we should encourage their use to the fullest extent.

It is often asked what is the proper number of stories in height for a school building, from the standpoint of desirability and cost. For the purposes of this article, school buildings over three stories high can be ignored, as they are only suitable in large cities, such as New York or Philadelphia, where ground area is not available, and where necessarily the building must be high in order to get capacity. Like all other decisions, the proper thing to do can be determined only by knowing all limiting conditions. Generally speaking, a two-story building is desirable where sufficient land is available; this means only one flight of stairs to climb, and it makes a very safe type of school in case of trouble. A two-story school is in better scale with the surrounding houses than a three-story building. A three-story structure is better for a high school, where the pupils are older, than it is for a grade school. A one-story school has its uses and also its limitations; while large one-story schools have been built, they spread over such large areas as to become unwieldy, and a two-story building in such cases is much better. It would seem that a maximum
size for a one-story building, especially where an auditorium and gymnasium is to be included, would not be more than 10 to 14 classrooms. As to which type of building is cheaper, the single-story or multiple-story, there are figures available to prove either way you want it. The decision as to the number of stories in a school building should not be based on cost. The differences in cost between the different types of same size and capacity are not sufficient to be the deciding factors. The deciding factor should be what is wanted or what is thought to be proper under the particular circumstances of the case.

It is realized that school building costs are always of interest, but they are very difficult to state accurately or in such a way that they would be very useful. These school building costs vary from year to year, due to labor and material market conditions, and in various parts of the country due to local labor and material costs. Prices in the New York metropolitan district do not apply elsewhere, and the architect will have to depend upon his own knowledge of local conditions and building costs to approximate the cost of the proposed building. It has at times been suggested that approximate estimates be obtained from contractors on sketch plans and memoranda specifications. This sounds like a good method, inasmuch as the contractor who deals with costs all the time is in a better position to make a price than the architect could be. In practice, however, this does not work out. No contractor is going to take the time and trouble to take off quantities or carefully go into the cost of a proposed school building, for the reason that he is too busy figuring on actual work and constructing the buildings he has contracts for. Out of courtesy to the architect he makes up some sort of a price, and he sometimes asks what the architect wants it to cost, and, trying to be accommodating, he puts it in at that figure, so that in the last analysis preliminary figures from contractors on sketch plans are useless, especially as there is no responsibility attached to the contractor and no commission to be given out at that particular time; all of which is not very encouraging to accuracy. The architect must, therefore, make up his own figure as to the cost of the building, based upon his knowledge of costs and experience in buildings of similar kinds,—and stand or fall by the result.

There are several methods of stating the cost of a school building, and one of the oldest methods and one still in the minds of school boards and school superintendents, is the "cost per classroom." Years ago, when a school building was simply a box-like structure divided into so many equal parts, each of which was a classroom, it was very easy to determine the cost of the building per classroom. Today, with all the various activities in our schools, especially high schools, it means there are rooms of varying sizes, such as laboratories, shops, libraries, etc., all of larger size than the standard classroom, and in addition, lunch rooms, auditoriums, gymnasiums, and similar large spaces; so it is obvious that the cost per classroom is not now the basis on which to state the cost of a school building. Another method is to find the cost of a school building "per scholar." This is more definite than the classroom basis, but still somewhat indefinite, due to different methods of computing the scholar capacity of the building. The American Institute of Architects and the National Education Association have fixed upon a method of computing the number of scholars accommodated in a school building, and it might be useful to describe this method here: "Compute the number of pupils normally accommodated in rooms designed for classes only. Special rooms are to be figured at the actual number of pupils accommodated for one class period only. Auditoriums and assembly rooms are to be ignored, but gymnasiums may be figured for one or two classes, as the accommodations may provide. No gymnasiums, however, shall be accredited with two classes, if below 40 by 70 feet in size."

The most accurate way and the most familiar way of stating the cost of school buildings is the same way architects state the cost of any other building, and that is the cost per cubic foot. All architects know how to compute the cubic of their buildings, and they are based on more or less the same methods. Since it is felt that a cubic foot method is the most suitable, it might not be amiss to give some figures as to cubic foot costs, even if they do not apply to all parts of the country or at all times. The average fireproof school building, outside of New York, costs from 45 cents to 50 cents per cubic foot. As we get farther away from New York the labor costs are less and there is a corresponding reduction in prices. A building of semi-fireproof construction can be built for from 35 to 40 cents per cubic foot in the eastern section of the United States.

Another item of interest is the number of cubic feet per scholar in a school building. This varies in different types of schools, averaging around 800 to 1,000 cubic feet per scholar in a grade school; 1000 to 1200 cubic feet per scholar in a junior high school, and 1200 to 1500 cubic feet per scholar in a senior high school. If an architect were asked the cost of a 600-pupil high school, he would not be very far wrong if he figured out in his mind, 600 scholars times 1500 cubic feet per scholar, or 900,000 cubic feet; which multiplied by the cost per cubic foot that the architect determines is the price in his particular district, gives a quick and close approximation of the probable cost of the building. The basis of cubic foot per scholar is on the usual school building without any extraordinary facilities in it, being simply the average. If facilities out of the ordinary are added or omitted, the number of cubic feet per scholar should be adjusted accordingly.

Another question coming up in the minds of boards of education is the time required to get the plans drawn and the school building completed after the appropriation has been made. This is something that is again indefinite, but the board's question has to be answered, at least approximately. The
WASHINGTON IRVING HIGH SCHOOL, TARRYTOWN, N. Y.
GUILBERT & BETELLE, ARCHITECTS
part of the work that is going to take up considerable time and cannot be always counted upon is the time given by the board of education to considering the preliminary sketches and deciding upon a definite scheme, which can be adopted and the architect ordered ahead with the working drawings. At the very quickest it takes one or two months to get the preliminary plans adopted by the board, and during that time a number of schemes have been submitted and discussed. After the preliminary plans have been adopted it takes the architect 10 or 12 weeks to make the working drawings, depending more or less upon the size of the building. After this it takes three or four weeks for the contractors to submit their figures, and probably 12 months for the contractor to complete the structure ready for occupancy. Altogether, this means at least 18 months from the time the money is appropriated to the time the building can be ready for occupancy. It can be done in less time, but it generally takes longer than this.

The contractors very seldom finish within the time stipulated in the contract for completion, and one reason for this is the type of contractors who are usually successful bidders on public work, such as schools. It should be realized that price is the only thing that is considered in awarding a contract on public work, for the reason that the law usually prescribes that the contract shall go to the lowest responsible bidder. It is very difficult to prove a contractor is not responsible, especially when he can get a surety bond guaranteeing completion of the work. Contractors of ability and with large organizations will not figure on school work, because they cannot compete in price with the newly organized and inexperienced concerns and the contractor without organization. But as one usually gets what is paid for, the board gets a slow, and possibly unsatisfactory, building from the lowest bidder, whom they would probably not permit to bid on any of their private work—and the more responsible and efficient builders are eliminated from the situation.

The architect and the superintendent of schools should get together even during the preliminary plan period and decide upon the size and equipment of the special classrooms, such as laboratories, shops, cooking rooms, etc., which are usually built too small to contain the special furniture and equipment needed for their proper use. Each of these special rooms should have the equipment and furniture laid out to scale as the plans are developed, and the architect can with profit get in touch with one of the many equipment concerns, so that when the building is completed these special rooms can be properly furnished. This layout is also necessary in order that the various electric, plumbing, heating and water outlets can be properly located.

The modern American school has shown vast improvements in plan layouts and architectural expression in the past decade, due to continued cooperation between the architect and school authorities.

Photo. Drix Duryea

End Elevation, Jefferson School, South Orange, N. J.

Gilbert & Betelle, Architects
GENERAL VIEW

SIDE AND AUDITORIUM ENTRANCES
NORTH PARK JUNIOR HIGH SCHOOL, FALL RIVER, MASS.
NATHANIEL S. CHASE, ARCHITECT; R. CLIPSTON STURGIS, ASSOCIATE ARCHITECT
COST AND CONSTRUCTION DATA
This school was completed in 1924 at a total cost of $685,000, or 53 cents per cubic foot. It is designed to accommodate 1200 pupils, which makes the cost per pupil about $570. Equipment costing $59,000 has been installed in the building. The construction is fireproof with wood roof structure. The exterior walls are of brick; the roof is covered with slate.
GENERAL VIEW

Photos: Richard Southall Grant

ENTRANCE TO GIRLS' LOCKER ROOM

JUNIOR HIGH SCHOOL, GLENS FALLS, N. Y.
TOOKER & MARSH, ARCHITECTS

AUDITORIUM ENTRANCE

Plates on Back

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COST AND CONSTRUCTION DATA

Designed to accommodate 630 pupils, this school was completed in 1924 at a total cost of $360,000, or 33 cents per cubic foot, making the cost per pupil $571. The general construction is fireproof, the exterior walls being of brick trimmed with tile. The roofing material is asbestos.
GENERAL VIEW

GALLERY IN AUDITORIUM

JUNIOR HIGH SCHOOL, WORCESTER, MASS.

JOSEPH D. LELAND & COMPANY, ARCHITECTS
COST AND CONSTRUCTION DATA

Erected in 1922 and 1923, this building has a capacity of 1762 pupils and cost $935,000, not including ground and equipment, making the cubic foot cost 40.7 cents. The cost per pupil is $530.

The building has a flat roof and the exterior finish is of sand-struck brick trimmed with artificial limestone. The stairs, corridors, and auditorium are of fireproof construction.
GENERAL VIEW

SCHOOL ENTRANCE

MAIN ENTRANCE

JUNIOR HIGH SCHOOL, FITCHBURG, MASS.
JOSEPH D. LELAND & COMPANY, ARCHITECTS
COST AND CONSTRUCTION DATA

Exclusive of ground and equipment, the total cost of this building was $394,135, or 32 cents per cubic foot. It is designed for 915 pupils, making the cost per pupil $430.

The corridors and stairways are fireproof in construction, and the exterior walls are of red waterstruck brick with limestone trim.
WOODROW WILSON JUNIOR HIGH SCHOOL, TERRE HAUTE
JOHNSON, MILLER, MILLER & YEAGER, ARCHITECTS

PLANS ON BACK
COST AND CONSTRUCTION DATA

Approximately 1800 pupils can be accommodated in this building, which was completed in June, 1927, at a total cost of $87,425, or 24.6 cents per cubic foot. The value of the equipment is $35,000. Reinforced concrete construction, brick exterior finish and composition and tile roofing make it fireproof throughout.
MOREY JUNIOR HIGH SCHOOL, DENVER
WILLIAM E. AND ARTHUR A. FISHER, ARCHITECTS
COST AND CONSTRUCTION DATA

Constructed of reinforced concrete with tile roof, this building was completed in 1926 at a cost of $775,000, or 40 cents per cubic foot. It has a capacity of 1600 pupils, making the cost per pupil approximately $484. The equipment used in this building cost $40,000.
PART OF MAIN FACADE

AUDITORIUM ENTRANCE

WILSON JUNIOR HIGH SCHOOL, APPLETON, WIS.

PERKINS, FELLOWS & HAMILTON, ARCHITECTS
COST AND CONSTRUCTION DATA

Sections of this school, designed to accommodate 600 pupils, were completed in September, 1924, at a cost of $234,904, or 29.6 cents per cubic foot. The cost per pupil was about $491.50.

Tile and composition roofs were used in connection with brick exterior walls. The general construction is fireproof.
GENERAL VIEW

THADDEUS STEVENS JUNIOR HIGH SCHOOL, WILLIAMSPORT, PA.
GUILBERT & BETELLE, ARCHITECTS
COST AND CONSTRUCTION DATA

Completed in August, 1927, this school cost $409,127, or 40.75 cents per cubic foot. The capacity is 983 pupils, making the cost per pupil about $406.

The construction is fireproof with brick and limestone exterior finish, and the flat roof is covered with a pitch and slag composition.

PLANS, THADDEUS STEVENS JUNIOR HIGH SCHOOL, WILLIAMSPORT, PA.
GUILBERT & BETELLE, ARCHITECTS
SOME NOTES ON JUNIOR HIGH SCHOOLS

BY

R. CLIPSTON STURGIS, ARCHITECT

THE public knows that schools, both the buildings and the instruction, are costing more and more. Increases in teachers' salaries can be understood and accepted; the cost of the buildings cannot. The blame has been put on the architect and his demand for at least some expression of beauty. This article is to ask for more beauty and less cost in our schools, and to show that wasteful expenditure is in the plan, in the demands of popular pressure for needless rooms and equipment, and not in bricks and mortar, nor in decoration. As a matter of fact, in a school building, the amount that can reasonably be put into ornament either inside or out is a perfectly insignificant item in the total cost. This is a plea for more beauty in our schools.

To understand the problem of the junior high school, it is perhaps well to review the steps which led to the demand for this type of school. Before 1900 the generally accepted division of the 12 grades was eight elementary and four high. The elementary was usually divided into four lower elementary or primary and four upper elementary or grammar. In most eastern cities there was a principal in the grammar school, and he was the head of the primary schools in his district. In response to a general demand for some kind of industrial education in the elementary schools, classes were established in cooking and woodworking for the two upper grades. In the grammar school also was the hall, which was frequently put under the high roof, the most dangerous place in the building for a crowd.

Educators generally were interested in an experiment started at Gary, Indiana. The ideas there embodied were not altogether new, but they emphasized what many were thinking about—the growing cost of schools; and this was one solution. It came naturally in a manufacturing town, and was the application to the schools of a commonplace of manufacturing—that a plant should be run to its capacity in working hours, and that, as far as possible, all machines should be running all the time. The school was a costly plant. It was idle during vacations. That perhaps could not be helped; but parts of the school were idle part of every school session. The hall was generally unoccupied. The industrial rooms might be filled every school hour, but the desks of the pupils at work elsewhere were empty. The Gary idea was to arrange a schedule so that every room and the hall would be in use every school hour. I believe two sessions a day for two sets of scholars, and summer school also, were included in the plan to make the schools work every day, all day, and all the year. This is mentioned merely as indicative of the fact that citizens were beginning to question the increasing cost of schooling and schools, and educators were trying to answer their questions.

Before 1914 careful study had been made, in various parts of the country, of the requirements for the three types of school, lower elementary, upper elementary, and high, and an attempt to arrive at a standard of cost for each one of the three. This was done with some success for the elementary schools. The lower, with classrooms only and no principal, cost $140 per pupil. The upper elementary, with principal, hall and industrial rooms, as well as classrooms, cost $180. The high school was another matter. Its cost was from $400 to $600 and $700—an enormous jump from the elementary. The worst of it was that there were an increasing number of pupils going on to high school, and as the teaching was equally expensive, the burden was becoming very heavy. One curious reason for the great cost of the high school was that the home-room system of the elementary was continued in the high,

Frick Junior High School, Oakland, Cal.
Blaisd & Olsen, Architects

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This junior high school was built in 1922 at a cost of $340,000 or 20.9 cents per cubic foot. It will accommodate between 1200 and 1400 pupils and has equipment costing $50,000.

The interior partitions are of metal lath and plaster on wood studs, and the stairways are of fireproof construction. The exterior finish is stucco on masonry walls.

Theodore Roosevelt Junior High School, San Diego
T. C. Kistner & Co., Architects
COST AND CONSTRUCTION DATA

Costing $198,700 or 24 cents per cubic foot, this school building was erected in 1924 to provide facilities for 400 students, making the cost per student about $497. Equipment costing $25,000 has since been installed. The construction is reinforced concrete with an exterior finish of stucco, and the roof is of terra cotta tile. All corridors, ramps and stairways are of fireproof construction, and the interior trim is Douglas fir with hardwood doors.

MOUNTAIN VIEW UNION HIGH SCHOOL, SAN FRANCISCO
W. H. WEEKS, ARCHITECT
and every pupil had his 26-inch desk in his home room, which was vacant a good part of the time while the pupil was elsewhere, or occupied by some other pupil; whereas in the grammar, there were but two places outside the classroom where a pupil might be,—woodworking or cooking; in the high school there were half a dozen or more, so that the pupil was more often out of his room than in it. The obvious remedy was to do what was being tried at Gary, even in the elementary school,—make the rooms recitation rooms or study rooms, and let the pupils keep books etc. elsewhere. School authorities were loth to give up a system to which they were accustomed, and discussion was going on over the costly high school, when attention became focused on a solution which touched the elementary, as well as the high, and seemed not only logical but economical.

In the grammar, but two grades, seven and eight, had industrial work. The other two were educationally on the same basis as the lower elementary. Why not put these with the four lower grades in the less expensive building? If the first grade of high were withdrawn and put with grades seven and eight, one would have a school in which all grades would be taking industrial work, all would be about to change from the home room to the departmental recitation room, and the schedule could be so arranged that every room would be occupied at every period by a class. The hall might well serve as a place for physical exercise, for which there was now a general demand; so shops, hall and recitation rooms would be fully occupied. This school was the intermediate or junior high. It was to be the stepping stone between the elementary and the high. There would be no expensive science department, nor commercial, such as was in the high, and the hall would be simply a large room for physical exercise and occasional meetings. One has noted already the economy of putting grades five and six into elementary buildings. There was a further economy in putting grade nine into a building less expensive than the high school.

The problem before the architect then, was to build to fit these conditions. They were not new; it was nothing but the old grammar school with slightly increased industrial teaching and with the hall planned to serve as a gymnasium. It should have cost little more than the grammar. The figures quoted are pre-war figures. They had been practically constant for ten years. When school building was renewed after the war, communities had got accustomed to rising prices, and before we entered the war they were far above 1914 (150); but then they jumped unexpectedly and soared with all building to the peak in 1920 (250), and then slowly receded, until today the factor is two as compared with 1914. If we apply the factor of 250, to allow for added industrial equipment, to the 1914 prices, upper elementary $180, we get $450 for the junior high.

