ARCHITECTURE

The Professional Journal

June, 1933

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●Entrance detail of Louisiana State Capitol, where permanence of electrical installation has been assured through the use of Youngstown Buckeye Conduit.

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ARCHITECTURE

REG. U. S. PAT. OFFICE

THE PROFESSIONAL ARCHITECTURAL MONTHLY

VOLUME LXVII

DECEMBER—JUNE

1933

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1933

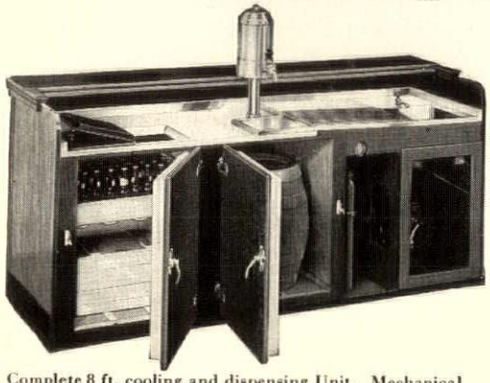
INDEX

VOLUME LXVII: JANUARY THROUGH JUNE, 1933

The pagination of the volume is divided as follows: Jan., 1–62; Feb., 63–122; Mar., 123–184; Apr., 185–246; May, 247–308; June, 309–370

ICE OR MECHANICAL REFRIGERATION - - -

it's the cooling system that counts!



Complete 8 ft. cooling and dispensing Unit. Mechanical Refrigerated. (Ask for folder showing complete line)

BEER that's correctly served—fresh! cool and *palatable*—that's what brings repeat sales and *profits!* And that is why it pays to specify Brunswick Service Fixtures. They serve your beer *fresh*—they keep beer palatable whether you use ice or mechanical refrigeration because the Brunswick *system of cooling* is right!

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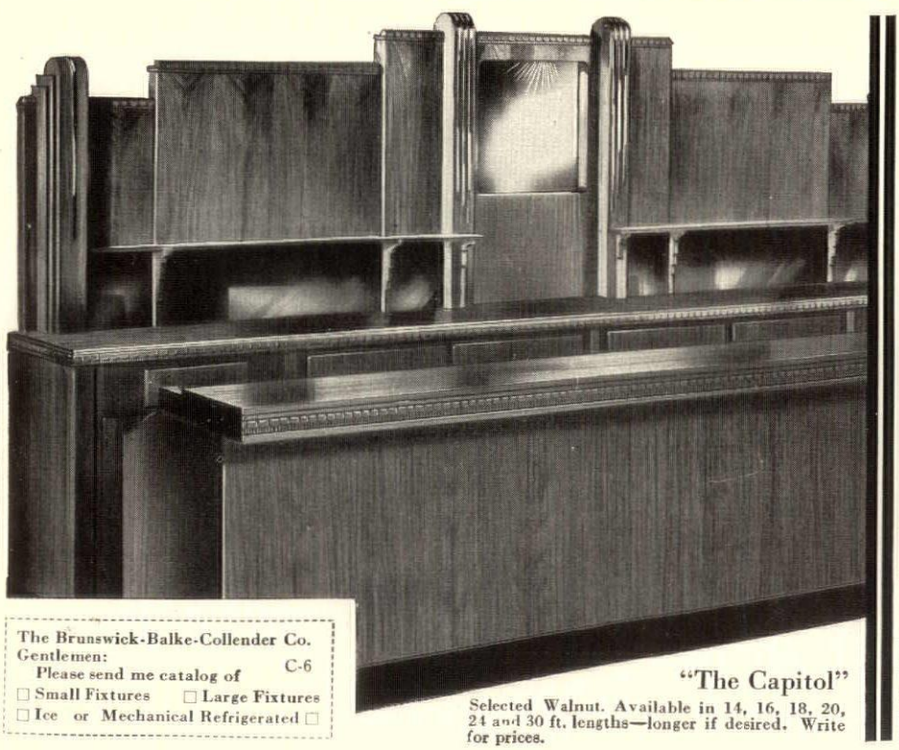

"The Capitol"

Selected Walnut. Available in 14, 16, 18, 20, 24 and 30 ft. lengths—longer if desired. Write for prices.

Novelty Box

With center, left or right hand tap, capacity two half-barrels. Kiln dried oak with golden oak finish, galvanized sheet lined, chrome plated hardware, Monel Metal faced. Price only $70.00 f.o.b. Muskegon, Mich. (faucets, coils, fittings, extra at low prices).

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Please send me catalog of
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ARCHITECTURE, published by CHARLES SCRIBNER'S SONS, 597 Fifth Avenue, New York, N. Y. June, 1933. Volume LXVII, 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.

Photograph of escalators in the new building of The Philadelphia Saving Fund Society

WHY ESCALATORS?

RECENTLY Otis escalators have been installed in a number of important buildings. In Rockefeller Center. In the new Cities Service Building, Sixty Wall Tower. In the Metropolitan Life Insurance Company's building of New York City. In the Old Merchants National Bank and Trust Company of Battle Creek, Michigan. In the new building of The Philadelphia Saving Fund Society.

It has been found that the Otis escalator provides convenient, economical transportation where people must travel comparatively short vertical distances. Because of the escalator, a bank can have its offices on the second floor and rent the valuable space below. A basement or upstairs restaurant served by escalators is almost as convenient as one located on the street level. The installation of escalators represents a distinct innovation in office building construction.

Recently Otis Elevator Company has developed refinements in escalator construction which produce smoother and quieter operation. This important improvement opens up many new uses for the escalator in varied types of buildings. Consider the escalator, either in the erection of a new building or the modernization of an old one.

OTIS ELEVATOR COMPANY

THE BULLETIN-BOARD

PRIX DE ROME

THE awards of the Prix de Rome in architecture and in landscape architecture have been announced. Olindo Grossi of the Bronx, New York City, who is studying for a degree of Master of Science in Architecture at Columbia, was awarded the Fellowship in Architecture. The problem called for a country club house for one thousand members, and nine men chosen from a field of one hundred twenty-four competed in the finals.

In landscape architecture, the award went to Morris E. Trotter, Jr., of Charlotte, N. C. In this division the problem called for a restaurant in an exclusive suburban district. There were four finalists surviving a field of fifty. Trotter will receive his degree of Master of Landscape Architecture from Cornell in June.

The jury in architecture consisted of Charles A. Platt, Chester H. Aldrich, Louis Ayres, and John Russell Pope. In landscape architecture, the jury was composed of Gilmore D. Clarke, Clarence Fowler, Alfred Geiffert, Jr., Norman T. Newton, Leon H. Zach, and Charles A. Platt.

AMERICAN ACADEMY IN ROME AWARDS

THIS year's awards in painting and sculpture are announced by The American Academy in Rome as follows: in painting the winner of the Prix de Rome is Daniel Boza, of Cleveland, who studied for five years at the Cleveland School of Art; in sculpture the award goes to Robert F. P. Amendola, of Natick, Mass., a student at the Yale School of Fine Arts.

Honorable Mention in Painting is given to Michael A. Sarisky, also of Cleveland, and in sculpture to Ruben Robert Kramer, of Baltimore.

The Academy this year reduces to two years the term of each Fellowship. Hitherto the appointees have been sent to Rome for three years.

T-SQUARE CLUB

THE Fiftieth Anniversary of the founding of the T-Square Club of Philadelphia was celebrated by a dinner, meeting, and the presentation of a play, in the club house, 204 South Quince Street, on Wednesday, April 19, 1933. On the walls of the meeting-room were displayed a number of drawings submitted in T-Square Club competitions of 1890–1900, and the original sketch for the club house made by Wilson Eyre. The prize-winning designs submitted in this year's Cope Competition were also exhibited. Dinner was served to 124 members, former members, and guests.

Adin Benedict Lacey read the story of the T-Square Club, bringing out the high lights of its activities during the past half century, and mentioning the important part it has played in the development of the architecture of the city.

Wilson Eyre, one of the founders of the club and the only original officer now living, was presented with the T-Square Club Gold Medal of Honor by D. Knickerbacker Boyd, as a token of the esteem and regard in which he is held by the club.

Arthur Truscott, Walter Smedley, and Charles L. Hillman, who also were founders of the club, spoke briefly of their memories of the earlier days. There were short addresses by Dr. Paul P. Cret, Honorary President; Dean Warren P. Laird; Dr. Charles Z. Klauder, George Howe, and Harvey Watts.

The results of the Walter Cope Memorial Prize Competition, which was judged the preceding day, were announced as follows: First Prize, James W. Breed; Second Prize, Robert Page; First Mention, George C. Rudolf; Second Mention, Frank D. Dean. The subject of the competition was "A Reviewing Pavilion for Notable Guests." The jury consisted of Dr. Charles Z. Klauder, H. Bartol Register, Robert R. McGoodwin, W. Pope Barney, and Grant M. Simon.

STRUCTURAL ENGINEERS' CODE

ONE year ago the Structural Engineers' Association of Southern California adopted a Code of Standard Practice governing professional structural engineering service. This Code sets forth just what a complete set of plans and specifications should cover. It defines such terms as Supervision, Inspection, Reviewing and Checking of Structural Designs, and Letting and Drafting of Construction Contracts.

During the past year the members of the Association have based their bids on engineering services to be rendered on this Standard Code of Practice, and by suggesting to the architects, contractors, and business men desiring engineering services that all comparisons of bids be made on this basis, they have eliminated a great deal of unfair price cutting. The members of the Structural Engineers' Association of Southern California feel that this Code has proven very beneficial in Southern California and recommend it to engineers, architects, contractors, and business men throughout the country for adoption. Copies may be had from Office of the Secretary, 838 Fidelity Building, Los Angeles, Calif.

THE INCH–MILLIMETER RATIO

THE American Standards Association has just approved, as a result of a general conference of industry held in New York last October, the inch-millimeter conversion ratio of 25.4. It is possible that the Association will publish more extensive standard conversion tables based on this ratio.

