# ARCHITECTURE

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JULY—DECEMBER

1932

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CHARLES SCRIBNER'S SONS

1932

# INDEX

## VOLUME LXVI: JULY THROUGH DECEMBER, 1932

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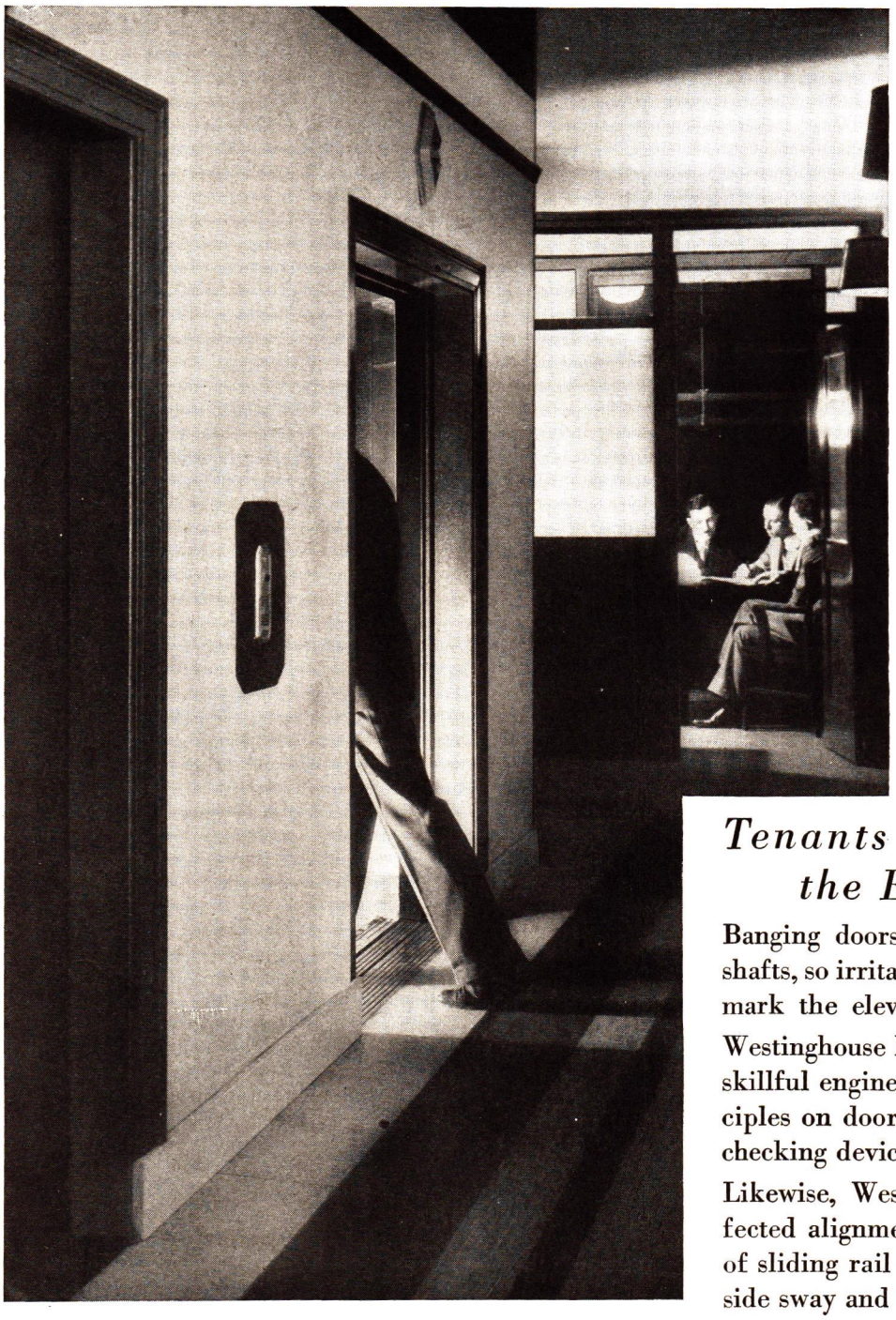
# QUIET *elevator operation*
## DEVELOPED BY WESTINGHOUSE



### *Tenants no longer shun the Elevator Zone*

Banging doors and noisy, rattling elevator shafts, so irritating to the business office, now mark the elevators as of "the older type."

Westinghouse has eliminated noisy doors by skillful engineering application of new principles on door closers, power operators and checking devices.

Likewise, Westinghouse has achieved perfected alignment of rails, and with the use of sliding rail clips has eliminated irritating side sway and hatchway rumbles.

The greater the efficiency, the greater the cut in operating costs.

Westinghouse is prepared in every way to serve in remodeling or rehabilitation — offering the newest conception of elevator comforts and economical elevator performance.

**Westinghouse Electric Elevators**

# COLOUR
# IN INTERIOR DECORATION

## BY JOHN M. HOLMES

Lecturer in Decoration at the Architectural Association School of Architecture, London

HERE at last is a book on colour which recognizes the fact that the colour of the physicist—the beam of light broken by a prism—is an entirely different matter from colour as used by the painter and decorator in pigment form. For instance, there is no separate colour purple, nor blue-green, in the solar spectrum. Then too, the spectrum colours are colours in the raw, not colours with which to work.

Here is an abandonment of the solar spectrum primaries for a new series of twelve pigment primaries, which make easily understandable an intelligent use of colour.

Moreover, the twelve colours which form the pigment primaries are not theoretical, but are colours that may be bought "in the tube.'

Nor is the author satisfied with making clear the various relationships between these pigment colours. He connects them up with the colours of woods, marbles, fabrics and the other materials used by the decorator, bringing them all on one palette. In all the literature of colour, there has been no such book as this, sound in theory, but also practicable in making easy a proper use of colour.

The volume consists of 92 pages, 8¾ by 12¼ inches, profusely illustrated in full colour. There are supplementary illustrations of colour schemes by well-known architects and decorators for various interiors. $7.50

## CHARLES SCRIBNER'S SONS, New York

ARCHITECTURE AND ARCHITECTURAL BOOKS

ARCHITECTURE, published by CHARLES SCRIBNER'S SONS, 597 Fifth Avenue, New York, N. Y. December, 1932. Volume LXVI, No. 6. Published monthly on the 28th of the month preceding date of issue. Entered as second-class matter, March 30, 1900, at the Post-Office at New York, N. Y., under the Act of March 2, 1879. Yearly subscription rate to members of the architectural and allied professions, $3; to all others, $6.

# THE BULLETIN-BOARD

### *CHARLES ELIOT TRAVELLING FELLOWSHIP*

THE Charles Eliot Travelling Fellowship in Landscape Architecture, highest award of the School of Landscape Architecture at Harvard, has been awarded to Arthur C. Sylvester, of Merrimac, Mass., a graduate of the University of Maine in 1927, and now a third-year student in the School of Landscape Architecture. The competition in which Mr. Sylvester's drawings were judged the winner called for plans of a community club and social centre.

### *LEBRUN TRAVELLING SCHOLARSHIP*

THE New York Chapter, A. I. A., announces the usual nationwide competition for the LeBrun Travelling Scholarship of $1,400. All contestants must be practicing architects or architectural draftsmen, citizens of the United States, between the ages of twenty-three and thirty, who have been actively engaged in their profession for at least three years, and have not previously been beneficiaries of any travelling scholarships. They must be specially nominated by a member of the American Institute of Architects.

The problem for the competition will be announced early in January by the Scholarship Committee of the Institute, of which Chester H. Aldrich is chairman, other members being Oliver Reagan, D. Everett Waid, Otto Langmann, and Lindley Franklin.

Nominations must be received before January 15, 1933, and blanks for this purpose may be obtained from the secretary of any chapter, A. I. A., or from the LeBrun Scholarship Committee, 522 Fifth Avenue, New York City.

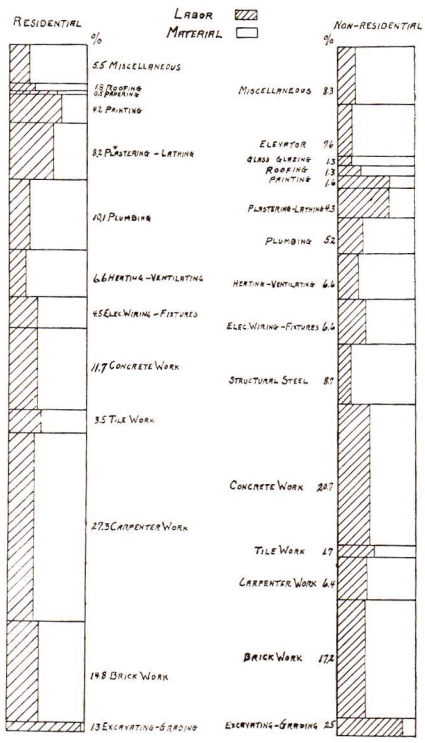
### *JAMES TEMPLETON KELLEY FELLOWSHIP IN ARCHITECTURE*

THE Boston Society of Architects announces the annual procedure for the appointment of a beneficiary of the James Templeton Kelley Fellowship in Architecture with an income of $2,500. It will be assigned to an individual of proved ability, whether student, instructor, draftsman, or practicing architect, for foreign travel in the advanced study of architecture. It is open to any man or woman residing in Maine, New Hampshire, Vermont, or Massachusetts, a citizen of the United States, and preferably over thirty years of age. The award is made on the recommendation of the Committee on Education of the Society. Applications should be in the hands of Niels H. Larsen, Secretary, Committee on Education, Boston Society of Architects, 814 Statler Building, Boston, on or before January 18, 1933, and should state the applicant's age, education, experience, present occupation, and suggestions for his work abroad.

### *THE BUILDING DOLLAR*

THE chart shown below is taken from the *Monthly Labor Review*, October, 1932, of the Bureau of Labor Statistics, U. S. Department of Labor. It is the result of a study covering the relative cost of material and labor in building construction in fifteen cities. In most cases data were obtained for six ordinary dwelling houses, two apartment houses, and six non-residential buildings. The latter quota usually consisted of two stores, two office buildings, and two factories or warehouses.

The report goes rather fully into the changes in balance between the cost of labor for these buildings, and the cost of the material that went into them. There is space here but to mention one feature of the survey, that is the relative costs of each class of work. The graph shows, for example, that in the building dollar spent for residential work, a little over twenty-seven cents represents carpenter work, and so on.




### *A. I. S. C. OFFICERS*

AT the tenth annual convention of the American Institute of Steel Construction held in Pittsburgh in October, the following officers were elected: president, Clyde G. Conley, The Mt. Vernon Bridge Co., Mt. Vernon, Ohio; first vice-president, Clyde MacCornack, The Phœnix Bridge Company, Phœnixville, Pa.; second vice-president, H. A. Fitch, Kansas City Structural Steel Company, Kansas City, Kans.; treasurer, Robert T. Brooks, The George A. Just Company, New York, N. Y.; assistant treasurer, A. J. Post, Post & McCord, Inc., New York, N. Y.

The next convention of the Institute will be held in Chicago in 1933.

### *SIXTH ANNUAL SMALL-HOUSE COMPETITION AWARDS*

NEW YORK and California have carried off the honors in this year's Small House Competition conducted by *The House Beautiful Magazine*. The awards have just been announced as follows:

In Class I, Houses East of the Mississippi: First Prize, Harvey Stevenson, Thomas and Studds, New York. Second Prize, S. Merrell Clements, New York. Third Prize, Hunter McDonnell, New York. Honorable Mention, Barber & McMurry, Knoxville, Tenn.; Douglas Orr, New Haven, Conn. (2); Kenneth W. Dalzell, East Orange, N. J.

In Class II, Houses West of the Mississippi: First Prize, Roland E. Coate, Los Angeles. Second Prize, Austen Pierpont, Ojai, Calif. Third Prize, Palmer Sabin, Pasadena. Honorable Mention, Ralph C. Flewelling, Beverly Hills; Palmer Sabin, Pasadena.

In Class III, Best House East or West of the Mississippi costing less than $10,000: Special Prize, Robert E. Sherlock, New York. Honorable Mention, Philip Avery, Boston; William I. Garren, San Francisco; Albert J. Schroeder, Beverly Hills.

### *THE COST OF STEEL*

AT the tenth annual convention of the American Institute of Steel Construction, held in October, Mr. H. B. Hirsh, of the Belmont Iron

(*Continued on page 6*)

# THE BULLETIN-BOARD *Continued*

Works, brought out some interesting figures relative to the cost of making steel:

Today the average price of a ton of structural steel is probably $55 to $60, erected in place. Of that sum, we must allow for local hauling, for setting, for compensation insurance, etc., $10 to $14 per ton, leaving available for the fabricated material on cars at destination $45 to $46 per ton.

Out of this $45 to $46, the fabricator pays the rolling mills $35 to $36, leaving him about $10 to pay for the labor and overhead of fabrication. His capital invested in the plant per that ton of capacity is not less than $25, and the depreciation, insurance, and taxes cannot be figured at less than $2.50. If the plant operates at 50 per cent of capacity, it must take out $5; if it operates at 25 per cent of capacity, it must take out $10.

The selling of that ton, estimating, reserve for bad debts, repairs, light, heat, and some power, must be paid whether the plant operates or not, and this is probably $2.50 per ton when running at capacity; $5 at half capacity; $10 at one quarter capacity.

That ton of steel must have been detailed, painted, and transported at a further cost of $2. These three items aggregate, when the plant is running at capacity, $7; at half capacity, $12; at one quarter capacity, $22. After these aggregates are deducted from the $10 available, it is easily determined how much is left for shop repairs and its overhead, interest on capital, and profit.

In a word, this $10 is about half enough to cover the minimum needs. A continuation of selling the ton on that basis means quick economical chaos in the steel industry.

### *UNITED STATES CIVIL SERVICE OPENING*

THE United States Civil Service Commission announces a competitive examination for an architect experienced in hospital work. There is a vacancy in Freedman's Hospital, Department of the Interior, Washington, D. C., for intermittent service only, and the applications will apply also to other vacancies occurring throughout the United States in positions requiring similar qualifications. The entrance salary is $5,600 a year, less a furlough deduction of 8⅓ per cent and a retirement deduction of 3½ per cent. Applications must be on file with the U. S. Civil Service Commission, Washington, D. C., not later than December 13, 1932. Applicants will not be required to report for examination, but will be rated on their education, training, and experience, as well as on specimens of drawings to be filed with applications. Experience must have included at least two years in the design of hospital buildings of public proportions. Full information may be obtained from the Secretary of the U. S. Civil Service Board of Examiners at the post office or customs house in any city.

### *A DICTIONARY OF ELECTRICAL ENGINEERING TERMS*

AFTER more than three years' work on the part of the committee of one hundred-twenty scientists and engineers, under the chairmanship of Dr. A. E. Kennelly, of Harvard, a proposed dictionary of electrical engineering terms has just been completed. The work has been published for review and criticism prior to its submittal to the American Standards Association for adoption as an American Standard. It is a document of 208 pages, listing over 3400 definitions.

### *BOWEN BANCROFT SMITH, 1869–1932*

BOWEN BANCROFT SMITH, a well-known architect of New York, died on October 26 at his home in Tuxedo Park, N. Y. Mr. Smith was born in Newton, Mass., June 19, 1869. After being graduated from the Massachusetts Institute of Technology in 1890 he went abroad and studied in the Atelier Paul Blondel, in Paris. Mr. Smith had been in architectural practice from 1895 until his retirement in 1925. He was a charter member of the Society of Beaux-Arts Architects and a member of the American Institute of Architects. During the last year or so Mr. and Mrs. Smith spent a good deal of their time in Europe.

### *SIR MERVYN MACARTNEY, 1854–1932*

SIR MERVYN MACARTNEY died on October 28, in London. He was known internationally as the architect directing the recent work of preservation of St. Paul's Cathedral. A graduate of Oxford, he was one of the founders of the Art Workers' Guild of which he was Master in 1900. Sir Mervyn had also helped to establish the Arts and Crafts Exhibition Society. He was editor of *The Architectural Review* from 1906 to 1920. He was architect to the Dean and chapter of St. Paul's Cathedral for twenty-five years, and he had also been consulting architect to Durham Cathedral. Sir Mervyn, who received his knighthood in 1930, was a corresponding member of the American Institute of Architects. Among his books were: "Old English Houses and Gardens of the Seventeenth and Eighteenth Centuries" and "Practical Examplar of Architecture."

### *A NEW SYNTHETIC RESIN*

MESSRS. C. A. Thomas and W. H. Carmody describe in a paper prepared for the Division of Industrial and Engineering Chemistry of the American Chemical Society, a new synthetic resin. The product is derived from cracked petroleum distillates. This fact is of interest to the architectural profession in that the new resin has several unusual properties which make it useful in the production of paints, varnishes, and other plastic materials. Combined with China wood oil it is said to make a quicker drying varnish than any hitherto known.

The type of resin required may be produced by control of the factors involved.

"For example, a resin for varnish formulation may be produced having a light amber color. It is a hard, brittle material which dissolves readily in drying oils, such as linseed and China wood oil, and with the latter makes varnishes which dry very rapidly. A varnish film of this composition has the tendency to bleach or lighten upon drying, which facilitates the use of light-colored pigments without after yellowing."

### *PERSONAL*

Frank Grad and Bernard J. Grad, architects of Newark, N. J., have become associated under the firm name of Frank Grad & Son with new offices in the Lefcourt Building, Newark.

Harry E. Reimer, architect, announces the removal of his offices to 11 and 13 West State Street, Marshalltown, Iowa.

Kimball, Steele & Sandham, architects, are now in their new offices at 2236 St. Mary's Avenue, Omaha, Nebr.

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CHARLES SCRIBNER'S SONS, PUBLISHERS

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CHURCH AT SANTA CATARINA, MEXICO

*From the drawing in lithographic crayon by Edward M. Schiwetz*

# ARCHITECTURE

VOLUME LXVI DECEMBER 1932 NUMBER 6

# The Ratio-Envelope of Form

## *By Rutherford Boyd*

*It seems almost incredible that in the long, long quest for the meanings of mathematical ratios in art forms—a quest that has been followed from the time of ancient Egyptian thinkers to the present day—the study has been mainly of the line and the plane. The* volume *is surely something more than a group of planes, and its full significance to the eye is based on something more than two-dimensional ratios. Rutherford Boyd leads our thought into ratios of the third dimension.*—EDITOR.



YOU have often noticed him hanging to a subway strap and always reading—the "mystery" fan—or curled between davits on the boatdeck, or alone in fireside concentration, his head bowed over the gaudy jacket of a detective "thriller." Perhaps you know the game he plays, which author always wins and reader loses!

His counterpart roams the contemporary scene of more æsthetic culture. Here you may be amused to find the devotees of another "mystery" cult that has its special brand of thrillers. Less than a five-foot shelf will hold all these books, which attempt to solve a greater mystery. One slender volume contains a lifetime spent in following some clue to that ancient mystery—in the art and architecture of the ancients was there a secret system of design, a great mystery and its clues in the proportions of the Parthenon?

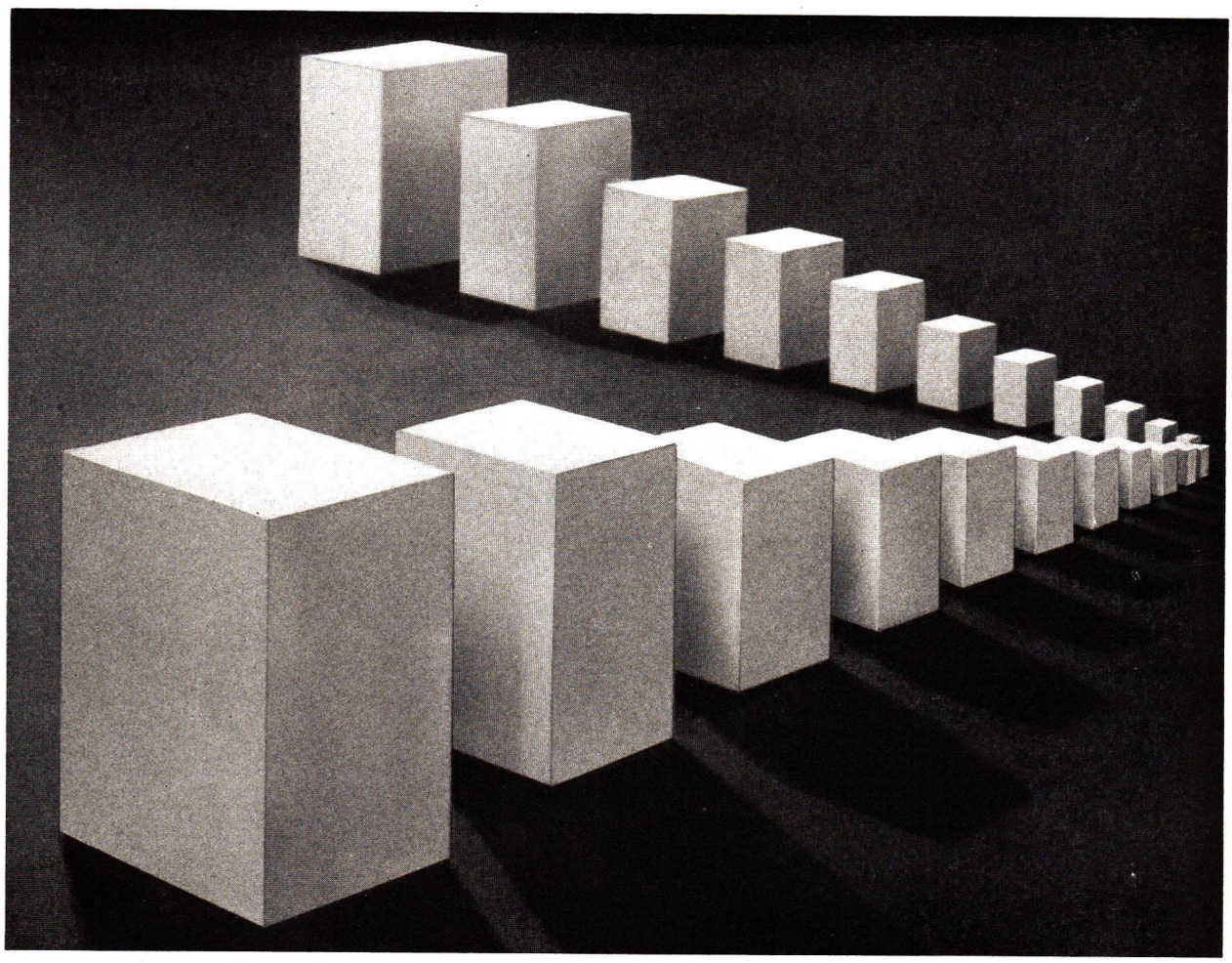
Less than a five-foot shelf—some vague fragmentary records, Egyptian, Hindu, Greek, theories and discoveries of those anonymous followers of Pythagoras, those pages in Plato on the cosmic scheme (now being interpreted as an allusion to the "lost" system of proportion in Greek art); the famous notebooks of Villars de Honcourt, the searchings in perspective of Paolo Uccello, with illustrations by his friend Leonardo, the writings and diagrams of Dürer, Hogarth's line of beauty, Sir Christopher Wren's treatises, the musical rectangles and other proportional devices presented a hundred years ago by D. R. Hay, "Decorative Painter to the Queen." Over near the end of the shelf in new bindings, the books of Samuel Colman, Professor Goodyear, Major Gardner, Claude Fayette Bragdon, Ernest Flagg, Edward B. Edwards, and the late Jay Hambidge. The two large volumes of "Ars Quadratum," by Lund, others by Cooke, Mendelssohn, Ernest Mössel, Le Corbusier, and, in French paper covers, the admirable summary of them all by Matila Gykha. And others, filled with enthusiasm and logic, curiosity, and mysticism.

If and when you have read them all, or nearly all, you will discover another mystery! There will be beyond them something exciting and extremely significant. For it will impress you that all these books, without exception, attempt to solve the mystery of ancient design and proportion within a two-dimensional concept. If they consider the design of a temple, then it consists of main façade, posterior, two sides, roof and floor plan, and a series of interior surfaces. But these are not the temple—these surfaces are the ornamented, the developed facets of a form. They are not that tri-dimensional identity—the form itself.

You may think and we may agree that the methods of form development used in ancient masterpieces were based on one or another of these systems which analyze the areas or planes limiting or incorporating the works of art.

But what of today? Now we are exhorted to think and work "in terms of Space"—to close our eyes and mind to the once familiar, to create and build the new! For all this we must significantly change our habits of thought. We must open our minds not only to new conditions and new materials but to a new conception of Form that will alter our habits of design which are so generally two-dimensional when we should be developing a tri-dimensional project.