The actual costs of the junior high, which have never been in any way stabilized any more than the require-
mum, but better still if such matters were not put on the statute books, to become obsolete or ridiculous. Some of the legal requirements about air have no longer a semblance of any relation to health.

One touches on these things because in many cases the casual citizen seeing a school of some architectural beauty at once concludes that it is this, to him useless or at least unnecessary beauty, which is making the costs of schools mount. It is nothing of the kind. The cost is due to what is in the building, the wastefulness of its plan, its elaborate and costly equipment of halls whose use, by the schools, hardly justifies the expense; the gymnasia for boys and girls, baths, and swimming pools. Consider for a moment the baths. The ordinary physical exercises are school routine, and in many places at least are not such exercises as require a complete change of clothes or a bath. In such schools the bath equipment need be only sufficient for athletic teams. Even here the girls' equipment is costly, as girls are not expected to bathe or dress together, and must have individual dressing rooms and lockers.

There is often no standard in a state, or even in a city, as to what industrial equipment should be provided. One school will have two or three classroom units for the boys' and about the same for the girls' industrial; another will have double this amount. One expects to find the second a larger school, but often it turns out to be smaller. It is, or should be, obvious that these industrial class subdivisions should be in a definite ratio to the number of pupils in the school, as a half-class generally is the standard in an industrial room. In the same way the capacity of the hall would be in proportion to the size of the school, to seat half the school, or the whole; to take double units or single on the floor for exercises, and so a standard would be established. If the hall is to be used by the town or city as a general auditorium, it is hardly fair to build it at the cost of the school appropriation. The school use alone would not justify the large halls here shown. Again the gymnasia. It is ideal to have a hall and separate gymnasia for boys and girls. If the building accommodates 3,000 to 4,000 pupils, such equipment is justified. If the building has less than 1,500, perhaps one gymnasium would have to serve. If 1,000 or less, a combined assembly hall and gymnasium would seem the reasonable limit.

A glance at the plans of junior high schools illustrating this article and in the foregoing plate section will show exactly what is meant. The Stevens, Glens Falls, the Lincoln and Kearney schools are more or less the same size. The Stevens has for hall and gymnasium 73 x 120, the Glens Falls 80 x 130, the Lincoln 70 x 120, Kearney 80 x 144. Not even the smallest of these is justified by the size of the school or needed for school purposes. Some have assembly hall and gymnasium combined, using a deep stage for the gymnasium. The hall is not available when the gymnasium, behind a movable partition, is in use, and the stage, provided by opening this partition, is useless in size. Kearney takes this overgrown stage for the boys and then has another gymnasium over the cafeteria for the girls. Glens Falls has a very large dressing room and bath equipment and swimming pool, which the others have not. There is no standard, and this one unit in all these plans is the large item in expense. California is lucky. All this is done out of doors. A couple of one-story locker and bath buildings and the open air,—and the gymnasium problem is solved.

On the next count, industrial equipment, there is still less correspondence. The Fall River School has perhaps the largest, with wood working, metal working, drawing, printing, textiles, etc. for boys; and sewing, millinery, cooking, household science and drawing for the girls; a general science and special music room and library as well.

As against this at the other extreme, the Thaddeus Stevens has a shop for boys, two for girls and a science room,—hardly more than would have gone into a grammar school of this size 20 years ago. The Glens Falls school seems more like a town hall, with a few classrooms added as an afterthought. If the plans of Glens Falls and Fall River are put side by side, one cannot believe them to be solutions of the same problem. Still both are called "junior high."

The North Park Junior High was planned for by a superintendent and school committee who knew just what educational end they were aiming for in Fall River. It may not apply anywhere else, and it may not be the solution of a junior high. It is at least a genuine attempt to obtain junior high accommodation without extravagance. A brief description may be of value. Of the three grades, about 400 each to be housed, the seventh was put in home rooms with wardrobes, the other two, eight and nine, had lockers for books, and were on the departmental system, going to recitation rooms. The hall was arranged so that the floor clear of the galleries was large enough for 70 to exercise; and chairs, in place elsewhere, would provide for morning service. The expense of baths and lockers was definitely faced, and accepted, and the boys and girls have a period long enough to include a bath. Two other exercising spaces were provided,—one on the hall roof, and one in the enclosed and paved courtyard. Unusual and costly features were included to meet definite demands,—a public library branch, an extra small hall, and a good sized music room. The cost of these does not really belong to the school. Otherwise it is a junior high where the amount of industrial equipment is justified by its location in a mill town.

To complete the comparison, this is the cost per pupil in Thaddeus Stevens, North Park, the Lincoln and Glens Falls: —The Thaddeus Stevens accommodation is 915, cost $409,127, $450 per pupil. The North Park accommodation is 1200, cost $685,000, $570 per pupil. The Lincoln accommodation, 780, cost $410,000, $520 per pupil. The Glens Falls accommodation, 890, cost $360,000, $400 per pupil.
COST AND CONSTRUCTION DATA

This high school building was completed in December 1925 at a cost of $216,000, or 20.4 cents per cubic foot. The cost of equipment installed in the building was $20,000, and it is designed to accommodate 750 pupils, making a cost per pupil of $288.

All corridors, classrooms and stairways are of fireproof construction. The roof structure is of wood, and the interior finish is of oak with oak floors in the classrooms. The exterior walls are of face brick with stone trim.
COST AND CONSTRUCTION DATA

Completed October 1, 1925 at a cost of $409,667 or 37.7 cents per cubic foot, this school building has a capacity of 900 pupils, making a unit cost of about $455. The cost of the equipment installed was $24,136.

The exterior walls are of waterstruck brick, and the pitched roofs are of red Spanish tile, while the flat roofs are covered with tar and gravel composition.

The interior is of fireproof construction as regards floors, corridors and stair towers.
The accommodations given here are not what were given by the architects,—some are higher, some lower. There are many ways of taking off accommodations in a junior high, and some of these returned by the architects were so obviously low, while others were obviously high, that it seemed fairer, if a comparison were made, to take them off on the same basis; namely, full quota for classrooms, half units for the industrial rooms, and double classroom unit for the gymnasiums. All these have cost the tax payers about the same per pupil, but in some cases the town has paid for a hall and in others for a school.

One has attempted to prove for the sake of the schools, for the sake of the tax payer, and for the sake of the community, that it is not architectural beauty, either within or without that caused the high cost of such schools as these, but the inclusion of costly space or equipment. There is nothing more vital in the life of the child than being surrounded by beauty. The Thaddeus Stevens school must leave its impress consciously or unconsciously on the children. Although the designer of a school building is somewhat hampered by the necessities of light, that is the architect’s opportunity, and our many good buildings are sufficient evidence that the schools can be made fine examples of design. Not sufficient emphasis has been placed on the beauty desirable in the interior. Classrooms have been cursed by the necessary blackboards; one believes that a needless amount has been demanded everywhere; but surely in the junior high the recitation room, under the guidance of its teachers of English or of geography, might well be made a room that would be more like a charming home study or library than a classroom.

Editor’s Note.—It is of little use for architects to practice economy in the preparation of their specifications and in their plans and elevations for school buildings if politicians are going to influence and control the selection of contractors; and too often it happens that contracts have been let on carefully planned and specified buildings for definite amounts of money and appropriations of sufficient amounts made by municipal governments, only to have costs tremendously increased during the progress of the work by so-called “extras” claimed by politically subsidized contractors. Often have thousands of dollars in pure graft been added to the costs of school buildings on the pretext of including extras, which are usually unjustly charged to the oversight of the architects. Graft-ridden communities can never expect to get the full value of money expended on schools and town halls.
Photos, Frances Benjamin Johnston

GENERAL VIEW

CORRIDOR ENTRANCE
WASHINGTON GRADE SCHOOL, SOUTH MANCHESTER, CONN.
FRANK C. FARLEY, ARCHITECT; WILLIAM HARMON BEERS, ASSOCIATE ARCHITECT

WINGS TO BE ADDED

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Having a capacity of 360 pupils, kindergarten to eighth grade, this school was built in 1915 at a cost of about $55,000 or about 19 cents per cubic foot.

It is constructed of common brick with cast stone trim and slate roof. The floors are of reinforced concrete, and the roof structure consists of steel trusses and wood rafters.

PLANS, WASHINGTON GRADE SCHOOL, SOUTH MANCHESTER, CONN.
FRANK C. FARLEY, ARCHITECT; WILLIAM HARMON BEERS, ASSOCIATE ARCHITECT
GENERAL VIEW FROM THE WEST

SOUTH ENTRANCE
BOULEVARD SCHOOL, CLEVELAND HEIGHTS, OHIO
WARNER, McCORNACK & MITCHELL, ARCHITECTS

MAIN ENTRANCE

Plans on Back
COST AND CONSTRUCTION DATA

Completed in 1924, this school was built to accommodate 570 pupils at a cost of $267,379, not including the heating plant, gymnasium or auditorium, which are in separate buildings nearby. The cubic foot cost of the main building was 56 cents.

The construction is fireproof, the exterior walls being of brick and stone with terra cotta trim. The roof is covered with a composition of tar and gravel.

PLANS, BOULEVARD SCHOOL, CLEVELAND HEIGHTS, O.
WARNER, MCCORNACK & MITCHELL, ARCHITECTS
COST AND CONSTRUCTION DATA

Built to accommodate 660 pupils, this building cost $281,782 or 41.75 cents per cubic foot and was completed in 1925.

It is of slow-burning construction and has an exterior finish of brick with limestone trim. The sloping roofs are covered with slate, while the flat roofs have a pitch and slag composition covering.

PLANS, TUSCAN ROAD SCHOOL, MAPLEWOOD, N. J.
GUILBERT & BETELLE, ARCHITECTS

374
COST AND CONSTRUCTION DATA

This school was finished in 1923, being planned to accommodate 550 students at a total cost of $152,000 or 21.5 cents per cubic foot.

The construction is fireproof, the exterior being of pressed brick with terra cotta trim and slate roof.

SECOND FLOOR

FIRST FLOOR

PLANS, JOHN L. SHEARER GRAMMAR SCHOOL, NAPA, CAL.
W. H. WEEKS, ARCHITECT
ALAMO SCHOOL, SAN FRANCISCO
J. R. MILLER & T. L. PFLUEGER, ARCHITECTS
COST AND CONSTRUCTION DATA

This building was built to accommodate 1000 pupils and was completed in October, 1926 at a total cost of $371,661.51, making the cost per pupil $371.66. The equipment cost was $6,300, and the cubic foot cost of the building 38 cents. Owing to difficult physical conditions incident to this particular site and plan, these figures do not furnish a fair comparison with other similar work.

The construction is fireproof, being of concrete with steel frame, concrete floor and roof slabs, and stud partitions covered with metal lath and plastered. The exterior finish is brick and terra cotta, and the roof is covered with composition.

PLANS, ALAMO SCHOOL, SAN FRANCISCO
J. R. MILLER & T. L. PFLUEGER, ARCHITECTS
Photos, Richard B. Holt

GENERAL VIEW

ENTEANCE DETAIL

CORAL GABLES ELEMENTARY SCHOOL, CORAL GABLES, FLA.

KIEHNEL & ELLIOTT, ARCHITECTS

SIDE ENTRANCE DETAIL

Plan on Back
COST AND CONSTRUCTION DATA

Completed in September, 1926 at a cost of 35 cents per cubic foot, this school accommodates 700 pupils. The total cost of the equipment was $22,000.

The walls are of masonry, and the roof is of wood construction covered with tile. The corridors on the first and second floors are of fireproof construction.

PLAN, CORAL GABLES ELEMENTARY SCHOOL, CORAL GABLES, FLA.

KIEHNEL & ELLIOTT, ARCHITECTS
EAST ELEVATION SHOWING PLAYGROUNDS

Photos, Gabriel Moulin

MAIN ENTRANCE DETAIL
RAPHAEL, WEILL SCHOOL, SAN FRANCISCO, CAL.
FREDERICK H. MEYER, ARCHITECT

INTERIOR OF AUDITORIUM
Plans on Bach

381
COST AND CONSTRUCTION DATA

This school was completed in February, 1927 at a total cost of $358,990 and is planned for 1100 pupils, making the cost per pupil $326.35 and the cubic foot cost 35.9 cents.

The cost of equipment was $6,800 or $6.20 per pupil.

The building is of reinforced concrete construction with stud partitions. The stairs are of concrete and are enclosed in fireproof concrete towers. The interior trim is Oregon pine, stained brown.

PLANS, RAPHAEL WEILL SCHOOL, SAN FRANCISCO
FREDERICK H. MEYER, ARCHITECT
FRONT ELEVATION

Photos. Drix Durex

SIDE ENTRANCE
CENTRAL GRADE SCHOOL, GLEN RIDGE, N. J.
GOODWILLIE & MORAN, ARCHITECTS

MAIN ENTRANCE
COST AND CONSTRUCTION DATA

At a total cost of $189,000 or 48 cents per cubic foot this school was completed in March, 1925. The number of pupils to be accommodated is 420, making a cost per pupil of $450.

The exterior walls are of brick and cinder concrete with tile backing. The floors are reinforced concrete, and the roof is formed of slow-burning timbers with metal lath and plaster underneath and mission tile on the upper side.

PLANS, CENTRAL GRADE SCHOOL, GLEN RIDGE, N. J.
GOODWILLIE & MORAN, ARCHITECTS
In an article on school houses of moderate size which appeared in *The Architectural Forum* for July, 1925, an illustration and plans of the upper part of this hillside school building were shown. This is the portion outlined in black in the basement plan. As the wings and auditorium are built on the lower grade, upper and lower approaches to the building are possible, and the principal entrances are on the ground level.

GRADE SCHOOL, SOUTHERN PINES, N. C.
AYMAR EMBURY II. ARCHITECT
This building is an excellent example of the adaptation of southern European precedent to the purposes of modern American school architecture. The long rows of classroom windows across the facade of the building are treated with engaged limestone columns, as facing for the mullions, supporting false arches in the brickwork above the windows which gives the effect of galleries or loggias across the entire second and third stories, the windows being recessed somewhat to heighten this effect. The center portion of the building has a fourth story consisting of a large covered play space and two open-air classrooms. The play space is open at the front and rear, and the colonnades forming these openings add still further to the gallery effect. The wings at either end of the building have parapets with iron railings and are paved with wood blocks, forming two additional open-air roof playgrounds. The exterior walls of the first story are of Indiana limestone, the upper portions being finished in brick with considerable limestone trim. The southern European effect of the whole is completed by the sloping roof which is of terra cotta tile.

Ample classroom and recreational space is provided for 1400 pupils, the first three floors being devoted almost entirely to classrooms, while the play space is on the fourth floor as already said. Another unusual feature of the plan is that the two shower rooms on the first floor are public baths. The construction throughout is fireproof, the only wood used being window frames and the finished floors in classrooms and play spaces. The bearing walls are brick and interior columns reinforced concrete. The floors are reinforced concrete of the tin pan type finished with terrazzo in the corridors and toilets. Partitions are of terra cotta and gypsum tile. Work on this building was completed about March 1, 1924, and the total cost was $481,329 or about 37.1 cents per cubic foot. Figured on the basis of a 1400-pupil capacity, this makes a cost of about $344 per pupil.
The Georgian Colonial type of architecture is particularly adaptable to modern school construction where great areas of classroom windows occur in connection with large blank wall spaces, the monotony of which must be relieved in such a way that they form a pleasing part of the whole. The school building illustrated herewith is a very good example of how this can be done, keeping the design in good taste without sacrificing any of the practical considerations of lighting and layout. The exterior treatment is carried out in red brick trimmed with limestone and has wrought iron railings and iron lamp posts at the front entrance steps.

The plans provide accommodation for 600 pupils, and provision is made for extensive future additions in the rear whenever it shall become necessary to expand. There is, in addition to the 17 standard classrooms, lunch rooms, rooms for sewing, cooking, manual training and a library, and a large combined gymnasium and auditorium with a seating capacity of nearly 700. There are also office suites for the superintendent and principal, including waiting rooms, private offices and toilets. The clinic is complete and well equipped, and there are ample locker and shower rooms, and toilet rooms on all floors. Although some of the classrooms are on the basement floor, these are all above natural ground level.

The boiler room, stairways, and corridors are all fireproof construction, and the roofs are of tar and gravel composition. The building was completed in October, 1927 at a cost of $230,000 or 36.6 cents per cubic foot. Had it been built with all floors and roof fireproof, the cubic foot cost would have been about 39.4 cents. Equipment costing $19,000 has been installed in the building. The cost of the school as it was built was about $383 per pupil.
TOWER AND SIDE ENTRANCE

AUDITORIUM ENTRANCE

LINCOLN SCHOOL, TRENTON, N. J.
ERNEST SIBLEY & LAWRENCE C. LIGHT, ARCHITECTS
SCHOOL GROWTH IN SOUTHERN CALIFORNIA

BY

JOHN C. AUSTIN

ARCHITECT

DURING the past ten years the population of southern California, and more particularly Los Angeles, has increased at such an unprecedented rate that one hesitates to tell of it, fearing that those who read or hear about it will consider it just that much "more southern California "bunk." Yet the federal government, in preparing its annual estimates of the population of cities, usually omits Los Angeles on the ground that it is gaining so fast it is practically impossible to arrive at a fair estimate. Carefully compiled statistics actually show that the average daily attendance in Los Angeles schools of all grades was for 1920 to 1921, 160,278; 1924 to 1925, 274,263; 1926 to 1927, 329,538. These figures have been furnished by the Los Angeles Board of Education and are authentic. Therefore, they represent the actual growth of the school population, and are not a part of the propaganda often employed by real estate dealers to boost their business.