ENGLISH–FRENCH ART AND ARCHITECTURE TOUR

UNDER the direction of Harry F. Cunningham, head of the Department of Architecture, University of Nebraska, a small group sails from New York on the *Majestic*, June 14, for the purpose of visiting England and France. The itinerary gives every promise of a most enjoyable and profitable trip at a cost of about $400. It is possible that there may be those who would like to take advantage of this opportunity even at this last moment. Applications for membership should be made to Eugene Robb, Apartment 702, 333 East 43d Street, New York City. The party will return from Le Havre on July 26, arriving in New York on August 2.

NEW YORK UNIVERSITY GRADUATE SCHOLARSHIP

THE Department of Architecture, School of Fine Arts, New York University, announces a competition for the selection of a student of unusual ability to pursue graduate work leading to a degree of Master of Architecture during the academic year 1933–34.

The competition is open to any graduate of an approved school of architecture, other than New York University, who is between 22 and 30 years of age on July 1, 1933, and

(*Continued on page 6*)

ARCHITECTURE'S SERVICE BUREAU FOR ARCHITECTS

ARCHITECTS AND EVERY ONE INTERESTED WILL FIND HERE THE LATEST AND MOST UP-TO-DATE INFORMATION ON BUILDING EQUIPMENT AND ACTIVITIES IN THE INDUSTRY. THESE PUBLICATIONS MAY BE HAD BY ADDRESSING ARCHITECTURE'S SERVICE BUREAU FOR ARCHITECTS, 597 FIFTH AVENUE, NEW YORK. OUR SERVICE BUREAU WILL OBTAIN ANY OTHER CATALOGUES OR DATA YOU REQUIRE.

ELECTRIC WELD TUBING

A copy of a comprehensive Handbook of Electric Weld Tubing awaits your mailing directions. Published by Steel & Tubes, Inc., a unit of Republic Steel Corp., Cleveland, Ohio, it represents a first serious attempt to establish standards for the electric weld tubing industry. A large fund of comprehensive and authentic information is contained in its sixty-eight pages.

METAL SASH

Two recent folders from the Kawneer Co., Niles, Mich., announce a new metal sash for store fronts. The new sash is perforated for drainage and when desired is equipped with a slide for controlling ventilation. It is made in bronze, aluminum alloy with or without alumilite finish, and stainless steel. Information gladly furnished.

FIREPROOF

Stressing "Concrete for Permanence," the Portland Cement Association, 33 West Grand Avenue, Chicago, publish a recommendation for use of concrete to make homes permanently fireproof. The folder is well illustrated and descriptive of methods used.

"SQUADS RIGHT"

For compactness, mobility, and efficiency the latest dispensing unit for that new beverage known as beer manufactured by (the dispensing unit) the Brunswick-Balke-Collender Co., of 623 South Wabash Avenue, Chicago, certainly has an unbeatable lead on other equipment of its kind. As the manufacturer says, it is as good as a squad of "devildogs" doing an about face in close quarters. For efficient club room or restaurant service it is provided with rolling casters. They are made in six or eight foot sizes and are equipped with a combined counter work board, cooling, and dispensing unit, mechanically refrigerated. Attach water supply, waste plumbing and electric connection, and they are ready for work. Your favorite movie star would call them ducky. Literature on request.

WATER-PROOFED CEMENT

To those interested in water-proofed concrete construction the folder from Coplay Cement Mfg. Co., 521 Fifth Avenue, New York City, manufacturers of Saylor's Portland Cement, will be interesting. This new feature of mixing water-proofing compound with portland cement at the mill, assuring a uniform mix, is a feature to be appreciated by engineers and architects. Saylor's Portland Cement combined with R. I. W. Toxement is announced as prepared for shipping.

DRAGON SUPER-CEMENT

A. I. A. file (3A-3) (7) from the Lawrence Portland Cement Co. describes Dragon Super-Cement as more than a high early strength portland cement. Well illustrated and well supplied with details and test data and supported with communications attesting to construction speed, economy in form lumber, reduction of curing period, and facilitation of cold-weather work, this catalogue is worth reviewing.

IGNITION ARCH PROCESS

For carbureting with heavy oil is the subject of a unique folder from the Semet-Solvay Engineering Corp., of 40 Rector Street, New York City. This process eliminates courses of firebrick in the carburetor. Two refractory arches are constructed at right angles to each other at the top of the carburetor. They ignite the blast gases which are thoroughly mixed in the angle connection with secondary air. The combustion in the carbureting zone is complete. The Semet-Solvay Ignition Arch Process for heavy oil is adaptable to coke, anthracite, or mixture of bituminous coal and coke. Besides a unique manner of illustrating this process, the folder contains data records from an actual operating test. The company will gladly consult with you on any water gas plant problem.

AIR CONDITIONING

Joint announcement has been made by the Campbell Metal Window Co., subsidiary of the American Radiator and Standard Sanitary Corporation and the General Electric Co., of their jointly developed air-conditioning unit—a single compact unit which will filter and circulate air and provide effective sound deadening. In winter it supplies automatic heating regulation and humidification and in summer automatic cooling and dehumidifying.

METROPOLITAN NEWS

The Metropolitan Life Insurance Co., of New York, has published two booklets in which you will find much of interest. One is entitled "Domestic Oil Furnaces and Their Operation," the other, "Air Conditions and the Comfort of Workers."

RETURN OF THE RAIL

The return of beer stages a comeback for "ye ole time" bar rail. Newman railings for bars, hotels, restaurants, clubs, and cafeterias are illustrated and described in recent circular from Newman Brothers, Inc., Cincinnati, Ohio (416 Elm Street).

HOME LIFTS

The Shephard Elevator Co., of 2413 Colerain Avenue, Cincinnati, Ohio, offers in descriptive circular an automatic electric house elevator at attractive price, completely installed. The user need only provide a hole in the floor and an electric outlet near the elevator. Sounds simple enough, but you better send for details and specification instructions.

SANITARY METAL TRIM

Knapp Brothers Mfg. Co., of 605 W. Washington Blvd., Chicago, have published for your convenience a catalogue on their metal plastering accessories, such as metal corner bead, base grounds, picture mould, etc. It gives you up-to-date information on the most practical, economical, and utilitarian sanitary metal trim.

(Continued on page 10)

who is a citizen and resident of the United States.

The competition will consist of a design problem involving a reasonable knowledge of design and construction. Programmes will be mailed to reach the contestant on June 16, 1933. A preliminary sketch will be required. The drawings must be done without criticism or aid except from reference works and must bear a postmark prior to 12 noon, June 26, 1933. Each competitor must work under the supervision of a member of the American Institute of Architects. Application forms must be filed on or before June 10, 1933. Address Dean E. R. Bossange, College of Fine Arts, New York University, 250 East 43d Street, New York City.

CRANBROOK ACADEMY OF ART

THE Cranbrook Academy of Art announces the third year of its post-graduate Architectural Department, under the direction of Eliel Saarinen, beginning in the fall of 1933. The Architectural Department limits its enrollment to thirty-five students, who are selected by competition. Each competitor must be either the holder of an architectural degree from a recognized university, or a practising architect or draftsman who can submit the necessary qualifications. As there is no tuition or any charge for instruction, each student is actually the recipient of a scholarship. Those who wish to enter the competition for these scholarships must register and signify their intention of so doing on or before July 15, 1933. Further details may be had by addressing Richard P. Raseman, secretary, Cranbrook Academy of Art, Bloomfield Hills, Mich.

A. I. S. C. STUDENT COMPETITION

THE American Institute of Steel Construction announces the awards in the 1933 annual bridge design competition. The problem called for a steel highway bridge crossing a deep gorge with two-hundred-fifty-foot span. The first prize, one hundred dollars, was awarded to George D. Recher, a student at the Atelier Adams-Nelson, Chicago; second prize to W. A. Smith from the University of Alberta, Canada. First Honorable Mention went to W. M. Horowitz, University of Illinois; Second Honorable Mention to Robert G. Jahelka of Columbia University; Third Honorable Mention to Leonard E. Palumbo, New York Architectural Club.

The awards were made as the result of a two-stage competition, one hundred thirty-four students competing in the first, and ten remaining for the final as a result of the first judgment.

The jury of award: Leon S. Moisseiff, Edward A. Byrne, William F. Lamb, Kenneth M. Murchison, and H. H. Saylor.

UNIVERSITY OF MICHIGAN SUMMER SESSION

THE Summer Session of the College of Architecture of the University of Michigan at Ann Arbor will continue from June 23 to August 18. Courses will be offered in undergraduate and graduate architectural design, in outdoor drawing and painting, and in office practice.

ROCKEFELLER CENTER FOUNTAIN

PAUL MANSHIP, the sculptor, is to design the broad ornamental fountain which, executed in bronze and gray granite, will form a focal centre against the west wall of the sunken plaza, just below the eastern entrance of the R.C.A. Building in Rockefeller Center, New York City.

LEE HAUN MILLER, 1877–1933

LEE HAUN MILLER, chief engineer of the American Institute of Steel Construction, died in Cleveland, Ohio, April 9. Mr. Miller was one of the founders and former managing director of the Institute, and has been prominently identified with structural steel for more than twenty-five years. He was a member of the Society of Civil Engineers. Charles F. Abbott has said of him:

"The structural steel industry loses a valuable monitor in Lee Miller. He carried the welfare of the industry close to his heart and numbered the rank and file of steel men and structural engineers among his friends. Lee Miller has done more than any man in the world to bring about co-ordination in this industry and largely from his efforts the public is today benefitting from the improved and high standards set up by the structural steel industry of the United States."

JAMES LEAL GREENLEAF, 1857–1933

JAMES LEAL GREENLEAF, a distinguished pioneer among the landscape architects, died April 15, at Stamford, Conn. Mr. Greenleaf was graduated in 1880 as a civil engineer from the Columbia School of Mines, and entered at once upon work in connection with the Tenth United States Census. In 1881 Mr. Greenleaf became an engineering instructor at Columbia, and later Adjunct Professor of Civil Engineering, serving until 1894.