For most of us Form must be largely rectangular, and this concrete fact has many advantages even in theory. For instance, what may be generally called "The Envelope of Form" includes all of the space limited by the three dimensions of the project—height, width, and thickness. But the rectangularity of such an Envelope includes an infinity of tri-dimensional shapes, some of only slight value to the creative artist. This Envelope of Form may have an infinite variety of proportion in its dimensions. This basic idea of rectangular form may be amplified by a modern application of the æsthetic ideal of the ancient Greeks —as expressed in the famous phrase, "Unity in Variety," three words that sum up our understanding of similarity (or unity) and dis-similarity (or variety).

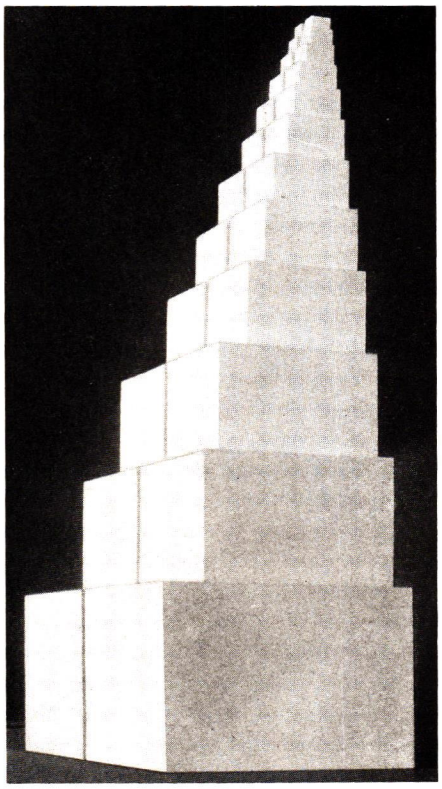


*Ten ratio-volumes of the bisection series in sequence, each one-half the volume of the next larger. Each one has two common dimensions and four similar sides with the adjacent volumes, being produced by cutting the length in half of the next larger or by doubling the smallest dimension of the next smaller volume. The mirror images show the doubling characteristic of this ratio-volume series which has spatial-properties analogous to the root-two rectangle*

Habitually we create structures in an Envelope of Form of which we know little and often care less. Yet there is available a concept in

which we can develop and manipulate "the part and the whole" as a unit. Now we may conceive of Form as an arrangement of space in a tri-dimensional composition that always exists enclosed in an invisible Envelope of Form described by its three great dimensions of height, width, and thickness. Of course, a degree of similarity is implied in all rectangular forms, but a unified similarity as stated by Aristotle is the whole in part, and the part in the whole. Thus we are confronted with the basic form-idea of *selectivity* in *similarity* and a consistency in shape far beyond the mere right angle.

A certain group or series of rectangular forms have been invented in which this development of design-organization can be carried on with the greatest facility. These rectangular "ratio-volumes" each have a continuity of proportion in their over-all dimensions, so that the thickness of the "Envelope of Form" is to its width as the width is to the height. Consequently these particular shapes we have called "ratio-volumes," and two of these forms are illustrated here for the first time.



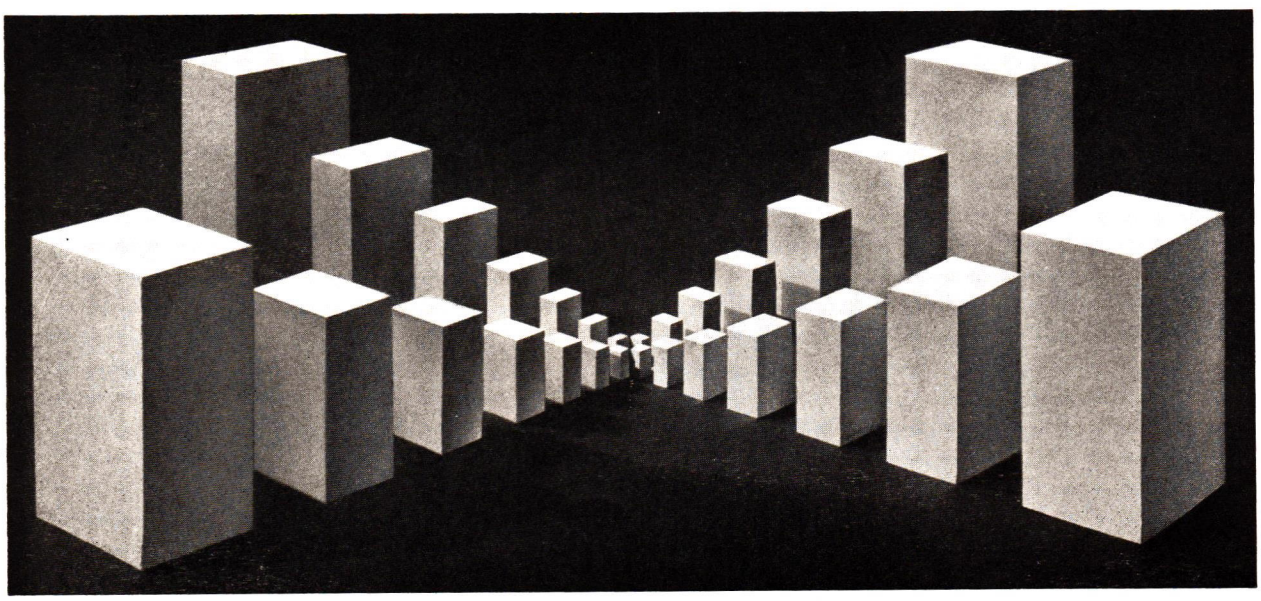
*A vivid illustration of the properties of the bisected series; the base volume equals in mass all the superimposed units. The unbisected volume at the top, if continuously divided in the same way, would produce an infinite number of units each one-half the previous volume in the pyramid. Also, as the mirror reflection doubles the volume, each unit and its reflection is similar and equal to the next lower volume*

Our photographic illustrations only suggest the possibilities of design-organization in three dimensions from this view-point, as they are made to indicate the simplest elements of the spatial anatomy of these exceptional instances of the form-envelope.

One of the simplest of these rectangular ratio-volumes has a proportional series of dimensions such that if the volume is bisected by a plane at right angles to the greatest dimension then the two smaller rectangular volumes so formed are each similar in shape to the larger form.

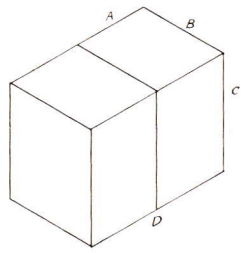
That is, $A$ equals $D$ bisected, and $A$ is to $B$ as $B$ is to $C$ and as $C$ is to $D$. In length, therefore, if $A$ is one unit $D$ is two units.

You will realize that in any rectangular volume, when so bisected, each smaller vol-



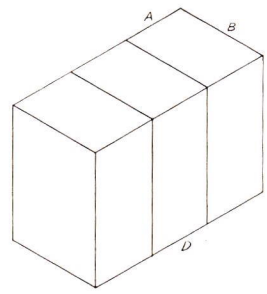
*The bisected series arranged symmetrically on their smallest faces, each one-half the mass of the next larger in the series. Shown in front of a mirror*

ume will be one-half the original *size*, but only in this particular *shape*, this rectangular "ratio-envelope of form," will one-half its volume be similar in shape to the whole.

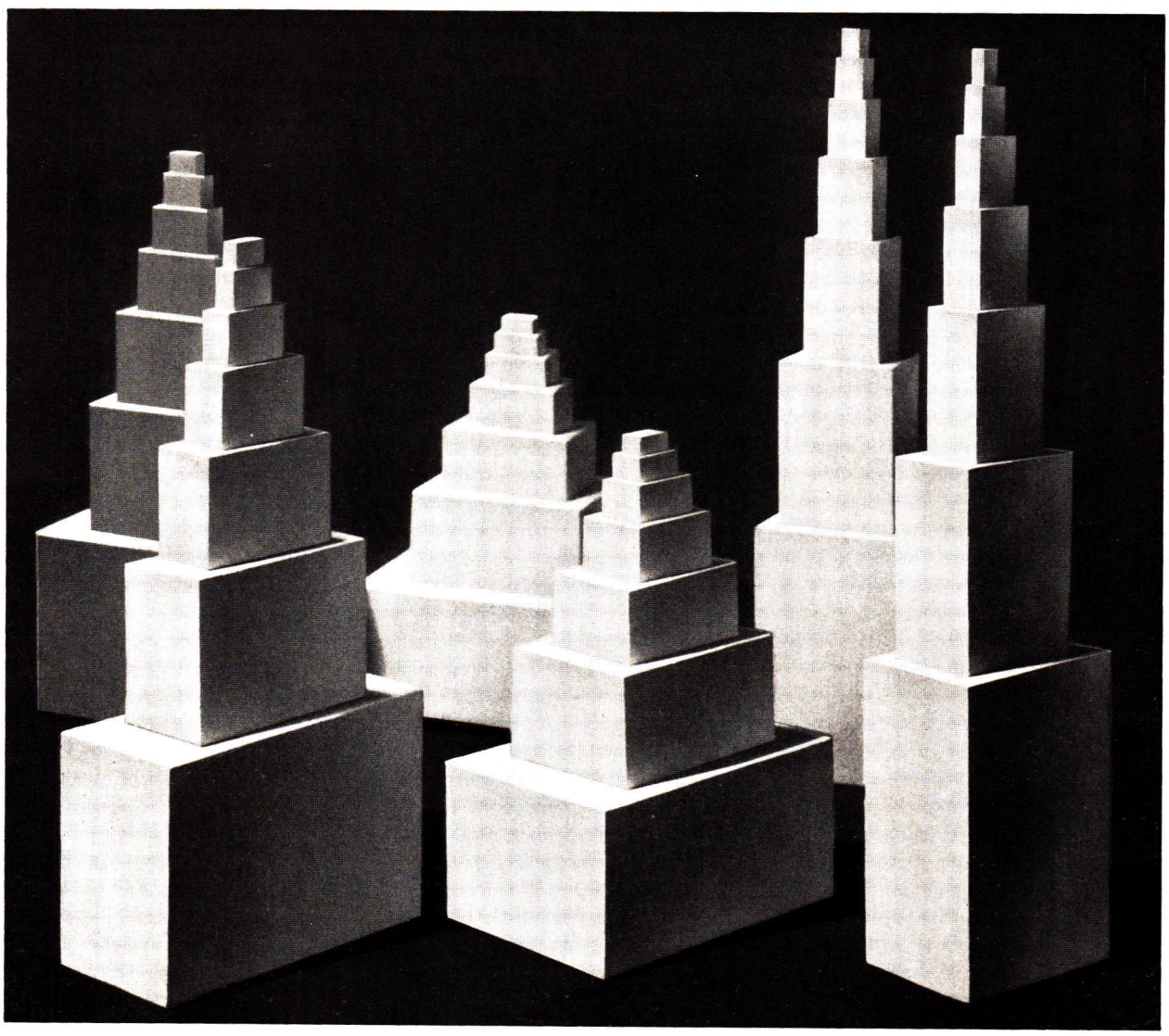



The other form illustrated is a slightly longer rectangular ratio-volume, and if its greatest dimension is trisected by two planes in the same fashion as before, then each section of the volume will be the same shape as the original unit.

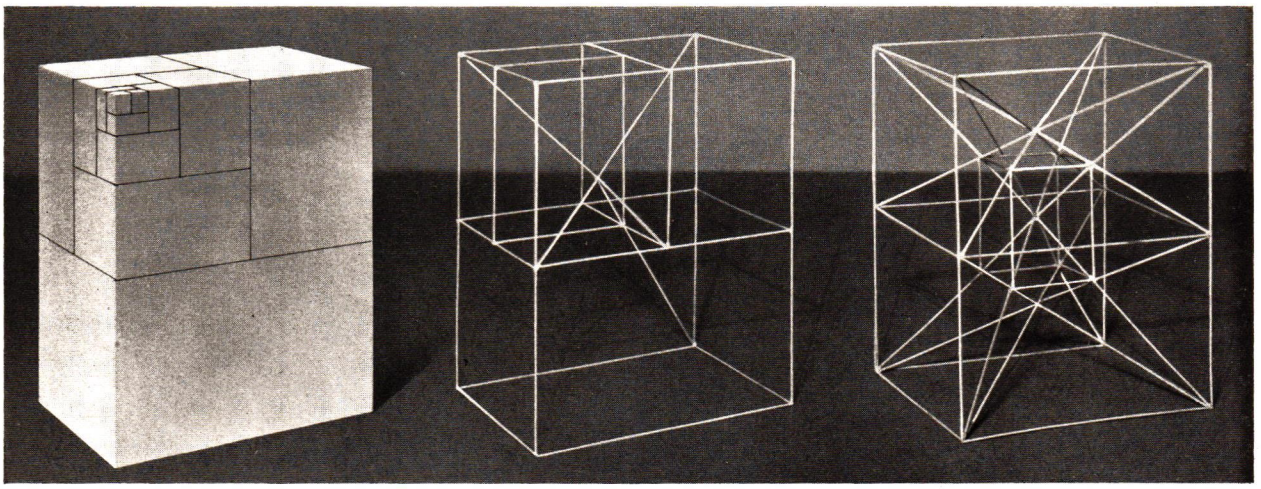
That is, following our definition, *A* is to *B* as *B* is to *C* as *C* is to *D*. But as *D* is trisected, if *A* is one unit in length, *D* is three units.



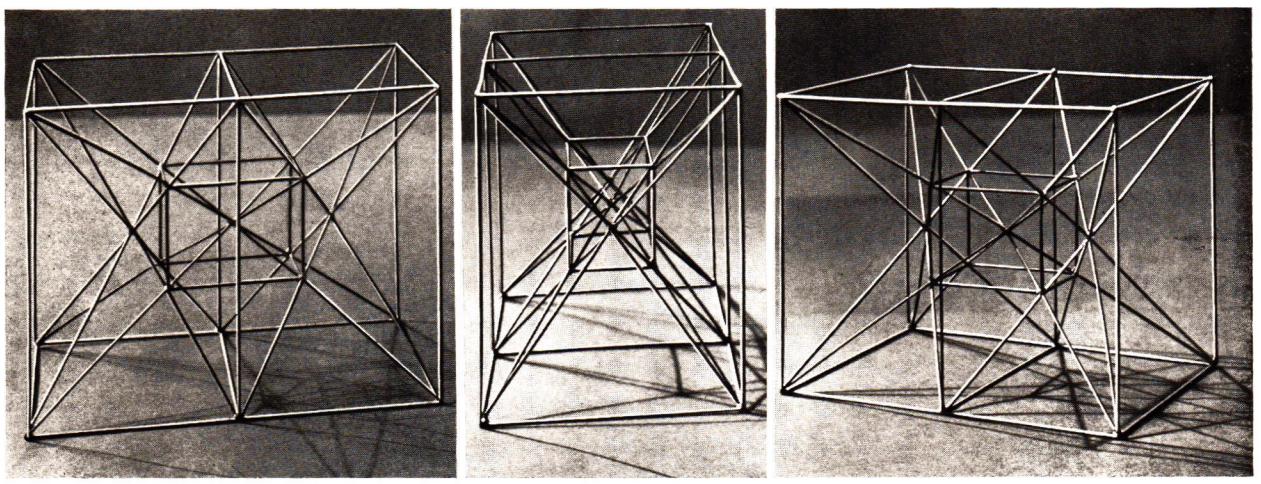

It is so important that we must emphasize again that each of these two forms has a unique spatial identity with certain formal characteristics that no other rectangular volume has. It is evident also that the smaller volumes can be



*Three pyramidal series of the trisected ratio-volumes, in front of a mirror. There are seven in each pile; the block on each base is identical in size and shape. The tallest pyramid is arranged on the smallest face of each block through a central vertical axis. The shortest pyramid is a similar arrangement of the same blocks each reposing on its largest face, and the third pyramid, at left, with the intermediate area on the base. Every unit is precisely similar in shape and each unit is one-third the volume of the unit beneath it*



*The blocks of similar shape contained in this ratio-volume are made by continuous bisection of one half of the volume in each step. The simpler wire model shows the intersection of a main diagonal with the corresponding diagonal to the bisected volume and the diagonal of the quarter volume in one point called the "focal-point." There are eight focal-points along the four main diagonals of the envelope which define the corners of an interior rectangluar form, the "focal-volume." These are the most elemental forms in the interior spatial structure, typical of all "ratio-volumes"*

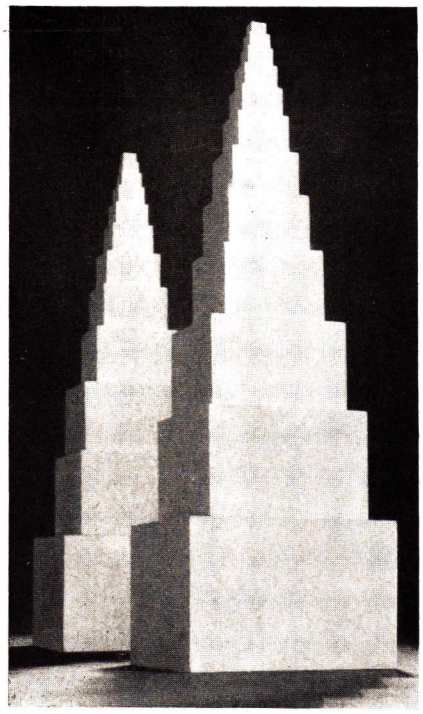


*Three different views of the same model, showing the interior "focal-volume." The eight focal-points of the ratio-volume are the corners of this interior form, which is of course similar in shape. The dimensions of the focal-volume are each one third of the dimensions of this bisected envelope of form, so that the cubic content is one twenty-seventh of the content of the form envelope. Note the interesting suggestions of pattern and silhouette in the wire model and its shadows*

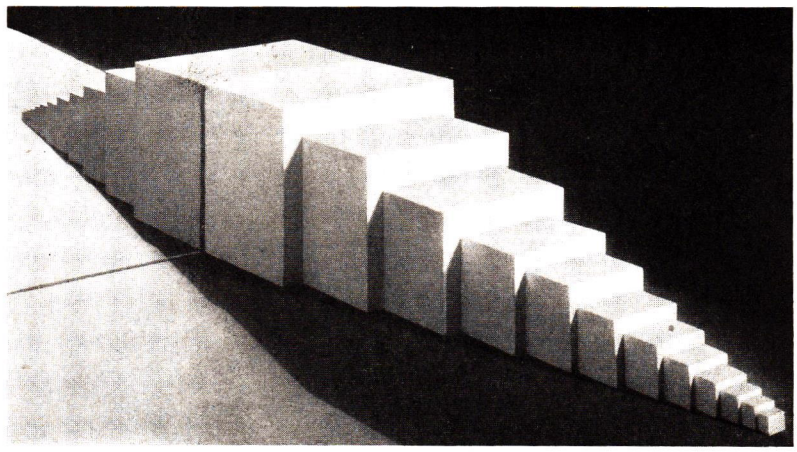
divided in the same method and the process continued to infinity, at least in theory, so that this envelope of form may be packed with groups of rectangular sections all similar in shape to their envelope and of course to each other. There are no "remainders," the form is completely packed and organized with similar shapes.

The elements of the interior structure of these forms exhibit a geometric organism that should be an instrument of the greatest value to the architect and designer in his study of Form. Here is a tri-dimensional application of geometry that creates and then motivates the interior structure of the envelope in which the artist works.

There is nothing in such an approach that inhibits the individual selection and idea-expression of the designer. If he inclines to functional-



*A pyramidal arrangement of the bisection series, with mirrored image, arranged on the intermediate face of each. The "set-back" is of course proportionate to the series and the bottom block equals the mass of all the superimposed volumes—if a duplicate of the small top block be added*

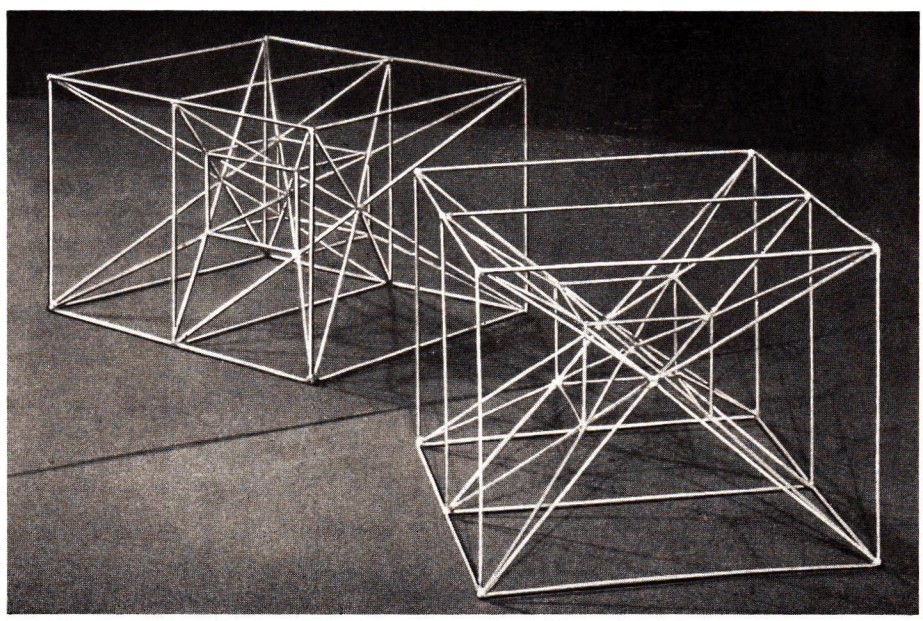


*Another sequence of twelve volumes of the bisection series, each one placed on an intermediate face. The group, mirrored, shows the largest set-back in one direction. Note foreshortening of the mirror image*

ism or to fundamentalism, if the sculptor is a realist or expressionist, his conception is enclosed by an invisible Envelope of Form just the same whether he knows it, or uses it, or not!

Today we are beginning to understand more of the significance of the great "form-themes" in art, regardless of the subject-matter or even of its purpose. The ideas of these form-themes are vitally important to all artistic conceptions. Such ideas, which are geometric realities, as thrust, asymmetric opposition of mass, axial symmetry, and other form-themes, are all directly involved within the spatial anatomy of this Envelope of Form, in the proportions of all ratio-values.

We can indicate here only the general idea of such a form organization which will be presented more completely in a subsequent article.



*Two views of the elemental structural lines and interior forms inherent in every size of the bisection series. Eight focal-points are corners of the focal-volume, two on each main diagonal at the intersection of the diagonal of the half volume. Only in this series are these one third of the distance in, so the focal-volume is one twenty-seventh of its envelope. The simplicity of structure is worth close study from the view-point of proportional form-organization*

# Inside the New Field Building, Chicago

*Graham, Anderson, Probst & White, architects, have used a brilliant tan color scheme in the main corridor. Walls of Loredo Chiaro marble above a black base; the metal work is white bronze*

*The stairway leading to the balcony arcades; these overlook the first-floor arcade. The two levels provide an unusually large proportion of space for shops opening inside the building*

# The Neglected Sense

## *By Carleton B. Ryder*

*Under this title we might have printed an article on achievements to date in pleasing the ear; again, we might have printed an article of the H. G. Wells type, visualizing acoustical achievements of, say, 1975. This is neither. Predicated on what the sense of hearing deserves of us, Mr. Ryder points out a logical path forward, taking acoustics into esthetics, but going no farther than is justified on the present record of achievement possibilities. It is the first of a series of articles designed to show the immediate possibilities of building to please the senses of hearing, seeing, and touching—in a word, organic structure.*—EDITOR.

POSSIBLY the interior designer has enough to think about; latterly, possibly not. At all events, up to the present he has rather neglected his share of a considerable burden. He ministers to the body with proficient understanding of physical comfort's causes and effects. He ministers to the eye with every authority of design, all the psychology of light and color at his command. But of the third faculty of his subject little or nothing does he say; yet—his client is seldom deaf!

The interior architect and decorator has not thought it sufficient to introduce light into a room; he directs it, colors it, shades it to a nicety. He will not permit leakage of light around the top of a valance or countenance unsoftened sun glare in a library. But as for sound, he may introduce mediums such as 'phone, radio or piano, place for appearance or convenience and have done. Leakage of generally disconcerting sound from another room, or street noise from windows and doors we all passively endure.

Environment and the comfort to be derived therefrom is communicated to the individual by the senses. One verifies another, and only when all agree does an impression become conviction. Disagreement immediately attracts suspicion, and so long as it persists makes ease or comfort impossible. Therein we find the inability to feel at ease in a mirrored room. Visual illusion denies the wall's existent position. But undeceived hearing confirms that position by recording, subconsciously, the time sound takes to travel to that wall and be reflected back. Thus the illusion is not merely incomplete but gives birth to distrust.

We are usually wary in our use of mirror, although it is a good mirror that reflects 95 per cent of light incident upon it. Meanwhile, that a common plastered wall reflects 98 per cent of sound has passed unnoticed. I do not and cannot exaggerate the importance of this issue. The eye commonly responds to only a single octave of color. The ear constantly deals with eight octaves and responds to more. The matter deserves attention and the means is at hand, for we have here no "necessary evil."