Money derived from bond issues can be used only for the purchase of land and the construction and equipment of buildings. No part of it can be diverted for maintenance and upkeep, the cost of which is met by direct taxation. The growth of the Los Angeles school system, as indicated here, is reflected in every school district in southern California in approximately the same proportion. The percentage of increase in daily average attendance in 1927 over 1926 was 8.6 per cent, the year beginning and ending in September. I have taken the average daily attendance as the measure of growth, rather than the enrollment, owing to the number of pupils who may, and usually do, drop out for various reasons. If the enrollment, purely as such, had been considered during the stated period, the actual increase was 9.75 per cent.

Anyone perusing this article need but compare the percentage of growth in his own district with that recorded here to enable him the better to appreciate the difficult and highly important problem now confronting Los Angeles and all of southern California. The $34,640,000, derived from the last bond issue, of June 3, 1924, was expended in this manner: $22,000,000 for buildings, and the remainder for sites and equipment.

Notwithstanding the trying experiences involved in her usual efforts to raise such large amounts of money at such frequent intervals, southern California has always insisted on employing substantial and fire-resisting construction. For instance, all corridors and stairways, auditoriums and boiler rooms have fireproof floors, walls and ceilings; exterior walls are of either brick or concrete. Classroom floors and partitions are generally of wood. This was the method of construction quite universally followed until recent ordinances enacted by the authorities made it compulsory for all buildings of more than two stories to be of fireproof construction throughout. This action, of course, met with the hearty endorsement of a majority of the architects, who believe it is but a forerunner of what will inevitably follow before long, namely, "that all schools, regardless of size or height, must be absolutely fire-proof" to properly safeguard the lives of the children and their instructors. While only the city of Los Angeles is affected by such legislation, it is certain, in time, to exert a wholesome influence on adjacent communities, always ready and eager to copy the older and larger city. Most elementary schools are two-storied, some senior and junior highs three-storied. Therefore, larger sites must naturally be provided than in districts where buildings of greater height are permitted.

The work of qualified school architects has, in many cases at any rate, been recognized, and their services are coming to be more and more appreciated by the school-governing bodies, as they realize that a building with carefully studied, convenient and practical plan and a well designed exterior is by far the most economical kind to construct. They also recognize the fact that good and attractive schools draw new settlers to the districts in which they are located, and that in due course these people become permanent and substantial citizens.

There are included here some illustrations of an elementary school just completed at Beverly Hills, a very popular and rapidly growing community between Los Angeles and the ocean, and considered to be essentially a part of Los Angeles. This building, erected at a cost of $400,000 exclusive of site and equipment, is situated on a gently sloping knoll with an area of about 6.5 acres. It is contiguous to the grounds of a country club on two sides and bordered on fine boulevards on the other two. The general plan is not only unusual, but quite unique, in my opinion, inasmuch as the arrangement separates the younger children from the older and provides each with independent toilet facilities and playgrounds. Special attention is directed to the peculiar requirements of the kindergarten, and first and second grades, in which the rooms were planned primarily to accommodate the equipment and were not considered to be part of a series of classrooms of stereotyped or standard form and size and wholly lacking in individuality. The auditorium seats 750 and has a fully equipped stage, 25 x 52 feet in size, that can be used for concerts, lectures, theatricals, etc., and also for community gatherings as well as for the usual school purposes. The manual training (Sloyd) department consists of a main workshop, rooms for gluing and finishing, lumber storage, tools and sheet metal work, and an instructors' office having full
command of the entire department. The domestic science department consists of a workroom, which is sub-divided into a number of small kitchens, special instruction room, locker room, and dining room, pantry and miniature kitchen. Sewing, fitting, work and supply rooms are essential parts of this department.

The grade classrooms from the third to the seventh are alike, but attention is directed to the convenience of coat rooms and supply closets in each and every one. Free textbooks are supplied by the state of California to the pupils of all public schools. Therefore, a special room for them is provided as near the center of the building as possible. The books are distributed to each classroom, and the teacher is held responsible for them. The administration department occupies the center of the building, and has full command of the main entrance and auditorium, also a good view of the boys' playground. The physical director's rooms are located on a mezzanine floor above the administration department, and are easily accessible to or from the first and second stories. The cafeteria will accommodate 300 and is situated in the basement which, owing to the contour of the ground, is not actually a basement, the floor being level with the finished grade on the east, and splendid light obtained by means of a generous area on the west. I have described this school in detail because it seems to be fairly typical of many erected in this district in recent years. Naturally, while every school cannot have such ideal surroundings, each department in such a school should be arranged to provide every practical convenience contained in this school, known as "El Rodeo de las Aguas," Spanish, meaning "the gathering of the waters."

The heating and ventilating of California schools are not as much of a problem as they are in districts where extremes of temperature commonly prevail. Usually the auditorium and the chemistry department are equipped with plenum systems, all other parts being heated by direct steam and ventilated by leaving the windows open from one year's end to another. Every conceivable style of architecture can be found in our school buildings, but those types indigenous to the countries bordering the Mediterranean appear to be in better harmony with the historical background, foliage and climate of southern

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First Floor

Second Floor

Plans, El Rodeo de las Aguas School, Beverly Hills, Cal.

John C. Austin, Frederick M. Ashley, and W. Asa Hudson, Architects
California, though the Tudor and English Collegiate styles of architecture fit in with many of our picturesque sites and, intelligently handled, readily become a part of the landscape, just as though they had been dropped on the spot. Our costs of construction are very low compared with those of other districts, and for many obvious reasons. All of our building materials, excepting structural steel, are either manufactured or obtained within 50 miles of the building sites, thus enabling our boards of education to stretch their appropriations so as to produce the "most building for the least money" and thereby receive the approbation of the usually critical and sensitive public. It is no more than 15 or 20 years at most since the use of brick was generally adopted in the construction of our schools in lieu of wood, which is still employed, however, for classroom floors, partitions and roof framing in buildings of under three stories. In a few isolated cases reinforced concrete has been used for interior as well as for exterior walls and, at the present writing, it is common practice to make corridor floors and ceilings, stairways, boiler rooms and (occasionally only) auditoriums of concrete.

As already said, all schools of more than two stories, hereafter erected in Los Angeles, must be

Main Entrance, El Rodeo de las Aguas School, Beverly Hills, Cal.
John C. Austin, Frederick M. Ashley, and W. Asa Hudson, Architects
fireproof throughout, in the sense that such construction is generally understood. Vast improvement has been made in the general planning of grade schools, and in the designing of their exteriors, to which, it is quite evident, much serious study and thoughtful consideration are being devoted. The combination of brick or terra cotta, with natural or artificial stone, the latter predominating, owing principally to its lower cost and the fact that there is no suitable stone in this vicinity except granite, has produced many creditable and attractive schools. These have served to stimulate public interest to such an extent that the people not only expect the standard to be maintained but even raised, whenever conditions should justify the indulgence in schools of higher aesthetic character and value. In fact the public is actually beginning to show signs of education, and seems to be better able to discriminate.

Because of the great size of the Los Angeles school district, much of which is sparsely settled, more schools are required in proportion to population than in a community more densely settled. In some sections the only way to solve the transportation problem has been to build more schools. Schools have had to be provided for large communities where, a few years before, there was only vacant land. The attendance at one school which opened with 100 children increased to 1668 in less than two years, rendering quick action in providing additional buildings imperative. Other similar instances could be cited, but this seems to be sufficient to convey a faint idea, at least, of the rapidity of school growth.

Again, in a district inhabited by people of the better class, it is possible, through larger returns yielded by the tax, to secure a school fully equipped to meet all requirements of that particular locality, while in less favored districts this is manifestly impossible. I have in mind a case in point. Some years ago I built a high school in Antelope Valley, about 25 or 80 miles from Los Angeles. This section, about equal in area to the state of Rhode Island, was sparsely settled by people, most of whom were practically compelled to live there because of the state of their health and finances. Many were situated at points so remote from the school that we found it necessary to provide dormitories to house those pupils who were unable to go back and forth in time for the sessions. So they would go home on Friday, returning on Sunday, and meanwhile find lodging in the dormitories. On the occasion of my visits there, after the school was completed and in operation, I was amazed to observe the hardy type of children in attendance, and the eagerness with which they tackled their studies. It was certainly a refreshing and unusual sight, considering the fact that most of them came from very poor homes.

In conclusion, I am so bold as to venture the statement that, all things considered, our schools compare favorably with the best in other parts of the country and, in many respects, even excel them.
Lying as it does in the midst of a broad fertile plain with the mountains for a background, there is a suggestion of northern Italy in the Romanesque treatment of this California school. The general proportions are low-lying and rambling, the main building being laid out in the form of a great L with a cloistered quadrangle in the angle having a large auditorium as its other enclosing wall. The building has been built in two sections at different times and is evidently planned for still further addition in the form of a wing on the right to balance the present wing on the left. Although the greater portion is only one story in height, the rear part of the wing on the left has been carried up a second story to make room for six additional classrooms. Besides having 18 classrooms, the plan provides ample toilet facilities as well as offices, library, auditorium and other rooms for general activities.

The exterior finish is of light colored stucco in combination with light colored variegated brick, used as trim, in which the Romanesque detail is worked out. This in combination with tile roofs gives a southern European effect which is particularly fitting.
COST AND CONSTRUCTION DATA

As originally constructed in 1921, the cost of this school was $97,550. An addition was made in 1926 costing $59,670, which makes the total cost $157,220 or approximately 25 cents per cubic foot. It is planned to accommodate 570 pupils, making the cost per pupil about $276. The value of the equipment used in the building is $6,500.

The exterior walls are of brick and stucco; floor joists and partition studs are of wood with metal lath and plaster. The roof covering is tile.

FIRST AND SECOND FLOORS
PLANS, ANDREW JACKSON SCHOOL, PASADENA
MARSTON, VAN PELT & MAYBURY, ARCHITECTS
GENERAL VIEW

DETAIL, ENTRANCE PORCH
ELEMENTARY SCHOOL, MASSAPEQUA, N. Y.
ERNEST SIBLEY AND LAWRENCE C. LICHT, ARCHITECTS
COST AND CONSTRUCTION DATA

One hundred and seventy-five pupils may be accommodated in this one-story school building, which was erected in 1926 at a cost of $76,000 or 37 cents per cubic foot.

The exterior walls are of face brick, and the roof covering is slate.
GENERAL VIEW

ENTRANCE PORTICO

COMMODORE MACDONOUGH SCHOOL, ST. GEORGES, DEL.

GUILBERT & BETELLE, ARCHITECTS

Plan on Back
COST AND CONSTRUCTION DATA

Completed in February, 1924 at a total cost of $105,198 or 34 cents per cubic foot, this school is designed for 300 pupils, making the cost per pupil $350.66. Although not completely fireproof, the building is of slow-burning construction with brick exterior and composition roof.
Built in the American Colonial style, the beauty of this school building lies in its simplicity, the general proportions, and the classical design of the Doric entrance portico. The treatment of the various roof areas is rather interesting, and the two ventilators surmounting the whole are in harmony with the general proportions of the building. The plan and utility of the layout are frankly expressed by the exterior treatment, there being no attempt to ornament in any way the large unbroken wall spaces occurring on the unlighted sides of the classrooms. The exterior finish is plain brick unornamented in any way except for the entrance, which is of white painted wood, with a graceful wrought iron railing for the steps.

The plan of the building is also very simple, consisting only of six classrooms, two toilets, a teachers' room and the necessary corridors and hall. The heating apparatus is located in the basement. The arrangement of wardrobes in the classrooms seems to be particularly successful.

PACKARD STREET SCHOOL, HUDSON, MASS.
JOSEPH D. LELAND & COMPANY, ARCHITECTS
COST AND CONSTRUCTION DATA

Of the bungalow or one-story type, this school was completed in June, 1925, with a capacity of 210 pupils at a cost of $72,983 or 30.17 cents per cubic foot.

Exterior walls are of brick and hollow tile, and the floors, partitions, and roof are of wood construction.
The principal interest in this bungalow type school, aside from the beauty of the general proportions, is centered in the classical entrance detail, and the graceful cupola which surmounts the roof at the center of the building. The entrance is particularly pleasing, being worked out as a modification of the Doric order in wood painted white, forming a pleasing contrast to the rest of the building which is of plain brick and practically unornamented. The basement course is also of contrasting color, being of white concrete, as are the front entrance steps, which are finished with an iron railing of pleasing design.

In plan the building is also exceedingly simple, being laid out in the form of an "H" and containing merely six classrooms, two toilet rooms and a room for the use of teachers. The boiler room and other mechanical equipment is located in the basement, leaving the entire space on the main floor free for school purposes. In plan and design this building is an admirable example of effective simplicity.

BROAD STREET SCHOOL, HUDSON, MASS.
JOSEPH D. LELAND & COMPANY, ARCHITECTS

Photos. Paul J. Weber

MAIN ENTRANCE
COST AND CONSTRUCTION DATA

The total cost of this building, completed in June, 1925, was $74,346 and the cubic foot cost was 30.69 cents. Each of the six classrooms has a capacity of about 35 pupils, making a total of 210.

The exterior walls are of brick backed up with structural tile. The floors, partitions and roof are of wood construction.
GENERAL VIEW FROM THE HIGHROAD
CENTRAL GRAMMAR SCHOOL, SAN MATEO, CAL.
JOHN J. DONOVAN & SYLVAIN SCHNAITTACHER, ARCHITECTS
COST AND CONSTRUCTION DATA

Costing approximately $88,000, this school was built in 1923 with a capacity of 360 pupils. Cost per cubic foot was 25 cents.

The general construction is concrete with an exterior finish of stucco and tile roof. The floors are of maple, and the interior trim is Douglas fir.
GENERAL VIEW

ENTRANCE PORTICO

GRAMMAR SCHOOL, HOLLISTER, CAL.

W. H. WEEKS, ARCHITECT

Plan on Back
COST AND CONSTRUCTION DATA

Constructed of pressed brick and artificial stone, with terra cotta tile roof, this one-story school building was completed in 1922 with a capacity of 225 pupils.

The total cost was about $100,000 or about 26 cents per cubic foot, making the cost per pupil $444.

GENERAL PLAN

GRAMMAR SCHOOL, HOLLISTER, CAL.

W. H. WEEKS, ARCHITECT
The simplicity of the Colonial design used here is very pleasing in a school of this type. Being all on one floor and designed for a capacity of 385 students, it necessarily covers considerable area and is laid out with two wings containing classrooms on either side of the central section in which are located the library, assembly room, teachers' and principal's rooms and some classrooms.

The exterior treatment is carried out in plain brick laid at the corners to give the effect of quoins. The main or central entrance consists of a rather plain brick arch with white stone keystone and impost blocks. The side entrances in either wing are somewhat more decorative, being of white woodwork in pleasing Colonial design. All the entrance steps have graceful iron railings.

The building was completed in 1926 and cost $152,000 or 37.5 cents per cubic foot. This makes the cost per pupil about $457, without counting the cost of the building's equipment.
THE ONE-STORY SCHOOLHOUSE

BY

MATLACK PRICE

THERE is a growing feeling that the ideal elementary or primary school building for the suburban community is the one-story type, which is not only attractive in itself but attractive likewise in its relation to the residential character of its environment. For this reason, also, it can definitely be said that it adds to the character of a residential neighborhood rather than in any way detracting from it, and its low lines give something of a domestic quality that correlates the school with the home.

Recent school buildings in progressive communities have been designed in general character with the styles suggested by locality or precedent, and architects make every effort to create stylistic harmony throughout the entire school system of the community. The one-story primary school, thus, is designed as a building related to the larger school buildings, and a pleasing consistency is the result. This harmony in design has been carried out with excellent effect at Hempstead, New York, where the high school is a monumental building of Georgian Colonial design, and the Franklin and Fulton primary schools are of the one-story type, adapting the same stylistic manner. Generous shelters have been provided for these two buildings, giving ample protection to the pupils who arrive early and furnishing a play space for use in bad weather. Certain conditions which are part of the daily routine of the primary school have led architects to give their best attention to meeting these conditions with definitely intentioned plan features. Since play and physical training are essential parts of modern school procedure, even for very small children, the large corridor or lobby in front of the assembly room is an important element in the plan. And in the assembly room itself, which has an average seating capacity of 450, half the floor space is left open for play and for physical exercises. The portion provided with seats is designed to accommodate class groups in assembly.

School boards have found that definite advantages are secured through professional architectural guidance in this, as in any other school project, and that the architect can and will be glad to assist with the landscaping problem, and with such details as furniture, draperies and equipment, all of which should harmonize in character and color with the entire scheme. The details may seem unimportant, and yet if they are neglected or poorly done much of the result of the architect's skill and labor may be lost, or at least rendered far less effective than might otherwise be the case. The necessity for practicing economy is ever present with boards of education, and on this account they often hesitate to employ the architect's services on these supposedly unimportant details of the work. Any architect, however, who desires the complete and ultimate success of his building, is entitled to render such service, and would rather do so than discover, at the end, that the setting for the building or its furniture and its other equipment do not faithfully carry out his origi-
inal conception of the finished scheme. Among other features provided by the architect who equips as well as designs the school building are ventilated wardrobes at the rears of the classrooms, the doors of which open and close together. Above the blackboards are exhibition boards, covered with soft-toned burlap and planned to provide generous exhibition space. The music room is provided with a stage, with an entrance from the corridor, and this room proves a valuable adjunct to the school for classes in visual instructions, civics, theatricals and for Mothers' and Parent-Teachers' meetings.