In the late nineties he turned from engineering to landscape architecture. Among works of his in this field that are best known are the estates of George D. Pratt at Glen Cove, Long Island; William K. Vanderbilt at Hyde Park, Long Island; C. Ledyard Blair at Bernardsville, N. J.; H. L. Pratt at Glen Cove, Long Island; Jacob H. Schiff at Red Bank, N. J.; Mortimer Schiff at Oyster Bay, Long Island; and Hobart Park at Purchase, N. Y.

In 1918 President Wilson appointed Mr. Greenleaf a member of the National Commission of Fine Arts.

After the war he supervised the landscaping of cemeteries of the American war dead in France. He retired from active practice about seven years ago, but still continued a consulting practice.

Mr. Greenleaf was also a painter, and exhibited his work at the National Academy of Design, of which he was an associate member. He was a Fellow of the American Society of Landscape Architects, and served as president of its New York Chapter, and later as national president.

PERSONAL

Henry Ludwig Kramer, architect, has opened an office for the practice of architecture at 254 Roosevelt Avenue, Elberon, N. J., and requests that manufacturers' catalogues be sent to him.

Edward Shepard Hewitt, architect, announces the removal of his office to 607 Fifth Avenue, New York City.

Sukert & Cordner, architects, announce the discontinuance of their partnership. The office of Lancelot Sukert is now located at 79 Westminster Avenue, Detroit, Mich., and the office of G. Frank Cordner at 5063 Spokane Avenue, Detroit, Mich.

ARCHITECTURE

REG. U. S. PAT. OFFICE

THE PROFESSIONAL ARCHITECTURAL MONTHLY

VOL. LXVII, NO. 6

CONTENTS

JUNE, 1933

WHEN CHANGING ADDRESSES, SUBSCRIBERS MUST GIVE FOUR WEEKS' ADVANCE NOTICE AND BOTH THEIR OLD AND NEW ADDRESSES

ARCHITECTURE is published monthly, appearing on the 28th of the month preceding date of issue. Price mailed flat to members of the architectural and allied professions, to any address in the United States, $3 per year in advance; to all others, $6; add $1 for Canadian postage and $2 for foreign postage. Single copies, $.50 Advertising rates upon request. Entered as second-class matter, March 30, 1900, at the Post-Office at New York, N. Y., under the Act of March 2, 1879.

CHARLES SCRIBNER'S SONS, PUBLISHERS

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EDWARD T. S. LORD, WHITNEY DARROW, MAXWELL E. PERKINS, *Vice-Presidents*
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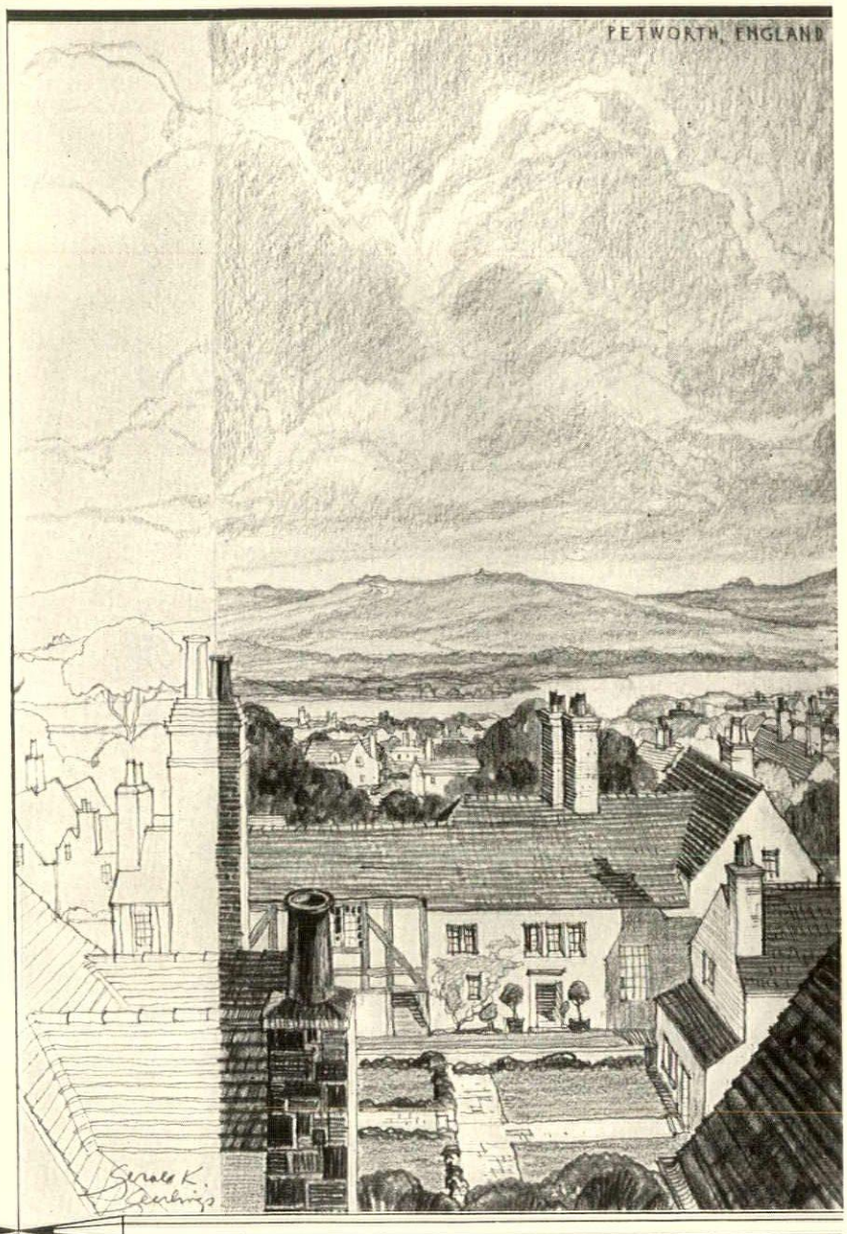
NEW YORK: 597 FIFTH AVENUE AT 48TH STREET

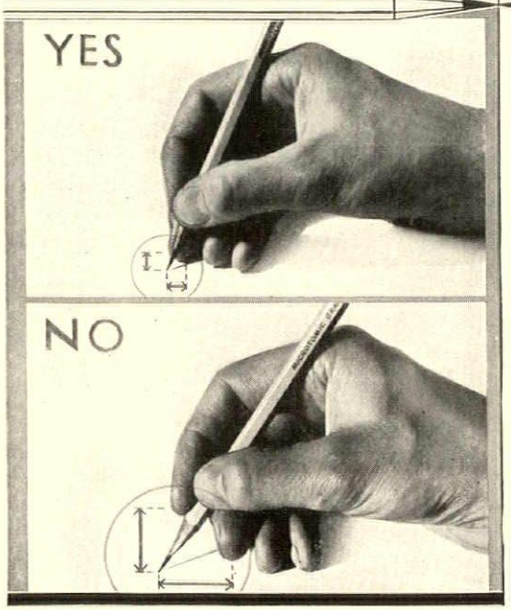
AERIAL PERSPECTIVE, HILLS AND CLOUDS

YOU CAN IMPROVE this drawing by completing it—why don't you? Because this paper is unusually smooth, you will find a 5B or 6B best. The original was drawn by Gerald K. Geerlings, exactly this size, on Bristol board. In doing it entirely with an HB Microtomic Van Dyke Pencil, he reports sharpening the point only once with the knife and twice with the sandpaper block. Some makes of pencils would require the use of several grades to attain the variety of values here obtained with one only. If you prefer to use more, however, there are 18 grades from which to choose. Concerning the drawing Mr. Geerlings says:

"The value of being facile with aerial perspective cannot be overestimated, for often its use in a single drawing shows the client more than several ground views. You can find ample opportunities for practice wherever you are. To be assured of a simple, satisfactory sketch, first do a reliable line drawing, then add values in practically flat tones."

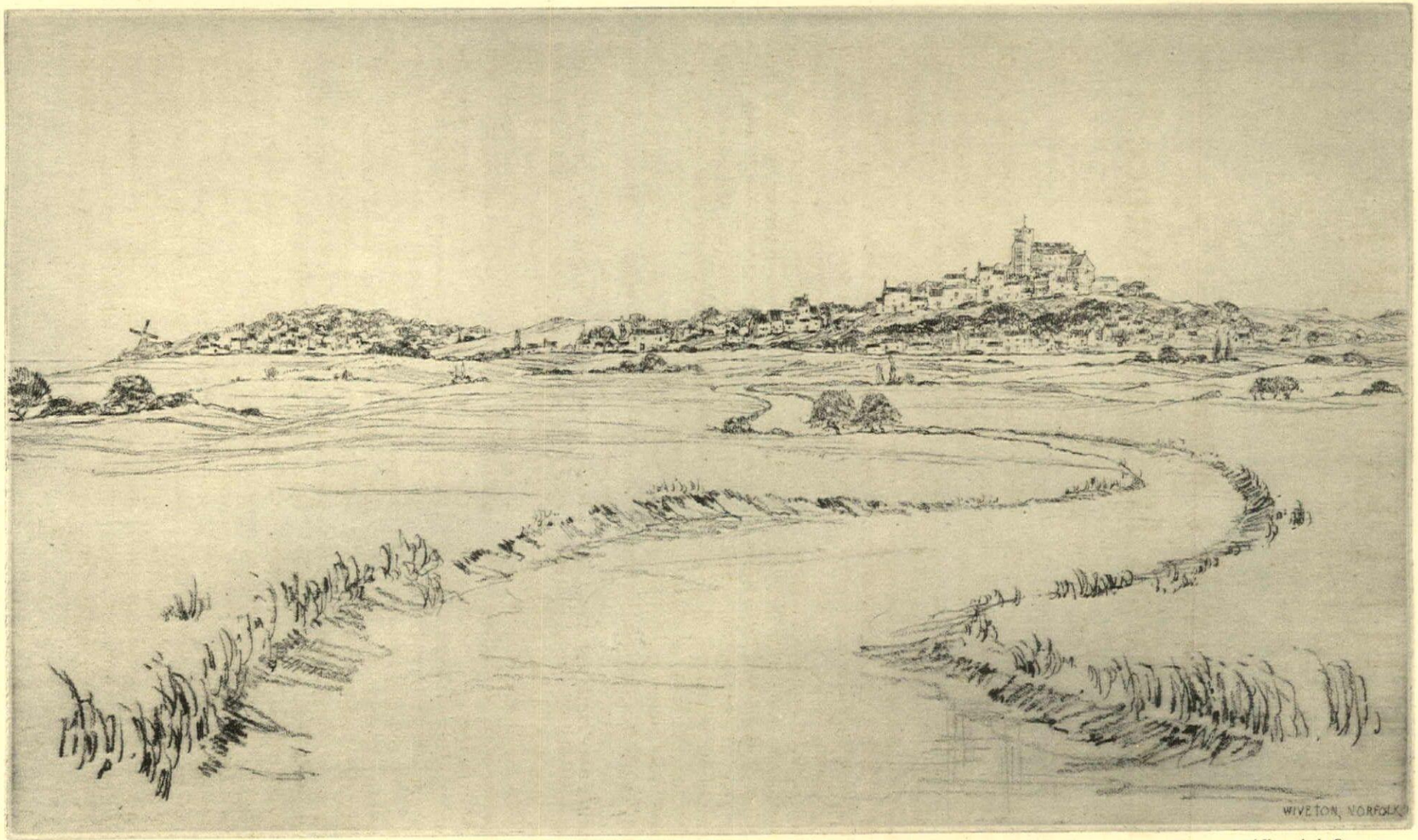
FREE SAMPLES of any two degrees of the Microtomic Van Dyke Pencil will be sent on request. Write to the Eberhard Faber Pencil Company, Dept. AR 6-33, 37 Greenpoint Avenue, Brooklyn, N. Y.