Structure springs from its imposed physical stresses to its psychological end: the accommodation of the occupant. It is too great a span for a single mind, although every step should develop through a most intimate understanding of its antecedent. Hence conception divides between the architect, specialist in structure, and the interior designer, specialist in psychology. The two proceed from opposite ends to a common solution.

To the interior designer, of the two most concerned, the psychology of acoustics is then the first phase of the subject. Volumes could and should be written upon this topic, but space will only permit my proceeding through generality and instance.

Sounds to a greater degree than colors have their respective effects upon the human make-up, go far toward causing and terminating its moods. Figure 1 is a graphic presentation of the entire audible frequency scale or band. Progressing from the average frequency of normal voice toward the lower end of the register, sound first dulls interest, is restful, next encourages sleep, and, as it reaches the limits of audible response, becomes definitely oppressive. Progressing upward through the register, sound first promotes interest, is tonic, next induces excitement, and finally becomes irritating to a degree that will augment fever. Acoustic faults may readily so alter the balance as to produce mood response in complete contrast to that of the original sound.

Increased intensity accentuates given effects. Figure 2 gives an approximation of the relative energy or intensity of typical sounds with transposition into the technical unit of decibels (db.). Doctor D. A. Laird, director of the Psycholog-

ical Laboratory of Colgate University, has determined that stenographers working under not uncommon conditions of noise burn 19 per cent more calories of physical energy than when the noise is reduced by 50 per cent. It is equally true that too low intensity of desirable sound, or poor hearing conditions, cause increased effort and resultant tiring. The New York City Noise Abatement Commission concluded that "At these levels (daily experienced noise peaks) conversation is difficult, study or concentration virtually impossible and normal sleep almost out of the question."

One of the psychological effects of sound is evidenced in the current decline of church-going. In the opinion of Vesper A. Schlenker, eminent acoustical engineer, religion is suffering from its architecture: an architecture that has made monotonous intoning, chanting (all at the expense of intelligibility) and generally low frequency sound necessary to accommodate prevalent acoustic faults. These faults mask higher frequencies and distort the lower ones psychologically conducive to sleep and oppressiveness. The sleepy congregation is *not* the fault of a futile creed.

Another example is "stage fright," wherein poor acoustics actually come between speaker and audience in the form of an unnatural separation. The very strangeness of a situation in which a speaker must bawl and his hearers gape precludes intimacy and its abnormality causes the speaker confusion and fear. The sensation of dread commonly felt before a microphone is again largely due to abnormality of situation, but in a different respect. Intimacy and consequent confidence are as absent as the audience; at the same time the situation is commonly aggravated by the use of acoustic materials and methods that absorb a greater percentage of the high frequencies than of the lower or more oppressive ones, producing an abnormal balance, often, and aptly, alluded to as a "dead room."

Thus it is that Naturalness obtained through *normal balance* announces itself as the all-controlling acoustic factor, with Intimacy or Seclusion the principal divisions of psychological application.

To answer the obvious question, "What is a normal acoustic balance?" we must decide between two contending theories: the first that acoustic applications should compensate for a falling off in efficiency of the human ear toward the lower end of the register; the second, and this writer's choice, that acoustic applications should convey sound from source to ear with its initial characteristics. For reason, in this choice, first recall that naturalness is the objective. Auditory inefficiency at low frequencies does not necessarily imply that the brain is less adequately informed of such sound because at low frequencies the sense of feeling begins to supple-

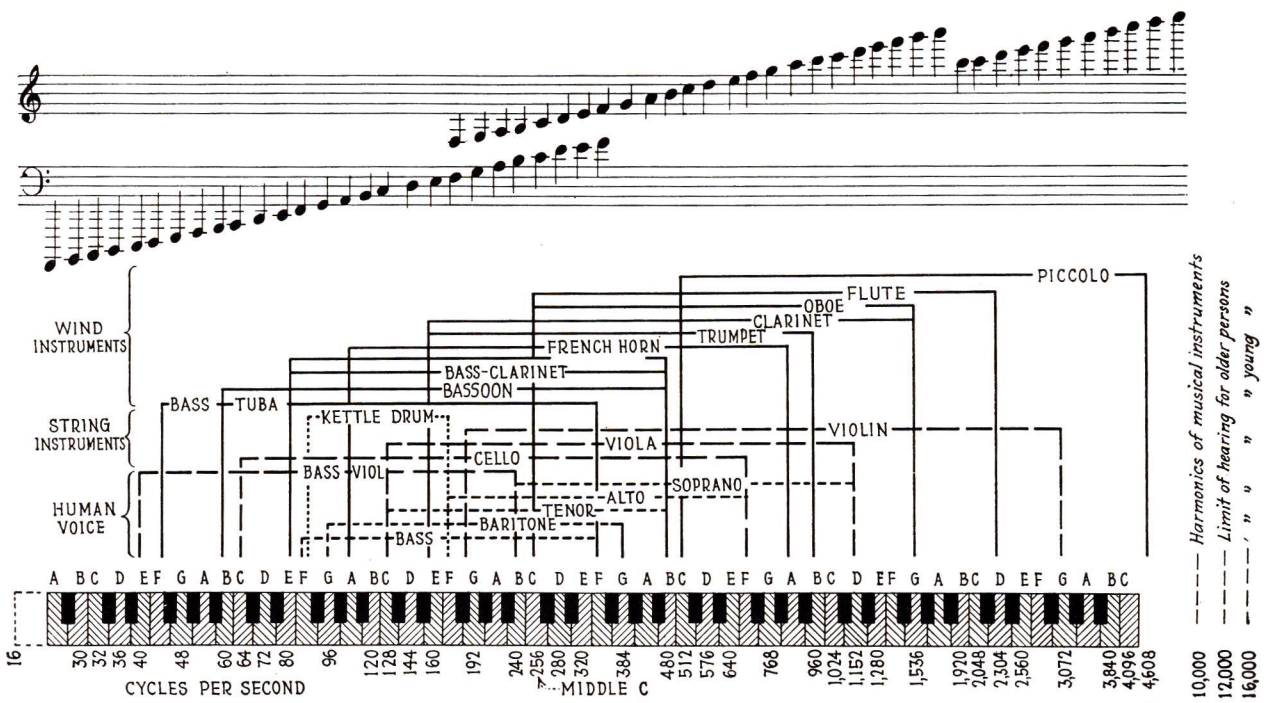



*Figure 1. Sound-frequency characteristics, as graphically represented in a chart copyrighted by* Electronics, *through the courtesy of whose editors it is here reproduced*

ment the sense of hearing. Nature originally constituted us for an outdoor environment where absorption of sound would be practically 100 per cent were it not for extensive reflective surfaces such as buildings. In other words, the ear was designed to hear only that sound proceeding in a straight line from the source. Thus drastic manipulation of sound is *unnatural.* Secondly, the decreased absorption at low frequencies necessary to increase the proportionate energy of sound permits its increased distortion, which is *unnatural.* Thirdly, the first theory oddly corresponds to an only recently overcome inefficiency at low frequencies of most manufactured acoustic absorption, which is *too* natural! A normal acoustic balance is one obtained by an application with proportionately equal absorption and minimized distortion, at all frequencies, barring minor concessions at special frequencies as psychological needs, acoustic needs, or incident noise may require, in the opinion of this writer.

Compensation for the two principal divisions of psychological need, intimacy or seclusion, are relatively as follows. Intimacy requires that special attention be given to the frequencies of speech, especially the higher frequencied components that contribute most to articulation. The degree of absorption may increase somewhat above the band essential to speech to minimize irritating sound; likewise increase below the speech band to minimize dulling or oppressive sound. General absorption should be low enough to make subconscious audible definition of the enclosing surfaces of a room readily possible, because intimacy is promoted by sensing smallness or cosiness of a room. A slight degree of extraneous noise in no way conflicting with the speech or other essential band is permissible since, by determining the remoteness of the outer world, it tends to encourage the gregarious instinct requisite to social, or informal, intimacy.

Seclusion is less important, but valuable in determining "formal" treatments. This primarily requires that a higher degree of absorption at all frequencies be employed to add to sense of space. Special frequency treatment should be such as to suppress more of the upper register and less of the lower than the foregoing application, but avoiding depressive frequencies. Extraneous noise may be eliminated to add to solitude. Variations of this general treatment are adaptable to sleeping quarters.

Consideration is next directed to the four

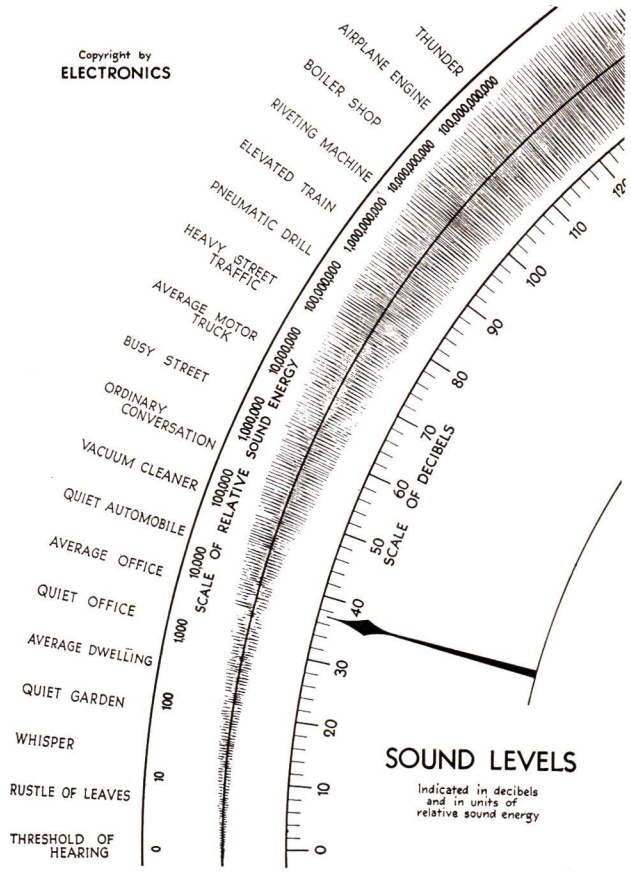



*Figure 2. An approximation of the relative energy or intensity of typical sounds. A decibel, it will be noticed, is ten times the logarithm of the sound energy*

divisions of acoustic treatment that directly govern means and methods. They are, in the order of their importance to the interior designer: Acoustic Illusion, Acoustic Correction, Sound Insulation, and Sound Isolation.

The first of these is herewith introduced to sound engineering, a result of study of the psychological applications. Importance of agreement of the senses has been stressed. Acoustic illusion is the greater part of the contribution of acoustics to such agreement. It is common practice in interior decorating to employ devices of directional design, occult balance, color, and illumination to change the effectual form or size of a room, thereby attempting to create illusions for specific purposes, principally better adaptation to function. Such efforts fail if they do not make similar appeal to each and all of the senses. For instance, if it is desired to lower a too-high ceiling, not only must its color be brightened and warmed, not only must apparent depth be added to beams through increased color contrast and to texture through deepened relief, not only must wall height be decreased through breaking

vertical lines and introducing horizontal ones, but also a greater degree of low-frequency sound reflection with moderate absorption at all frequencies must be allowed for. In the reverse case higher absorption is employed to distance the ceiling. The extent of similar applications will be apparent to the reader.

Acoustic Correction is the second division. This covers the undistorted, unmasked, and articulate transmission of desirable sound from source to hearer. This consideration deserves attention wherever voice or musical instrument is to be heard in a room. Treatments are based upon a normal balance with the degree of absorption correct for an "optimum" period of reverberation as determined by the individual treatment. Reverberation is the continuation of sound after cessation at source as a result of active reflection. The period or length of time may run from fractions of seconds to five and six seconds. At four syllables per second from source there would be sixteen audible sounds at once in a room where sound is prolonged four seconds. Such conditions would make understanding difficult if not impossible, and require absorption to bring the period down to a proper length. Special surfaces, the sources of echoes or sound foci receive increased absorption. Furnishings should be introduced and distributed with a precise knowledge of their action upon sound.

It is interesting to observe the probability that reverberation and its resultant overlapping of sounds is responsible for the great difference between the Occidental pitch scale and those adopted in the Orient and other countries where climate or hardiness permits frail and porous walled structures that are sound absorbent in contrast to the stone architecture of the Occident. Discord can prevail only where sounds are simultaneous or overlapping.

Sound Insulation, the third division, deals with the entrance of air- or structure-borne sound from undesirable sources into a room. For relief from city noise we must direct our attention toward insulated construction rather than attempting to stop the source, a fairly hopeless prospect. However, the worst offenders, windows, may be made effectually soundproof by employing three differing thicknesses of glass spaced apart. When necessary to open, ventilating baffles having acoustic linings or filters should be used. If the opening is vertical, curtains backed by an acoustic blanket baffle will appreciably reduce noise. Further reduction may be effected by lining soffits, etc., directly adjacent to opening and opposing wall with absorption of the highest efficiency at the proper frequency. (See Figure 5.)

The natural or functional difference between most rooms calls for comprehensive recognition of their individuality uncompromised by ineffectual separation. The common practice of connecting dining and living rooms by an open arch is seldom necessary and never desirable. Soundproof doors (with silent checks) are everywhere available and may be closed.

Another prevalent and easily remediable source of extraneous noise is the air-conditioning duct. Lining ten or more feet of the duct with acoustic absorption would check this annoyance.

Sound Isolation is the last division and comes almost wholly under the architect's supervision. This deals with the prevention and absorption of sound or vibration at the source when source is in or directly adjacent to the building. Such sources include all mechanically operating equipment and in very few instances, notably kitchen, laundry, and bathroom equipment, ever come under the interior designer's supervision.

Our progress from psychology to solution has brought us to means. Acoustic materials have the following four properties in combination or individually:

*Reflection.*—Given by a smooth, dense, rigid surface; except rarely, to be avoided.

*Diffraction.*—Given by an uneven rigid surface; typical of treatments ranging from highly textural plaster to coffering; affecting the frequencies of sound relatively according to the sizes of areas of various reflecting surfaces; the area required to reflect sound of one frequency increases for diminishing frequencies.

*Absorption.*—Given by a material that accepts a percentage of sound and decays it by means of multiple reflection before it can escape; or as given by a soft and porous packing between structural members to prevent vibratory transmission; affecting sound with respect to the size, depth, and number of perforations; the size increasing and the number decreasing for diminishing frequencies; as a whole more efficient on high frequencies than low.

*Diaphragmic Action.*—Given by a resilient surface that recoils under the impact of sound vibrations and thereby delays and subdues reflection; affecting sound with respect to the extent and speed of resiliency; the extent increasing and the speed decreasing for diminish-

FIGURE 3—TYPICAL FURNISHINGS

*Comparative list of coefficients or percentages of absorption at a 512-cycles-per-second frequency, based upon 100 per cent absorption of an "open window." Widely variable.*

| FURNISHING | COEFFICIENT |
|---|---|
| Carpets, rugs | .15 — .20 |
| Carpets, rugs with usual lining | .20 — .30 |
| Carpets, rugs with special acoustic lining | .45 — .60 |
| Chenille curtains | Avg. .23 |
| Heavy velour curtains | .40 — .75 |
| 18 oz. per sq. yd. velour, hung flat on wall | .23 |
| 10 oz. per sq. yd. cotton, hung flat on wall | .11 |
| Unfinished wood | .06 |
| Painted or finished wood | .03 |
| Common plaster | .02 |

FIGURE 4—ACOUSTIC MATERIALS

*Tile.*—Solid acoustic composition or fibrous cushion encased in perforated metal; efficiency high but inflexible as to particular frequency response, although selection may be made from numerous tiles of various peaks.

Supplied in a diversity of authentic designs and colors or may be painted with paints that do not block up perforations.

*Fibre Blanket.*—A fibrous cushion in blanket form generally supplied bound in metal mesh; efficiency high but offering a small diversity for particular frequency peak selection.

Usually applied unbroken from cornice to base or in moulding-framed panels; covered with a suitably loose woven drapery fabric.

*Fibre Board.*—A structural board of compressed fibre or composition; low overall efficiency but structurally highly adaptable.

Application should be such that area of contact with joists or other support is minimized to permit diaphragmic freedom.

Porosity should be preserved as far as possible by non-filling paint if paint is used.

*Acoustic Plaster.*—Acoustic composition applied in plaster form or cast in ornamental moulds; efficiency high considering widespread area of adaptability; may be substituted for any common plaster.

It may be finished texture, applied in relief, or after the manner of "cement murals"; may be tinted, painted with non-covering paint, stencilled, or frescoed.

ing frequencies; as a whole more efficient on low frequencies than high.

Of materials having acoustic properties, furnishings are first in the interior designer's eyes. It would be impossible to speak here of every such article. A few are listed for comparison in Figure 3. Of the majority it may be said that they are less effective absorption at low than high frequencies, and therefore require compensation in other, probably structural, forms. The factors governing the absorption of upholstered furniture are the depth of stuffing and the size of openings or the looseness of the weave covering. Open shelves of books may be noted for their good absorption. Persons in average garments are fairly high absorption. Unupholstered furnishings, such as small tables, chairs, cabinets, pictures, and ornaments, can be considered only as factors for diffraction.

Arrangement of furnishings also has a controllable effect on sound. The grouping together of furnishings responsive to a common frequency peak should be avoided. Musical instruments in general should be arranged against a live wall with balanced absorption in an opposing position; in small rooms absorption may be general. The radio, however, is better immediately backed by an absorbent wall to preclude masking of the directly emitted sound by reflected sound. Musical instruments should never be opposed by an extremely reflective wall, large mirror, closed window, or furnishing having a surface of large area such as wood. It is well to surface the top of table or stand upon which a 'phone is placed with highly absorbent material and mount similar absorption in panel or hanging form upon the walls immediately adjacent to the instrument. This will add appreciable privacy to 'phone conversations held in an occupied room.

Figure 4 is a list of the four main types of structural materials for application to walls and ceilings, together with notes upon their decorative possibilities. It should be quite plain to the reader that a material or combination of materials ought to be able to meet specific frequency requirements anywhere in the audible band. However, to the writer's knowledge at this time, only one theory and process has been evolved whereby a truly normal acoustic balance may be attained by adjustment of the material on the job to meet necessities both as to total absorption and particular frequency response. This process employs acoustic plaster. Most other

materials are inflexible and less efficient at low frequencies than high. And although the coefficient of absorption at one frequency, 512 cps., by no means indicates the overall efficiency of a material, nevertheless such designation has unfortunately been widely adapted. Misrepresentation is thereby possible. Materials should be selected by inspection of their coefficients at several typical frequencies throughout the audible band and selection made for either particular fixed response or flexibility.

FIGURE 5—COMPARATIVE FREQUENCY LIST OF COMMON SOUNDS AND NOISES

| TYPE OF SOUND | FREQUENCY, CYCLES PER SEC. |
|---|---|
| Insect chirp | 14,000 |
| Door squeak | 11,000 |
| Typewriters | 3500 |
| Dining service, cutlery | 2000—3000 |
| Street and traffic noises | 200—1100 |
| Average woman's speech | Avg. 256 |
| Average man's speech | Avg. 128 |
| 60-cycle alternating current | 60 |
| Niagara Falls | 40—50 |
| Distant gunfire | 40 |
| Thunder | 20—40 |

Space denies a discussion of specific applications. Apartments, residences, offices, restaurants, stores, shops, salesrooms, clubs, hotels, hospitals, theatres, auditoriums, and sound studios fail to complete the potential list. The interior architect's judgment and his client's willingness to advance are the sole arbiters. It is the author's purpose in this article to emphasize the basic importance of the issue, and from the abundance of available information suggest corrective generalities.

In its less than forty years of existence this science has leaped to a recognition unparalleled by any other in its growth. Recently developed electrical instruments have been largely responsible and have reached a perfection whereby it is now possible to make complex analysis for the production of precise results, and it will not be long before there will be no desired result the causes of which cannot be reduced to specific methods and materials in quantitative form. If it is true that only one out of three acoustic treatments have been entirely successful, it is largely due to the self-sufficiency of too many designers who are not acoustical engineers. The office of the interior architect and decorator is to establish the psychological and design objectives. The consulting acoustical engineer is then available, should be called in, and relied upon as the architect relies upon his engineers.

This is entirely fitting to the proper progress of the interior decorator from connoisseur of arts to co-ordinator of sciences: a development at last recognized as essential to the permanence of the profession.

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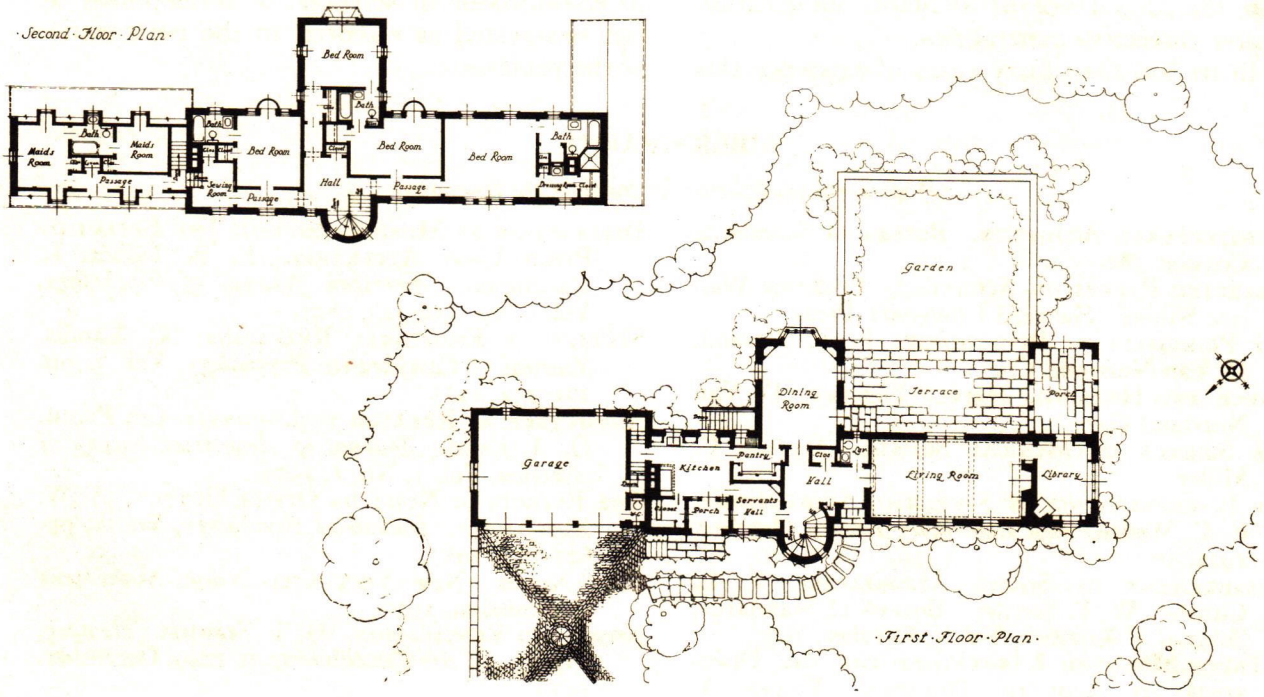
F. R. Watson, V. O. Knudsen, P. E. Sabine, C. F. Eyring, W. C. McNair, S. K. Wolf.