A little specific information is more valuable than quantities of generalities, and architects and school boards alike will probably find considerable definite suggestion in the notes on a few primary school buildings illustrated in connection with this number. Plate 80 illustrates the Franklin School. If it were possible to cite the source which inspired the design of this building, as well as some others also presented here, the old Colonial mansions and homesteads of Maryland and Virginia would come nearest to supplying the answer. Three characteristic features have been retained,—the main center building, its two end wings, and their connection by means of open shelters, as at Mt. Vernon. Only sufficient basement space was allowed to accommodate the oil burners, so that the building is but three steps above the ground. A large kindergarten provides work and play space for kindergarten and first grade children, and the music and visual instruction room, and the library, with book shelves and fireplace, are delight-
ful innovations in this modern primary school. Little chairs and tables of Colonial design, a miniature piano, attractive hangings and accessories everywhere greet the eye, and so completely is the spirit of childhood expressed throughout that one experiences a feeling of surprise when an adult enters the picture. The building is planned for future extension, with possibly a two-story wing in the rear, if the growth of the community demands it, thus forming across the court a background for the beautiful, homelike facade of the little children's schoolhouse. The school just described cost, in the metropolitan district, about $130,000, which is probably 20 per cent or 30 per cent more than it would cost in the middle west and south. It is of fireproof construction, excepting the roof timbers, and has face brick on all sides. Due to the saving in heavy construction, floor slabs and the other structural necessities of larger buildings, the cost per pupil for similar construction is appreciably lower than in buildings of two or three stories.

Elementary School No. 4 at Bergenfield, New Jersey, is a building of a type similar to that just described. It was recently completed, and is planned, due to its site, for a different scheme of enlargement. Its unusual charm is evident in the accompanying reproduction of a water color drawing, but for a more adequate impression photographs (not yet available) of the finished building are essential. This school has been built at a cost of about $152,000.

The Massapequa School. The variety of plan and design possible in schools of this same size and type,
and serving the same general purpose of housing the primary grades, is indicated by the unusually quaint building, with its unique plan, developed for Massapequa, New York. (Plate 74.)

School for School District No. 1 and Owen D. Young, Van Hornesville, New York. When the village school at Van Hornesville, New York burned to the ground last year, Owen D. Young saw his opportunity to give to the school children of his home town a building that would give them more complete educational opportunities than are usually provided in a rural community. His love and appreciation of all that is native to Van Hornesville and its vicinity caused Mr. Young to decide not to import anything necessary to the building of the new school—excepting his architects. Securing the choice of all the available building sites, he proceeded to engage local workmen exclusively, and one of the most interesting facts about the entire project has been that the youngest skilled workman on the work was 67 years of age and the oldest 83. They are master craftsmen of the old kind—a type rapidly vanishing. Old walls dividing the Young, Van Hornesville and other nearby farms furnished the stone for the walls of the building, and these, when split ready to be laid, revealed a wonderful variety of sparkling color effects in red, black, lavender, rust and gray.

In addition to two regular classrooms which can be thrown together for community purposes, the building provides rooms for manual training, domestic science, teachers' room, and a library, which will also be the library for the village. Nor does the ultimate plan stop here, for it has been laid out with a view to indefinite enlargement, by a group scheme, and eventually it may comprise a district high school. The rooms at the rear of the building overlook a large playground, seen across the picturesque Otsequaga Creek, which is crossed by rustic bridges, which are a part of the landscaping scheme. It is an appropriately simple scheme, planned by Mortimer Merritt, landscape architect, and will provide a setting for the building which will form altogether a delightful picture. As the ground at the rear slopes rapidly away toward the bank of the creek, this natural grade allows for an entrance under the classrooms, and for a spacious room for the storage of playground apparatus during the long winter. Beautiful floors and woodwork are being put in place, and the building is equipped with the best and most modern of plumbing, heating and electrical systems, special provision being made so that all developments in radio, vitaphone and television may be enjoyed within the building. The furniture, which is to reproduce early American forms, is being made by a few veteran craftsmen.

The present building overlooks the main highway between Cooperstown and Fort Plain, and has already attracted wide attention, not only on account of its beauty and the surprise of finding it in so small and unpretentious a community, but because the donor, Mr. Young, is a figure of national and international prominence. Born in the hills overlooking the village which his ancestors settled generations ago, Mr. Young now maintains his most frequent residence, "By the Side of the Road," in the village of Van Hornesville, which he has beautified.
THE PRIVATE SCHOOL

BY
CHARLES G. LORING, ARCHITECT

The characteristic flavor of a private school may be derived from advanced educational theories or from the acute social desires of its organizers and clientele. These surprisingly diverse motives, even when they occur simultaneously, can be easily reconciled by the architect. An out-and-out educator looks upon the institution as an opportunity for research, for the introduction of new and better methods of developing the minds and characters of the young. The worldly-wise parent looks upon the private school as the matter-of-course means for the selection of the fittest human environment. Unlike as they are, the earnest believers in these two creeds have one common denominator,—the avoidance of mass production.

In designing public school houses, the architect is cribbed, cabined and confined. The building committee has only limited funds; the new structure must not cost more than so many cents per cubic foot, nor more than so many dollars per pupil. For economy in teaching force, the classrooms must hold the determined maximum which one teacher can put through the daily mill. Regulations prescribe the minimum breadth of corridors, the minimum number of toilet fixtures, the minimum area of windows, the minimum width of treads, and seldom are these basic limits exceeded. The inspiring challenge to the imaginative designer, after the skill and common sense of the planner and the builder in him have done their utmost, is to clothe the factory of education with a dignity and graciousness which will in some measure stimulate the pupils and their teachers and enhance the beauty of the community.

Private school buildings are the products of successful business ventures or the remorseless extraction of "loans" from parents, or of fine, fat endowment funds. Occasionally, when the wherewithal is not adequate for a permanent plant, an old house is remodeled or a frankly temporary and experimental structure is evolved. The latter is often somewhat akin to the small, one-teacher schools in the country or the "portable bungalows," the overflow make-shifts in congested cities. The Shady Hill group, designed by S. W. Mead, was built on a strictly limited budget and on the assumption that wooden roofs and walls of clapboards lined with plasterboard would last till new generations of parents had rolled up a fund for a more permanent type of construction. There are nine buildings in the little village, all one story in height. Four house the assembly hall with administrative offices and show rooms, the laboratory, the studio and the carpentry shop; the other five units each contain two classrooms, each with a supplementary small workroom connected by glazed double doors, and two toilet rooms. The classrooms have one long side to the south and one end with continuous windows so glazed that they may be completely opened, and additional windows on the north. The rooms have sufficient depth to allow the movable desks and chairs to be pushed back out of the direct sun. Simplicity, freedom, quiet and fresh air were the key words in the cooperative venture, jointly developed by parents, teachers and architect.

In private schools the classrooms have fewer...
pupils than in the public schools,— often no more than 20 for the upper grades and 15 for the lower, in place of the usual 35 or 42, but the rooms themselves may be no smaller. In fact for the younger pupils there is often a clear space left near the desk for group work, and for the older pupils for conferences and seminars. In municipal schools a fireplace is not considered a luxury in the kindergartens, and this attractive (and hygienic) feature is carried into the upper grade rooms in many private academies to relieve the austerities of blackboards and desks. Open-air classrooms, or at least classrooms which can be opened up on two or three sides, are sometimes introduced, though this feature is not in such vogue as formerly, the eccentricities of American winter climate tending to restrict their use. The introduction on a commercial basis of window glass which allows the passage of the sun’s ultra-violet rays has appropriated for the average schoolroom one of the advantages of the open-air type. The rest room for day pupils is a definite feature, and it may sometimes be in the form of a loggia and sometimes as an adjunct to the lunch room.

In some states and localities the boards and inspectors who try to teach the teachers how to plan to the best advantage for the health of the pupils prescribe rules for ventilation, circulation and fenestration. Massachusetts, for instance, calls for windows with one-fifth the classroom floor area, two means of egress from each room, and fan ventilation. New Hampshire in her public schools allows window ventilation, but is dead set against windows placed behind the teacher and so shining in the faces of the pupils. Some other states don’t meddle, and the architect who is more preoccupied with the design for a monumental or picturesque facade may cut down the window openings. A most romantic boarding school in Connecticut has as few and as small windows as a Surrey farm group, but the class-rooms and sleeping quarters must pine in vain for a flood of good, outdoor light! Eye strain and murky interiors have more effect on the body and mind of both pupil and teacher than may be atoned for by the most fascinating craftsmanship and stage setting of the exterior of the school buildings. Indulging a beautiful fad is not a progressive step in education.

Much is demanded in the way of auxiliary units in a private school. Grade for grade, the rooms for drawing and for domestic arts, for manual training and for science, above all for luncheon and for recreation, are usually more cheery and more ample, while the library invites contemplation and browsing rather than suggesting only organized group research and the pursuit of original sources. Such effects are not due to the expenditure of more money on decoration than in the typical public school but frequently to the larger ground area, fewer stories and more rambling plan of the private academy and the avoidance of standardized floor heights. Commercial rooms are notably absent, but music cubicles take their places. Perhaps this summarizes the obvious differences between the expenditure of tax payers’ money and the expenditure of donations. In the boarding school or the modern day school where the pupils spend the afternoon, the playrooms and the playgrounds are of particular importance. Yacht model building, printing the school paper, costume designing, wireless experimentation and general tinkering with mechanical gadgets or the crafts of enameling and metal work are all introduced as indoor sports, with the educational features well disguised in the fun of the thing. And whether for boys or girls, there must be space for these pursuits.

The Roxbury Latin School, designed by Perry, Shaw & Hepburn, is an excellent example of the suburban private school of the “country day” type. The grounds are ample to screen the building from the neighborhood and are well planted with trees and
shrubs and there are playgrounds for organized and for informal sports. Although there is a separate house for the masters, there are no "boarding" pupils and no need for non-scholastic buildings such as dormitories, an infirmary, or a chapel,—departments the planning of which is not specifically identified with schoolhouse design. The original program emphasized a desire for a friendly personality, even requiring fireplaces in all the classrooms, and the building has struck this note admirably. The plan is rambling and this allows a definite coordination into four departments: (1) administration, (2) academic, (3) lunch room wing, and (4) auditorium wing. This further allowed part or all of the building to be constructed at one time. The classrooms have all the same orientation, and their bay windows give to the rooms a sunny informality and to the exterior a charming individuality. The typical classrooms are about 29 1/2 feet in length by 24 1/4 feet wide and are intended for 25 pupils each. The clock tower not only suggests the time-honored tradition of the bell but serves as a semi-isolated stair well and as a centralized location for the ventilating fans.

The Georgian style is closely enough allied to the early traditions of the state, and in its free use there are avoided many of the restrictions of Colonial.

One of the minor skirmishes still unsettled between warring groups of pedagogues on the public payrolls concerns the storage and supervision of pupils' outer wraps. Except in the kindergartens and the one-room school, the coat room, per se, has gone down in defeat, its floor area being too large and its visibility too low. For the lower grades, the wardrobe built into the classroom wall, with group doors, has the greater number of followers, for it is inexpensive, easy of control and may be well ventilated. For the upper grades, where the classes circulate from room to room, often subdividing and then coalescing again, the "home room" unit is not practical, and the majority of experts favor individual steel lockers, built into the main corridors or grouped in alcoves. On one thing both sides agree:—there must be supervision or security. Not so in the private school, at least in the smaller type; there, wardrobes may be ranged unlocked along the corridor walls, for the idea is to inculcate honesty. In quantity production this is a far more difficult undertaking! In plants which do not have separate locker buildings, the parking space for outside wraps must be generously supplemented by locker rooms, convenient to the gymnasium and to the athletic fields.

The assembly hall and the playroom or gymnasium (the name suits the ages of the pupils) vary in their mutations, but they may be grouped in three classifications: (1) Separate; where the expense is great, but the problem simple. (2) Combined in one; a none too satisfactory compromise and requiring much chair storage space and janitor service. (3) Articulated; that is with the two back to back, separated by folding partitions or heavy curtains, where, in theory, the auditorium seats may be used for spectators of games in the gym and where the gymnasium may be used to enlarge the stage enormously. The separate units are to be preferred, if the size of the school and the need for organized, competitive games justify the expense. After all, the treatment of an auditorium for proper acoustics and suitable decorations is incompatible with washable and rough-usage gymnasium walls and ceilings. A stage suitable for music and theatricals is a poor background for a basket ball goal, and the moving of chairs from storage, setting them up and then replacing them, is not a task which will be lightly undertaken for one evening's entertainment or one morning's address by the headmaster. The "articulated" hall and gym (each profession has its own trick vocabulary) was highly favored in the larger high schools a few years ago, but it has not been
introduced into the private schools where those with heavy enrollments have land enough and money enough to build separate structures for their athletics and for their assemblies. In some of the smaller boarding schools and in some of the larger day schools the auditoriums are adapted to religious services. In all cases it is well to have the hall so located that it is easily accessible to the pupils for general assemblies or class work and yet with independent doorways so that it may be used without interference with the rest of the plant.

The boarding school group of many buildings, set on the open hillside, or the suburban country day school, with its trees and grassy playgrounds, pictures the private academy at its best and overshadows the rural and small town public schools; but when the pay-as-you-enter institutions of learning come within the congested city limits, their personalities fade; land values restrict their facilities, and the teeming municipal high schools make a far grander show and often are better equipped. Playgrounds are driven to the roof, libraries and lunch rooms are cramped, and even the classrooms sometimes have a much smaller area of floor per pupil. The corner lot is much to be desired, and R. Chipston Sturgis' Brimmer School, with streets on three sides, presents an interpretation which is at once dignified, practical, expressive of its purpose, and economical.

Standardization of the rubber stamp ideal is out of the question in the designing of private schools. In size they may range from the kindergarten of one or two rooms to the long established boarding schools with collegiate plants including guest houses for visiting parents and fraternity houses for the boys. The theory of pedagogy on which they are based may lean toward "the development of the individual" and have no two classrooms shaped or decorated alike, or toward "the development of character" and have a military academy in gaunt barracks. The administration in one school will have all the teaching done in "home rooms" supplemented by a few laboratories and special units; another will have large "study rooms" with many small recitation rooms as well as the auxiliary units. And with the exterior treatment the funds and the fancies of the building committee are the only outside limitations on the architect. The Colonial style is a prime favorite in New England, where education has become almost a major industry, and in Virginia, where children are sent for a modified winter climate and a taste of Southern traditions. The Gothic, especially the domesticated British version, is popular with ecclesiastical schools, and its flexibility in fenestration is a great advantage. In Florida and California the Spanish is the correct thing, and in New Mexico some schools have been constructed after the old pueblos, truly American. With such freedom of action before him, the architect need only coordinate minds of educators, vision of parents, and inarticulate reactions of children with his own technical business and artistic experience in order to undertake the designing of a private schoolhouse!
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Remington Rand
BUSINESS SERVICE INC.

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THE pencil comfort and satisfaction you obtain when using VENUS is due to the perfect uniformity of the smooth, gritless, non-crumbling leads which you can use right down to the last inch—a factor that means pencil economy.

Made in 17 degrees for every pencil requirement; each degree absolutely uniform, always—a feature of particular importance to engineers, draftsmen and architects.

The wood is specially selected cedar, of the best quality obtainable; and the distinctive water-mark finish enables you to easily identify VENUS Pencils—a mark recognized the world over as a symbol of pencil quality.

17 Black Degrees—3 Copying

For bold, heavy lines . . . 6B-5B-4B-3B
For writing, sketching . . 2B-H-1H-F-H
For clear, fine lines . . . . 2H-3H-4H-5H-6H
For delicate, thin lines . . . 7H-8H-9H

Plain Ends per doz. . . . $1.00
Rubber Ends, per doz. . . . . 1.20

At Stationers and Stores throughout the World

American Lead Pencil Company
229 Fifth Avenue New York
Low cost floors for schools—more durable—quiet

Oak Blocks (FabriCELLized) cost much less, laid and finished, than the more usual strip flooring. They are laid in mastic (Barrett XC) directly over cement, without nails, saving the material and labor cost of screeds, floor fasteners, cinder fill, and subfloor. Also save at least 2½ inches in height per story, with resultant economy in structural cost. This total combined saving often exceeds the entire cost of the block floor. Three sizes: 6¼', 9' and 11¼' squares, in all standard grades.

Each block is a complete unit, three or more oak strips, splined together. Each block is BruCELLized, a marvelous chemical process developed in the Bruce laboratories, which prevents shrinking or swelling, and increases durability. As a result, the floor will remain firm and level, and as the mastic is sound-deadening, is more quiet than any other permanent floor covering. Low cost, lowest maintenance, together with distinctive beauty, are now possible in school floors for rooms of any area.

The holding power of mastic is such that ¼-inch screws, entering the wood only, secure the seats firmly. In remodeling, over old worn floors, Bruce FabriCELLized blocks are also laid in mastic, without nails.

The FabriCELLized block floor is insect proof; moisture proof. Easier to lay, scrape, and sand. Will not change in size, and takes a superior finish. For full technical information, write E.L. Bruce Co., Memphis, Tennessee, The largest manufacturers of oak flooring in the world.
Something you may not know about Kraftile

Ordinary tile is made by the veneer method, the glaze being applied after the first firing.