THREE ARE BETTER THAN TWO

"Only two sensitive contacts—tips of forefinger and thumb—control the pencil when held as shown below to the left. The last joint of the middle finger serves as a rest, but exercises no active control over the pencil point. In contrast with this remote control, the end of the third finger provides a third sensitive point of contact, if held as shown in the upper photograph. After a little practice you will marvel at the increased precision in your drafting, particularly in curved lines. Compare the length of arrows for the relative merits of control." — G. K. G.



By courtesy of Kennedy & Company

INLAND ISLANDS. *Soft-ground etching by Gerald K. Geerlings*

Size of original, 6⅜ by 11¼ inches. See article on page 333

ARCHITECTURE

VOLUME LXVII JUNE 1933 NUMBER 6

Are We Ready for an American Housing Advance?

By Henry Wright

A SUMMARY, such as was given in my first article ("The Sad Story of American Housing," April ARCHITECTURE), would seem conclusive evidence against the possibility of achieving decent housing standards through regular real-estate practice. At the end of forty years we find both the planning and the construction more wretched, if possible, than they were before, so that the movement from 1911 to 1931 is not forward but backward. The promise for the future lies in a different concept, that of the large, responsible operating company that undertakes the whole project in one continuous procedure, from acquiring and subdividing the land to planning the details of the individual dwelling and managing either the purchase or the operation for the occupants.

There is one preliminary condition to be fulfilled before the architect will be able to proceed in this direction of group planning and group dwellings at all. This condition is relief from the incubus of pre-ownership of the land. Unless this pre-ownership is removed, no progress can be made, and it is scarcely worth while to discuss any form of improvement in American housing. What is meant by pre-ownership of the land? Not home ownership. Not productive ownership in any form, but simply the subdivision and holding of lots long before there is any conceivable need for them, and then their sale to scattered individuals in a manner that makes it thenceforth impossible for any responsible agency to secure any large-scale control.

Once released from pre-ownership, technical competence would have an opportunity to function. First of all, the responsible agencies, planning with human needs in view, would recognize technical gains and encourage them; and secondly, the technician himself would acquire the facility and understanding that come only with long study and repeated practice.

Whether housing should then become a social function is another question. Whatever the motives that produced it: whether personal enjoyment in the enterprise, social magnanimity, or business gain, the technical competence would nevertheless be in demand. And it is inconceivable that with new processes in action, the movement would not spread, city planning and housing knitting themselves together, so that considerable areas could be organized, with their streets, public improvements, access, and other city-planning factors coordinated to the new building technique.

Now at precisely this point it is necessary to pause. We cannot assume offhand that our present group forms are the correct and settled basis for progress. We scarcely appreciate the extent to which the basic individual dwelling types we have provided within the group, even in advanced experiments such as Sunnyside, fall below the possible standard of quality. The planners have always had to reckon with the general state of non-appreciation on the part of the expected users—a limitation particularly restrictive when the product was for purchase. The chief advance that could be made in a project such as Sunnyside was, first, in the organization of "two-room-deep" space, and second, in group organization.

Out of our practice to date, then, we have acquired a small set of what we think are universally valid principles. These can be presented more extensively in a book, and can only be listed here. First is the principle of the *row*, which saves land, and permits cheaper and more efficient construction both by virtue of continuous processes and the elimination of one wall. Next is the *broad front*, which secures sunlight

exposure, interior circulation and ventilation, particularly in conjunction with *two-room-deep planning*. Now when it comes to fitting these principles to specific dwelling plans, suited to the needs of individual families, the problems are far more complicated. How do people like to live? How can they live most conveniently? What are their real needs? To these questions our answers have mainly been wholesale assumptions. And it is not only in the United States that this has been true, but, as I shall be at pains to point out, also in the far more widely spread operations in England and Germany. Where a satisfactory solution would seem to call for the greatest variety of accommodations, too heavy a reliance has been put on what must be called stock plans.

Before going into greater detail, it may be well to recall whence some of these assumptions about people's living habits derive. We are all of us accustomed to thinking in terms of certain labels: we think of "houses" (whether free or attached), we think of "flats," or of "apartments." Into each of these types our mind's eye places a certain kind of family—thus the family in the "house" has a lot of children, and the couple in the apartment has none—and we plan to continue the assumed living habits of these people with as little disturbance as we can. Meanwhile, even a natural evolution, unguided, would tend to shuffle all these types of domicile, each with its different advantages, and reassort the elements in a quite unprecedented fashion.

What has occurred in the various countries can be noted only in the briefest review, by no means doing justice to unquestioned achievements. In each country the chief basis of postwar advance has been the principle of two-room-deep planning. Only the United States has been behind, with a mere handful of examples. England centred on the perfection of the row-house, to build, under the guidance of the Ministry of Health, many hundreds of organized communities all very much alike in general concept and varying only in group detail and in the size of the houses. Orientation study in many instances brought about variations in the stock plans for opposite sides of the street, particularly where exposures were north and south. For the most part, however, the main effort in the planning was confined to placing the living-room on the garden side. The development was carried to an extreme of large hollow blocks with cul-de-sac injections. There was no such universal adjustment in the direction of the row units with respect to the sun as in Germany. In England, as elsewhere, plans were based upon fairly rigid assumptions as to how people would occupy the house. They were left to fit themselves into what the architect had predetermined, and all in a pattern fairly uniform.

In Germany during 1925–1931 there was an even larger movement toward new community building, which supplied almost every industrial community with new housing units. The fact of the "modern" style is important here only insofar as the freedom and experimentation in form were accompanied by new thought and freedom in planning detail. The community-planning movements of both Germany and Holland are of the utmost importance as a demonstration of the civic and social values arising from orderly communities. The new is of course in the most striking contrast to the old. This organization of community development should receive the most careful study (and is taken up elsewhere), but for our present purposes let us consider not its credits but its limitations.

As in other countries, the plan details in Germany have been divided into two categories. First, there is the single-family row house. This is of either two or, more frequently, three stories, with one bedroom and the laundry usually placed in the attic. Such a type follows the old traditions of living. The other type is a definite concession to new needs and emergent ways of living, for which the appropriate form is assumed to consist of some sort of apartment. Frequently in the same community different architects will be assigned different sectors, each designer putting up two or three rows repeating the identical plan unit throughout. The community plan as a whole, developed by some one of the architects, results from an orderly disposition of these group units in relation to a special street plan. In its larger elements the grouping takes its character from the relative disposition of the row house and the apartment units.

Thus in any particular plan we shall almost always find part of the community made up of row dwelling units two and one-half stories high, and row apartments four stories high (although the apartment height has recently tended toward only three). There may or may not be a storage attic, which may cover either the whole building or only the front half. So, without discussing the design problems that have determined this form of planning, we find in the

Part of the great horseshoe apartment group in the Siedlung Britz, of which the Brothers Taut and Hoffmann were the architects. A plan of the group is shown on page 313

results the following more or less rigid and hampering limitations:

(*a*) The assumption with respect to people's prejudices that has led to the provision of just two classes of dwelling space of widely separate origin.

(*b*) The assumption that those wanting large accommodations want them in the form of houses with gardens, while others will want apartments of relatively small capacity and often without gardens. (An excellent exception in respect to gardens is found at Britz, Berlin, where a convenient and fair-sized garden is provided for every apartment in a set of three-story structures.)

(*c*) The segregation of these basic types in different areas, the taller often surrounding the lower buildings.

(*d*) Large units, or numbers of units, or sometimes whole projects, held to one standard apartment plan.

To this there might be added that behind the impressive novelty of these flat-roofed exteriors is concealed an anomalous admixture of elements old and new in the interior equipment.

Possibly the limitations were inherent in a period of advance when technical skill was concentrated upon problems of universal application, such as good orientation for every occupant. Using what they had learned, the designers faced a sufficiently complicated problem in securing community balance and a pleasing artistic use of the constant repetitive external elements. There was a fine spirit of democracy, or socialism if you will, in securing an equal share for every one in the sunlight and the green of the garden. Yet, this much once accomplished, the claims of diversity in the human family, even upon the most democratic basis, urge themselves anew.