# House of Gilbert Browning, Greenwich, Conn.

*The west front. All exterior walls of common brick, lightly parged with cement mortar. Roof is of handmade shingle tiles in shades of reds and burgundies*

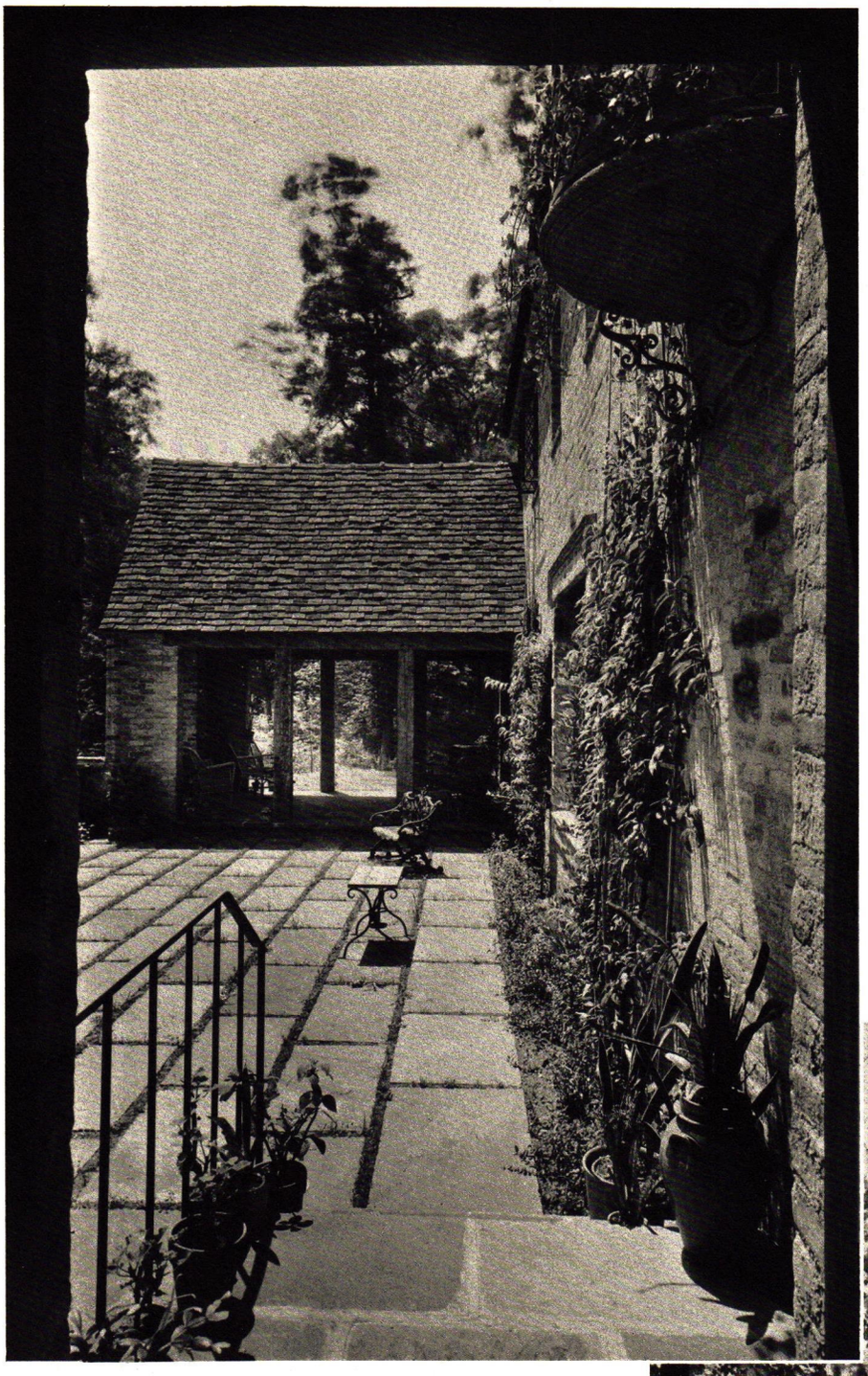
*Photographs by Robert MacLean Glasgow*




FRANK J. FORSTER, R. A. GALLIMORE, ARCHITECTS

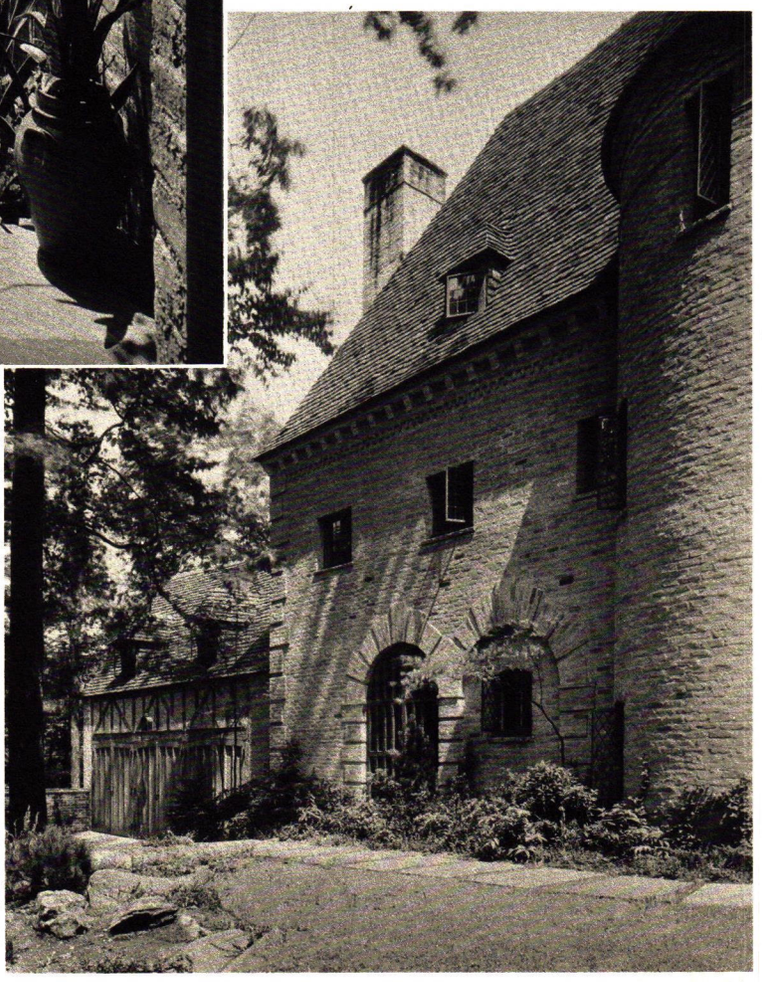
*Looking toward the circular stair tower from the garden court. The arched opening with its grille gate of solid oak forms the service entrance. The steps at the right lead to the main entrance*

*The garage doors are of oak, iron studded. Brick nogging is used in the oak half-timber work over these doors. In the dormers the overhanging roof is supported on oak brackets*



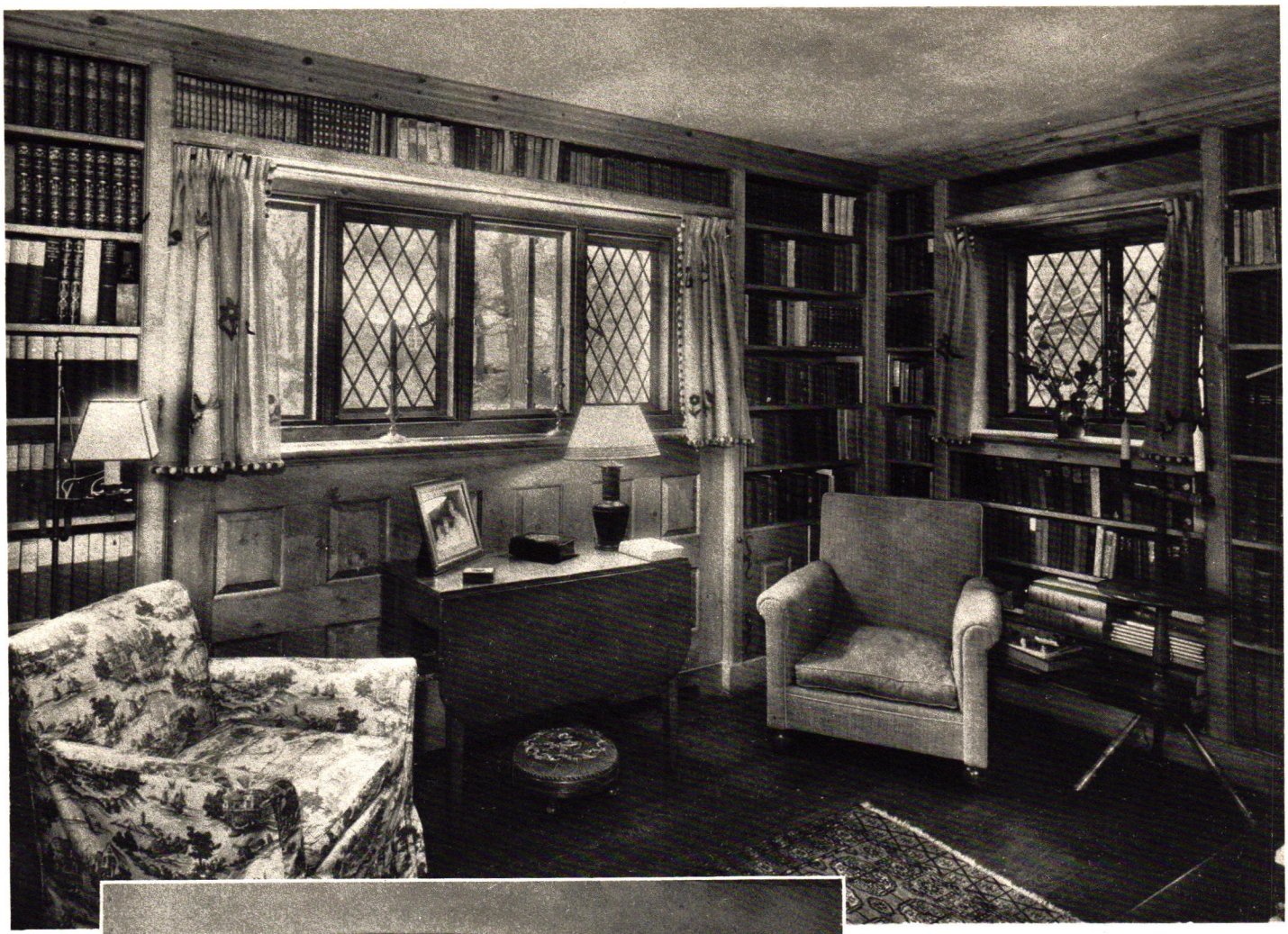
*Looking across the garden court and its bluestone flagging, from the outside dining-room door. Overhead will be noticed the projecting floor of the balcony, which is of reinforced concrete*

*The cornice is unusual—constructed of limestone and brick. In the extreme upper right corner of the photograph will be noticed the cornice of the circular tower with its two courses of pantiles over which is a projecting course of limestone*



*Looking across the garden court from the main porch. Timbers of solid oak are used for the posts and lintels of this porch. The touches of wrought iron in balcony railing and dining-room entrance stair railing are worthy of note*

*The porch as seen from the garden enclosure. Its main arch in the gable end employs projecting brick quoins. The brick wall extends from the corner of the porch around the garden, as shown on the plan*



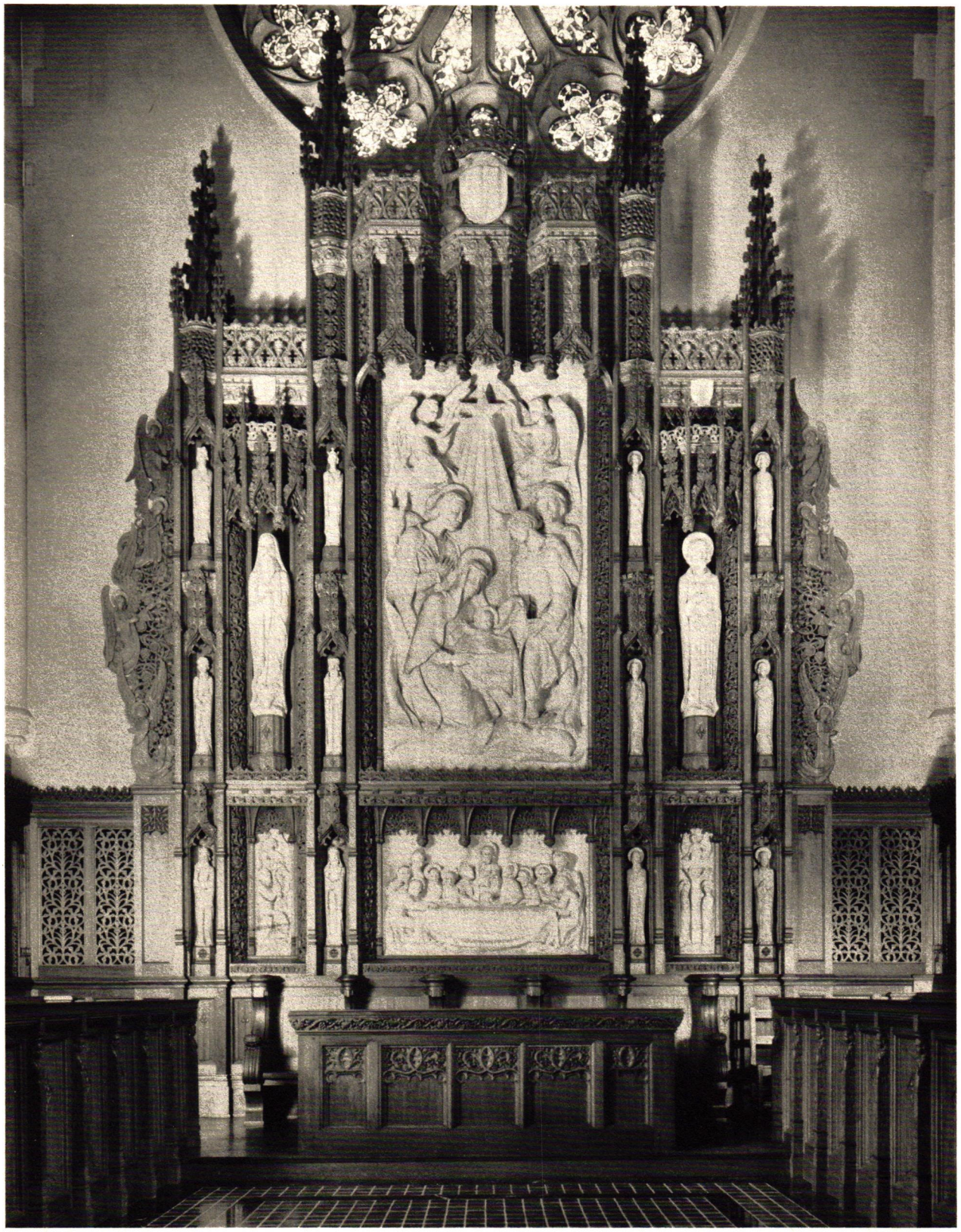
*In the library the book shelving carries to the ceiling, it and the panelling being of pine stained in light brown. The curtains are crewel work on a natural net*

*In the circular tower, where winding steps lead up from the entrance hall, woodwork is of oak stained light brown; floor of red slate*

*The southeast end of the dining-room with its bay window. In the corners the china shelving and cupboards are of pine. Here the other woodwork is painted a warm green. Floors are of oak*

*A detail of the entrance hall with the main door of iron-studded oak with the leaded light. Walls and ceiling are smooth natural plaster finish; the floor of red slate*

*Looking into the living-room from the upper level of the hall. The carved oak lintel and limestone jambs frame the fireplace and its raised hearth. Here the ceiling beams are moulded oak. The walls and ceiling are of smooth sand plaster. Wide oak planks are used for the flooring*



*Built of Philippine mahogany to conform to the other woodwork, with panels and figures of English limewood*
*Cram & Ferguson, architects; carved by The W. B. McAllister Co., from models by Alexander Blazys*

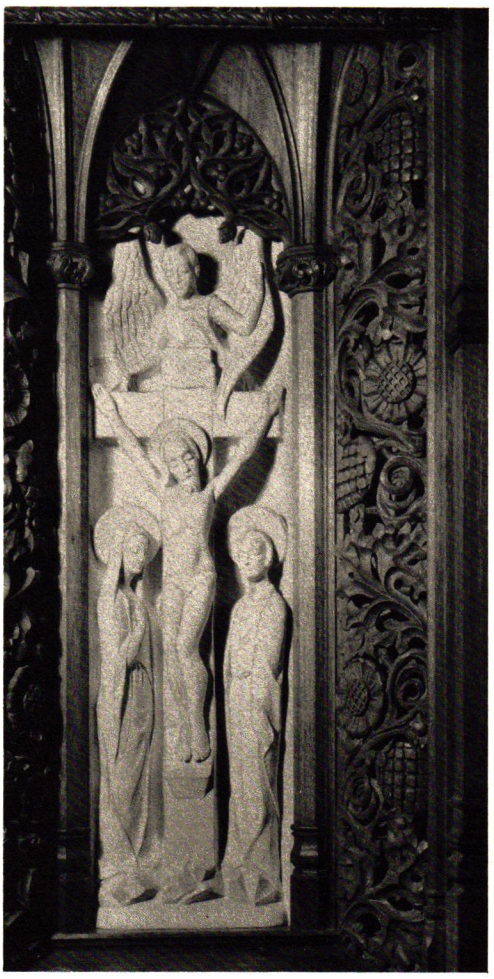
# Reredos, Presbyterian Church of the Covenant, Cleveland, Ohio

*"The Nativity," the lower panel on the left. The carved lime-wood resembles the color of old ivory*

*The two main figures at right and left of the central panel: St. Peter and Abraham. As is well known, the limewood has a smooth, undirectional grain which delights the wood carver*

*"The Last Supper," the lower central panel. The maximum relief on this panel is seven inches*

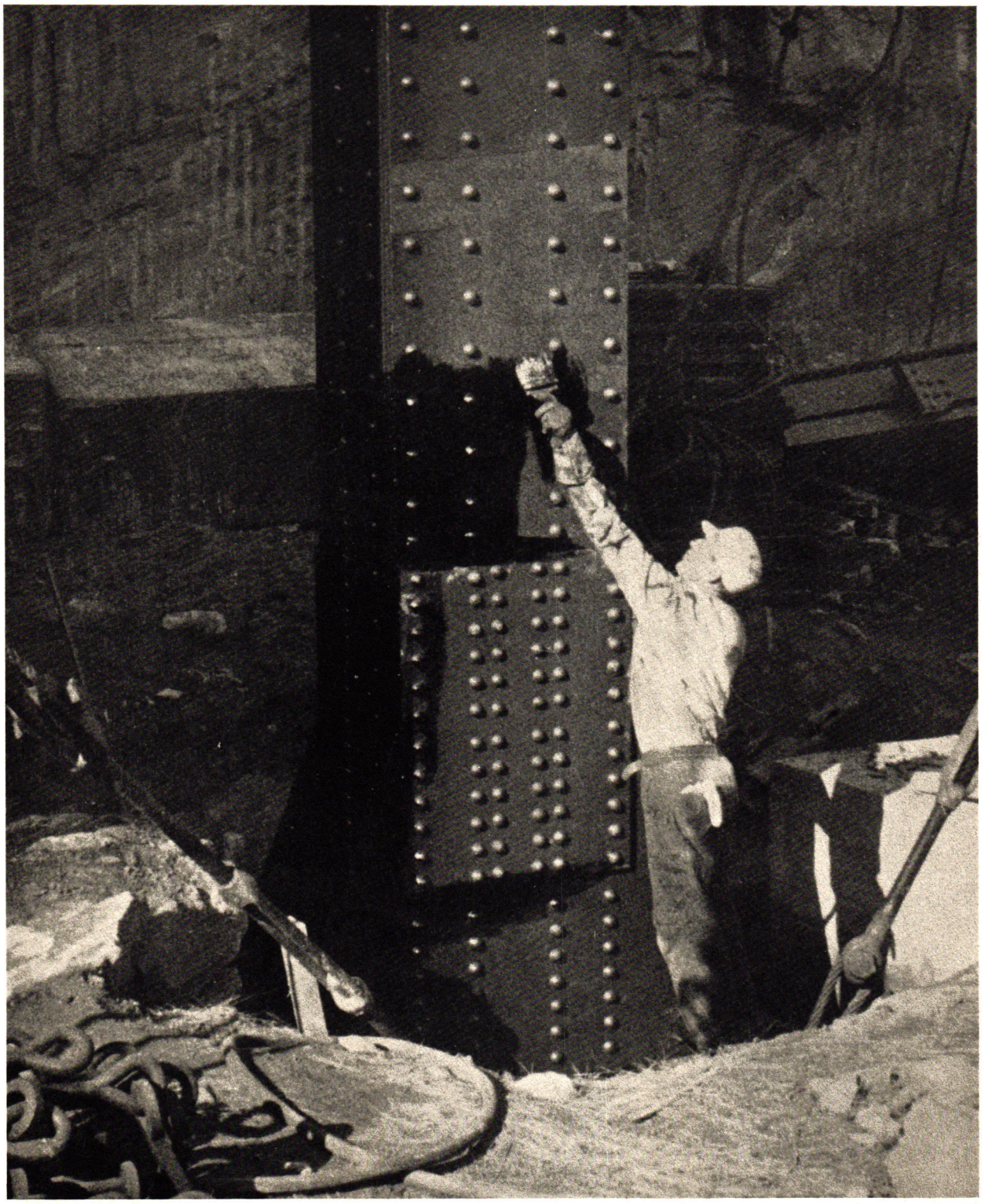
*The panel at left of "The Last Supper," the "Sacrifice of Isaac." Here and in the panel opposite the maximum relief is four inches*



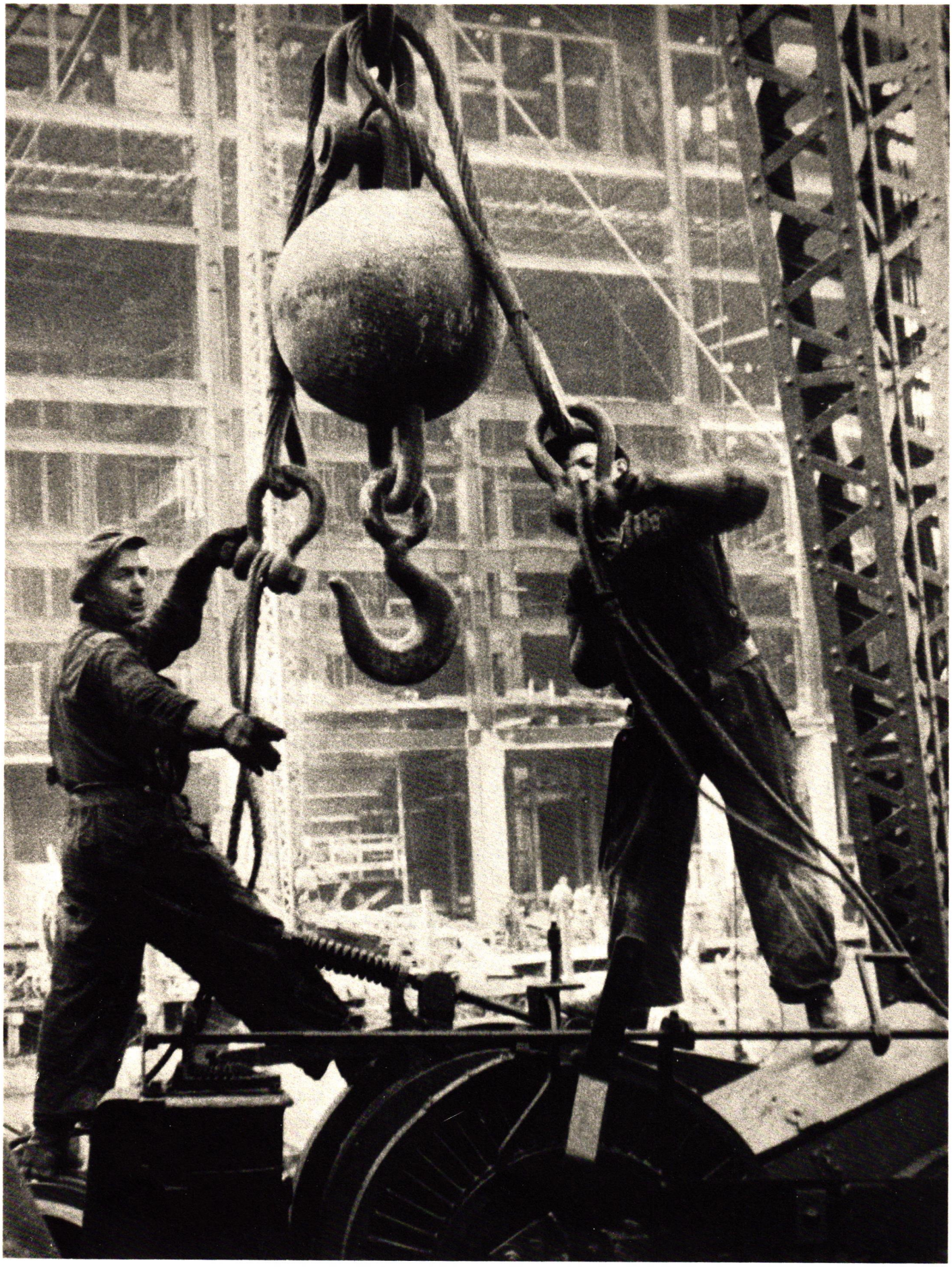
*The lower panel of the right-hand side, "The Crucifixion." In the niches there are on the Old Testament side, Moses, David, Isaiah, Jeremiah, Hosea, Micah; on the New Testament side, Matthew, Mark, Luke, John, Paul, and Timothy*

# THE DRAMA OF BUILDING: IV

A SERIES OF PHOTOGRAPHIC STUDIES BY JEANNETTE GRIFFITH WHICH MAY HELP US TO APPRECIATE THE STIRRING MAGNIFICENCE OF OUR OWN CONTRIBUTION TO THE HISTORY OF BUILDING