Kraftile is made by an exclusive monolithic method, the glaze and the body being burned in one continuous firing at an intensely high temperature and thus fused inseparably.

This is one reason why Kraftile has such remarkable resistance to wear and is crack, craze, and frost-proof.

The Kraftile catalog contains all the surprising facts about our product and shows in full color, our decorative and plain faience and interesting renderings.

Kraftile is used for walls and floors and for interior and exterior work.

Dictate a note to your secretary today requesting the Kraftile catalog.
Kundtz Eclipse Perfected School Furniture

Healthful, Sanitary and More Durable

In the design of Kundtz Eclipse school furniture, Kundtz engineers have first given consideration to the comfort of the growing children in school. Equipment has been produced that helps the children maintain correct posture, and that keeps their little bodies at ease. This means much both as to their health and to their ability to concentrate on the lesson at hand.

A BRAND NEW FINISH

All Kundtz Eclipse desks and chairs are now finished with a newly developed crystal enamel, baked onto the metal. The properties of this finish make the metal support highly resistant to the scuffing of active little feet. Kundtz Crystal Finish is smooth, dustproof and easy to keep clean.

From the standpoint of appearance, Kundtz Crystal Finish blends harmoniously with the walnut lacquered desk tops and seats. The desk top itself is finished with a hard tough lacquer that keeps its newness in spite of sharp pencil points, dropped rulers, or ink stains.

A complete description or models with recommendations as to the style best suited for the specific installation, will be forwarded to architects interested in equipment for new school buildings.

The Theodor Kundtz Company

ECLIPSE

SCHOOL FURNITURE

CLEVELAND, OHIO
can’t spot these new soil-proof linoleums

So remarkable a development as the Sealex Process of soil-proofing linoleum has very naturally aroused widespread interest among all those concerned with floors. Architects, general contractors and business executives who have seen this improved linoleum regard it as a tremendous advance in linoleum manufacture.

Originated by Congoleum-Nairn Inc., the Sealex Process has the effect of penetrating and sealing the tiny pores of the linoleum so that dirt cannot grind into it. Grease and liquids can be readily removed without leaving a spot or stain. This process also increases the durability and flexibility of Gold Seal Linoleums.

Gold Seal Linoleums made by the Sealex Process are ideally suited for hospitals, business offices, restaurants, schools, private residences. The soil-proofness of these floors and their ease of cleaning open the way to maintenance economies which business men are sure to welcome.

VALENTINE'S
FOUR-HOUR
FLOOR VARNISH

Dries ready for use or second coating in 3 to 5 hours. Provides a tough, hard-wearing surface. Works easily. Flows freely. Is exceedingly pale in color and more resistant to water and soap than the ordinary floor varnish.

Speed is the word these days and Valentine sets the pace with two new quality-varnishes which dry hard in four hours! Valuable time is saved in finishing floors and woodwork! Clients are surprised and grateful that rush jobs can be completed in such short order! Floors and trim varnished in the morning, ready for use by afternoon! Two coats in a single day! Less than half the usual time.

Faster and cheaper than shellac—when you consider that two coats of Valentine Four-Hour Varnish is equivalent in "body" to 3 or 4 coats of shellac.

And these Valentine quality varnishes far excel shellac in beauty and durability.

VALENTINE & COMPANY
386 Fourth Avenue, N. Y. C.
Chicago Boston
2500 Prairie Ave. 49 Purchase St.
Pacific Coast, W. P. Fuller & Co.

VALENTINE'S
FOUR-HOUR
INTERIOR VARNISH

A very full-bodied elastic varnish for interior trim and cabinet work. Dries to a tough, hard surface in 3 to 5 hours. It is pale, free-flowing, with the ideal brushing and filling qualities of the finest interior varnish.
THIS INTERIOR FLAT FINISH IS

WASHABLE throughout long life

White-lead and flatting oil give a paint that stays washable... that can be safely cleaned again and again because nothing in it becomes soluble in water.

A very desirable quality in a flat paint is that it be washable. Important, too, is "How long does it remain washable?" Can it be safely cleaned with soap and water not only a few months after it is applied, but a year, or two years, or longer? Washability is one of the outstanding characteristics of paint made with Dutch Boy white-lead and flatting oil. Here is a flat paint that will withstand many washings... that stays washable throughout its long life.

There are very definite reasons for the extreme washability of this paint. Its vehicle, flatting oil, binds the pigment particles together strongly. Its pigment, white-lead, undergoes no chemical change under ordinary conditions indoors... it is insoluble in water and stays so. Therefore, it does not wash off and leave streaks on the wall or woodwork.

No brushmarks—no laps

Furthermore, with Dutch Boy white-lead and flatting oil you can count on an interior finish unspoiled by brushmarks, laps and joints. This flat paint possesses to an unusual extent the ability to level itself out. Thus it gives a smooth, even finish free from brushmarks. At the same time, it "sets up" slowly. It remains workable on the wall long enough to permit the joining of one painted surface to another without laps or joints showing.

Color, design, finish

Being mixed to order specially for each job, this pure all-lead paint is extremely adaptable. You can obtain the exact tints required to express fully your color ideas. You can get both flat and "eggshell" finishes. And if figuration is desired, you have access to the crumpled roll and sponge mottle effects, not to mention blended finishes—the Tiffany, for example.

If you wish further information about these finishes, let us send you a booklet which describes them—"Decorative Possibilities of Paint." We shall also be glad to send a complete specification book which gives formulas for all work, coats, and finishes. Address nearest branch.

DUTCH BOY WHITE-LEAD FLATTING OIL

NATIONAL LEAD COMPANY
The Belvedere Hotel at Baltimore, Md.

The Belvedere Hotel at Baltimore is widely known to architects for its majestic beauty of design. And the interior fully measures up to the exterior. Appointments and decorations are thoroughly modern.

Barreled Sunlight was chosen for painting the side walls throughout—and in the bathrooms for ceilings as well.

In this choice the Belvedere agrees with scores of other fine hotels.

Barreled Sunlight Gloss gives a rich enamel finish with a depth peculiar to itself. Containing no varnish, it flows with remarkable freedom, whether applied by brush or spray. It has unusual opacity—and its surface is so satin-smooth it can't hold dirt embedded. Washes like tile.

When used in the pure white, Barreled Sunlight is guaranteed to remain white longer than any gloss paint or enamel, domestic or foreign, applied under the same conditions.

Barreled Sunlight Flat produces a surface extremely handsome and uniform.

Barreled Sunlight Semi-Gloss strikes a happy balance between the Gloss and Flat.

Sold in large drums and in cans. Where more than one coat is required, use Barreled Sunlight Undercoat first.

See our complete catalog in Sweet's Architectural or Engineering Catalog. Note coupon below.


White or Easily Tinted

By simply mixing colors in oil with Barreled Sunlight white, the painter on the job can easily obtain any desired shade. In quantities of five gallons or over we tint to order at the factors, without extra charge. For tinting small quantities our dealers carry handy tubes of Barreled Sunlight Tinting Colors.

U. S. GUTTA PERCHA PAINT CO.
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Please send me your booklet "Information for Architects," and a panel painted with Barreled Sunlight. I am interested in the finish checked here—

Gloss ( ) Semi-Gloss ( ) Flat ( )

Name .
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City .................. State ..................
The highly integrated resources for chemical research possessed by the du Pont Company have a distinct relevancy to architectural use of an industrial product bearing the du Pont name. For the architect rightly insists upon an unvarying uniformity of behavior in any product he utilizes. Because of a matured manufacturing philosophy, dating back a century and a quarter, of dependence upon what the chemical laboratory contributes to manufacture, any given du Pont paint product possesses, in a notable degree, this unvarying uniformity of behavior.
STARTING with the roof and going down to the foundation line—you must have a harmonious color combination or the entire effect may be spoiled. The same is true of the interior—colors must not “clash”—they must not “jar”.

Selecting complementary colors has been reduced to a simple science with Pee Gee Color Selectors (one for exteriors, one for interiors—both pocket size).

Helping your client select the Color becomes a most pleasant task and it now requires but a few moments—all of the assembling and grouping of colors has been done for you in advance.

Good paint is an economy—it pays for itself many times over in the additional service it renders and the protection it affords.

There are other manufacturers who make good paint—there are none who make any better than that which bears the Pee Gee trademark. It has earned its reputation in the past sixty years.

PEASLEE-GAULBERT COMPANY
Incorporated
LOUISVILLE
Floors in this building are preserved and beautified with 825 gallons of

"61"
FLOOR
VARNISH

Possessing the maximum of resistance to wear and water, "61" Floor Varnish enhances wood grain, adds to the charm of fine interiors and long preserves the original beauty and freshness of newly-laid floors.

Where a rubbed effect is desired, this can be quickly and economically obtained by specifying a coat of "61" Floor Varnish, Dull Finish, over two of Gloss.

Because of its outstanding durability, "61" Floor Varnish has been the choice of leading architects and painters for over 40 years. In large buildings or small — in mansion or bungalow — "61" Floor Varnish, Gloss or Dull, gives the utmost service on floors.

Upon request, we will send you sample panels showing "61" Floor Varnish — Gloss, Rubbed and Dull Finish.

For over three-quarters of a century Pratt & Lambert Varnish Products have been used for every finishing requirement — surface-saving materials to meet every purpose for interior and exterior varnish and enamel work.

Let the P&L Architectural Service Department nearest you help you with any finishing problem.

Write Pratt & Lambert- Inc., 122 Tonawanda St., Buffalo, N.Y. Canadian Address: 34 Courtwright St., Bridgeburg, Ontario.
Essex County Hall of Records

NEWARK is proud of this fine new public building, and well she may be!

The architects are Messrs. Guilbert & Betelle of Newark, N. J.

A notable building, inside as well as outside. The interior finish is of the finest—the painting contractor is Mr. Charles Stopper, and the finishes used are Murphy Transparent Interior and Floor Varnishes, the standard fine interior and floor varnishes for the past half-century, also Murphy Muronic Enamel.

Murphy Varnish Company

Newark  Chicago  San Francisco  Montreal
Do all Paint Will—and More


Exterior Trim finished with Cabot's Double White and Green Collopakes.
Exterior Walls finished with Cabot's Old Virginia White Collopakes.
Roof of Cabot's Creosote Stained Shingles.
Walls and end frieze finished with Cabot's XX and XXX Quilt.

These remarkable colors, ground to submicroscopic fineness by a newly invented process, and colloidally suspended in a special vehicle, are revolutionizing the art of exterior painting. Cabot's Old Virginia White and Cabot's Double White Collopakes are universally accepted as standard for exterior brick and woodwork. Collopakes do not tend to settle in the can,—have more covering power,—and outlast the older types of paints.

We predict that the use of Collopakes will become as general as the use of electric lighting or any other modern improvement.

Ask your dealer for Collopakes and insist on getting them. Send in the Coupon below for full information on Cabot's Collopakes.

Put clay wall coping on the top bricks and the rest will take care of themselves.

CLAY PRODUCTS ASSOCIATION
CHAMBER of COMMERCE BLDG.
Chicago

VITRIFIED CLAY
Wall Coping
AF3-Gray
THIS tile installation offers many contrasting variations of color, glaze, and texture, from full glazed units of repeat to unglazed pavers. Variations are desirable, but harmony is essential. The products of our factory are bound together by a common factor. PATINA GLAZES harmonize with our unglazed PAVERS of solid body color, also with our CRINKLE MOSAICS and MOTTLED FINISH tiles. All of these may be combined effectively in a single project. These tiles are made in many shapes, sizes and patterns. Our catalogs offer many suggestions.

The following catalogs are available to architects only: Pavements, Mantels, Fountains, Bathrooms, General Catalog of Figure Tiles and Borders, etc.

BATCHelder-Wilson COMPANY

LOS ANGELES
2633 Artesian St.

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38 So. Dearborn St.

NEW YORK
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TERRA COTTA

The Expressive Medium

H O M E Telephone & Telegraph Company Building, Pasadena, California, John & Donald Parkinson, Architects.

Strength and beauty of detail are readily secured with Terra Cotta as the working medium. The process of manufacture permits the duplication of delicate ornament at minimum cost.

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19 WEST 44TH STREET

NEW YORK, N. Y.
March, 1928

THE ARCHITECTURAL FORUM

71

Selected List of Manufacturers Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to The Architectural Forum, 385 Madison Ave., New York, or the manufacturer direct, in which case kindly mention this publication.

ACOUSTICS
R. G. Gunterstein Co., 40 Court St., Boston.
Sennestth Plaster, Catalog. 6 pp., 8 x 10 1/2 ins. Illustrated. Contains specifications in two forms (with manufacturers' name and number of items) for ceiling and wall material.

ASH HOISTS—ELECTRIC AND HAND POWER
Gillis & Goughan, 355 West Broadway, New York, N. Y. 5% x 8 1/2 ins. Illustrated. Describes electric and hand power models; watertight sidewalk doors, automatic opening, closing, and locking devices.

BASEMENT WINDOWS
Genflex Steel Company, Youngstown, Ohio.
Truscon Data Book. Catalog. 3 1/4 x 6 in. 128 pp. Illustrated. Contains specifications and connection details.

BATHROOM FITTINGS
A. P. W. Paper Co., Albany, N. Y.

CEMENT—Continued
Pennsylvania-Dixie Cement Corp', 311 East 46th St., New York.
Concrete, Engineering Service Bulletin No. 12. Booklet. 10 pp., 8 1/2 x 11 ins. Illustrated. On use of Celite to secure workability in concrete to prevent segregation and to secure water-tightness.

CONCRETE BUILDING MATERIALS
Celite Products Co., 1300 South Hope St., Los Angeles.
Concrete, Engineering Service Bulletin No. 12. Booklet. 10 pp., 8 x 11 ins. Illustrated. On use of Celite to secure workability in concrete to prevent segregation and to secure water-tightness.

CONCRETE COLORS
The Master Builders Co., 7016 Euclid Ave., Cleveland.

CONSTRUCTION, FIREPROOF
Master Builders Co., Cleveland, Ohio.
Color Mix. Booklet. 18 pp., 8 1/2 x 11 ins. Illustrated. Valuable data on concrete hardener, waterproofer and dustproofers in permanent colors.

DAMPPROOFING
Brochure, 4 pp., 9 x 11 ins. Illustrated. A treatise on fireproof floor construction.

DAMPPROOFING
Brochure, 4 pp., 9 x 11 ins. Illustrated. A treatise on fireproof floor construction.

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Brochure, 4 pp., 9 x 11 ins. Illustrated. A treatise on fireproof floor construction.

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DAMPPROOFING
Brochure, 4 pp., 9 x 11 ins. Illustrated. A treatise on fireproof floor construction.
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 71

DOORS AND TRIM, METAL
The American Brass Company, Waterbury, Conn.
Armstrong Cork Co. (Linoleum Division), Lancaster, Pa.
Battleship Linoleum. Explains the advantages and uses of this particular type of linoleum.
 Бесходня, Тамара. Экологичность строительных материалов в современном мире. Вестник зодчества, № 6, 2015.

ELEVATORS
Sedgwick Machine Works, 151 West 15th St., New York, N. Y.
Frank Adam Electric Company, St. Louis, Mo.
Pick & Company, Albert, 208 West Randolph St., Chicago, 111.
Otis Elevator Company, 260 Eleventh Ave., New York. N. Y.
Concrete Engineering Co., Omaha, Nebr.

ELECTRICAL EQUIPMENT
Frank Adam Electric Company, St. Louis, Mo.
Catalog No. 35—1925. Panellar.s—Steel Cabinets. 74 x 11 ins. Illustrated.
Catalog and pamphlets, 85 x 11 ins. Illustrated. Valuable data on various types of cabinets.

GALLERIES
One

FIREPROOFING—See also Construction, Fireproof
Genfire Steel Company, Youngstown, Ohio.

FLOORING
Armstrong's Cork for use in buildings of various types. Booklet, 85 x 95 ins. Illustrated.

FIREPROOFING—See also Construction, Fireproof
Genfire Steel Company, Youngstown, Ohio.
Armstrong's Cork for use in buildings of various types. Booklet, 85 x 95 ins. Illustrated.

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Armstrong's Cork for use in buildings of various types. Booklet, 85 x 95 ins. Illustrated.

FLOORING
Armstrong's Cork for use in buildings of various types. Booklet, 85 x 95 ins. Illustrated.
American architecture—
a vital poetic force

The architect of the Book Tower, the loftiest and one of the most beautiful of Detroit's business structures, has utilized G-E floodlighting to reveal its artistic distinction at night. The mellow, golden rays preserve all the values of the nicely balanced design, without glare or distortion, and support the ornamental detail with faithful recognition of the architect's conception.

Alfred Noyes recently said: "American architecture is one of the most vital poetic forces in the world today". Electric floodlighting is peculiarly adapted to the genius of American architecture. It marks the rhythm of this "poetic force" and performs its service during the hours when daytime distractions have ceased and men are in the mood to pause, study, and admire.

The architect who provides for floodlighting when a building is designed is sure that his thought will be faithfully interpreted at night as well as by day, and he obviates structural changes that a future installation might necessitate. G-E illuminating engineers offer you their services in thus continuing your message, which else would be interrupted at nightfall.