Before leaving German housing, we might call attention to the more recent theoretic studies of the German architects, including those of the Bauhaus. They seemingly result in a community organization even more rigid and monotonous than heretofore (and my own observation leads me to believe that this mania for universal exposure loses more in other living qualities than it gains in its one acknowledged aim), but there are other very promising aspects. There are plan studies, for example, that start from a fixed stair and bathroom position, and permit

a variety of adjustment in rooms, both in number and use, in both vertical and horizontal grouping. There are also extensive studies of fenestration bearing upon internal effectiveness of light and ventilation. All these studies will permit more freedom to the designer when once more he begins thinking of human needs and better ways of life rather than organized façades or balanced grouping. It is reasonable to assume that nothing need be lost for design if the human needs are met by those technically competent.

In the few experiments that have been made in the United States there has been the same tendency to constrict variety while concentrating on the more elementary general problems. The war housing communities, of special merit, were based upon a development of the Philadelphia row house. The long Philadelphia rows were broken into short groups, with studied and sometimes successful group interest. Yet the plan was still based upon the repetition of one or two typical plans little different from the few "broad-front" plans then in use. Community groupings of note may be seen in Yorkship Village, where more than half the houses are of an identical five-room plan, or at Buckman Village, Chester, and Sun Hill, Chester, where row houses were effectively handled on a hillside site. Exceptions to this rule of limited-scale repetition were made at Seaside Village, Bridgeport, where buildings of one and a half and of two stories were varied internally to serve for one or for two families and were intermingled in a successful mass design; and more especially at Newburg, N. Y. Here the architectural composition grew out of a more related juxtaposition, in which there figured single-family houses, semi-detached and row houses, and apartments of two sizes and plan variations. All these were designed in response to a predetermined spread in demand. Quantities of accommodations were built in sizes and kinds elsewhere not provided at all.

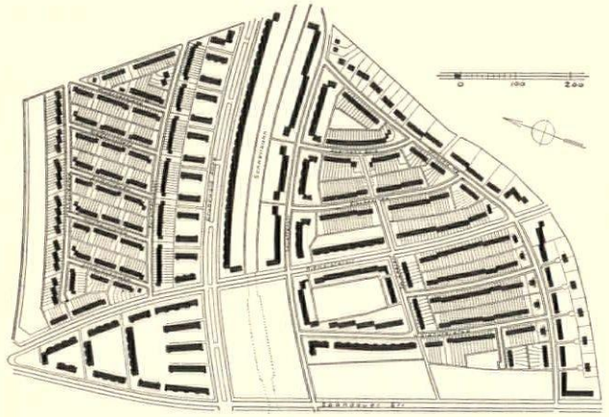
Mariemont, Ohio, straddled the problem. One corner of the community plan was to be taken up by row and two-family houses, variety being secured in these by employing a large number of architects; the town centre was laid out in apartments; all the rest of the town, in short the most of it, was devoted to lots with extravagant costs of street frontage and of heating from a central plant. These were to be built upon by individual owners under compulsory architectural guidance.

Sunnyside was the outgrowth of the war experience and of the study its planners had devoted to English practice. It was limited by the directing concept of holding to housing types that were known and were more or less current in the neighborhood. The structures were held to a uniform two-room depth. The street blocks were of the New York narrow width but unusually long. Because of the length, the house rows were broken down into groups of from four to seven units. Removal of the garages from the centre of the block created a garden and at the same time permitted erection of enough additional structures to pay for the space occupied by the garages elsewhere. In the first units the community composition was effected by juxtaposing symmetrical units, made up respectively of two-story two-family houses, three-story apartments, and one group of two-story single-family row houses. In later years the planning became standardized upon the basis of individual groupings, consisting of a row of single-family houses flanked at one end by a double two-family unit and at the other concluded by a three-family unit of two stories that projected inward into the garden. This last sort of structure was provided for the double purpose of permitting some variation in apartment size and semi-dividing the garden into two or three more intimate small courts.

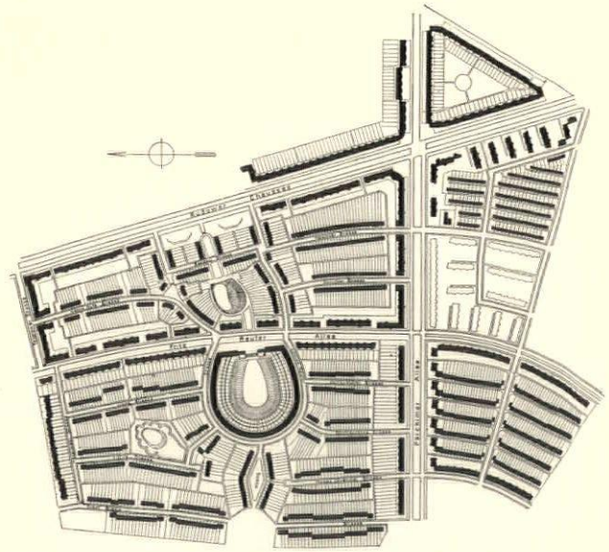
This early Sunnyside experience had in it at least the germ of plan variation for divergent human needs rather than for stereotyped technical assumptions. Certain factors limited its effectiveness. The inadequacy of the kind of cost accounting in use by everyone at the time misled the designers into accepting too restricted a plan area and particularly too narrow a frontage width. Hence over a four-year period there were repeated some 300 identical houses —identically deficient in dining-rooms and with an almost useless third bedroom. In all plans used, the well-known tendency of architects toward an overstudied plan compactness was also a limiting factor.

At Radburn the same architects were engaged in the very stimulating innovation of reversing the house front. This was done to meet very human requirements, but again the results were limited by the assumption that people would insist on an old concept of a house in a

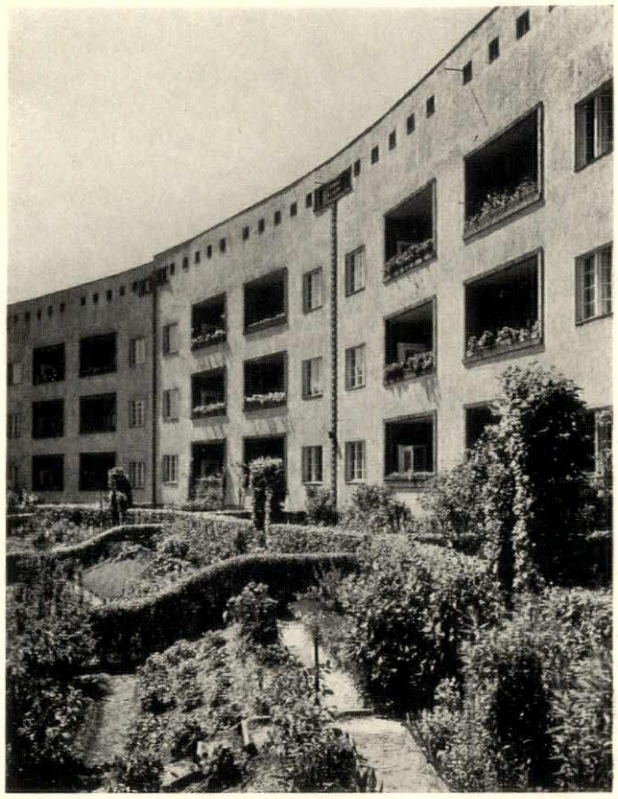
new dress. And the new block form, perhaps too well known to require exposition here, was also unfortunately limited by overemphasis on symmetry or balanced planning on an axis. The result is an orientation not always ideal. What tendency toward diversification had begun at Sunnyside was arrested by the assumption, correct on its own premises, that it would be unwise to mix single-family houses with two-family ones owned by one of the occupants. The two-family houses remained in company ownership and were segregated, and this segregation weakened the advance that was made in their design and their arrangement as repetitive but architecturally varied groups.



Plot plan of the Siedlung Zehlendorf, located in one of the better residential suburbs of Berlin. The Brothers Taut and Hoffmann, architects



Plan of the Siedlung Britz in a suburb of Berlin near Neukoln and the southeast industrial area. The horseshoe represents the three-story apartment group, around which are the low houses with their individual gardens. The Brothers Taut and Hoffmann, architects



A detail in the horseshoe at Britz which makes clear the appearance of terraced gardens, one for each apartment. The Brothers Taut and Hoffmann, architects

Here, then, are three different countries, and in all three of them the existing housing of even the most advanced type is limited and obstructed in its free evolution. In none of the countries is there the diversification that modern occupants would have a right to expect on the basis of their needs. And the limitation was in part the result of the very progress that was made through the application of technical thought. To have achieved release from the lot crowding and the idiotic house organization that were described in the last article was in itself no mean achievement. And yet technical advance has been arrested because the technician ascribed to the public an exaggerated love for existing dwelling types as he himself classified them: the single-family houses, the flats, and the apartments of the past; and he believed that the public would insist upon their perpetuation. Advance was arrested, again, because of certain cost assumptions. It was believed, for example, that savings must be achieved by means of small rooms and narrow fronts. There was also as yet only a partial de-

velopment of automatic service facilities—new heaters, refrigerators, and the like—which make it possible both to arrange dwellings in groups and leave individual control without the usual onus.

Now it would be most unfortunate to distract the attention of American students from the great importance and excellence of the English, Dutch, and German advance, or from what limited progress we have made at home. The value of the two-room-deep standard cannot be overstressed. And yet, to digest the European work of the last ten years so thoroughly as to make our own projects completely in its image would be a most unfortunate thing. We should be fully aware of the Europeans and build upon their experience; however, there are certain advantages we ourselves possess, once we get rid of pre-ownership of the land, that are unique and not to be spurned. For one thing, the American public has been permeated with the consciousness of apartment-type living to an extent that has broken down old, long-established prejudices. Add as another factor our great capacity in construction, hitherto concentrated on the skyscraper, and our new structural techniques, already rapidly developing; add also our unique advances in the direction of automatic services, and, with half a chance, American technical ability should carry us far beyond the excellence of any existing results. We could place America as the "leader" instead of the "lagger" in the whole housing world.