*Jeannette Griffith* STEEL



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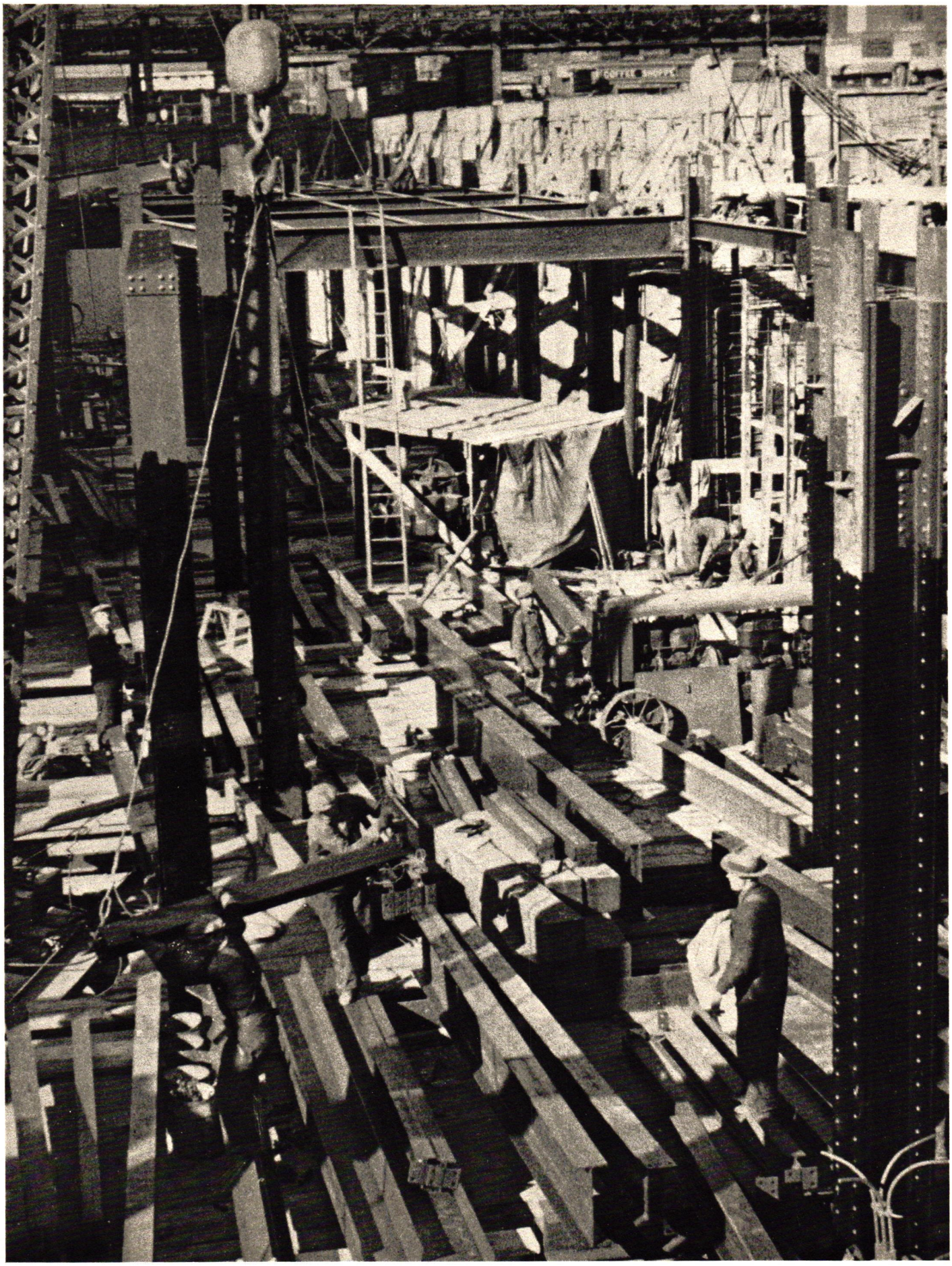
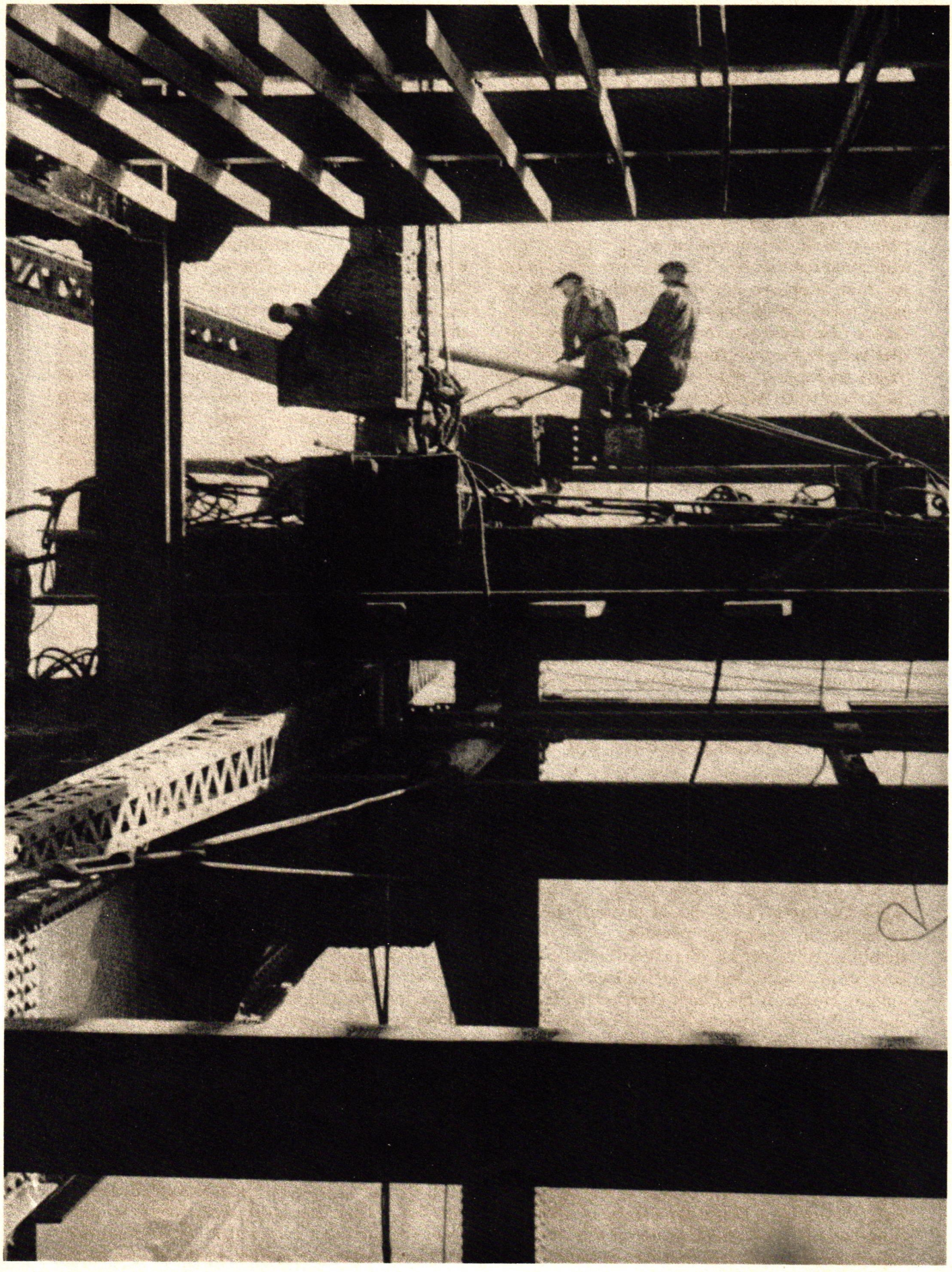




STEEL

*Jeannette Griffith*



STEEL

*Jeannette Griffith*

# Some Pitfalls in Supervision

*By W. F. Bartels*

XXVI. STEEL STAIRS

(*CONTINUED*)

THE stair platforms must be properly supported, of course. Should the stair stringers carry any partition or wall they should have additional reinforcing. The superintendent must see that they are not only strong enough to carry such a wall, but to prevent any plaster cracks. He must see that the installation is as specified as to the gauge or thickness of the treads and risers. Many small iron dealers feel that their work will receive but scant scrutiny, and the alert superintendent does well occasionally to measure the angles, etc., with his rule, and the various plate thicknesses with a micrometer—then checking them back against the plans and specifications.

It is important that brackets for the handrails be installed at the proper time. This is generally when the rough partition work is going ahead. To have to go back and install them later means a tedious, trashy, and untidy job, not to mention the fact that they probably will not hold up as well. The fastening of handrails is an important item, needing careful supervision. Scarcely a job of any size is ever completed without several loose handrails. Newel posts must be properly anchored and at the correct locations. Some time well in advance of installing a rail in a limited space its length must always be checked, particularly if it is largely ornamental and the newel post is considered essential. Jobs have occurred where the newel posts were buried in the plaster because the rail was several inches longer than called for, and because of scroll work which could not easily be cut off.

The finish of stair work is important because one not only notices the floor side (risers and treads), but also unconsciously looks at the under side (unless it is furred in) at the flight above when walking downstairs. The material should come on the job fully covered with a good coat of genuine red lead and oil—not a paint colored to resemble red lead. Then, when the stair is finished ready for another coat of paint, the bolts should be trimmed down to the nuts, all rough edges filed down, rust removed from any place it may have accumulated, and all cement and foreign matter cleaned off. Too often the stairs, particularly if there is an elevator in the building, receive little consideration during the construction, but are given an inviting and workmanlike appearance just before the architect's final inspection.

## ORNAMENTAL IRON AND BRONZE

ONE of the most important items coming under the head of Ornamental Iron and Bronze is that of fire-escapes. They should advisedly be kept as simple in design as possible. All crevices should be eliminated so that it will not be a difficult or impossible job to reach all surfaces with a paint brush. A little care exercised in this respect will render upkeep less and eliminate rust spots on the concrete should there be a sidewalk beneath the fire-escape.

Fire-escape members should be substantial, and if built to order all parts should be specified as to size. If ordered from a stock design this should be checked to make sure that all the sizes are furnished as given for that particular type. Too often a fire-escape is simply specified: "Furnish a Blank fire-escape of standard construction." On checking up on this item the superintendent will find that five or more different sizes come under this heading, varying from one substantially constructed down to a flimsy affair that may or may not just come within the requirements of the code.

After the fire-escape is delivered it is up to the superintendent to see that it is properly installed. It should be left with no bolts projecting beyond the nut heads, nor should any ragged projections be allowed which will suffer from exposure to the weather. It is understood that all fire-escape parts will have been sent to the job well protected by a coat of red lead, and will receive at least two additional coats of lead and oil before being finally turned over to the owners.

It might be well to mention here that the superintendent does well to check shop drawings with the fire-escapes on their being delivered on the job. They are more than likely to differ from the architect's drawings. Sometimes they may only vaguely resemble what is shown on the

shop drawings. Changed sizes and changed weights are among the many common discrepancies. Contracting in the building business has not—in toto—passed beyond the *caveat emptor* stage, and it is the superintendent's duty to see that the owner gets what he is paying for.

In measuring sheet and plate iron and steel it will be found that there are several gauges used. The most common is the United States Standard Gauge, but the superintendent should confirm this before proceeding to check up. "The United States Standard Gauge is a weight gauge based upon the weights per square foot, in ounces avoirdupois, and approximate thickness based upon 480 pounds per cubic foot. In the practical use and application of the United States Standard Gauge, a weight variation of 2½ per cent either way may be allowed." It must be borne in mind, however, that in any sheet there is likely to be a small discrepancy between the exact size called for by that gauge and the sheet itself when measured. If the sheet varies too much in thickness for the gauge it is supposed to be, a piece should be weighed to make sure it is wrong before the contractor is hauled in on the carpet. Where a diamond plate or similarly corrugated surface is encountered it will readily be seen that the measurable size will vary. The corrugations are formed by the last rolling and hence their depth varies somewhat. And as such plates are measured not over all but from the smooth side to the bottom of the corrugation, a variation must be expected. Such plates are measured in fractions of an inch. Confirmation of any discrepancy should be checked by weighing a measured piece.

If these plates are intended for trap doors and similar uses it is necessary to see that they fit into their frames properly and that the frame is of the size specified. Then, too, if the plates are reinforced the angles or channels should be looked over to see that they meet the requirements. Handles or holes should be provided for all plates unless they are to remain fixed.

When the average man is on a penthouse roof he is apt to look at the view above the railings, but never see the railings themselves. But the superintendent must see them with a concentrated eye. They usually mean many unhappy moments and unceasing vigilance. They represent one part of the building construction that he would like to avoid. The details may be difficult to follow. Following them may mean making a secure job at the expense of leakage, or vice versa, an absolutely waterproof result but so insecure that the first vigorous push may upset the railing. But whatever the details the superintendent should use his ingenuity to secure both a water-tight job and a safe railing. If the rails are of the threaded type, the threaded ends of all members should be long enough so that a firm connection is secured, in spite of the contractor's objection that it is "not a plumbing job."

Stair or guide-rail fittings should be built into the walls wherever possible. In cases where a rail is attached to a vertical stanchion it is well to have the latter fastened to the slab structure itself, rather than merely to a surface finish, such as a cement or wood floor.

Superintending the installation of a door might be separated into three parts, all of them important: first, the setting of the buck; second, the setting of the saddle; and, finally, the hanging of the door and fastening of the trim (unless the latter happens to be integral with the buck). Setting the buck properly requires initially that it be in the correct location, particularly if the dimensions have been closely calculated because of cramped quarters. The height must be carefully checked so that when the door is finally hung it will clear the finished floor or saddle. The buck must be plumb and square so that in the application of the trim there will be no bulging or breaking of the mitred corners. Generally there is a strip of metal across the bottom of the buck in order to facilitate setting it, and also to prevent its being twisted out of shape in handling. If this strip is missing it not only slows up the setting but also adds to the probability of the buck's not being set accurately. After the buck is correctly set it should be well braced until it is built into the partition. Also, when the walls are being built a check should be made to see that the anchors attached to the steel buck are being securely built into the walls. Some mechanics are careless about embedding this means of support and their omission is very likely to result in a shaky door frame. In the matter of "shimming" the bucks up, it is better to use steel shims than wooden ones. It is an expensive matter to change or move a buck, so it will well repay any extra attention given them when they are being set. In erecting a large entrance or ornamental door it is often better to erect the frame simultaneously with the masonry, thus taking care of minor discrepancies in measurements and generally giving a better finished job.

(*To be continued*)

*Photograph by Robert MacLean Glasgow*

*An executive's office, New York Life Insurance Company, New York City. Cass Gilbert, architect*

# Business Offices of Executives

*Photograph by Lucy Lamar*

*An executive's office in Lee Higginson Company's banking quarters, New York City. Cross & Cross, architects*

*Office of Carleton Palmer, President, E. R. Squibb & Sons, Squibb Building, New York City. The walls are of walnut; floor of slate; hangings, beige and brown; chairs, tan pigskin. The Firm of Ely Jacques Kahn, architects*

*Photograph by Sigurd Fischer*

*Former office of Luther Blake, Standard Statistics Company (see also page 346), New York City. Walls are panelled in pine; carpet, dull green; Venetian blinds, olive green; hangings, a Jacobean linen having gold background with red, olive-green, and brown figures; sofa, sage green with gold damask cushions; chairs upholstered in red leather and red velvet. Decorated by Margery Sill Wickware*

*Photograph by Richard Averill Smith*

*The office of Sir Ashley Sparks, President, The Cunard Steamship Company, Cunard Building, New York City. The room has something of the flavor of an eighteenth-century drawing-room in a London house. The Heppelwhite chairs in mahogany are upholstered in black leather; the panelled walls are painted. Benjamin Wistar Morris, architect*

*Photograph by Lucy Lamar*

*Another executive's office in the banking quarters of Lee Higginson Company, New York City. Panelling is of English oak. The mahogany desk is an old one with tooled leather top; the sofas and armchairs are upholstered in leather and wool damask. Cross & Cross, architects*

*Photograph by Lucy Lamar*

*Office of John C. Von Glahn, 1 Wall Street, New York City. Walls, pine; tan rug; hangings and upholstery of blue. Walter Johnson, interior architect*

Photograph by Richard Averill Smith

Photograph by Richard Averill Smith

*Present office of Luther Blake, Standard Statistics Company. Walls in pine; Venetian blinds, green; hangings, old gold. Margery Sill Wickware, interior decorator*

# The Editor's Diary

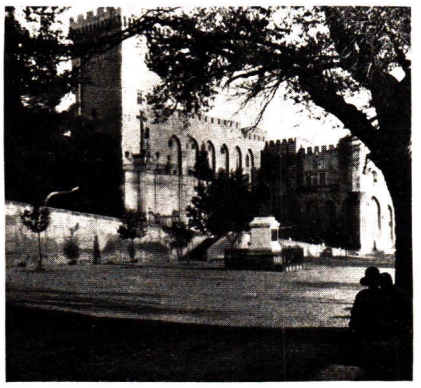
*Monday, September 26.*—Those who know Philip Youtz's booklet published by the American Library Association will be interested in knowing that a new booklet in the series, Reading With a Purpose, has just been published: "Interior Decoration," by Dudley Crafts Watson, who serves, among other activities, as official lecturer on interior decoration with the Chicago Art Institute.

*Tuesday, September 27.*—Thomas C. Pratt has a breezy and helpful article in *The Charette*, the monthly organ of the Pittsburgh Architectural Club, for September. He tells how, being unable to do anything about the depression, he grabbed a suitcase and a knapsack to board a slow steamer for Europe. Most of his impressions one can agree with, but his comment on Avignon raised the hair on the back of my neck. He calls the Palace of the Popes "a barren, fortress-like Gothic barn," which convinces me that he must have had, that morning, a bad omelet for breakfast.

*Thursday, September 29.*—Lunched with Rutherford Boyd, J. Scott Williams, and David Coyle—a stimulating group, each one of which has very clearly defined ideas on practically every subject. The chief topic of discussion was the philosophy of design governed by geometric or mathematical bases. It was particularly interesting to me that Rutherford Boyd, who has spent an active life in drawing and painting the naturalistic, should himself be convinced that far greater possibilities are open to us through design with a mathematical basis; while David Coyle, on the other hand, an engineer who has been dealing with mathematics all his life, is convinced that in designing for function, one must free himself from all *a priori* restrictions, even the mathematical ones. His theory is that beauty increases with the intricacies of the factors controlling the design. One can use any stick with which to beat a dog, but when one shapes a paddle for canoeing, several other factors intrude which, in the result, make a stick that is much more pleasing to our æsthetic sense.

*Friday, September 30.*—John Sloan is back from a summer in Santa Fé, and, having resigned from the presidency of the Art Student's League, is going to teach drawing and painting at L'Ecole d'Art, Archibald Archipenko's school. Sloan says that he becomes more and more convinced of late that the eye sees only color, drawing being what the mind impresses on the will. Well, it's a good subject for argument.

*Saturday, October 1.*—Architects and hospital authorities have done a lot of talking about the advisability of using glass that will pass the maximum of ultra-violet rays. So far as I know they have ignored the copper screen. Dr. Reginald G. Harris, director of The Biological Laboratory at Cold Spring Harbor, told me today that the laboratory has just produced an instrument which measures quickly and accurately the ultra-violet light passed through any medium. The instrument was made by Ernest Victoreen, working under Dr. Hugo Fricke, in charge of the laboratory for biophysics. A doctor who came from New York the other day had reason to believe, as the result of several years' work in ultra-violet therapy, that screens for hospital purposes appreciably cut down the value of the sun's rays to the patients exposed there for treatment. Tests with the new instrument, based on the principle of the photo-electric cell, showed that a certain amount of ultra-violet light reaches the unscreened machine in nine seconds; the same amount if through new copper screens, fourteen seconds; and if through screening of several years' service, seventeen seconds.



*The Palace of the Popes, Avignon*

*Monday, October 3.*—Out to Perth Amboy this afternoon with Paul Jennewein and a group of interested architects to see Jennewein's great pediment for the Pennsylvania Museum. It is unquestionably the most elaborate attempt ever made to use terra-cotta in color sculpture. Collaborating with Jennewein were Leon Solon, colorist, and the architects: Horace Trumbauer and Zantzinger, Borie & Medary. Three years have been required in the making of the small-scale models, the full-size models, and the glazing and firing, and the pediment is now ready to be set in its stone frame on the building. The figures are free standing, and in the ensemble represent the influences which have produced western art. One of the most interesting details of the whole scheme is the way in which the terra-cotta units have been extended into the background so as to provide no possible resting place for water or snow. The president of the museum, with Charles Borie of the architectural firm responsible for its design, came over from Philadelphia with a few other architects to inspect the work as temporarily set up in the Atlantic Terra Cotta Company's plant. One will never have the opportunity again of seeing it at close range, but it will be interesting to compare its effect high up on the museum with the details as we now have been privileged to know them.

*Tuesday, October 4.*—If we were for the moment sitting on the southeast shoulder of Mars looking toward our well-known earth, I suppose we would see that architecture at the end of the first third of the twentieth century is in a parlous state. The Scandinavian countries are doing something fresh and worthy of enduring—so far as we can judge. England has certainly not produced anything of real note for many years. France seems utterly at the nadir of an art cycle. Italy most assuredly is in the same condition, one that is aggravated by the fact that the Italian architects have so much about them that should furnish inspiration. Germany is on a byway of bare functionism; Russia, hardly to be considered worth looking at. The United States has certainly excelled in quantity, in ingenuity, in lavish expenditure of materials; as to the results, perhaps we have arrived from the object of our observation too recently to qualify as an authoritative observer.

*Thursday, October 6.*—One of the serious disadvantages of making one's diary public is that some one is always contradicting the writer. Under date of August 2, I said, "So far as I know" there are only two architectural schools insisting that their students have a full knowledge of working drawings. In the same mail today Professor Harry F. Cunningham, head of the Department of Architecture, University of Nebraska, and Professor Francis W. Kerwick, head of the Department of Architecture at Notre Dame, demonstrated to me that my knowledge was limited. Cunningham says that his students not only make full working drawings for building, but this extends to scale and full-sized details, and checking up of the effect of these on the jobs themselves. Good for him!

Professor Kerwick says that for many years each student in Notre Dame has been required to prepare a set of working drawings and some details. Of course, this has always been the case to some extent—we did it at M. I. T. thirty years ago—but neither I nor most of my contemporaries recall that we took it very seriously or then really learned what a working drawing should be. However, Cunningham tells me that it is evident that I have not read "A Study of Architectural Schools," by F. H. Bosworth and Roy Childs Jones. I thought I had read it, but apparently with not enough care.

Professor R. E. Lee, of The Clemson Agriculture College, also tells me that his students are required to make working drawings, including details, and write specifications for a building which they design.

*Friday, October 7.*—Alexander C. Guth raises the question in the September *Octagon* as to why our architectural conventions are not arranged more in the form of the clinic by which the medical men profit when they get together. It is not a new suggestion, for I have heard the same comment made many times at previous conventions—too much dry discussion of ethics and collaboration, and not enough sharing of practical working procedure. Possibly one way out of the difficulty might be to make the convention a week long instead of three days, and use the time gained for architectural clinic purposes. It seems a good deal to ask a man to come to Washington from the Pacific coast for the sake of a three-day convention.

*Saturday, October 8.*—Raymond Hood is back from abroad, having signed up Frank Brangwyn, José Maria Sert, and Diego Rivera for nine panels in the main corridor of the seventy-story building of Rockefeller Center. The theme running through the whole development is "New Frontiers"—the story of two centuries of American civilization.

*Monday, October 10.*—Lunched with Magonigle, Oliver Reagan, and Antonin Raymond. Raymond, who was associated with Magonigle in the design and supervision of our Embassy in Tokyo, has practised as an architect in Tokyo for twelve years, and finds the crowded, gas-fumed, canyoned streets of New York almost unbearable after the abundance of clean air to which he was accustomed in Japan. The building procedure in Japan is quite different from ours, the general contractor being nothing more than a broker who traffics with the sub-contractors. Raymond told us many interesting details of the precision and thoroughness with which Magonigle's drawings for the Embassy were executed. Many of the forms of construction were entirely new to the Japanese, so that practically thousands of shop details had to be made and checked to show every tiny detail of the work. Incidentally, the carpenter in Tokyo—and he is an extremely good carpenter—receives forty-six cents a day as a wage. Common labor receives half of that; not that the actual amount of the wage means very much, since the Japanese workman is able to have a home and its little garden at a cost of about twenty-five per cent of his wage, which ratio is in line with our own.