"This majestic roof fretted with golden fire"
SHAKESPEARE

THE ARCHITECTURAL FORUM

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 72

HEATING EQUIPMENT—Continued

American Radiator Company, The, 40 West 40th St., N. Y.
Ideal Type "A" Heat Machine. Catalog 34, 4 pp., 8% x 11 ins. Illustrated in 4 colors. A brochure of high-efficiency heating apparatus for residences and commercial buildings.
Ideal Hot Water Boilers. Catalog 734 x 976 ins. 32 pp. Illustrated in 4 colors. A compact, all-iron heating boiler of the Water type.
Ideal Steam Boilers. Catalog 734 x 976 ins. 32 pp. Illustrated in 4 colors. Fully explains a boiler free from the objection of condensation.
Ideal Boilers for Oil Burning. Catalog 595 x 854 ins. 36 pp. Illustrated in 4 colors. Describing a line of Heating Boilers especially adapted to use with Oil Burners.
Curtis—The Radiator. Classic Brochure, 9% x 8% x 8% ins. 16 pp. Illustrated. A brochure on a space-saving radiator of beauty and high efficiency.
Ideal Aurora Radiator Warmth. Brochure 6% x 9% illustrated. Describes a central all-on-one floor heating plant with radiators for small residences, stores, and offices.
James B. Clow & Sons, 54 S. Franklin St., Chicago.
C. A. Dunham Company, 400 East Ohio St., Chicago, III.
Dunham Packless Radiator Valves. Bulletin 107, 8% x 11 ins. 8 pp. Illustrated. A valuable brochure on valves.
Dunham Return Heating System. Bulletin 109, 8% x 11 ins. Illustrated. Covers the use of heating apparatus of this kind.
The Dunham Differential Vacuum Heating System. Bulletin 114, Brochure 6% x 8% x 11 ins. Illustrated. Deals with heating for large buildings.
Excella Products Corporation, 121 Clinton St., Buffalo, N. Y.
Excella Water Heater. Brochure, 12 pp. 6 x 9 ins. Illustrated. Describes the excella method of using domestic hot water in connection with heating boilers. (Firepot Coil eliminated.)
The Palus Engineer Company, Knoxville, Tenn.
Sylvania Temperature Regulators. Illustrated brochures, 8% x 11 ins. 12 pp. Illustrated. Dealing with general architectural and industrial applications; also specifically with applications of special instruments.
Sylvania Heating Specialties. Catalog No. 79, 8% x 11 ins. Illustrated. Important data on heating.
Illinois Engineering Co., Racine Ave., at 21st St., Chicago, III.
Vapor Heat Bulletin 21, 8% x 11 ins. 32 pp. Illustrated. Contains views and sizes of the various units of Vapor Heat apparatus. Rules for computing radiation, pipe sizes, radiator transmitting. Steam table showing radiator efficiency and vapor pressures, also description of Illinois Vapor Specialties.
S. T. Johnson Co., Oakland, Calif.
Ventures in Comfort. Booklet, 24 pp., 6% x 9% ins. Illustrated. Describes a valuable line of specialties used in heating.
Kewanee Boiler Company, Kewanee, Ill.
Kewanee Boiler. Catalog, 8% x 11 ins. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.
Kewanee Catalog No. 78, 6 x 9 ins. Illustrated. Describes Kewanee Fire-box Boiler with specifications and setting details.
Kewanee Catalog No. 79, 6 x 9 ins. Illustrated. Describes Kewanee power boilers and smokeless tubular boilers with specifications.
May Oil Burner Corp., Baltimore.
Taking the quest out of the question. Brochure, 16 pp., 6% x 9 ins. Illustrated. For home owners interested in heating.
Milwaukee Valve Co., Milwaukee.
MILVAO Vacuum & Vapor Heating System. Nine 4-p. bulletins, 8% x 11 ins. Illustrated. Important data on heating.
MILVAO Vacuum & Vapor Heating Specialties. Nine 4-p. bulletins, 8% x 11 ins. Illustrated. Deal with a valuable line of specialties used in heating.
Mildine Mg. Co., Racine, Wis. 
Thermode Unit Heater. Brochure, 24 pp., 6% x 11 ins. Illustrated. Apparatus for industrial heating and drying equipment.
Thermode Cabinet Heater. Brochure, 12 pp., 6% x 11 ins. Illustrated. Cabinet heaters to buildings of all kinds.
Nash Engineering Company, South Norwalk, Conn.
No. 17. Utilizing Hytor Retort for Vacuum Heating Pumps, electrically driven, and supplied in standard sizes up to 300,000 square feet equivalent direct radiation.
No. 16. Dealing with Jennings Hytor Air Line Heating Pumps. No. 16. Dealing with Jennings Condensation Pumps, sizes up to 70,000 square feet equivalent direct radiation.
No. 12. Illustrated. Jennings Hytor Vacuum Heating Pumps, Sizes II, IV, for equivalent direct radiation up to 1,000 square feet.
National Radiator Corporation, Johnstown, Pa.
Aero Radiators; Beauty and Worth. Catalog 34, 4 pp., 8% x 11 ins. Describing and illustrating various kinds of residential apparatus.
Heating Homes the Modern Way. Brochure, 8% x 11 ins. Illustrated. Data regarding Petro Boiler Bulletin in a bulletin approved by Investigating Committee of Architects and Engineers.
You can't put real sunlight into your buildings twenty-four hours a day, but you can use a substitute that, in certain respects, is an improvement on the original.

The cheerful, mellow, restful light from Sol-Lux Luminaires affords good "working" illumination—and there's no glare at the source. Even the sun can't give you that.

Sol-Lux has other advantages, too! An occasional washing of the exterior surface keeps the globe clean. Dust and insects can't get inside. The lamp man never removes the globe to change a lamp—the "tilt out" cap in the bottom makes that unnecessary.

If you'll write the Westinghouse Illuminating Engineering Bureau, or the lighting specialists at our nearest office, they'll cover the whole story of Sol-Lux lighting for business buildings, from easier installation and maintenance to finer illumination.
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS

HEATING EQUIPMENT—Continued


Present Accepted Practice in Domestic Oil Burners. Folder, 8¥/4 x 11 ins. Illustrates. Booklet from Heating and Ventilating Magazine.


The International Nickel Company, 67 Wall St., New York, N. Y.

The Frink Co., Inc., 24th St. and Tenth Ave., New York City.

The Kny-Schecter Corporation of America, 119 Seventh Ave., New York City.

Armstrong Cork & Insulation Co., Pittsburgh, Penn.

The Pick-Barth Companies, Chicago and New York.

Wilmot Castle Company, Rochester, N. Y.

Kay Rotary Furnaces, Booklet. 16 pp. 8¥/4 x 11¥/4 ins. Complete line of rotary furnaces, blast and multiple concentrators, warp retarders, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses.

The International Nickel Company, 67 Wall St., New York, N. Y.

Hospital Applications of Monel Metal. Booklet. 8¥/4 x 11¥/4 ins. 16 pp. Illustrated. Gives types of equipment in which Monel Metal is used, reasons for its adoption, with sources of such equipment.

The Key-Scheerer Corporation of America, 129 Seventh Ave., New York, N. Y.

Hospital Equipment, 56th Edition. 74 x 10¥/4 ins. 224 pp. Illustrated. Complete description of Hospital and Surgical Furniture, Hospital Appliances including Operating Tables, Cabinets, Stools, Chairs, Dressing and Dressing, also Hydrotherapeutic Apparatus.

Surgical Restraints and Catherin Applications of Monel Metal. Booklet. 74 x 10¥/4 ins. 16 pp. Illustrated. Gives types of equipment in which Monel Metal is used, reasons for its adoption, with sources of such equipment.

The Pick-Barth Companies, Chicago and New York.

Hospital Food Service Equipment. Booklet. 31 pp., 7¥/4 x 11¥/4 ins. Valuable data on an important subject.

Wilton Castle Company, Rochester, N. Y.

Sterilizer Specifications for Hospitals. Booklet. 76 pp., 8¥/4 x 11 ins. Illustrated. Gives important and complete data on sterilization of surgical instruments and medical supplies, also on insulating boiler walls, breechings, and stacks.


Illuminating Equipment for piping, venting, valving and wiring for hospital sterilizer installations.

Hospitals—Arranging for Service. Five booklets. 8 to 36 pp. 6¥/4 x 9 ins. Illustrated. Deals specifically with sterilizing instruments, operating rooms, x-ray, water, and rubber gloves.

HOTEL EQUIPMENT

Pick & Company, Albert, 208 W. Randolph St., Chicago, Ill.

Serving the Hotel Furnishing a Hotel. Booklet. 75 x 9 ins. Data on complete outfitting of hotels.

INCINERATORS

Kernor Incinerator Company, 725 E. Water St., Milwaukee, Wis.


Garbage and Waste Disposal for Apartment Buildings. Folder, 8¥/4 x 11¥/4 ins. 8 pp. Illustrated. Describes principle and design of Kernor Chimney-led Incinerator for apartments and gives list of buildings where it has been installed.

Sanitary Disposal of Waste in Hospitals. Booklet. 4 x 9 ins. 12 pp. Illustrated. Shows how this necessary part of hospital service is taken care of with the Kernor. Gives list of hospitals.

INSULATING LUMBER

Mason Fibre Co., 111 West Washington St., Chicago, Ill.


Insulation of Woods to Prevent Condensation. Illustrated booklet. 7¥/4 x 27¥/4 ins. 32 pp. Illustrated.


INSULATION—Continued


Celite Products Co., 1320 South Hope St., Los Angeles.

The Insulation of Boilers. Booklet. 8¥/4 x 11¥/4 ins. Illustrated.

On insulating boiler walls, breechings, and stacks to reduce amount of radiation.

Hospital Insulating Specifications and Blue Prints. Booklet, 20 pp., 8¥/4 x 11¥/4 ins. Illustrated. On approved types of insulation.

Philip Carey Co., The, Cincinnati, Ohio.

Carey Asbestos and Magnesia Products. Catalog. 6 x 9 ins. 72 pp. Illustrated.


JOISTS

Bates Expanded Steel Truss Co., East Chicago, Ind.

Catalyst No. 4. Booklet. 32 pp., 8¥/4 x 11 ins. Illustrated. Gives details of truss construction with loading tables and specifications.

Truscon Steel Co., Youngstown, Ohio.


Tables of sizes and safe loads.

Truscon Steel Joist Buildings. Illustrated 32-page brochure attractively illustrating types of buildings equipped with Truscon Steel Joist.


KITCHEN EQUIPMENT

The International Nickel Company, 67 Wall St., New York, N. Y.

Hotels. Restaurants and Canteen Applications of Monel Metal. Booklet. 8¥/4 x 11 ins. 32 pp. Illustrated. Gives types of equipment in which Monel Metal is used, reasons for its adoption, with sources of such equipment.

McDougall Bros., Inc., Chicago, Ill.


File Folder. Service sheets and specifications useful in preparing kitchen layouts.

Domestic Science Kitchen Units. Brochure, 8¥/4 x 11 ins. Illustrated. Deals with flexible line of kitchen equipment.

Pick & Company, Albert, 208 W. Randolph St., Chicago, Ill.

School Cafeterias. Booklet. 9 x 6 ins. Illustrated. The design and equipment of school cafeterias with photographs of installation and plans for standardized outfits.

LABORATORY EQUIPMENT

Alberene Stone Co., 123 West 23rd Street, New York City.


Herringbone Metal Lath. Folder 4 pp., 8¥/4 x 11 ins. Illustrated. Steeltex Data Sheet No. 1. Folder. 8 pp. Illustrated. Steeltex for floors on steel joists with round top chords.

Duriron Acid, Alkali and Rust-proof Drain Pipe and Fittings. Booklet. 8¥/4 x 11 ins. 20 pp. Full details regarding a valuable form of piping.

LANTERNS

Tobin's, Arthur, 139 E. 57th St., New York.


Milwaukee Corrugating Co., Milwaukee, Wis.

The Miller Manual. Booklet. 8¥/4 x 11 ins. 64 pp. Illustrated. Covers Miller methods and materials, metal lath, corner beads, steel domes, channels, etc.

National Steel Fabric Co., Pittsburgh.


Stuteflex Data Sheet No. 1. Folder. 8 pp., 8¥/4 x 11¥/4 ins. Illustrated. Stuteflex for floors on steel joists with round top chords.

Stuteflex Data Sheet No. 2. Folder. 8¥/4 x 11¥/4 ins. Illustrated. Stuteflex for floors on steel joists with flat top shapes.

Stuteflex Data Sheet No. 3. Folder. 8¥/4 x 11¥/4 ins. Illustrated. Stuteflex for floors on wood joists.

Northwestern Expanded Metal Co., 1254 Ohio Colony Building, Chicago, Ill.

Northwestern Expanded Metal Products. Booklet, 8¥/4 x 10¥/4 ins. 20 pp. Fully illustrated, and describes different products of this company, such as Kno-horn metal and Metal Lath. Northwestern Expanded Corrugated. Plaster-saver and longspan lath channels, etc. Longspan 8-inch Rib Lath. Folder 4 pp., 8¥/4 x 11 ins. Illustrated. Deals with a new type of V-rill expanded metal.

A. I. A. Sample Book. Bound volume, 8¥/4 x 11 ins. Contains actual samples of several materials and complete data regarding their use.
From end to end of Fifth Avenue there is scarcely a block without some great building or store using Frink lighting. In the Savoy-Plaza Hotel we have installed double face Empco signs and special show window reflectors.

The Frink Co., Inc.
241 Tenth Ave., New York
Branches in Principal Cities
LATH, METAL AND REINFORCING—Continued

Truscon Steel Company, Youngstown, Ohio.

Truscon 1-A Metal Lath. 12-page booklet. 8½ x 11 ins. Beautifully printed, with illustrations of details of lath and method of application.


LAUNDRY MACHINERY

American Laundry Machinery Co., Norwood Station, Cincinnati, Ohio. Functions of the Hotel and Hospital Laundry. Brochure, 8 pp., 8½ x 11 ins. Valuable data regarding an important subject.

LIBRARY EQUIPMENT

Art Metal Construction Co., Jamestown, N. Y.

Planning the Library for Protection and Service. Brochure, 32 pp., 8½ x 11 ins. Illustrated. Deals with library fittings in general.混乱

Library Bureau Division, Remington Rand, N. Towaunawa, N. Y.

Cutler Mail Chute Model F. Booklet. 4¼ x 6½ ins. Illustrated. A beautifully printed brochure describing cutler's mail chutes. Illustrated with numerous sections of cutler's mail chutes.

Hartmann-Sanders Company, 2155 Elston Ave., Chicago, Ill.

RODDI Doors for Hospitals. Brochure, 24 pp., 9½ x 12 ins. Illustrated price list of hospital doors.

Roddis Doors for Hotels. Brochure, 15 pp., 8½ x 11 ins. Illustrated work on doors for hotel and apartment buildings.

MAIL CHUTES

The Pfister Company, 217 Building, Rochester, N. Y.


LAUNDRY MACHINERY

Amshire Laundry Machinery Co., Norwood Station, Cincinnati, Ohio. Functions of the Hotel and Hospital Laundry. Brochure, 8 pp., 8½ x 11 ins. Valuable data regarding an important subject.

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The Shadow Chasers


Ideal for Hotel Lighting

LIGHT—plenty of it, but well diffused and free from glare and sharp shadow,” specified the architect of the new Lowry Hotel, St. Paul, Minnesota. And so Monax Globes were installed.

Guests of the new hotel found it ample, yet restful to the most sensitive eyes. Reaching far into remote corners, destroying shadows and chasing gloom, Monax Light illuminated corridors and rooms with its golden flood. Yet so perfect was the diffusion, that harsh glare was entirely absent.

Monax Globes are ideal for hotel lighting because they are practical as well as artistic and efficient. They collect no dust and are easily cleaned. They are economical of wattage because they absorb so little light.

Architects and building managers are urged to avail themselves of counsel in designing and installing lighting systems offered by the Macbeth Illuminating Engineers. There is no charge for the service. Macbeth-Evans Glass Company, Department J, Charleroi, Pa.

Monax Globes for Better Lighting
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 78

PIPE


Chow & Sons, James B., 534 Franklin St., Chicago, Ill. Catalog "A," 4 x 10 ins. 700 pp. Illustrated. Shows a full line of steam, gas and water works supplies.


National Tube Co., Frick Building, Pittsburgh, Pa. "National" Bulletin No. 2, Corrosion of Hot Water Pipe. 8 1/2 x 11 ins. 24 pp. Illustrated. In this bulletin is summed up the most important research dealing with hot water systems. The text matter consists of seven investigations by authorities on this subject.

"National" Bulletin No. 3. The Protection of Pipe Against Internal Corrosion. 8 1/2 x 11 ins. 20 pp. Illustrated. Discusses various causes of corrosion, and details are given of the deactivating and desalting systems for eliminating or retarding corrosion in hot water supply lines.

"National" Bulletin No. 4. "National" Pipe in Large Building. 8 1/2 x 11 ins. 88 pp. This bulletin contains 254 illustrations of prominent buildings of all types, containing "National" Pipe, and considerable engineering data of value to architects, engineers, etc.

Modern Welded Pipe. Book of 88 pp. 8 1/2 x 11 ins. Profusely illustrated with halftone and line engravings of the important operations in the manufacture of pipe.

PLASTER


PLUMBING EQUIPMENT


Cranston Pipe. 836 S. Michigan Ave., Chicago, Ill. Plumbing Suggestion for Home Builders. Catalog, 3 x 6 ins. 8 pp. Illustrated. Planning the different types of plumbing to suit the kind of family living the different types of buildings.