It is upon this foundation that I have envisioned a new and far-reaching organization of American housing. It occupies the second section of my forthcoming book, the section devoted to "Group Housing." Here, then, is a summary, or credo: I believe

(*a*) That the apartment-house development in America has been actually of much less consequence and permanency than its spectacular nature might lead us to assume.

(*b*) That its original impetus is greatly weakened by the fact that the convenience once inherent in the apartment can now be attained in other and better ways.

(*c*) That the apartment house is a less natural and logical outgrowth of our widespread cities and our ample space than some intermediate form of housing, less ponderous and less burdened by centralized service facilities that are privately maintained for profit.

(*d*) That our new structural techniques and our automatic facilities make possible the provision of forms other than apartments that meet city conditions both in areas to be reconstructed and in new areas where individual detached houses cannot actually and permanently be maintained.

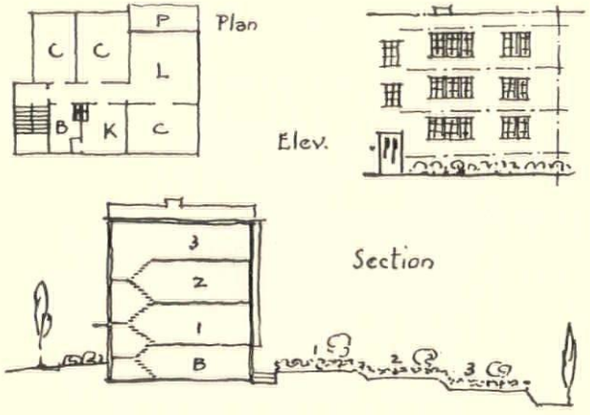
(*e*) That the past advances in improved row dwellings and small multi-family units give us the basis upon which, aided by the emerging facilities, we can best continue to grow.

(*f*) That a new concept of mixed group dwellings is necessary. Technical design, popular thinking, and city regulations should all be adjusted to the new concept. The accepted "single-family row house," "multi-family dwelling," and "apartment," in two-room-deep planning, must all be included, but further developed. They must not be segregated, but must be freely intermingled. They must lose their categorical significance as "single-family houses," or any other compartmentalized type, and become more variable elements in community groupings. They must offer a wide range of space accommodations, up and down, or flatted, with maximum or minimum cooking, laundry, and other conveniences. All varieties should share in utilizing automatic services, comforts, common or collective nurseries, kindergartens, and the like, provided according to the nature of the individual community.

(*g*) That we cannot be content to design for a catch-as-catch-can group of occupants, but, whether in public or private enterprise, must seek for groups corresponding to the membership of the public utility societies of England or Holland. This does not eliminate the objectives of such well-constituted and experienced owning and management companies as the *Einfa Gehag* at Berlin, or the *Gartenstadt und Kleinhaus Aktiengesellschaft* at Frankfort on the Main.

(*h*) That students from many angles of approach should restudy the new techniques for such a free and experimental adaptation to diverse needs.

To visualize how a further diversification of dwelling-space might be achieved, while holding to the essential features of our present advance, I have sketched such variations upon a fine existing project in Germany, the *Britz*



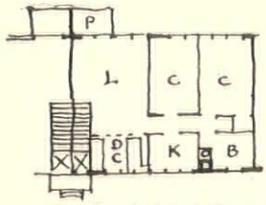
Plan, elevation, and section of a very common type of four and a half room apartment in Berlin. The apartments are identical on each floor and throughout long building groups, the unit being about 30 by 32 feet. The section shows the basement access to gardens for each family

Siedlung at Berlin. The ideas here presented are to be taken as a rough and imperfect outline for further theoretic study.

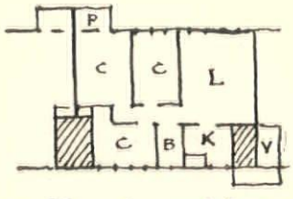
The great horseshoe at Britz is a much finer scheme than photographs would indicate. The single-family houses radiate from the central curve, this latter being composed of a large number of practically identical four and one-half room apartments on three floors. Each apartment is provided with a garden on the court side, in a series of terraces sloping down from a level half-way up the basement wall. The gardens are reached by going to the basement, climbing up half a flight of stairs in an areaway, and then walking down again along the slope to the various garden levels.

In the alternative scheme it is proposed to move the structure slightly further back from the street, retaining the same shape and stair spacing. Our object is to replace the identical four and one-half room units with a diversity of types. The first floor is dropped a few feet, to the top garden level; on the outside of the curve this puts it a few feet below the front yard. This will permit masking the minor rooms, which are placed on the side of the front yard and are shielded by a hedge. All entrances are directly at the exterior of the building. They are approached along paths that slope a little more steeply than the garden, reducing exterior steps to a minimum. The first-floor entrances are on the opposite side, and are reached by an occasional archway through the building, such as already exist.

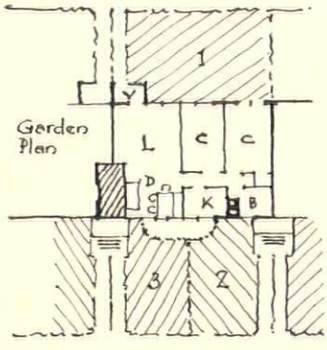
With this preliminary modification, which gives all floors their direct outside entrance, and necessitates only one flight of internal stairway (from the second to the third floor), we



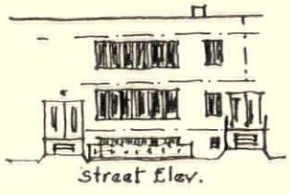
Plan of third floor

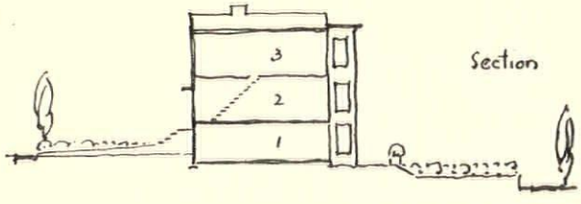


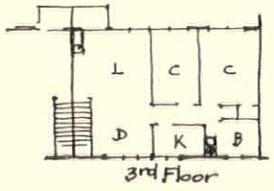
Plan of second floor

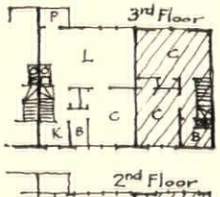


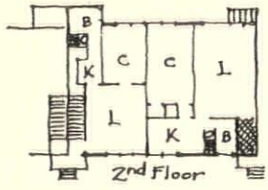
The above represents building unit A, described in the text. At the left is the plan of the first floor, showing the relationship of the gardens for each apartment

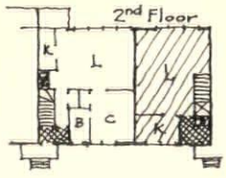


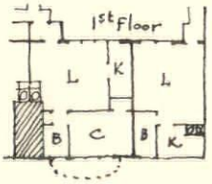






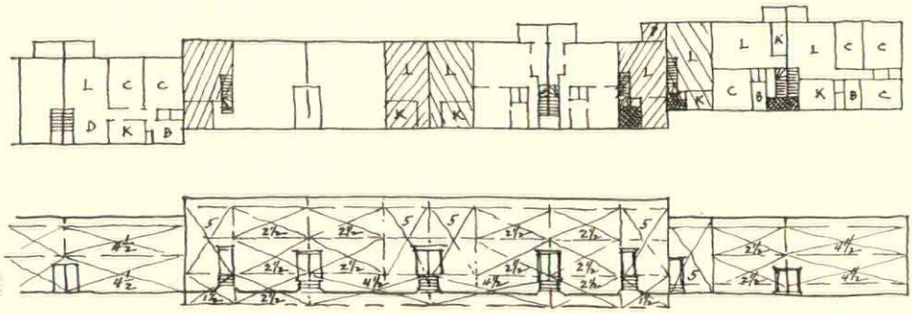


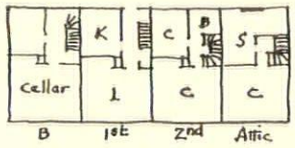




The above second and third floor plans represent building unit B with a four and a half room apartment on the third floor; a two and a half and a two room apartment on the second floor, the latter sharing the vestibule with the third floor; the first floor is another four and a half room unit similar to the third floor except for entrances

The C unit: on the second floor a two and a half room unit, and the lower part of a two story unit of five rooms with bedrooms on the third floor





Above, the four floor plans of the typical one-family house in such a group

Plan and diagrammatic elevation showing one of many possible combinations of units A, B, and C in two and three story dwellings. Any number of other variations would be possible without destroying the unity of the exterior as a whole

are ready to vary our types. Three different building units have been evolved, called *A*, *B*, and *C*, all of the same width and interchangeable. Building *A* might have identical four and one-half room apartments on all floors if the vestibule entrance were shared by the second and third. To give these two floors separate entrances and direct access to their respective gardens, a variation can be introduced in the second floor, giving it a second vestibule and one more bedroom instead of the dining alcove shown on the standard plan.

When we come to Building *B* we have on each—or either—side of the stair a four and one-half room apartment on the third floor; on the second floor one two and one-half room suite, and one two room suite that shares the vestibule with the third floor; on the first floor is another four and one-half room unit similar to the one on the third floor except for entrances.