*Tuesday, October 11.*—Robert D. Kohn, who seems to be the spear point these days in our battle to secure better housing for the country through the credit made available by the Reconstruction Finance Corporation, says that there is real hostility to these loans on the part of investors and real-estate interests. "The real-estate opposition seems utterly unsocial. There is no longer any excuse to be ignorant of the degraded housing in which a large percentage of city and country people live." Three months have passed since the passage of the Emergency Act of 1932, yet the whole progress so far is measured by three or four projects, approved by the New York State Housing Board, now waiting for action by the R. F. C., and the passage by Ohio of the necessary enabling registration by which that State can take advantage of the credit, the law becoming effective in January. We still continue to hear from some of the largest cities, "We have no housing shortage; we have no slums." Mr. Kohn insists that both of these statements are probably untrue in each case where they have been made. It seems quite evident that the real-estate and investing interests are basing their objections on the fear that the sale or rental of their existing housing will be injured by a much better article produced at a lower price. This unsocial opposition and the failure of city land prices to come down to earth are the two main obstacles to our progress.

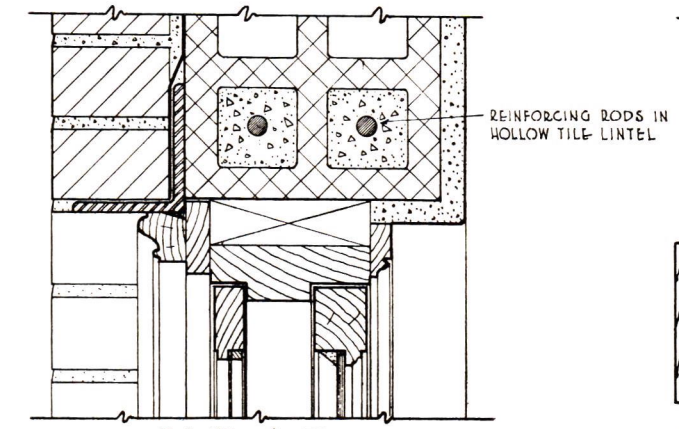
*Wednesday, October 12.*—The Weekly Bulletin of the Michigan Society of Architects, of which Talmage C. Hughes is editor, contributes a suggestion for a rather new activity of architects not otherwise gainfully employed. The procedure is for an architect to write to his own past clients or other prospects, suggesting that they are probably paying too much insurance on a valuation of their property that no longer holds. Expert appraisal would probably save them considerable money in premiums. The architect's fee for this appraisal might be based on part of the premium savings for one year. If, on the other hand, the property is found to be under-insured, it is equally to the owner's advantage to know this fact and rectify it.

*Thursday, October 13.*—Dropped in at the Museum of Modern Art to see some reconstructions of seventeenth-century Persian frescoes painted in two palaces in Isfahan by Sarkis Katchadourian. Here is a branch of Persian art far less familiar to us than the miniatures that we have long associated with the paintings of this country. They are particularly fine in color and line—not unlike the Japanese print in quality. Most of them are quite small and are framed.

*Friday, October 14.*—I see that we have to add to the horrors of political campaigning a new piece of amplifying apparatus that may be carried in a suitcase, making it possible for a speaker to magnify his voice to many thousand times its natural power. The Western Electric Company and Bell Telephone laboratories have perfected the device, making it possible for the soap-box orator to set down his suitcase in the vicinity of an electric-light line, plug a wire into it, pin a tiny microphone on his lapel—and heaven help the audience! We are told that an assistant seated some distance away can, by means of remote volume control, help the speaker emphasize his points. All that is needed now is another man to make his gestures for him.

*Monday, October 17.*—Mrs. Annette Hoyt Flanders is giving a small exhibition of her work as a landscape architect in her new offices on Park Avenue. Her ten years of practice have produced an amazingly large and consistent body of work. One notices in all of her gardens a primary sense of order, repose, and very definite though unobtrusive design. Like most of her successful contemporaries, Mrs. Flanders subordinates the color and form of flowers, depending rather upon broad masses of turf, pools, allées, and large trees for her effects. There were some particularly skilfully made models by the South Salem Studio, South Salem, N. Y.

*Tuesday, October 18.*—The history and significance of the chestnut blight in the United States is possibly as confused in the minds of most architects as it has been in my own. Starting in 1906, a blight appeared in New York which, by slowly girdling the tree, kills it. The blight has spread widely, yet there is still in the Southern Appalachian Mountains an extensive stand of chestnut that has not yet been touched, though even this is seriously threatened. Since the very inception of the blight constant effort has been made to find a way to stop it, but in these whole twenty-five years without success. Nevertheless, there is indication in some cases that the young chestnut trees that are coming along are more resistant. It seems more than likely that in the long run the chestnut will adapt itself for defense

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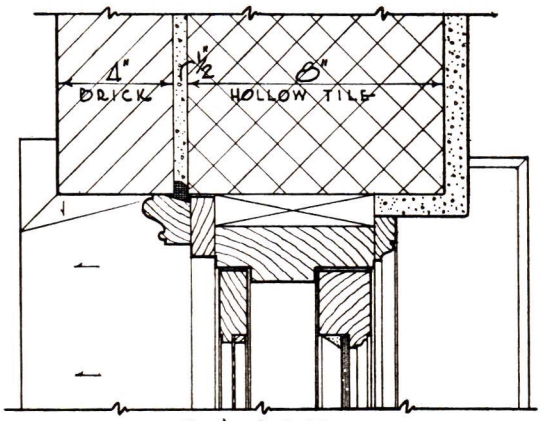


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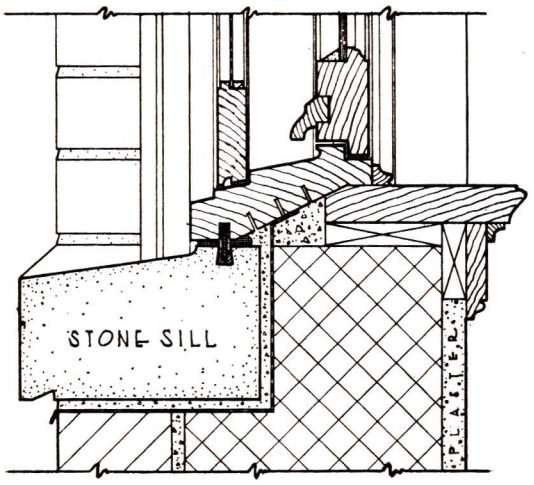
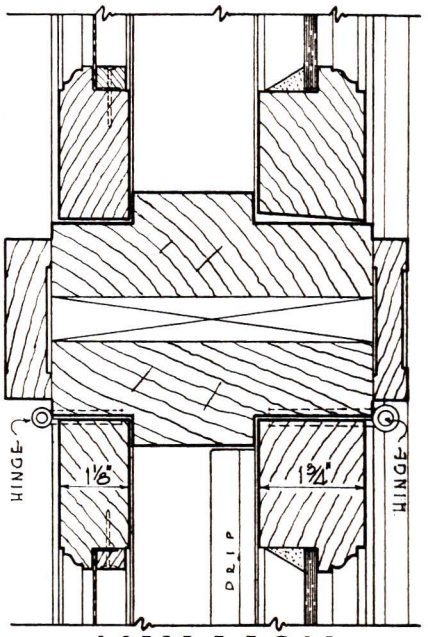



·SILL·

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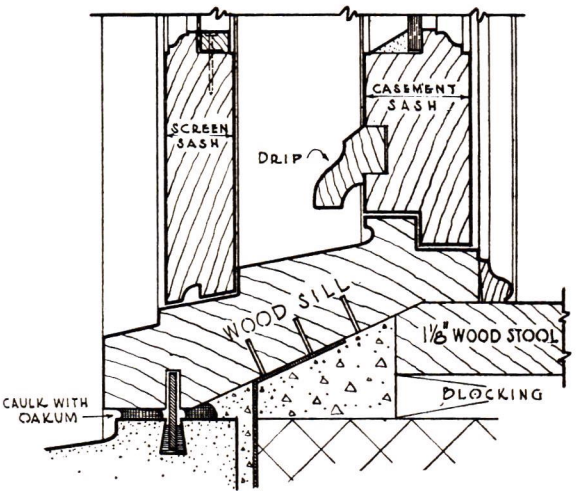


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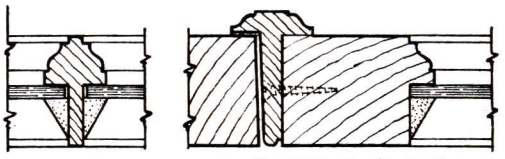


·MUNTIN· ·ASTRAGAL·

# ·CASEMENT·WINDOW·IN·BRICK & HOLLOW·TILE·WALL·
## ·OPENING·IN·

A SERIES OF WORKING DRAWINGS BY JACK G. STEWART

·SCALE: 0 1" 2" 3" 4" 5" 6" / 0 1 2" 3"

·PLATE·No·31·

against this fungus growth, but thus far the evidence to that effect is not conclusive.

One important fact, from the point of view of the building industry, is that trees killed by the blight are not made unavailable for lumber use—the trees are merely girdled as they would be by cutting, and even if they stand, the deterioration of the wood is negligible at four years, and possibly not serious even at ten years. The fact is that chestnut will remain available for building use for some years to come, if not indefinitely. We are fully protected by grading rules under which chestnut lumber is sold, so that an architect may use it when it suits his purpose without any fear of damage from the blight.

*Thursday, October 20.*—Today is the tercentenary of the birth of Christopher Wren. His grave in a crypt of St. Paul's Cathedral, London, has been covered with wreaths from architects and architectural organizations all over the world, our own Architectural League of New York among them. It has been said that in spite of the need for economy in those days, as now, Wren built very largely as he liked. His diplomacy, poise, and assurance protected him against irritation of small affairs and the difficulties with those of his clients who could not fully share his visions. It would be interesting indeed if we could know how he would feel today as to the moot question of just how far a disregard of structural expression should be carried. Wren undoubtedly used façades to conceal structure of a different order from that which the external appearance indicated. We have become more self-righteous in this regard, though seldom with complete consistency.

Over to Philadelphia to examine a new printing process, and found myself asking unanswerable questions regarding Philadelphia's newest architecture. The railroad train in approaching the magnificent new station at West Philadelphia, at least so far as I could judge from the car window, dives into a second-story window of the monumental mass, and out again on the other side. One of the questions that I was unable to answer was just why this occurs and also how those responsible for the building justify a perfectly stupendous monumental porch on either side of the station, which columned porch may possibly be for the purpose of sheltering the incoming taxis, although the soffit of its roof must be fifty or sixty feet above the driveway.

Leaping metaphorically from this example of traditional architecture to Howe & Lescaze's startling office building on Market Street, which has been very much published in drawing and in model, I again wonder how the architects justify the use of a black brick on one corner of the building continuing from street to top, and a sudden shift to a light gray brick elsewhere. If the black brick was best suited for the wall in one place—or the gray—why not for all? Surely no mere consideration of appearance would be allowed to affect a structure so purely functional.

*Friday, October 21.*—George Gove, executive secretary of New York's State Board of Housing, has put squarely up to the real-estate and investing interests the situation with regard to our proposed housing with R. F. C. credit.

"Now, I recognize that certain interests view new construction anywhere with alarm. I think they are mistaken. I believe that unless something is done to create buying power in Greater New York, the owners of property will find themselves in a much worse situation next year than they are today. . . .

"Of course new construction is always competition. It is the hope of the Federal Government that the building industry will soon begin to compete again. New low-cost housing is always in competition with old low-cost housing. Every year when the automobile industry brings out its new models it makes the old Model T Ford just a little bit worse. Are we going to ask the automobile industry to stop bringing out new models?"

*Monday, October 24.*—Most of us have had a sort of a hazy impression that on most kinds of work the cost of labor and the cost of materials were about equal. The Bureau of Labor Statistics now shows that the cost of materials is higher than that of labor. They have made records of work in fifteen cities, taking cost figures covering the actual cost of the building from the time excavation started. These figures do not include overhead expenses, profits, land costs, financial charges, or architects' fees. Nor do the labor costs include any shop labor such as that involved in mill work, quarrying, or other fabrication in mills. For the fifteen cities taken as a whole, 63.6 per cent of the money spent went for material, and 36.4 per cent for labor. Labor's share was slightly higher on residential work than on non-residential. The variation in cities was rather startling: in Boston, labor's share was 41 per cent; in Dallas, Texas, 27.2 per cent. Possibly this trend away from the fifty-fifty basis is partly explained by the fact that we are doing more of the work in the shop, and less in the field, with the prospect of a considerable movement further in that direction. There are some particularly interesting results deducted from these figures in the division of the building dollar. A graphic representation of it will be found in the Bulletin Board pages.

*Wednesday, October 26.*—F. R. Webber, whose series, "The Liturgical Requirements of Churches," appeared in these pages last year, has an interesting article in the November *American Mercury*—"Symbolism and the Sects." It shows how many of the Protestant churches are employing symbolistic details that have other ritual associations —Lady Chapels for the Calvinistic churches; a symbol of St. Paul in a Jewish temple's stained glass; Protestant altars with tabernacles, hinting at reservation of the Host.

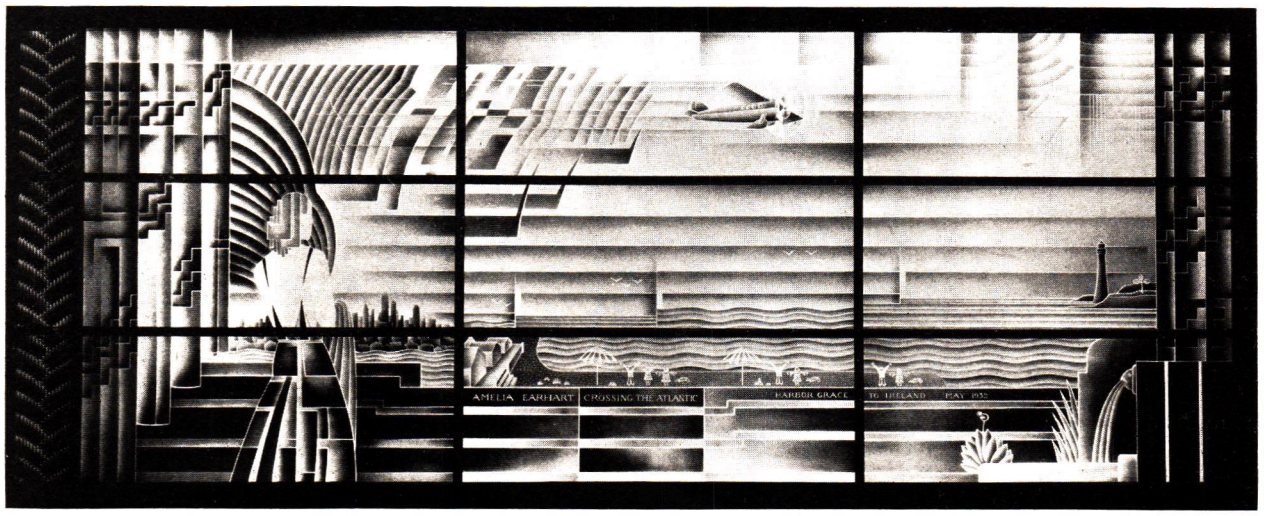
All of which is amusing enough, but Mr. Webber fastens upon the architectural profession the absurdity of framing many of its ecclesiastical symbols in a shield-shaped border—due, as he says, to the fact that Geldart's "Manual of Church Decoration and Symbolism" happens to have a shield-shaped border around its illustrations, simply for typographical uniformity.

*Thursday, October 27.*—Karl Mortz thinks the architects have lost much by failing to take a leaf from the advertisers' note books. He suggests that we might ask the people whether they are living in a house which suffers from "sour style," warning them that their best friend will not tell them, but the architect, with a few deft touches, can do them a world of good. Or the apartment-house dwellers might be reached with the question, "Do you ever have that oppressive low-ceiling feeling?" If so, "Let us treat you for sardine fixation." Again, an architect might become more specific as to his capabilities, "My brick parapets and walls always retain their school-girl complexion, and will not suffer from efflorescence."

*Saturday, October 29.*—Several architects in Chicago gave the Porcelain Enamel Institute some good advice recently. It would be a grand thing if that same advice could be broadcast to many other manufacturers of building materials. The porcelain enamel people said, in effect: "We have the technical and industrial problems of porcelain-coated steel fairly well solved. What we want to know is what form this material should take in order to satisfy you architects. We can duplicate wood finishes and colors; we can duplicate marble finishes for about one-third of the cost of actual marble."

Max Dunning, Terrill Ferrenz, and John Bollenbacher united in cautioning the manufacturers to imitate nothing. This material apparently has merit enough to stand on its own feet. It should not be made to resemble wood, marble, tile, or shingles. It would be a grand thing if a placard to this effect could be hung over the desk of every manufacturer of new building materials. A product is either good enough to appear unmasked, or it is not.

# An Illuminated Glass Mural




THE FLIGHT OF AMELIA EARHART ACROSS THE ATLANTIC

FOR THE WOMEN'S LOUNGE OF THE NEW ROXY THEATRE, ROCKEFELLER CENTRE, NEW YORK CITY

*Designed and executed by Maurice Heaton*

*The room was decorated by Eugene Schoen, interior architect for the theatre, and Mr. Schoen suggested the subject and the original conception of the design*

*At the right, Mr. Heaton setting up the glass in a temporary frame. The mural is evenly lighted from behind by artificial light at all times. Color in vitreous glazes is applied to the glass by airbrush and fused on in the customary stained-glass technic. Vertical bands of red and mauve suggest the side curtains of a stage behind which are the sky and sea, the latter represented as alternating waves of blue and green broken arbitrarily. The sky is a simple series of horizontal bands each receding over the next below. Behind the airplane are streamers of glistening transparent lines crossing a cloud formation in deep blue. Mr. Heaton is shown setting a brilliantly glazed sheet of glass behind vertical glass rods at the extreme left edge of the mural*

# BOOK REVIEWS

MODERN ARCHITECTURAL DESIGN. By HOWARD ROBERTSON. 220 pages, 5¾ by 8¾ inches. Illustrations from photographs and drawings. Printed in Great Britain. London: 1932: The Architectural Press. 15 shillings.

Mr. Robertson's own work (Easton and Robertson, architects) in so far as we know it over here, has been so refreshing in its logic and its ingenious use of materials, that what he has to say on the subject of designing buildings naturally interests us. Mr. Robertson may be classified distinctly among the progressives, though he certainly does not venture as far ahead of the profession as Dudok, Le Corbusier, Asplund and van der Rohe.

NATIONAL DIRECTORY OF COMMODITY SPECIFICATIONS. Classified and Alphabetical Lists and Brief Descriptions of Specifications of National Recognition. Prepared by CLARENCE W. INGELS. 548 pages, 7½ by 10½ inches. Miscellaneous Publication No. 130. Washington: 1932: U. S. Department of Commerce. $1.75 cloth.

A classified list and brief descriptions of the standards formulated by national technical societies and similar bodies.

IMMIGRANT GIFTS TO AMERICAN LIFE. Some Experiments in Appreciation of the Contributions of Our Foreign-Born Citizens to American Culture. By ALLEN H. EATON. Foreword by SHELBY M. HARRISON. 185 pages, 6 by 9 inches. Illustrations from photographs and paintings, some in color. New York: 1932: Russell Sage Foundation. $3.

A surprising revelation of the extent to which our arts and crafts are dependent upon our foreign-born citizens. The author, in revealing the extent of this contribution, pleads for various means by which the purity of these converging streams may be assured.

A HISTORY OF SIENESE PAINTING. By GEORGE HAROLD EDGELL. 302 pages, 6¼ by 9½ inches. Illustrations from paintings. New York: 1932: Lincoln MacVeagh—The Dial Press, Inc. $10.

Dean Edgell is perhaps best known to the architectural profession through his architectural writings. The profession probably does not know that his opinions on the intricacies of Italian painting are so widely appreciated that in 1929, as Visiting Professor to the University of Paris, he gave a course on the History of Sienese Painting at the Sorbonne. Dean Edgell served also for a period as Visiting Professor to the American Academy in Rome, teaching history of Italian art. The present volume is a scholarly, comprehensive picture of the Sienese School in its development. Whether Dean Edgell is talking or writing, and whether his subject be architecture or painting, he never fails to interest and enthuse his readers.

ACCELERATED WEATHERING TESTS OF SOLDERED AND TINNED SHEET COPPER. By PETER R. KOSTING. 25 pages, 5¾ by 9 inches. Illustrations from photographs and drawings. Research Paper No. 422. Pamphlet binding. Washington: 1932: U. S. Department of Commerce. 10 cents.

THE DISAPPEARING CITY. By FRANK LLOYD WRIGHT. 90 pages, 8¼ by 8¼ inches. Illustrations from photographs. New York: 1932: William Farquhar Payson. $2.50.

In other writings and lectures, Mr. Wright has hinted at his belief that concentration of populations in large cities, and their building high in the air on restricted sites, is illogical and likely shortly to pass. In this little volume he develops this thesis further with his characteristic vigor and assurance.

STANDARDS YEARBOOK 1932. Compiled by THE BUREAU OF STANDARDS. 394 pages, 5¾ by 9 inches. Bureau of Standards Miscellaneous Publication No. 133. Washington: 1932: U. S. Department of Commerce. $1, cloth.

A record of the extreme rapidity with which standardization has moved forward in recent years.

BOUWEN, HOLLAND. By IR. J. B. VAN LOGHEM. 144 pages, 7¼ by 9½ inches. Illustrations from photographs and drawings. Amsterdam, Holland: 1932: N. V. Uitgevers-Maatschappij "Kosmos." Cloth, Hfl. 8.50.

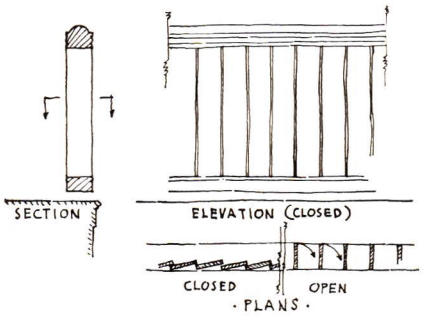
The extreme of Dutch modernism, in which function rules supreme. There is an introductory essay on the subject in Dutch, German, French, and English which would be decidedly more intelligible if the typographical modernist had not abolished all the capital letters.

SMALL HOUSES AND BUNGALOWS. Edited by FREDERICK CHATTERTON. 104 pages, 9½ by 12 inches. Illustrations from photographs and plans. Printed in Great Britain. London: 1932: The Architectural Press. 7s. 6d.

A collection of one hundred and four examples, all the work of English architects, of which what might really be called bungalows are very much in the minority—which is perhaps as it should be, since the one-story house has apparently lost for us, and for the English, its appeal of two decades ago.

# The Architectural Observer

THE common hospital element of the open deck offers a troublesome problem. If you use a solid parapet you hamper your air currents. Particularly where there are children's beds, the parapet would have to be so high that it would cast a shadow. The open railing, on the other hand, has many disadvantages, blocking out air and sunlight to some

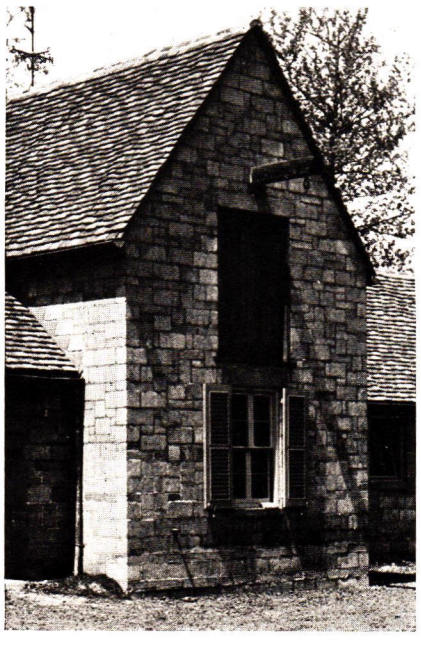



extent without weather protection against storm. Here is a scheme in the Sanatorium for Tubercular Children at Haggerode, where G. Schwerthelm, the architect, has modified the railing scheme with an adaptation of the vertical louver.

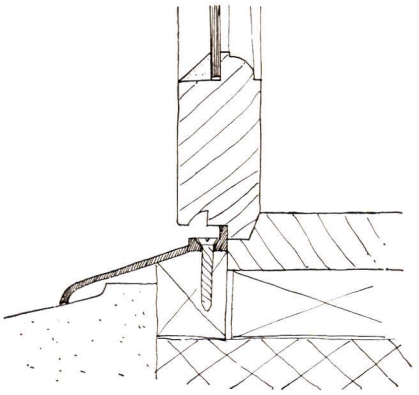
AWNINGS at windows are never very handsome, either when let down or folded up. In England it is quite usual to find them covered with wooden boxes or valances when closed, the valances being cut with various curves and scallops, but generally following the lines of the awn-

ing in order to protect them completely. The photographs show one found on the Lansdowne Crescent and another on the Camden Terrace at Bath. While these coverings are primarily practical as protection for the awnings, they are also more decorative than the awning alone, and are interesting as forming heads for the windows.