Eger Company, Ford City, Pa. Complete Catalog, 364 x 104 ins. 104 pp. Illustrated. Describes fully the complete Eger line of standardized vitreous china plumbing fixtures, with diagrams, weights and measurements.

Empirical Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill. Waterworks Patent Globe Valves, Buzenet Water Closets, Liquid Soap Fixtures, etc. 8 1/2 x 11 ins. 136 pp., loose-leaf catalog, with diagrams, weights and measurements, etc.

Maddock's Sons Company, Thomas, Trenton, N. J. Catalog "K." 8 1/2 x 7 1/2 ins. 242 pp. Illustrated. Complete data on various china plumbing fixtures with brief history of Sanitary Pottery.

Sphoncooler Company, Wilmington, Del. Sphoncooler Showers and Fixtures. Catalog, 455 x 7/5 ins. 230 pp. Illustrated. Describes fully the complete line of modern brass shower heads and brass Plumbing Fixtures, with drawings showing layouts, measurements, etc. Tongue-and-Groove Drain Mound. 7 1/2 x 10 1/2 ins. 16 pp. Illustrated. Modern Showers and Washups for Industrial Plants, showing the sanitary method of washing in running water.

PUMPS
Chicago Pump Company, 2300 Wolfram St., Chicago, Ill. The Chicago Pump to Use. Portfolio containing handy data. Individual bulletins, 8 1/2 x 11 ins, on bilge, sewage, condensation, circulating, steam, building and fire pumps.


RAMPS

The Trane Co., LaCrosse, Wis. Trane Small Centrifugal Pumps. Booklet, 39 x 8 ins. 16 pp. Complete data on an important type of pump.

REFRIGERATION
The Fulton Syphon Company, Knoxville, Tenn. Temperature Control of Refrigeration Systems. Booklet, 8 pp., 8 1/2 x 11 ins. Illustrated. Deals with cold storage, chilling of water, etc.

REFRIGERATORS

REINFORCED CONCRETE—See also Construction, Concrete
Genfire Steel Company, Youngstown, Ohio. Self-Centred Thru-Welded, 8 1/2 x 11 ins. 36 pp. Illustrated. Methods and specifications on reinforced concrete, roofs and floors with a combined form and reinforced material.


Philip Carey Co., Lockland, Cincinnati, Ohio. Specifications, Genisco Standard Trinidad Lake Asphalt Built-up Roofing. Booklet, 8 x 10 1/2 ins. 24 pp. Illustrated. Complete data to aid in specifying the different types of built-up roofing to suit the kind of roof construction to be covered.

Carey Built-up Roofing for Modern School Buildings. Booklet, 8 x 10 1/2 ins. 32 pp. Illustrated. A study of school buildings of a number of different kinds and the roofing materials adapted for each.

Heinz Roofing Tile Co., 1750 Champa St., Denver. Plymouth-Shingle Tile with Sprocket Hips, Leaflet, 8 1/2 x 11 ins. Illustrated. Shows use of English shingle tile with special hips. Italian Promenade Floor Tile, Folder, 8 x 11 ins. Illustrated. Floor tile adapted from that of Davanzati Palace. Mission Tile, Leaflet, 8 1/2 x 11 ins. Illustrated. Tile such as are used in Italy and southern California.

Georgia Tile. Leaflet, 8 1/2 x 11 ins. Illustrated. Tiling as used in old English and French farmhouses.

Ludwig-Celadon Company, 104 S. Michigan Ave., Chicago, Ill. "Ancient" Tapered Mission Tiles. Leaflet, 8 1/2 x 11 ins. 4 pp. Illustrated. For architects who desire something out of the ordinary, this leaflet has been prepared. Describes briefly the "Ancient" Tapered Mission tile, hand-made with full corners and designed to be applied with irregular exposures.


Sheffield Pyrfyld Roof Construction, Folder, 8 1/2 x 11 ins. Illustrated. Covers use of roof surfacing which is poured in place.

SASH CHAIN
Smith & Edgar Co., The, Bridgeport, Conn. Chain Catalog. 8 1/2 x 11 ins. 24 pp. Illustrated. Covers complete line of chains.

SEWAGE DISPOSAL
Kewanee Private Utilities, 44 Franklin St., Kewanee, Ill. Specification Sheets, 7 1/2 x 10 1/2 ins. 40 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.
The Demands of Modern Building

Modern building demands beauty of design as well as utility in exterior lighting fixtures. These fixtures must harmonize accurately with the architectural conception and at the same time embody the latest principles of correct lighting.

Architects will find Smyser-Royer's many years of experience in the iron working and exterior lighting fields of considerable aid to them in carrying their plans to a satisfactory completion.

There are over 300 patterns of every type of exterior lighting fixture in our catalogue “J” which will be sent on request.

Lamp Posts: Lanterns: Brackets

SMYSER-ROYER CO.

Main Office and Works:
YORK, PA.

PHILADELPHIA OFFICE:
1700 WALNUT STREET

No. 433
Scale
3/4"=1'0"
8' high overall

No. 420
Scale, 3/4"=1'0", 7'6½" high overall.
Base, 1'11" square.
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<th>SCREENS</th>
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<tr>
<td>American Brass Co., Thos., Waterbury, Conn.</td>
<td>Facts for Architects and Screen Lusters. Illustrated folder, 9'/2 x 11'/2 ins., giving actual samples of metal screen cloth and a description of by screens and screen doors.</td>
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<td>Athey Company, 605 West 56th St., Chicago, Ill.</td>
<td>The Athey Perforal Window Shade. An accordion pleated window shade, made from transparent Herringbone woven Cotton cloth, which rises from the bottom and lowers from the top. It eliminates awnings, affords ventilation, can be dry-cleaned and will wear indefinitely.</td>
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<th>SHELVEY-STEEL</th>
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<td>David Lupton's Sons Company, Philadelphia, Pa.</td>
<td>Lupton Steel Shelves. Illustrated brochure, 40 pp., 8'/2 x 11 ins. Contains steel shelves, cabinets, racks, partitions, etc.</td>
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<th>SKYLIGHTS</th>
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<td>The Effectiveness of Sidewalk Lights. Folders, 4 pp., 9'/2 x 11 ins. Illustrated. Sidewalk or vault lights.</td>
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<td>In the Light—The Light That's Free. Folders, 4 pp., 9'/2 x 11 ins. Illustrated. Data on securing good lighting.</td>
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<th>SOUND DEADENER</th>
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<td>Cabot, Inc., Samuel, Boston, Mass.</td>
<td>Sound Deadener. Illustrated brochure, 32 pp., 8'/2 x 11 ins. Illustrated. Details of sound proofing by James O. Betelle, A. I. A.</td>
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<tr>
<td>Davis Solid Architectural Bronze Sash. Set of five sheets, 9'/4 x 12'/2 ins. Illustrated. Data on an important type of valve.</td>
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<tr>
<td>Jenkins Valves for Plumbing Service. Booklet, 4'/2 x 7'/4 ins. 16 pp. Illustrated. Description of Jenkins Brass Globe, Angle Check valves, etc., used in home plumbing, and Iron Body Valves used for larger plumbing installations.</td>
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<th>STORE FRONTS-Continued</th>
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<th>TERRA COTTA</th>
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<td>Color in Architecture. Revised Edition. Permanently bound volume, 8'/2 x 11'/2 ins., containing a treatise upon the basic principles of color in architectural design, illustrating early European and modern American examples. Excellent illustrations in color.</td>
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<tr>
<td>Present Day Schools. 8'/2 x 11 ins. 32 pp. Illustrated. Describes a method of purifying water in bathing pools.</td>
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<th>TILE, HOLLOW</th>
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<td>Standard Fireproofing Bulletin 171. 8'/2 x 11 ins. 32 pp. Illustrated. A treatise on the subject of hollow tile as used for floors, girders, columns and beam covering and hollow tile construction.</td>
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<td>Naco Double Shell Load Bearing Tile Bulletin. 8'/2 x 11 ins. 6 pp. Illustrated.</td>
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<td>Naco Omnicore Tile Bulletin. 8'/2 x 11 ins. 4 pp. Illustrated.</td>
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<td>Naco Header Backer Tile Bulletin. 8'/2 x 11 ins. 4 pp. Illustrated.</td>
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<tr>
<td>Nacofoil Bulletin. 8'/2 x 11 ins. 6 pp. Illustrated.</td>
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<tr>
<td>Naco Face Tile for the Up-To-Date Farm Bulletin. 8'/2 x 11 ins. 6 pp. Illustrated.</td>
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<tr>
<td>Kratfiled Company, 55 New Montgomery St., San Francisco</td>
<td>High Fired Enamel Tile. Booklet, 32 pp. 8'/2 x 11 ins. Illustrated. Presents a fine line of tiles for different purposes.</td>
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<th>VALVES</th>
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<td>Crane Co., 836 S. Michigan Ave., Chicago, Ill.</td>
<td>Crane Co. Illustrated. Describes the complete line of the Crane Co.</td>
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<tr>
<td>C. A. Dunham Co., 60 East Ohio St., Chicago.</td>
<td>The Dunham Parkless Radiator Valve Brochure, 12 pp., 8 x 11 ins. Illustrated. Data on an important type of valve.</td>
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for
SCHOOLS

ADEQUATE artificial lighting must always be available in modern school building for day time as well as for night time use. Natural light fails too often to be relied upon as the only source of illumination.

Because of the exacting requirements and peculiar conditions to be met, the planning of the artificial lighting of schools is of utmost importance. School lighting equipment should be chosen on the basis of performance—rather than appearance.

Engineering recommendations to meet the specific requirements of any school will be made by the Holophane Engineering Department without obligation.

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New York San Francisco Chicago Milwaukee Toronto

In the Holophane "Light and Vision" Institute, now open at 342 Madison Avenue, New York, the principles of correct lighting are demonstrable. Architects and engineers are cordially invited to call.
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 82

VENTILATION

American Blower Co., Detroit, Mich.

A.O. Smith Company, Milwaukee, Wis.

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Walk into any building using CELESTIALITE. Then go to a place not using CELESTIALITE and notice the very great difference. Compare the soft white rays of CELESTIALITE with any other light. Talk with those using CELESTIALITE and note their opinion. Observe how long they are able to work under CELESTIALITE without incurring eye-strain or brain fatigue. Notice the enhanced attractiveness of the furnishings—then look up at CELESTIALITE itself. It won't hurt your eyes even if you look directly at it. Its three individual layers diffuse and soften the rays so perfectly that the most sensitive eye is not offended.

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Series 61 Casement Stay

**Operated** with only one hand and in the most natural and easy manner imaginable. There is no need to lean out of the window at any time and there are no holes to find, no screws to tighten, no tension to adjust.

Releasing the finger-piece instantly **locks** the casement in any position automatically and positively so that even a high wind cannot budge the sash.

Win-Dor Series 61 Stays absolutely do away with rattling, banging casements, prevent glass from being broken, eliminate repairs, maintenance and owner liability.

They combine the best features of other types of stays and add several entirely new ones. Yet they cost no more than older types. Recently they have been improved in appearance, material and ease of operation. They come in rust-proof steel with brass channel (on sash) or in all-brass, all standard hardware finishes.

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For casements used with inside screens, this handsome crank-style geared operator should be substituted for the stay. Series 25 Operator controls the casement through the screen which need not be opened at all. It works with exceptional ease and speed, four turns being sufficient for 90° opening. Locks automatically and positively in any position.

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Especially suited to steel casements, Series 61 Stays and Series 25 Operators are applicable to nearly every make. Fenestra and Truscon casements are all standard punched for ready attachment. Readily supplied by most other manufacturers to your specification. Available for wood casements from leading builders' hardware dealers.

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(or for condensed data see Sweet’s pp. B2076-2079)

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Wilson Sectionfold Partitions are quickly and easily folded back and out of the way when not required. They are adaptable to old and new buildings, and can be made to blend effectively with the decoration of the room.

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Doors can be placed so as to form a corridor, retarding noise from penetrating from the auditorium to the gymnasium.

CHURCH ARCHITECTS

A copy of the annual CHURCH BUILDING issue of CHRISTIAN HERALD (out this month) will be sent to interested architects on request. It contains articles on all phases of designing, building and financing.

CHRISTIAN HERALD maintains a Bureau of Church Planning to counsel with church building committees and to impress on them the importance of planning the church structure—not merely building it.

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HOPE'S METAL WINDOWS
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That Final Distinguishing Touch
OF DAVIS SOLID BRONZE

In keeping with the artistic details that lend character to the modern business building, hotel or department store, is the handsome framing of bronze that enriches the shop windows.

For the first time there is now available a completely unified system of heavy solid bronze store front construction that anticipates in its unique design, every requirement for perfect service.

Davis sash and bars are built around the distinctive patented fulcrum principle that affords the utmost safety to the plate. The strength of solid bronze assures a life beyond even that of the building. Installation is made simple—every factor an added value—yet all at moderate cost within easy reach.

Architects will find Davis details and samples of unusual interest—gladly sent promptly on request without obligation.
A Van Cafeteria in John Gorrie Junior High School.

Well-cooked food served in attractive surroundings is the right of every student in every school—and a fundamental principle of modern education.

Above, Van Kitchen of the Nazareth Academy, La Grange, Ill. Right, the marvelously efficient kitchen of the Wilson Junior High School, Erie, Pa.—a noteworthy Van installation.
Every School Needs a Van Cafeteria

Educators agree that the school cafeteria is a vital factor in present-day education. Every school must meet the problem of feeding students—whether it is grade school, high, "prep" or college, in rural communities as well as larger cities.

Though the problems confronting the Architect differ with each school, the equipment remains the same. Van Equipment is the national preference, because of its economy (Van Equipment is economical the day it is installed and every day thereafter); for durability (Van Equipment withstands use and abuse); and for dependability (day-after-day, year-after-year service without replacements). And Van Equipment is scaled to meet any budget—indeed, the smaller the appropriation, the greater the need for safeguarding it with a Van Cafeteria.

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THESE WINDOWS MAKE BETTER HOMES

Recent years have seen a great increase in the use of steel casement windows for homes, and it is interesting to note that this increase has come during a period of quite general improvement in residence architecture.

The slender lines and gracefully proportioned small panes of the steel casement fit in so well with the simple charm which characterizes present-day design that this type of window is now accepted for every style of home.

Lupton Residence Casements, in particular, are widely specified by architects because these windows offer, in addition to conventional steel casement beauty, many other practical advantages. Made of heavy one-piece copper-steel sections, butt welded at the corners, Lupton Casements have the strength and rigidity to retain their alignment and weather-tightness throughout years of use. Smooth operation, good hardware and standard tapping to receive many convenient accessories are other features of Lupton Casements which have found universal favor with home designers.

Lupton Catalogue C-217 covers all these points in detail. May we send a copy for your files?

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Lister Holmes, A. I. A., professional adviser in the West Coast Woods Architectural Competition, of which this design won first prize, states: "This design is unquestionably in good wood character."

In approaching the West Coast woods competition, the exploitation of Douglas Fir, West Coast Hemlock, Sitka Spruce and Western Red Cedar was an intent. However, other purposes of almost equal value were in mind . . . to stimulate better character in home design with freedom from standardization and stultified methods . . . that familiarity with wood construction and interesting modes of developing the beauties of these various woods would be made the subject of intensive study.

The American Architect, commenting editorially on the competition, states: "The entire competition in all its aspects seems to have been very much worth while."

The above, and other prize winning designs, together with a number of the other interesting examples submitted, have been made up into a brochure especially prepared for the architect. We will be glad to send you a copy of this without charge.

Address West Coast Lumber Bureau, 128 Mt. Hood Building, Longview, Washington.
FRIENDLINESS

The charming hospitality of Colonial days is reflected in this all-wood room at the Metropolitan

FEW finer examples of classic simplicity of design in wood can be found than the charming XVIIIth Century room from "Marmion," the celebrated Virginia estate of George Lewis, Esq., General Washington's Chief of Staff. As admirably expressed in the above photograph, wood of all materials best lends itself to the creative genius of the architect.

Can human brain conceive more subtle nuance of design than found in nature's own grainings? Man's friendship with wood dates back to the dawn of unremembered time. Warm and friendly to the touch, wood presents a depth of tone and harmony of color, making possible the achievement of effects impossible with any other materials.

The delightful room depicted above was selected by the Metropolitan Museum of Art to be displayed in the American Wing. Framing each door and window are fluted pilasters, Ionic capitals, and an entablature of architrave, frieze, and cornice, treated with dentils and modillons, which give it dignity. Two spacious cupboards are cleverly concealed within the panelled walls which extend unbroken from floor to ceilings.

There's plenty of good lumber today...and for posterity...just as in the days when "Marmion" was designed.
The problem on this Southampton estate was to find something that would relieve the severity of the sandy shore land, and blend readily with the white stucco buildings.

That Dubois provided the solution may be seen at a glance, and the more the situation is studied, the more the versatile nature of Dubois is realized.

It has charm, and great strength as well. It graces a lovely garden, yet it can perform the most rugged type of duty. It is highly individual, and yet there never was a fence that could give more all-round service, for country or town, at so reasonable a figure.

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For many years Roddis has been famed for doors that are guaranteed against warping, shrinking, swelling and peeling. Cores of softwood strips, welded together with waterproof glue, are covered with crossband and surface veneers. The resultant five layers of wood offer maximum resistance to the passage of noise and flame.

In schools the country over Roddis Doors are known for their high quality and completely satisfactory service. They are carried in stock in a variety of surface veneers. Special veneers are furnished when desired. Numbers or letters may be inlaid in the doors. When solid doors are used, observation openings of any size or shape may be had.