IT seems a pity that the machine-made concrete block should have gotten away to such a running start in the hands of speculative builders and backyard block makers—so much so that it now has a frightful handicap of prejudice to overcome. Ingenuity and sympathetic handling would have widened its use tremendously—such handling, for instance, as that shown (at left) in the Gavin farm group at Jericho, Long Island, where Alfred Hopkins made the blocks in several sizes to lay up in an ashlar pattern. Or, again, even with the uniform 8 x 16 in. size, H. L. Mitchell, in a small house at Larchmont, N. Y. (at right), has redeemed the block wall by a simple use of brick quoins and surrounds for the openings.

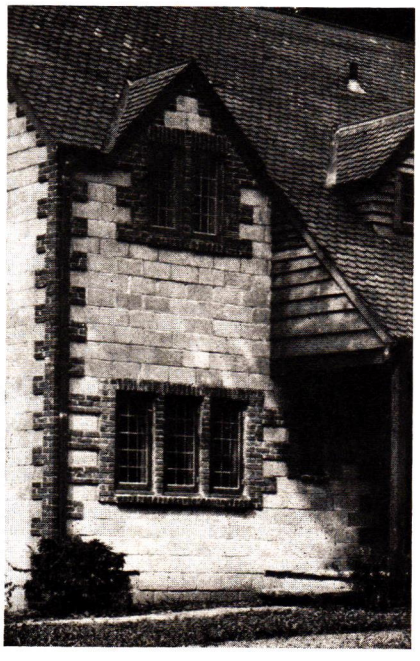


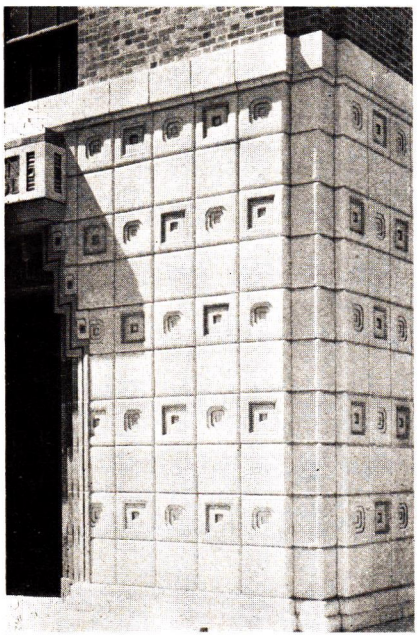
THERE may be on the market a cast or extruded metal outside window sill of this simple character, but we have not happened to see it. This one is from an advertisement in *Das Werk*, a Swiss journal, and the



section makes quite clear some of its many advantages over the outside wood sub-sill.

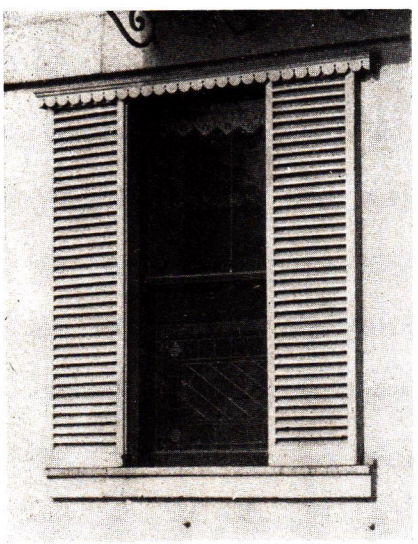
WE continue to quarrel with the designer who uses stone as he would use brick, wrought iron as he would use cast, or any of the many similar parallels that mar present-day architecture. Here, as an object lesson, is a designer using terra-cotta as terra-cotta. There is none of the too familiar suggestion that he



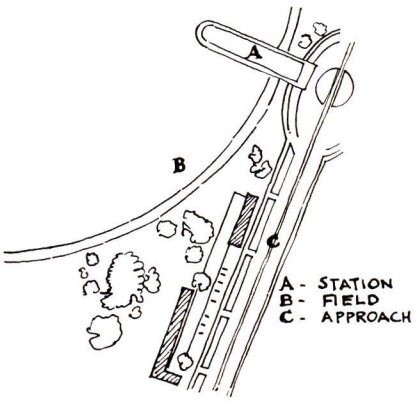


wanted stone but had to use a cheaper material. This job, the Metropolitan High School in Los Angeles, by Noerenberg & Johnson, proclaims very clearly that terra-cotta was to be used and the wall texture and pattern were made for terra-cotta and nothing else.

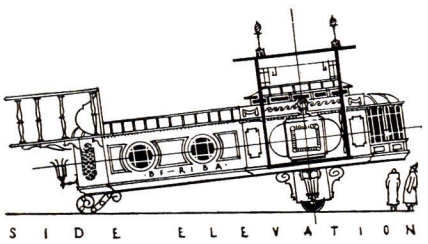
IN Europe, and particularly in England, shutters are frequently made to slide instead of swing. This would be a solution when screens and rabbets and other difficulties make hinges impossible. This example is from Bath and with the neat little valance covering the slides makes a very pleasant treatment of the whole window.



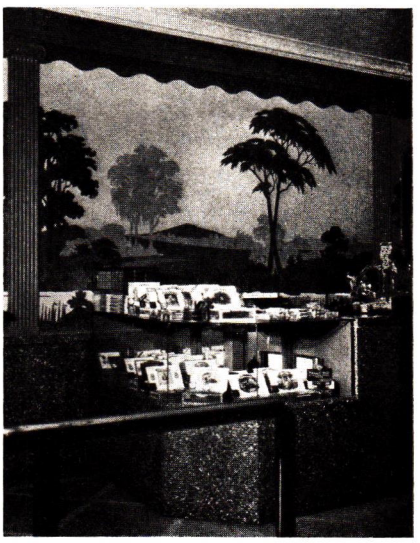
THE problem of the airport, particularly just how we bring together travel by air and travel on land, is always somewhat puzzling. Here is a scheme by H. A. Ritscher and S. F. Genbert of Berlin—a design which won first prize in the Schinkel Competition, 1931. The scheme avoids the common arrangement of running the automobile or bus lines tangent to the starting field, reaching in rather at right angles to the field and at a higher level. This allows the automobile approach to be brought overhead right up to the planes, achieving the least possible amount of time in transfer.



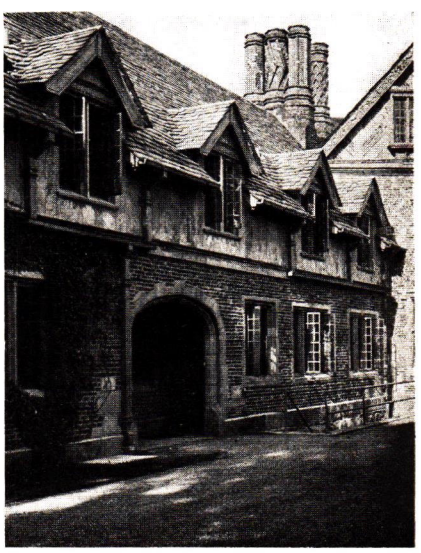

AND here we have, from *The Architect and Building News*, an approximation of what might very easily have happened to a Handley-Page if an architect had been entrusted with the design of the craft.




USING linoleum for mural decorations seems a somewhat startling twisting of materials until one sees the results. The Benjamin R. Marshall office, in Chicago, originators of more than one rather daring detail of design, used plain and jaspé Sealex Wall Covering in a Thompson restaurant in Indianapolis. The effect pictured in the photograph was secured with a special white for sky and water, apple green for hills, dark green for trees and shrubs in foreground, light green for the distant foliage. The inlay cutting was done by the decorating contractor with a small power tool, following the architect's full-size cartoons. It is said that an experienced cutter can prepare about 65 sq. ft. of wall area in a day.



WHAT do you do with your gutters and downspouts when you have a long line of overhanging roof broken by dormers? Usually the solution is a series of long-legged Y's that play havoc with your façade. Here is one way out of the difficulty, as developed by the Office of John Russell Pope for the famous Stuart Duncan house at Newport. Half-losing the intermediate horizontal runs in the belt course terminating the plaster seems a happy way out.



CONTACTS

DEVOTED TO A BETTER UNDERSTANDING OF THE BUSINESS SIDE OF ARCHITECTURE AND ITS RELATION TO THE INDUSTRIES

# Moisture Penetration Through Masonry Walls

PART II—CONCLUSION

*The Boston Society of Architects, through its Committee on Materials and Methods, has been investigating the causes—and corresponding preventive measures—of leaky walls. A slightly abridged form of the report was printed in part in the November issue and is here concluded.*—EDITOR.

IN the construction of masonry walls serious thought must be given to the type and method of flashing. Whereas a proper masonry wall, perfectly constructed, theoretically, should not leak, nevertheless the human element entering into the work makes advisable proper and intelligent flashing at certain points. Copper seems to be the most satisfactory material for flashing masonry walls. Lead if used with cement mortar seems to deteriorate badly over a period of years. Exposed surfaces of copper where used with stone work may have a tendency to stain the stone and under such conditions lead-coated or tin-coated copper could be used to advantage.

*A.* The back of all parapet walls should be flashed. This flashing should be of metal with an open overlap at the top to allow the back of the wall to breathe. The flashing should extend through under the stone capping or over wood capping and both vertical and horizontal expansion joints should be required. The tops of all cornices should be flashed and the flashing should carry out over the edge of the cornices and turn down. If proper attention is given to the detailing of cornices this can be done without detriment to the architectural effect. Reglets for the fastening of flashing to the outer surfaces of cornices are not satisfactory and the copper may be either fastened with lead plugs along the upper surface of the cornice or else buttoned with lead dowels along the vertical face. Roof flashings should not carry out too far on the roof, 3 inches seeming to be the best distance, and it is much better to form a nailing strip with some sort of nailing compound than to use wood screeds, as these tend to rot out in time.

*B.* The Committee believes it advisable to flash over the heads of windows, such flashing to carry through the wall and be turned up at least 1½ inches on the inside and be turned down on the outside. In most cases copper flashing would seem to be more satisfactory, although under certain conditions the use of spandrel cloth for through flashing, properly applied, seems to give satisfactory results. It does not appear to be so necessary to flash under stone sills except where joints occur. Flashing for cast stone sills should be in the form of pans turned up on the ends as well as the back.

*C.* All masonry walls that are set back or carried over rooms below should be carefully flashed through the walls and it is advisable to install weep holes through such walls at intervals to take off the water of penetration or condensation that may gather on the back of the walls above. If this is not done such water may collect in the turned up portion of the flashing and come over the back of the flashing to form leaks on surface below. Weep holes may be formed with small brass or copper pipes so as not to interfere with the appearance of the building. In some places weep holes, formed by using ordinary lamp wicks soaked in tinner's acid, will be found sufficient.

*D.* In skeleton frame construction it is essential that the steel be thoroughly protected from the weather. This may be done with a trowel coat of asphalt asbestos cement and by using particular care in laying the bricks; or in the case of spandrel beams by a careful use of spandrel cloth damp-proofing carried over the beams and turned up on the inside of the wall.

*E.* Through flashings should be installed on all chimneys and turned up against flue linings. In the case of chimneys having flues for gas heaters it may be noted that considerable condensation takes place inside the chimney and where through flashing occurs cap flashing should be installed which will carry through the flue lining and turn up on the inside of the flue; also provision for weep holes should be made as noted above.

Roofing, although not an essential part of our investigations, brought forth many interesting points which the committee believes worthy of including in the report.

*A.* With wood shingles, the use of copper for flashings or gutters is not advisable, the acid in the wood attacking the copper. Lead coated copper or zinc is recommended. The old type wood gutter appears preferable to those with copper linings.

*B.* Copper work with slate roofing is satisfactory. In open valleys it is better not to solder cross joints but to allow for expansion by using a 3-inch lap. Metal gutters should have provision for expansion at least every seventy-five feet. For large copper-lined gutters some provision should be made for cross expansion. The best practice would seem to be to use copper for the sides and a built-up membrane roofing for the bottom of the gutter. With copper gutters it is advisable to use copper dogs, not galvanized iron. The practice of using iron bars for reinforcing the edges of copper gutters should be avoided. These bars will sweat and corrode and make trouble eventually. We recommend that such reinforcing bars be of cop-

per or brass. Chimney flashings should lap 3½ inches at the sides.

*C.* The life of a built-up roof depends on the protection from the sun's rays given by covering of gravel, slate, or tile. A roof covering will deteriorate rapidly without such protection. Gravel stops should not be made of the same metal piece with gutter but of separate pieces tached to the gutter metal at intervals. On flat roofs it is often advisable to install some form of scuppers through the parapet in case of stoppage of outlets. In copper work a lock joint is better than crimping, as the metal tends to break at the crimp; and for large areas a standing or batten seam should be used rather than a flat seam.

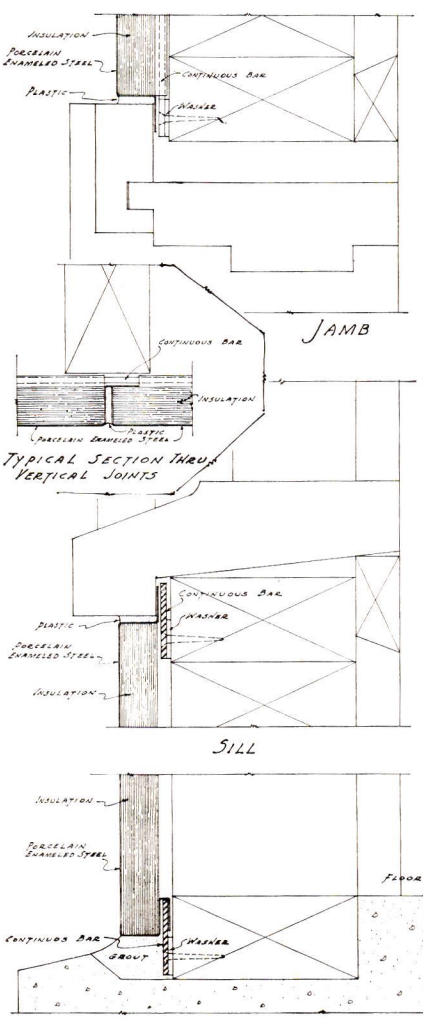
The committee is offering this report with the hope that the suggestions contained therein may tend to help with drawings and specifications, but cannot impress too strongly on the Society that because of the human element entering into all construction the final test of quality will depend on intelligent and experienced workmanship.

G. H. BURR, *Chairman.*
FELIX BURTON, *Secretary.*
FRANCIS V. BULFINCH,
CHESTER N. GODFREY,
WENDELL T. PHILLIPS,
FREDERICK W. WEAD,
S. WINTHROP ST. CLAIR.

# Porcelain-Steel for Gas Stations

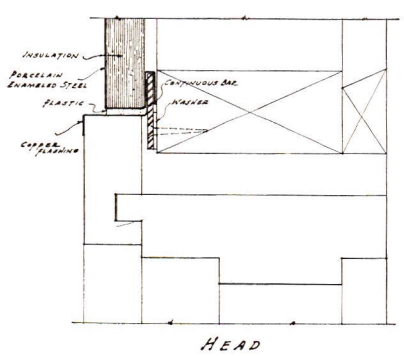
AN entirely new method of service-station construction has been developed by S. E. Toussaint and J. F. Moore, of Chicago, and has been put into practice in a combination gasoline filling station and lunch room in Chicago. The project is sponsored by the American Rolling Mill Co., Middletown, Ohio, the Chicago Vitreous Enamel Products Co., and the Celotex Company of Chicago.

The building's exterior is finished in black and orange porcelain enamel on 17¾-in. square metal ashlar sections, or flanged units, into which the porcelain has been fused. The units are attached to the wood studding by means of horizontal steel bars placed 18 in. apart. They were fabricated, enamelled, and insulated with ¾-in. Celotex in advance of erection, and are sealed with elastic asbestos cement. Through the use of this construction method, and by insulating the metal sections, it was possible to construct the building with walls only 5¼ in. thick, including a 3¾-in. air space. A wainscoting of porcelain enamel has been used to finish the interior.



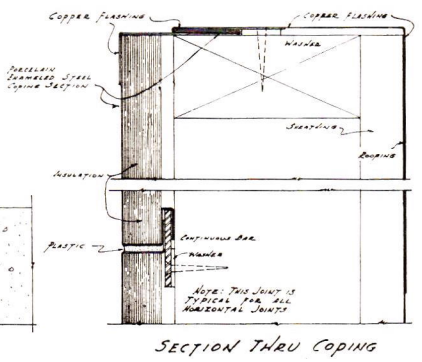

This new method of construction, which is applicable to many types of building, made it possible to erect this gasoline station in less than three weeks' time. It took two men but sixteen hours to apply the exterior finish of porcelain enamel. Other features of this type of construction are that either a wood or steel framework may be used; a wind brace that needs no other support is provided by the steel horizontal bars which hold the sections in place; individual porcelain sections may be inserted or removed, and the building may be dismantled and moved to another location.

The advantages of porcelain enamel on metal buildings and this particular method of construction, as pointed out by the sponsors, are: simplicity and quickness of erection, material cost reduction; colors available; reduction of maintenance; and the identification and advertising value made possible.









1926
DORMER WINDOWS
SHUTTERS AND BLINDS

1927
ENGLISH PANELLING
GEORGIAN STAIRWAYS
STONE MASONRY TEXTURES
ENGLISH CHIMNEYS
FANLIGHTS AND OVERDOORS
TEXTURES OF BRICKWORK
IRON RAILINGS
DOOR HARDWARE
PALLADIAN MOTIVES
GABLE ENDS
COLONIAL TOP-RAILINGS
CIRCULAR AND OVAL WINDOWS

1928
BUILT-IN BOOKCASES
CHIMNEY TOPS
DOOR HOODS
BAY WINDOWS
CUPOLAS
GARDEN GATES
STAIR ENDS
BALCONIES
GARDEN WALLS
ARCADES
PLASTER CEILINGS
CORNICES OF WOOD

1929
DOORWAY LIGHTING
ENGLISH FIREPLACES
GATE-POST TOPS
GARDEN STEPS
RAIN LEADER HEADS
GARDEN POOLS
QUOINS
INTERIOR PAVING
BELT COURSES
KEYSTONES
AIDS TO FENESTRATION
BALUSTRADES

1930
SPANDRELS
CHANCEL FURNITURE
BUSINESS BUILDING ENTRANCES
GARDEN SHELTERS
ELEVATOR DOORS
ENTRANCE PORCHES
PATIOS
TREILLAGE
FLAGPOLE HOLDERS
CASEMENT WINDOWS
FENCES OF WOOD
GOTHIC DOORWAYS

1931
BANKING-ROOM CHECK DESKS
SECOND-STORY PORCHES
TOWER CLOCKS
ALTARS
GARAGE DOORS
MAIL-CHUTE BOXES
WEATHER-VANES
BANK ENTRANCES
URNS
WINDOW GRILLES
CHINA CUPBOARDS
PARAPETS

1932
RADIATOR ENCLOSURES
INTERIOR CLOCKS
OUTSIDE STAIRWAYS
LEADED GLASS MÉDALLIONS
EXTERIOR DOORS OF WOOD
METAL FENCES
WOOD CEILINGS
MARQUISES
WALL SHEATHING
FRENCH STONEWORK

THE SEVENTY-FOURTH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

# ARCHITECTURE'S PORTFOLIO OF

# OVER-MANTEL TREATMENTS

*Subjects of Previous Portfolios Are Listed at Left*

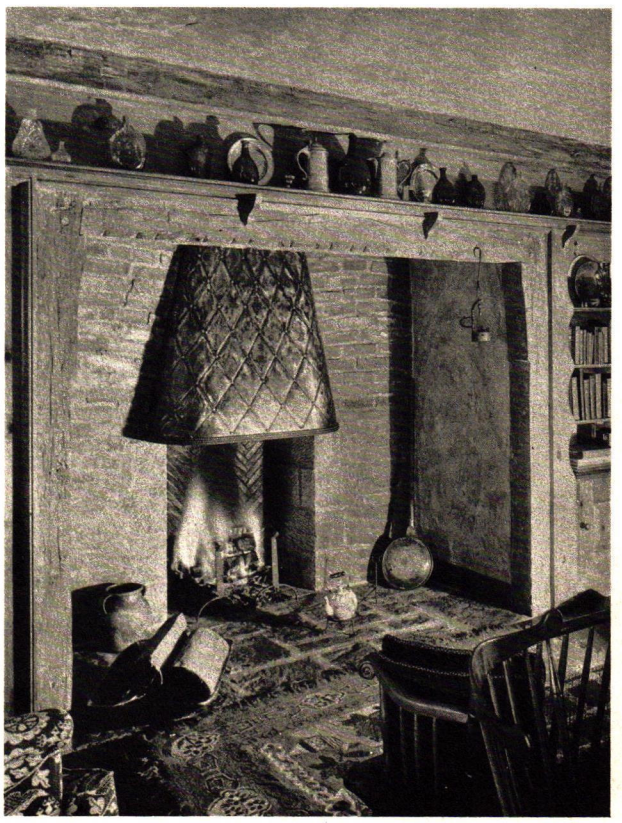
*Forthcoming Portfolios will be devoted to the following subjects: Bank Screens (January), Interior Doors (February), Metal Stair Railings (March), Verandas (April), The Eagle in Sculpture (May), and Eaves Returns on Masonry Gables (June). Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.*

*Pliny Rogers*

*Charles S. Keefe*

*Hentz, Adler & Shutze*

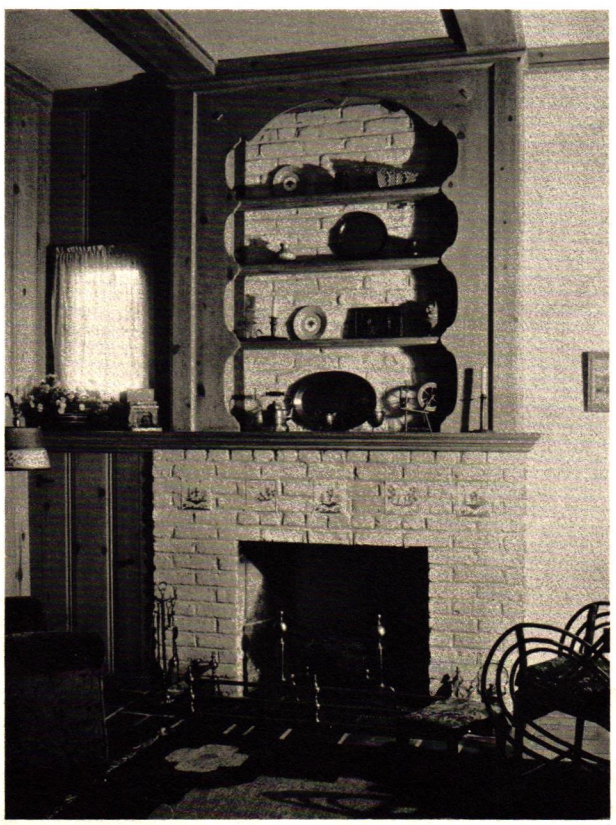
*Frank J. Forster*



*Allen G. Siple*

*Mount Pleasant Mansion, Philadelphia*

*Allen G. Siple*



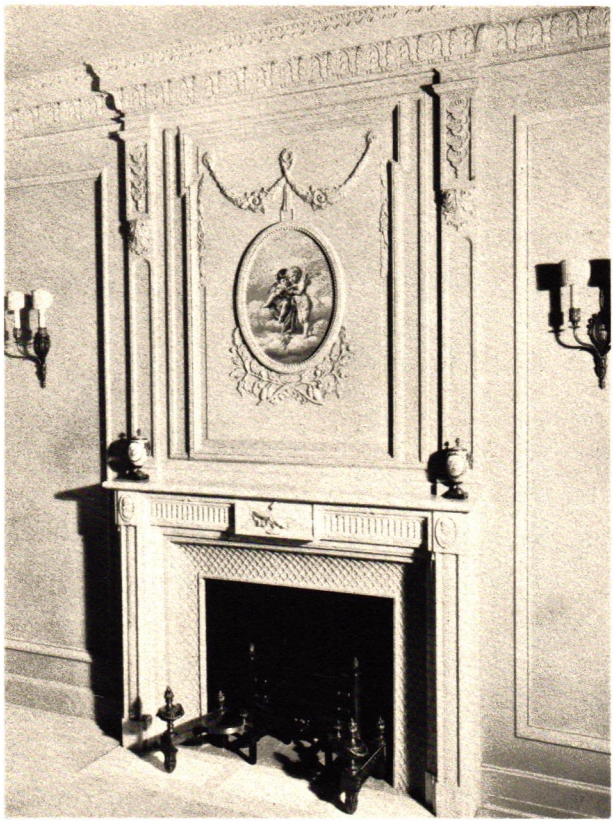
*Aymar Embury, II*

*Hentz, Reid & Adler*

*Office of Roswell F. Barratt*

*Bottomley, Wagner & White*

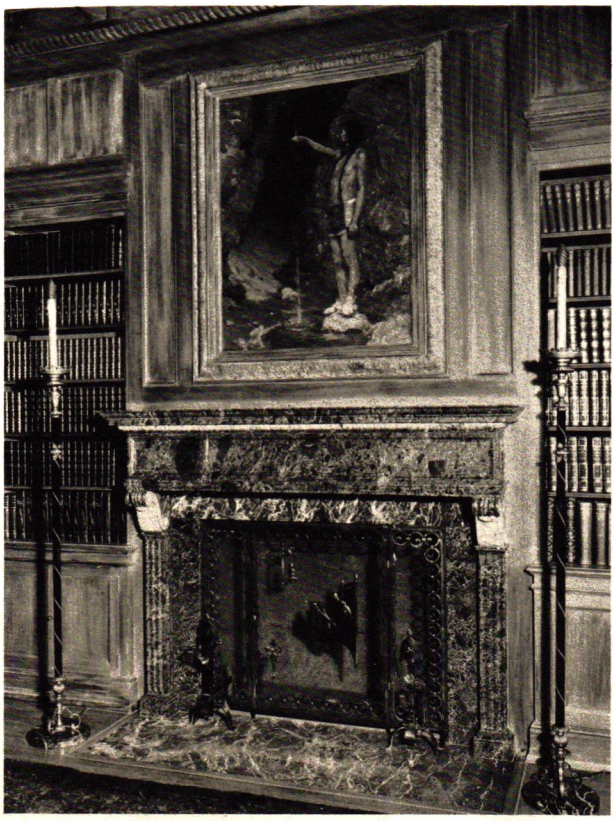
*Aymar Embury, II*



*Edward Buehler Delk*

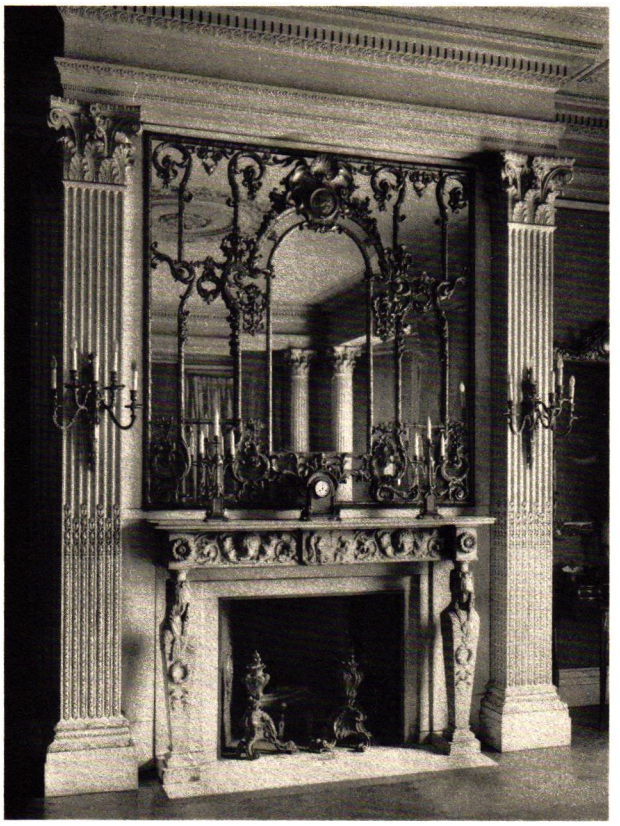
*Hampton, the Ridgely Mansion, Towson, Md.*

*Edward Buehler Delk*



*Douglas Orr*

*Bradley Delehanty*

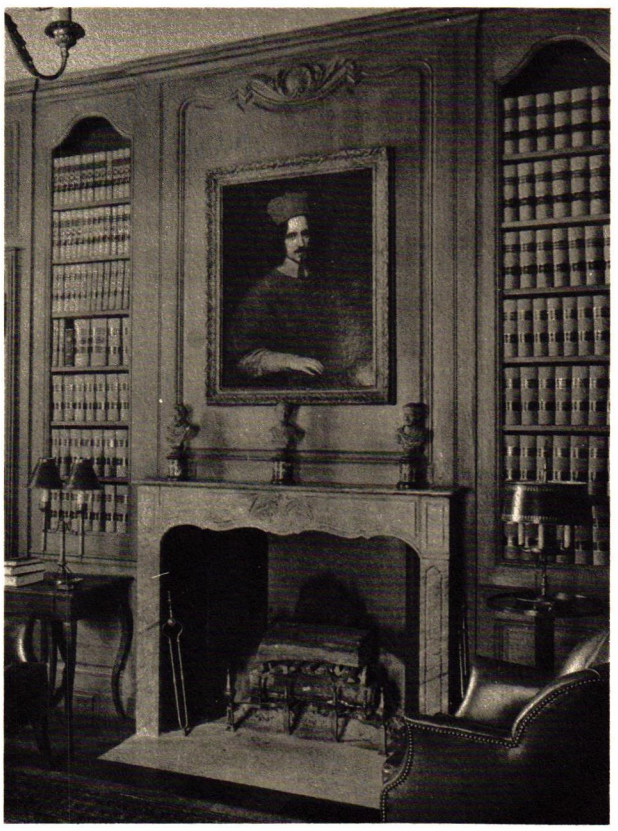


*McKim, Mead & White*

*Aymar Embury, II*

*Cross & Cross*

*Mott B. Schmidt*



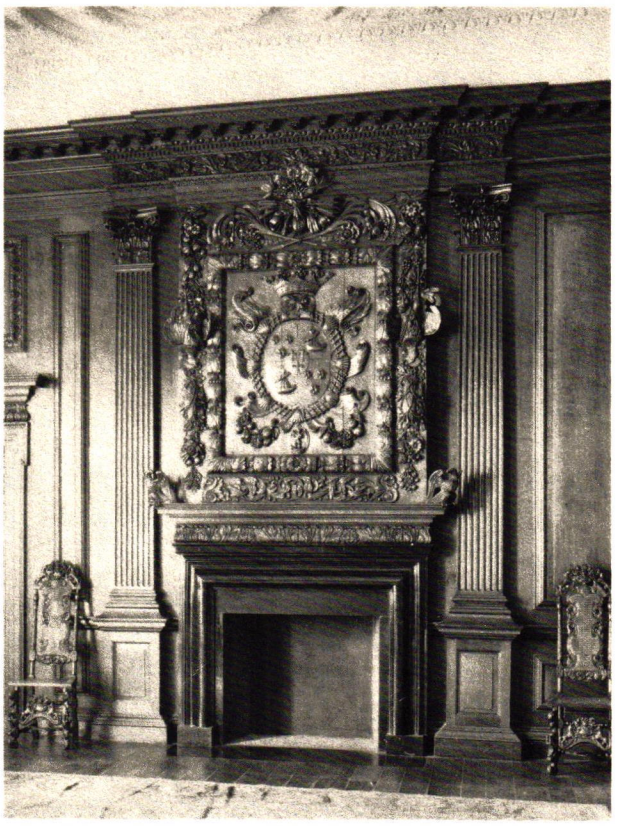
*Bradley Delehanty*

*Harry Creighton Ingalls*

*Aymar Embury, II*

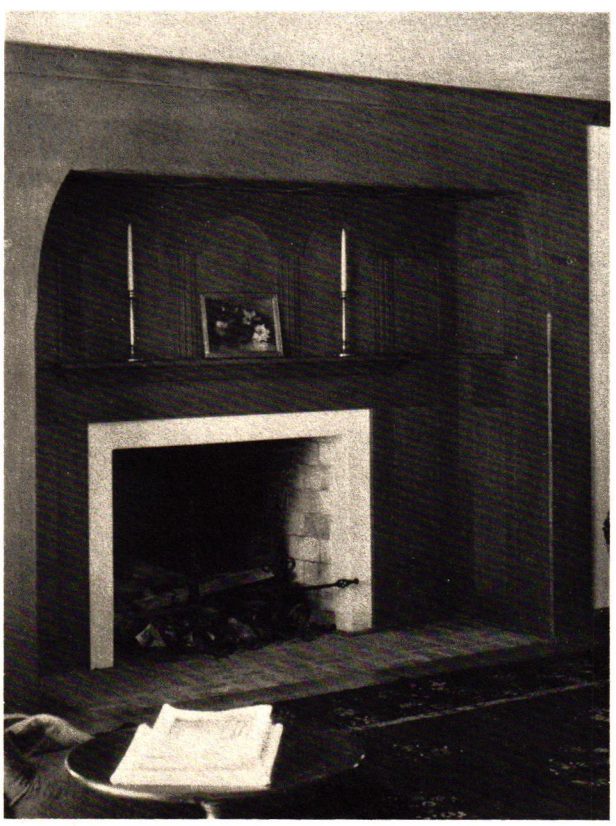
*Fiskdale (c. 1750), Worcester Co., Mass.*
*(now in Museum of Fine Arts, Boston)*

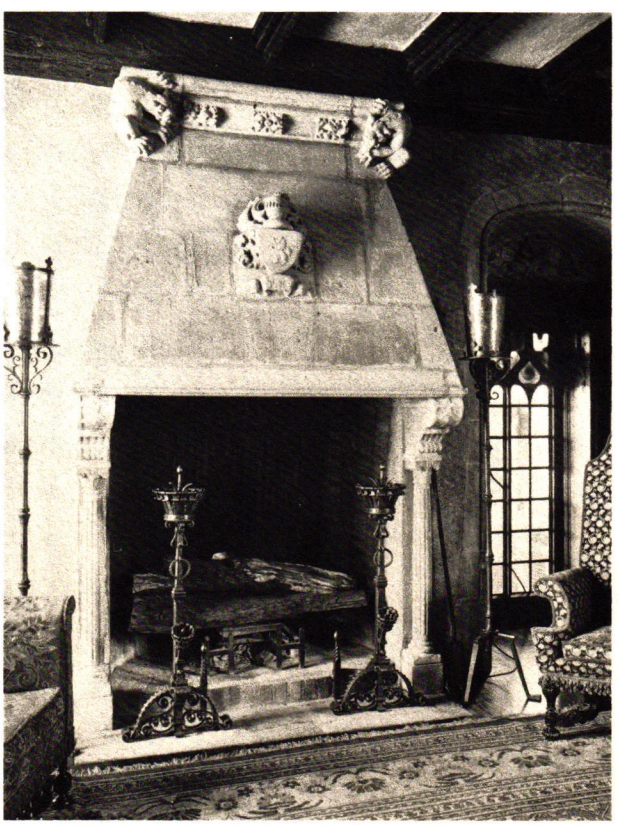
*Donald D. McMurray*



*Hamilton Palace (1690), Lancashire, Scotland*
*(now in Museum of Fine Arts, Boston)*

*Dwight James Baum*





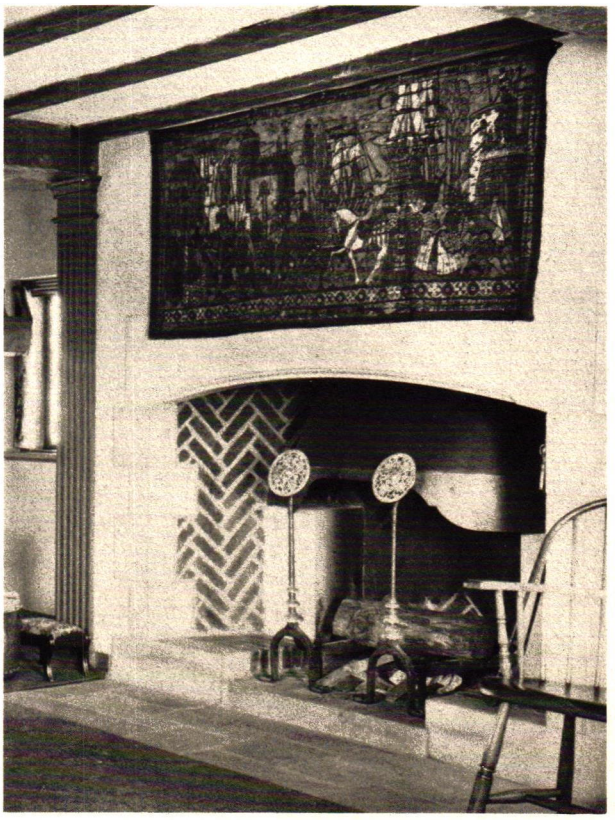
*York & Sawyer*

© Amemya

*Roger H. Bullard*

*Tracy & Swartwout*

*Wesley S. Bessell*



*Evans, Moore & Woodbridge*

*Henry & Richmond*

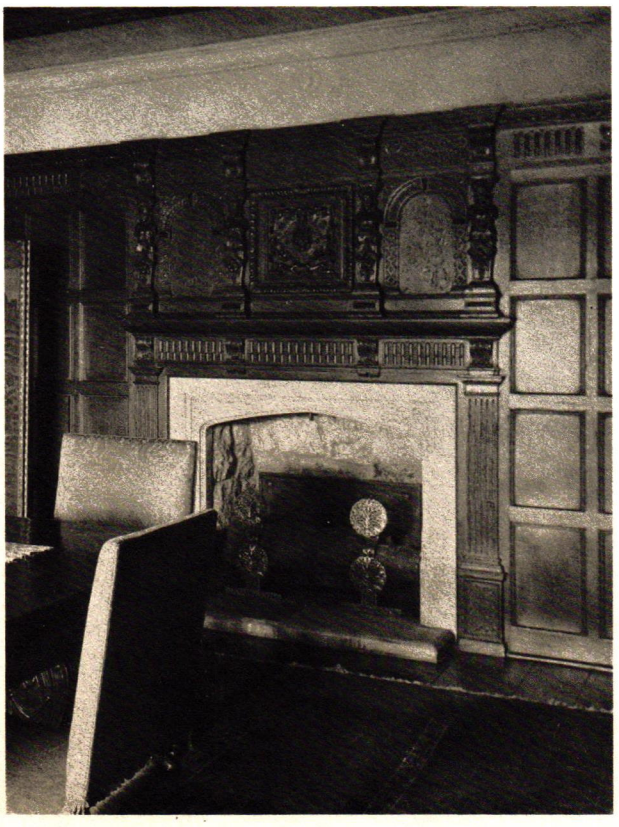
*Roger H. Bullard*

*Louis Hessler*

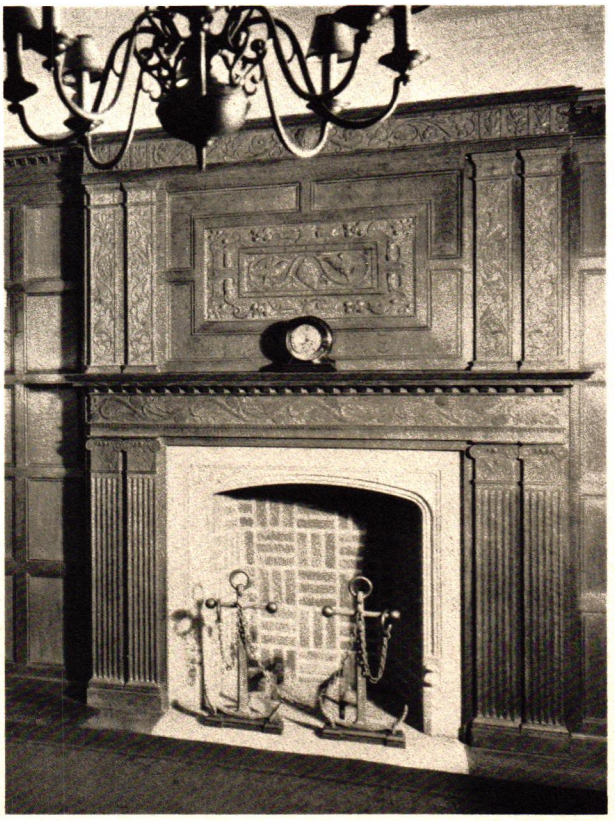
*Rouse & Goldstone*

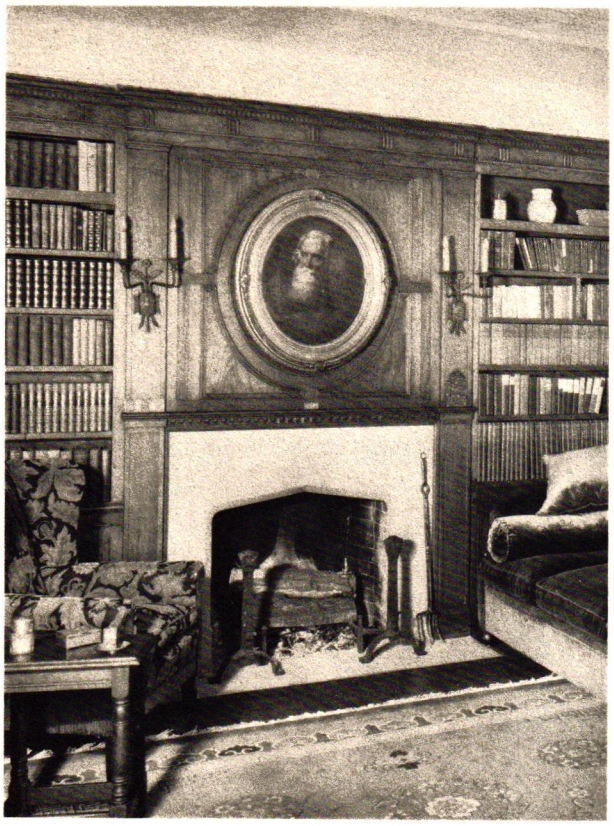
*Walter B. Chambers*

*Lewis Bowman*

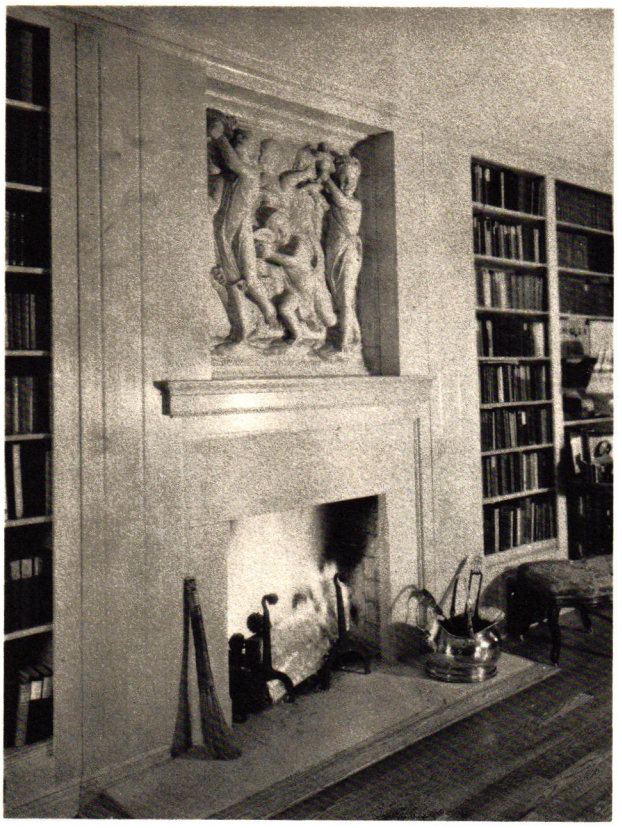


*Benjamin W. Morris*





*McKim, Mead & White*

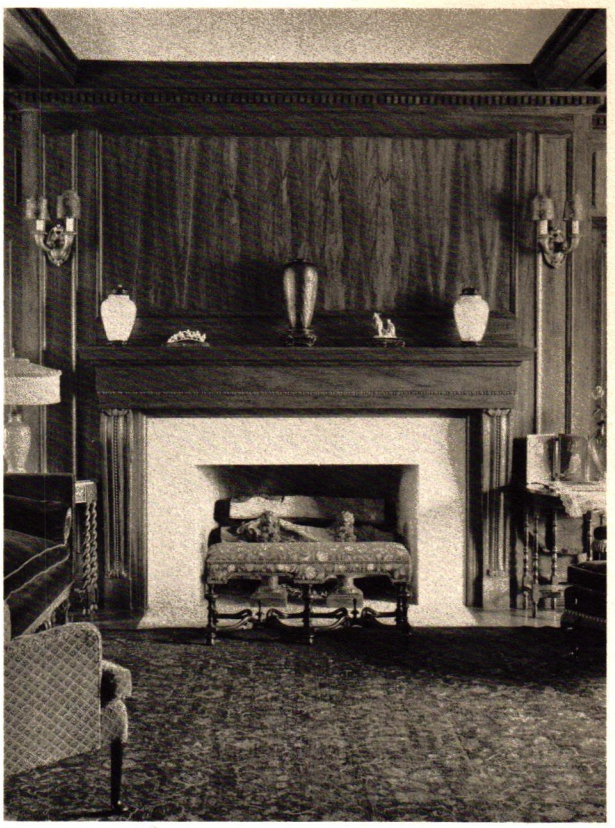


*Heth Wharton*

*Chandler Ireland, Inc.*

*Arthur Loomis Harmon*

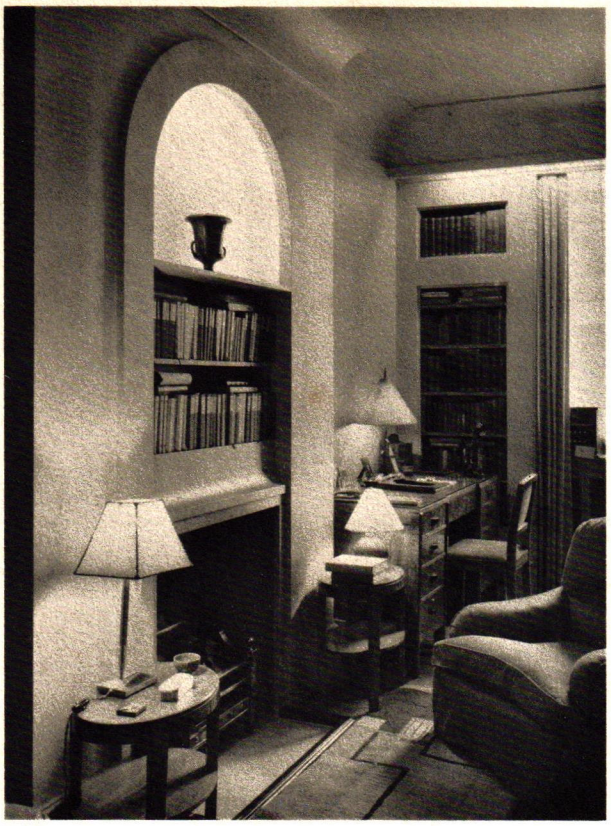
*Roland E. Coate*



*James Purdon*

*Evans, Moore & Woodbridge*

*Hentz, Adler & Shutze; mural by Allyn Cox*



*Robert W. Symonds and Robert Lutyens*

*Robert W. Symonds and Robert Lutyens*

*Samuel E. Lunden*

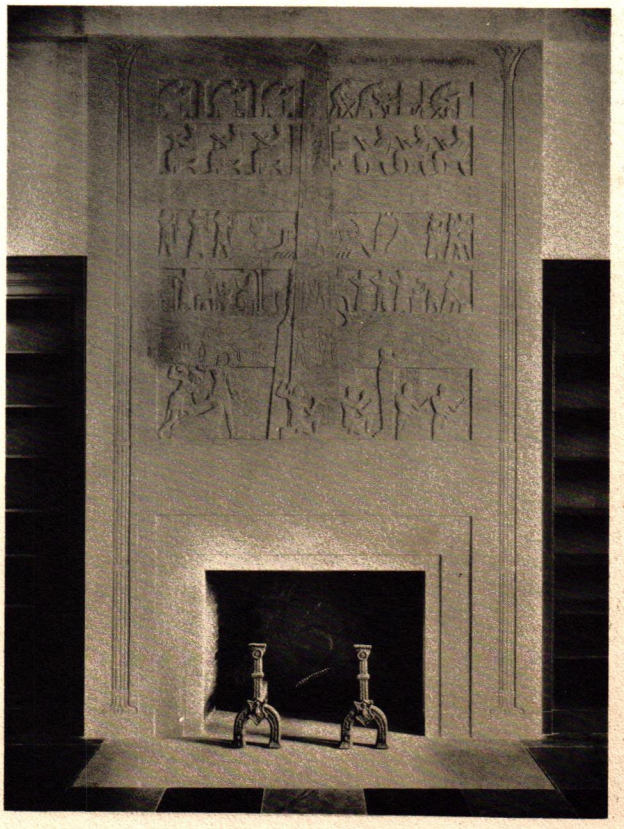
*Arden Studios, Inc.*

*Aymar Embury, II; Miller & Martin*

*Office of Roswell F. Barratt*

*Eric Kebbon*

*Bertram G. Goodhue; Lee Lawrie*



*Aymar Embury, II*

*Evans, Moore & Woodbridge*

*Evans, Moore & Woodbridge; painting by D. Putnam Brinley*

*Bradley Delehanty*