For more than a quarter century, Roddis Doors have meant the finest obtainable in permanence, soundproof qualities and resistance to fire. Yet their cost is reasonable.

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Among prominent persons and institutions served by the Davey Tree Surgeons are the following:

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In 1927 Davey Tree Surgeons served 17,417 clients, from Boston to Kansas City and from Canada to the Gulf. The volume of business last year was $2,400,000. And yet for this expert, reliable tree service—9,726 clients paid less than $50.00 each
9,294 paid from $50.00 to $100.00 each
9,272 paid from $100.00 to $200.00 each
9,157 paid from $200.00 to $500.00 each
And only 688 paid over $500.00 each.

Davey Tree Surgeons are easily available. They live and work in your vicinity. There are nearly 900 of them now—all carefully selected, thoroughly trained, properly disciplined and supervised, and held to a high standard of service—scattered over the eastern half of this country and Canada.

The business of The Davey Tree Expert Company has trebled since 1923, as follows:

<table>
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<th>Year</th>
<th>Volume in '000</th>
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<tr>
<td>1923</td>
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</tr>
<tr>
<td>1924</td>
<td>81,000,000</td>
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<td>1925</td>
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<td>1926</td>
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<td>1927</td>
<td>82,400,000</td>
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This steady and substantial growth does not prove everything, but it does indicate a high measure of value and satisfaction. How else could this personal service business be maintained and made to grow? More than half the business each year comes from former clients.

Every hour of every day 900 Davey Tree Surgeons are working on probation. Every client receives the right to stop the work at his discretion. They must give satisfaction or they would have no employment. They will please you also. Wire or write nearest office.

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Send for local representative to examine your trees without cost or obligation.

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MARTIN L. DAVEY, President and General Manager
WHAT opportunities has the architect in the average house or apartment of achieving distinctive architectural effects?

So often his work virtually stops with the exterior. If a good facade is produced, with perhaps an interesting entrance, the architect is dismissed. The rest is in the hands of the interior decorator, who is too often only a graduate painter or paper-hanger. His stock in trade is trick wall finishes or bizarre color schemes.

Isn’t the architect worth his fee on the interior details of the house, too? Can’t he carry out the architectural character of his design on the interior, too?

Many architects do. And without unreasonable expense to their clients, on even the most inexpensive work.

Curtis Cabinetwork enables them to do it.

Here is furniture—permanent furniture—of architectural character and its possibilities for the architect are three-fold.

First, it is designed to become a part of the house itself—integral factors in its very construction. Therefore it has a dignity and importance that movable furniture does not possess.

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And finally the architect has a personal interest in architectural furniture as the most visible expression on the interior of his work.

Strip the average house of its rugs, hangings and Curtis Architectural Furniture
Its three-fold possibilities for the architect in residential work
Interesting features of two apartment buildings, recently erected in New York City, are the charming roof gardens, a picture of one of which is shown.

Providing a beauty spot literally in mid-air, they add an unmistakable attraction to apartment living; as well as offering a suggestion that we believe many architects will appreciate.

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The genius of Hartmann-Sanders craftsmen is a revelation to many architects and builders. Whether in interior or exterior work, these trained men know how to give true expression to your artistic conceptions.

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Pergolas
Rose Arbors
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Koll
Columns
In New York City, the Bush Terminal Building, constructed in 1916. Ten years later, in Coral Gables, Florida, the Miami-Biltmore Hotel and Country Club. Both built by the same general contractors, Thompson Starrett Co. Both built with Atlas Portland Cement. More than coincidence, here is significance and suggestion for every architect; cumulative evidence that Atlas possesses in high degree that dependability and permanence which are the true measure of quality in Portland cement. For great structures and small, the growing choice of Atlas advises with increasing emphasis its wider specification and use. For sign-post or silo, for culvert or column, for stucco house or skyscraper—Atlas, "The standard by which all other makes are measured."

Among its many friends, the country over, Atlas is proud to count architects who year in and year out, over a long period, have built great structures for others and increasing good-will for themselves with Atlas. That prospective builders may the more readily approve the architect's specification of Atlas quality is one of the prime purposes of the current national advertising campaign. May we suggest that you watch for the full-color advertisements in the great national magazines. The Atlas Portland Cement Company, 25 Broadway, New York.

The Conference Room in the House of Representatives Office Building, Washington, D.C., offers one among many examples of the beauty and utility of walls made with BEST BROS. Keene's Cement. This room of stately beauty has excellent acoustic properties. Its walls, largely because of the cement used, are sound-proof.

More and more attention is now being given by architects, plasterers and contractors to the study of acoustics and sound-proofing. In this work they are finding a real aid in BEST BROS. Keene's Cement. Tests prove conclusively that this gypsum cement absorbs sound waves. We can cite many jobs where it has been a valuable factor in obtaining proper acoustics.

For 39 years BEST BROS. Keene's Cement has been accepted as the standard. It is the pioneer Keene's Cement of America ... made by an independent company that specializes on this one product. It is your assurance of tough, durable walls ... beautiful walls ... walls that win the lasting approval of those who design them, those who build them, those who pay for them!

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Bankers were among the first to recognize the advantage of having distinctive buildings. That Georgia Marble is a popular choice is evidenced by the many banks throughout the country built of this material. A book, "Examples of Bank Work in Georgia Marble," will be sent on request.

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TOP: Should be 14 gauge furniture steel. So made, Trico tops will last a lifetime under severe treatment as window seats and wall cabinets.

GRILLE: 16 gauge frame—20 gauge panel. Reinforced design prevents warping or buckling.

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WATER PAN: Entirely one piece with rounded corners and no seams (or solder) for possible leakage. Rustproof. Pan filled through trap door without removing top. For humidity and for keeping radiator smudge off walls and draperies.

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Equipment like this simply cannot be had "knocked down" or at "cut prices." It is sold, however, on convenient terms, and there is sufficient range in Trico equipment for every kind of job.

Covers as low as $20.

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OLDEST AND LARGEST IN THE FIELD
An Unusual Monument
Built of Concrete

HIGH on the hill overlooking Astoria, Oregon, and the mouth of the Columbia River stands this exceptional shaft, erected as a memorial to John Jacob Astor, Lewis and Clark and other pioneers who founded our Pacific Northwest.

It is 123 feet high and 15 feet in diameter, constructed of reinforced concrete. An interior spiral stairway leads to the lantern balcony. On the surface of the shaft is a 10-foot spiral band with a sgraffito pictorial depicting historical scenes of the district.

The ornamental and colorful effects of the sgraffito process were attained by first superimposing several thin layers of concrete of different tints upon the surface of the shaft, then cutting through to the correct depth to complete the design in the desired colorings. Thus a striking relief effect in permanent colorings was achieved.

The monument was designed by Elec-tus Litchfield of New York and was built by A. Guthrie and Company of Portland under the supervision of engineers of the Great Northern Railway Company.

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That's why the architects of this million-dollar building chose Art Metal as best qualified to meet these highly specialized equipment needs.

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Helpful consultation—free ... This experience is ready for any job—small or large. Art Metal facilities can handle the most diversified specifications. More than this, Art Metal service is ready to cooperate with you in every way. An experienced representative will be glad to consult with you on bank equipment or other metal work. This carries no obligation. Please write. The Art Metal Construction Company, Jamestown, N. Y.

Art Metal
JAMESTOWN - NEW YORK

BRONZE AND STEEL INTERIOR EQUIPMENT FOR BANKS, LIBRARIES AND PUBLIC BUILDINGS—HOLLOW METAL DOORS AND TRIM
REVIEWS OF MANUFACTURERS' PUBLICATIONS


Much of the charm of the interiors of Italian and Spanish buildings—and buildings of certain other styles—lies in the facing of their walls with stone or with other materials which suggest that sense of strength and stability which is always valued, though it is not analyzed or even understood. Many American house owners and probably many architects might deprecate use of stone for the interiors of domestic buildings on the score of its coldness or lack of what we suppose to be "domestic character." This useful little brochure, however, brings to attention a material which would seem to possess all of stone's desirable characteristics of color and texture without any of the qualities which might render its use objectionable, and many illustrations of interiors of quite a variety of kinds suggest the warmth and atmosphere of comfortable living which may easily be had by following the teachings which the booklet lays down.

MODERN BRONZE STORE FRONT CO., Chicago Heights, III. "Introducing Extruded Bronze Construction."

That the standard of good taste in things architectural is continually advancing is proved by studies of illustrations, brochures of the shop fronts which are being installed everywhere. Even in small towns surprising merchants are demanding fronts of a far better type than were common a few years ago, and large cities and their suburbs abound in excellent shop fronts, designed in many instances by widely known architects, which rival when they do not equal in excellence anything which the past has to offer. This brochure, which should be had by any architect interested or likely to be interested in the subject, illustrates a few of the many metal sections which this firm of metal workers is prepared to furnish, not only illustrating the sections but giving details of side jamb sections, corner bar sections, panel moldings, and other details which enter into the designing and construction of shop facades and store fronts.

NATIONAL ASSN. ORNAMENTAL IRON AND BRONZE MFRS., Cincinnati. "Ornamental Iron, Bronze & Wire."

Of all the accessories which aid so powerfully in making buildings beautiful and attractive there are not many which play a more important part than metalwork in such forms as interior vestibules, grilles about elevators, windows and doors, the railings often used at windows, balustrades of stairways, etc. Such uses of metalwork are by no means confined to large and monumental structures, such as public buildings, banks, theaters, etc., for metal is quite as often used in buildings of smaller sizes, such as residences, and often in residences which are of no great extent. This valuable booklet suggests many uses for metalwork by illustrating much that has been done already. It deals with work large and small, simple as well as ornate, in buildings of varying degrees of importance, and in work of architects well known and not so well known. The brochure suggests the vast extent of the resources back of this large association.


Designers for firms manufacturing many materials for the construction of buildings and for furnishing their interiors have succeeded in bringing the output of a number of firms to a high standard. In few lines of effort have manufacturers been as successful as have the makers of different materials intended for floor coverings, this being amply proved by examination of the catalogues, brochures, etc., which they issue. This particular publication proves just this. It deals with the excellent line of linoleums manufactured by this firm, and it illustrates,—in color as well as in black and white,—the beautiful patterns and colors in which linoleum is to be had. A great advance has indeed been made by the manufacturers of floor coverings, and it is a long step from the supplying of such a material as linoleum was some years ago. The models and the uses are brought in this brochure to the attention of architects and decorators.

INDIANA LIMESTONE COMPANY, Bedford, Ind. "Indiana Limestone for Schools and College Buildings."

Unless it be marble, there is probably no building material which would be preferred by most builders to stone. There is no type of architecture which has not been developed in stone or of which stone does not form an important part. This well presented brochure, one of quite a number issued by this large concern, deals with the use of limestone for school and collegiate structures. It is replete with half-tint illustrations of such buildings in all parts of America, the work of many widely known architects, illustrations which suggest anew the high standard to which American architecture has attained, and which prove the large extent to which stone is being used in buildings which usually, because of their sizes, cost and prominent locations, are of great importance. Many of the illustrations are of interiors, showing the use of stone for facing walls or for screens and other minor structures used within such buildings.

DAVID LUPTON'S SONS CO., Philadelphia, "Lupton Casements of Steel." Valuable data on their use.

Designers well know the value of casements in giving architectural expression to windows of buildings of certain other types. This brochure deals with the excellent line of metal casements manufactured by the well known Lupton firm, casements of considerable variety in the way of design and of all sizes, together with the hardware and other fittings which aid so greatly in rendering casements attractive. Designers and draftsmen will welcome the "details of installation," which give practical help in designing buildings.


Use of marble, that most sumptuous and luxurious of building materials, suggests Greece in the age of Pericles. Its use is highly appropriate for a structure of a purely Classic type, and the use of marble seems to be particularly fitting when the building in question happens to be planned as a museum of art. This is suggested by a folder issued by the Georgia Marble Company and dealing with the Cleveland Museum of Art, of which Hubbell & Benes are the architects. One illustration shows the severely beautiful main façade, the entrance emphasized by four columns of the Ionic order, while in another page there are shown the details of the columns and their capitals, and details also of the other parts which enter into the making of an exterior so well known in the work of architects well known and not so well known. The brochure suggests the vast extent of the resources back of this large association.


Designers for firms manufacturing many materials for the construction of buildings and for furnishing their interiors have succeeded in bringing the output of a number of firms to a high standard. In few lines of effort have manufacturers been as successful as have the makers of different materials intended for floor coverings, this being amply proved by examination of the catalogues, brochures, etc., which they issue. This particular publication proves just this. It deals with the excellent line of linoleums manufactured by this firm, and it illustrates,—in color as well as in black and white,—the beautiful patterns and colors in which linoleum is to be had. A great advance has indeed been made by the manufacturers of floor coverings, and it is a long step from the supplying of such a material as linoleum was some years ago. The models and the uses are brought in this brochure to the attention of architects and decorators.


The use of hardware patterned after that used upon the doors and windows of early American buildings is likely to be stimulated by study of the buildings themselves. This large firm of hardware manufacturers, therefore, issues a series of quite a number of little folders illustrating the old New England buildings and the hardware appropriate for such structures as well as for buildings of certain other types. The series includes folders presenting illustrations and little sketches of such buildings of historical interest as the "Old Witches' House" and the "Seven Gables" in Salem; the "Wayside Inn" at Sudbury; Whittier's birthplace at Haverhill, and that of Nathan Hale at Coventry, Conn.; and the famous Hannah house, Paul Revere's house, and the "Old South Meeting House" in Boston. The folders of hardware illustrate an excellent assortment of fittings in a wide variety of types, designed with the excellent taste for which the Russell & Erwin Mfg. Co. is widely known.

108
The new improved Kawneer Store Fronts are identified by this design

This year The Kawneer Company offers a new improved store front—more beautiful in design—more powerful in its sales appeal—and identified for your protection.

NEW members of construction such as—
NEW BULKHEADS
NEW TRANSOM BARS (Plain or enriched)
SOLID NICKEL-SILVER AND BRONZE DOORS
APPROPRIATE BRONZE SPINDLES
PROFILED SHAFTS
ORNAMENTAL GRILLES—

and other features of interest can be fabricated into distinctive store front creations to conform with architects' designs.

"Modern Store Fronts for Better Display" is a handbook on store fronts. If interested, mail coupon with your letterhead.
CONGESTED CITY.—That most of the trees in Central Park can’t be saved if city officials will but do what should be done. They show that trees can live in New York or any other city. Illustrations in this brochure show these trees to be made impossible for trees to live in the heart of New York. Because of their richness of color as well as of design, tiles are particularly valuable for use about fireplaces or for facing chimney breasts, this richness adding architectural emphasis to a chimneypiece, which should always dominate the room of which it is a part. This brochure or booklet illustrates what is in the broadest sense are called tile, for it shows and describes a large assortment of actual mantels and chimneypieces built up of tile, though not of tile in the usual flat and square or hexagonal form. The booklet shows, for example, several fine mantels in the Italian style, the requisite pilasters, capitals, cornels and carefully designed and scaled cornices and other mouldings worked out in color and relief and possessed of all the dignity and grace they could possibly have worked out in stone, and having in addition the advantages of color. In addition to illustrating and describing tile mantels and chimneypieces of quite a variety and tiles appropriate for building fireplaces and laying their hearths, the brochure illustrates the proper method of constructing a fireplace and chimney to insure their satisfactory use, a detail of much interest to designers.


Only by unceasing care and vigilance can the beauty of the public parks in a large city be preserved. The splendor of Boston’s park systems is the result not only of the rare skill and taste which created them but also of intelligent care taken with their maintenance and administration.

Wholly different is the case in New York, where the park system has long been a sort of happy hunting ground for politicians, the results being plainly and painfully evident.

The president of the Davey Tree Expert Company said that fine old trees were dying as a result of neglect, and that most of them could be saved. Park Commissioner Gallatin admitted that they were dying, but claimed they were being poisoned by noxious gases in the air. Trees, he said in effect, could not live in New York. A New York newspaper,—*The Herald Tribune*—editorially suggested that Mr. Davey be allowed to prove his assertion. “Go ahead,” said Mr. Gallatin. “We will,” said Mr. Davey. “As a civic proposition, we will do it without cost to the city.”

One hundred dying trees were selected for the demonstration. Meantime, exhaustive chemical tests were made of the air at the expense of the Davey Company. They showed conclusively that there are no poisonous gases of sufficient concentration to be considered. This disposed of the theory that death results from auto masonry, which made it impossible for trees to live in the heart of New York.

Illustrations in this brochure show these trees before and after they were saved by Davey tree surgeons. They show that trees can live in New York or any other congested city—that most of the trees in Central Park can yet be saved if city officials will but do what should be done.
BRASCO BUILDS
BUT ONE QUALITY
Single High Standard
Protects Your Specification

The feeling of safety and satisfaction that Brasco brings to the Architect, comes from the unvarying policy of making one grade of store front construction—and that the highest.

A plant keyed up to precise workmanship with fine, heavy-gauged materials, along lines of advanced design, cannot at the same time, manufacture products of lower standard and do justice to both grades.

Architects know that with Brasco written into the specifications, there can be no doubt of the final delivered worth of the store front. Certain glass safety—permanent architectural beauty—great strength—easy, economical installation—long life—all these measure Brasco value in terms of practical requirements.

An examination of convenient samples, catalogs, full-sized details, will be convincing. Sent without obligation, promptly on request.

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5031 Wabash Ave., Chicago

Eastern Sales Office and Warehouse, 28-14 Wilbur Ave., Long Island City, N. Y.
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