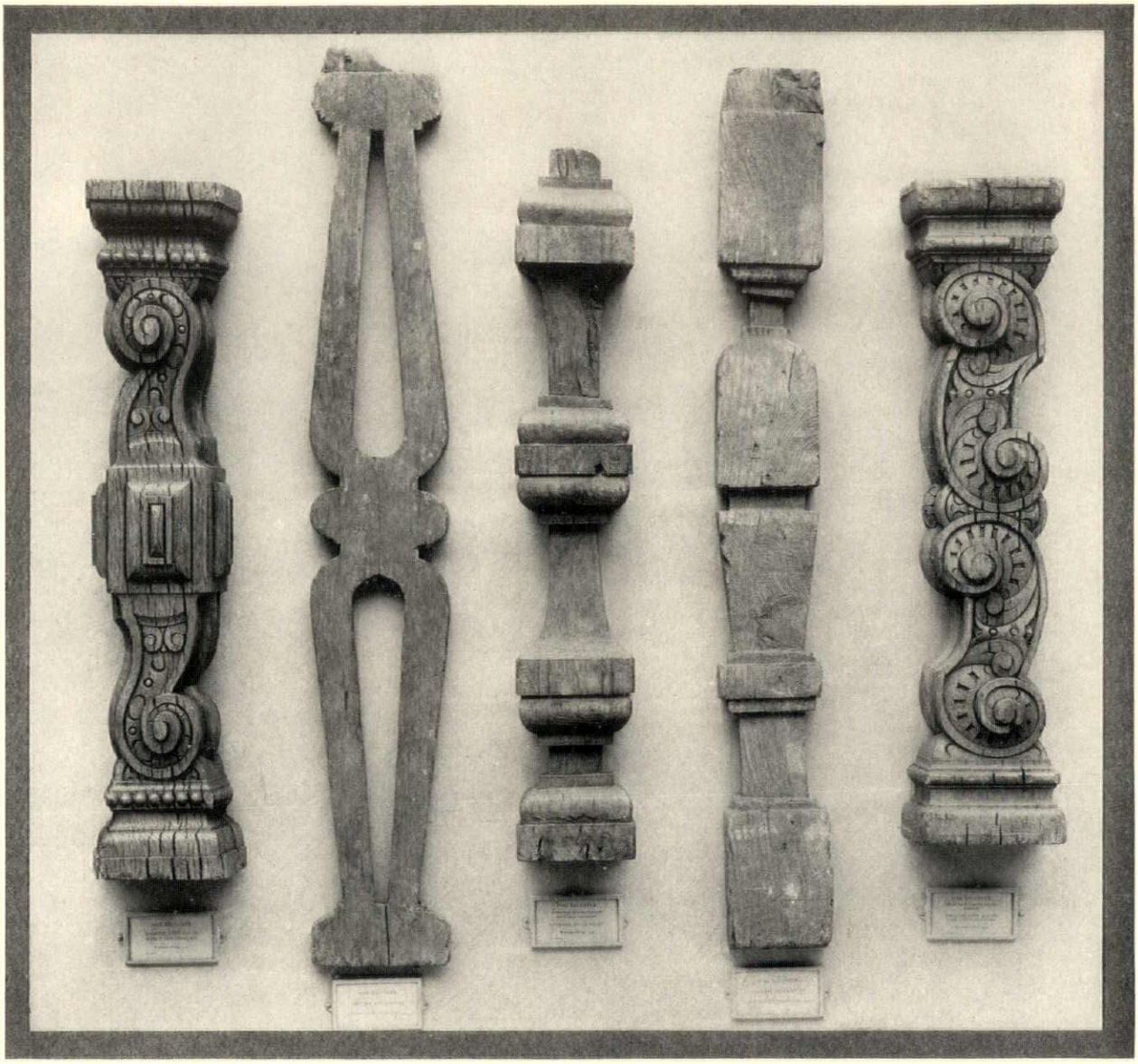
In the *C* unit there is on the second floor one two and one-half room unit and also the first floor of a two-story unit of five rooms, with its bedrooms on the third floor. The rest of the third floor is occupied by a three-room apartment. The ground floor can contain the usual four and one-half room unit, provided that the floor above is made to support the upper partitions; otherwise the ground-floor can be divided into one two and one-half room and one one and one-half room apartment as shown.

A larger composition based upon *A*, *B*, and *C* units might then work out as shown in the plan and diagram. Any number of other variations would be possible without showing differently on the exterior, since the ground-floor divergencies would be hidden by the hedge. No basement is required, though a pipe and conduit trench might be needed along the outside of the front wall. Heating would be by small gas-fired boilers for hot-water radiation in each apartment separately, the apparatus for which is now perfected, eliminating all piping except gas and cold water to each apartment. The stacks for these boilers are provided in the plan. Waste would have to be carried to common points here and there in the development, unless incinerator stacks were introduced.

The various relationships involved—the amount of diversification, the desirability of various types of dwelling space, the need or needlessness of gardens for every dwelling—all these and many more questions can be ironed out by a process of cross-criticism. The aim of diversification has however been established and illustrated. Why turn out houses alike by the dozen, each with an inexcusable amount of waste storage space, and then confine apartment dwellers to two and a half or four and a half rooms, with no storage space at all, and only occasionally with cellar access to the garden?

Further architectural interest will be found in a combination of two and three story buildings, and occasionally four stories, with common stairs to the top floors, need not be avoided. Study and criticism by architect readers is invited.

In the great blighted areas of many large cities land costs have so receded as readily to permit an average height of two and a half stories in replacement schemes. In smaller cities land has seldom, in the past, warranted buildings higher than this standard. There is, then, almost no limit to the application of these proposals.



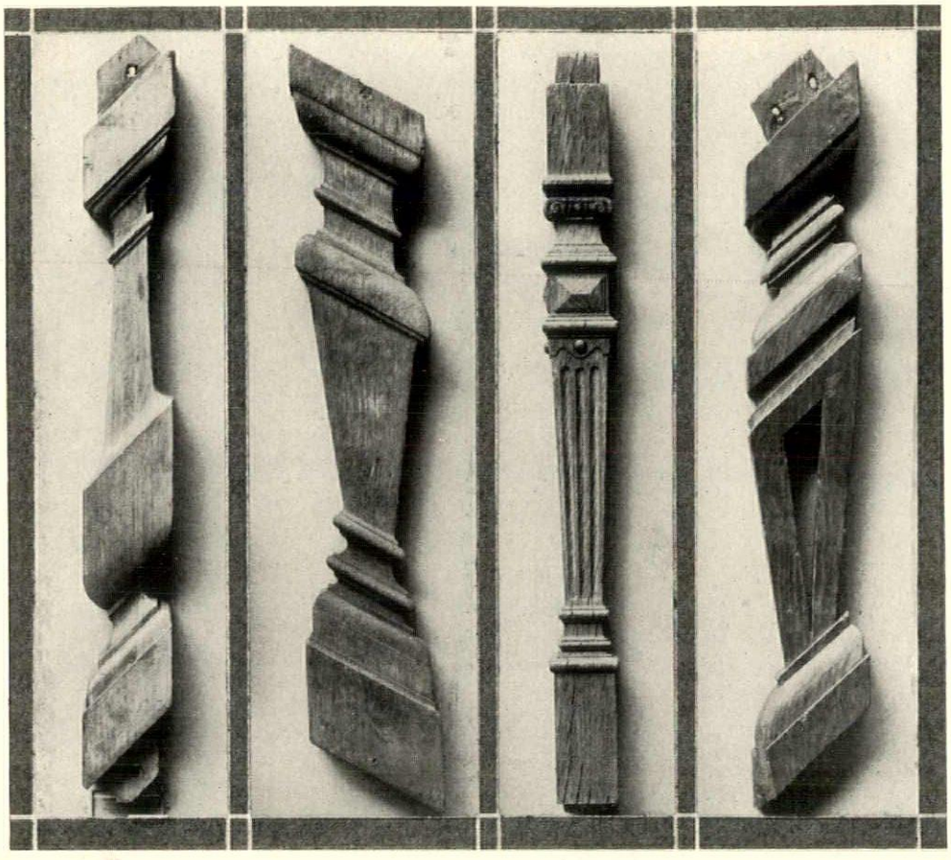
From left to right: oak, later 16th or early 17th century; oak, 16th century; oak, 16th century, from the old monastery, Southall, Middlesex; oak, 16th century; oak, late 16th or early 17th century, from Ealing, London

A collection of seventy-six wooden balusters from English staircases has recently been acquired by the Metropolitan Museum of Art, New York City. Sixty-nine of these were obtained by purchase, the remaining seven being a gift from Acton Surgey, Ltd., of London. The collection illustrates rather clearly the development in England of the stair baluster from the late sixteenth century to the third quarter of the eighteenth century

The balusters fall into three general periods: the later sixteenth and the first half of the seventeenth century; the second half of the seventeenth century; the eighteenth century to about 1770. The overlapping of styles has made the dating of certain examples more or less hypothetical

English Balusters

FROM A COLLECTION IN THE METROPOLITAN MUSEUM OF ART, NEW YORK CITY



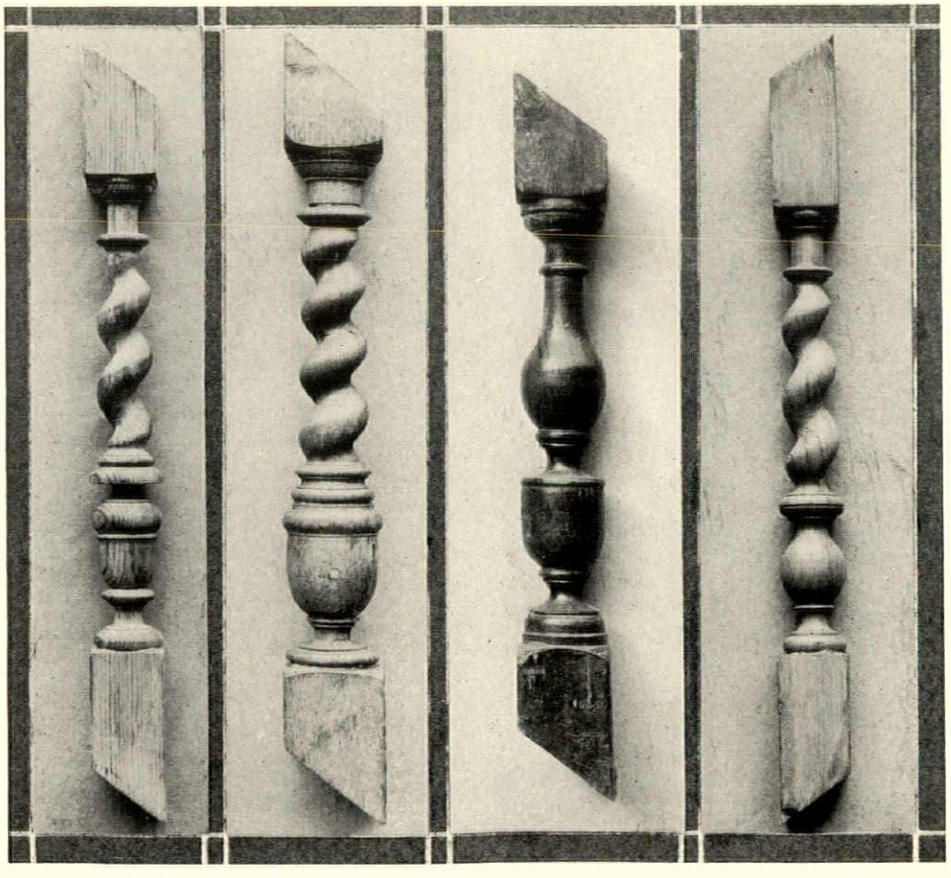
At left, reading from left to right:

Walnut, first half 17th century, from Great Windmill Street, London

Oak, first half 17th century, from Market Place, Yarmouth

Oak, first half 17th century, from Eastwell Towers, Kent

Oak, first half 17th century



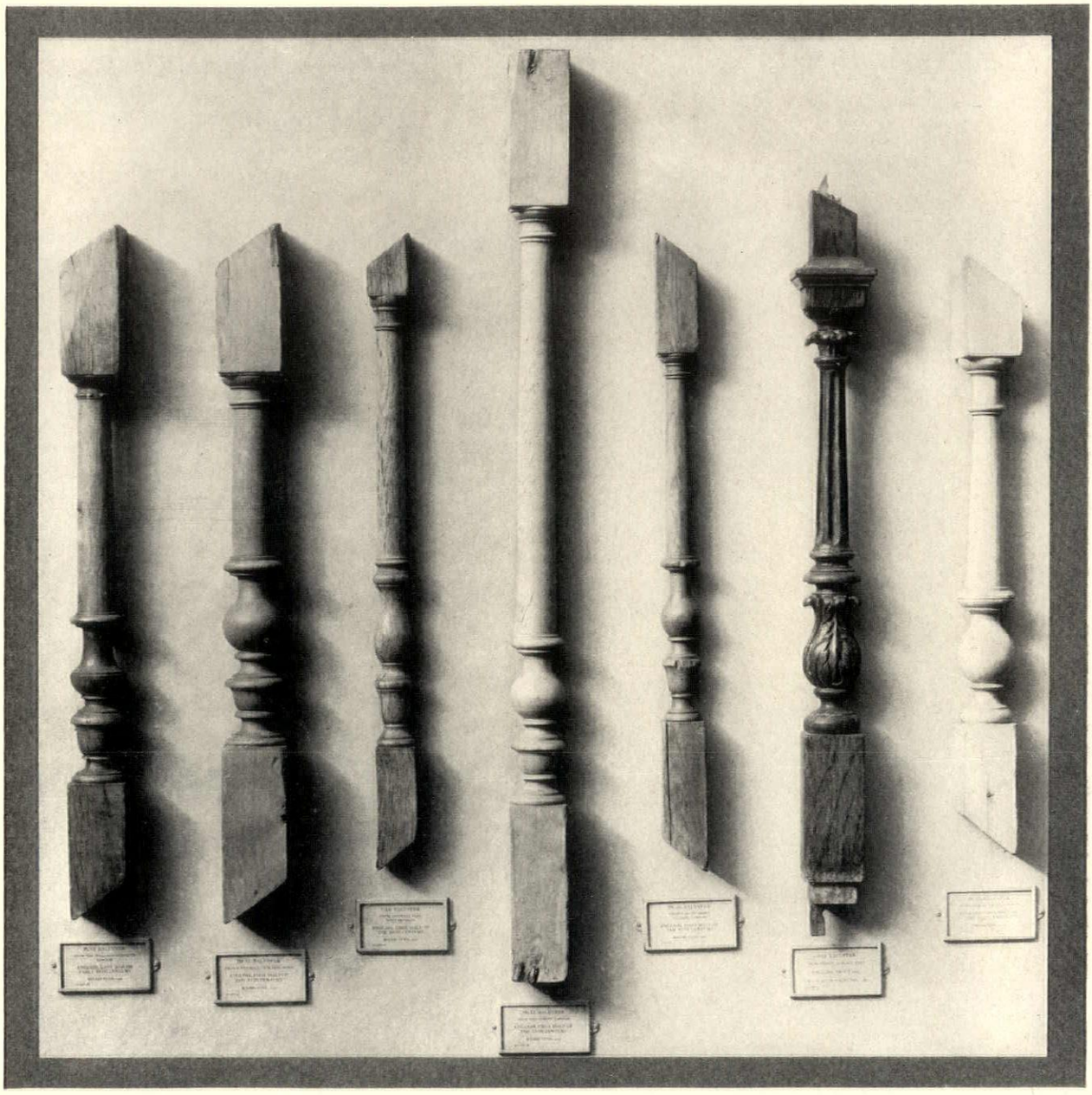
At left, reading from left to right:

Pine, second half 17th century, from Spitalfields, London

Oak, second half 17th century, from Guildford

Oak, second half 17th century, from Kiddal Hall, Leeds

Deal, late 17th or early 18th century, from Hanover Square, London



In the panel above:

Pine, late 17th century or early 18th century, from The Mall, Hammersmith

Deal, first half 18th century, from Blyth Hall near Doncaster

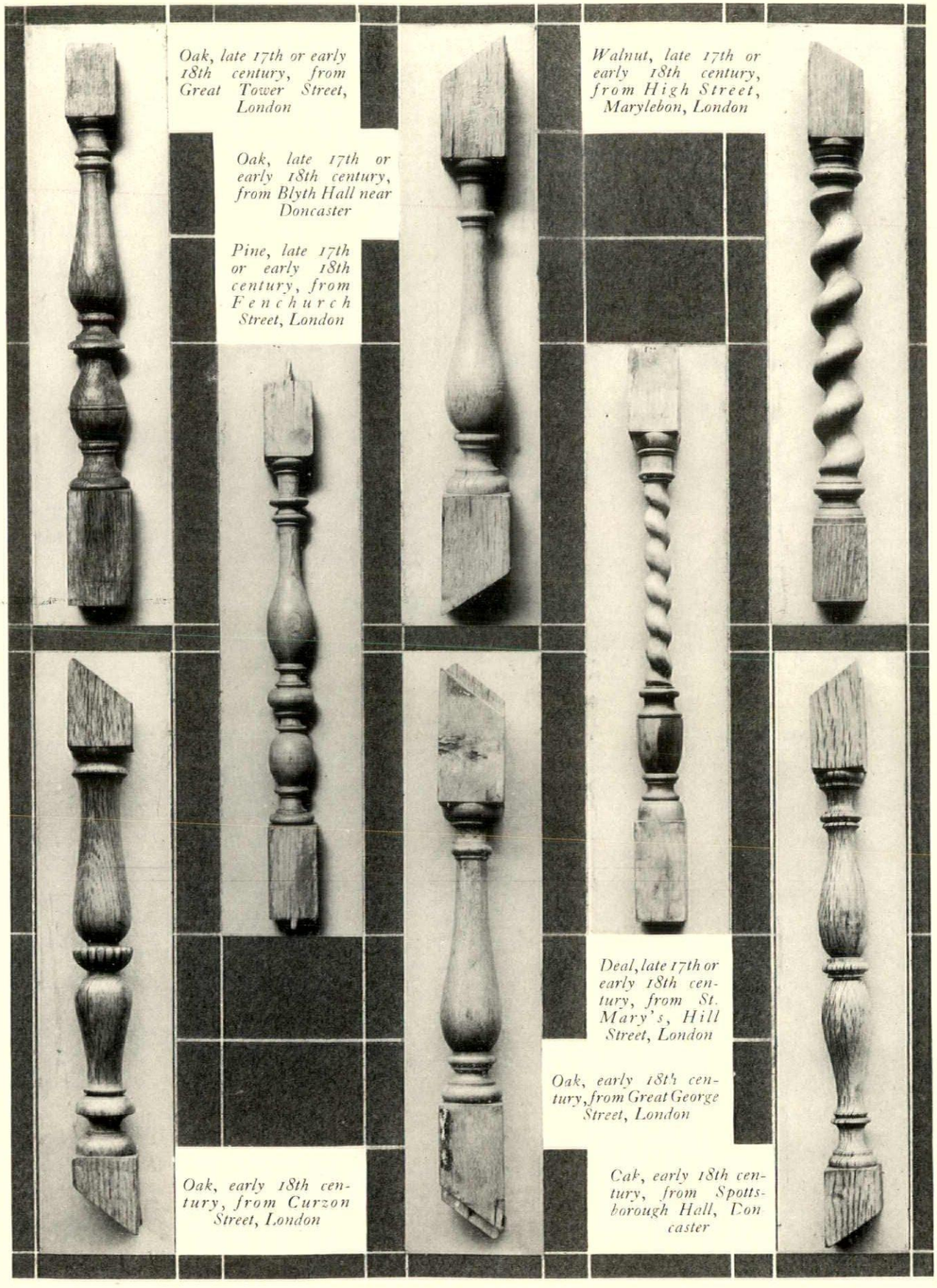
Oak, first half 18th century, from Sandwell Hall, West Bromich

Deal, first half 18th century, from Hill Street, London

Deal, first half 18th century, from Parson's Green, Fulham, London

Oak, about 1693, from Chipstead Place, Kent

Deal, first half 18th century, from Charles Street, London



Oak, late 17th or early 18th century, from Great Tower Street, London

Oak, late 17th or early 18th century, from Blyth Hall near Doncaster

Pine, late 17th or early 18th century, from Fenchurch Street, London

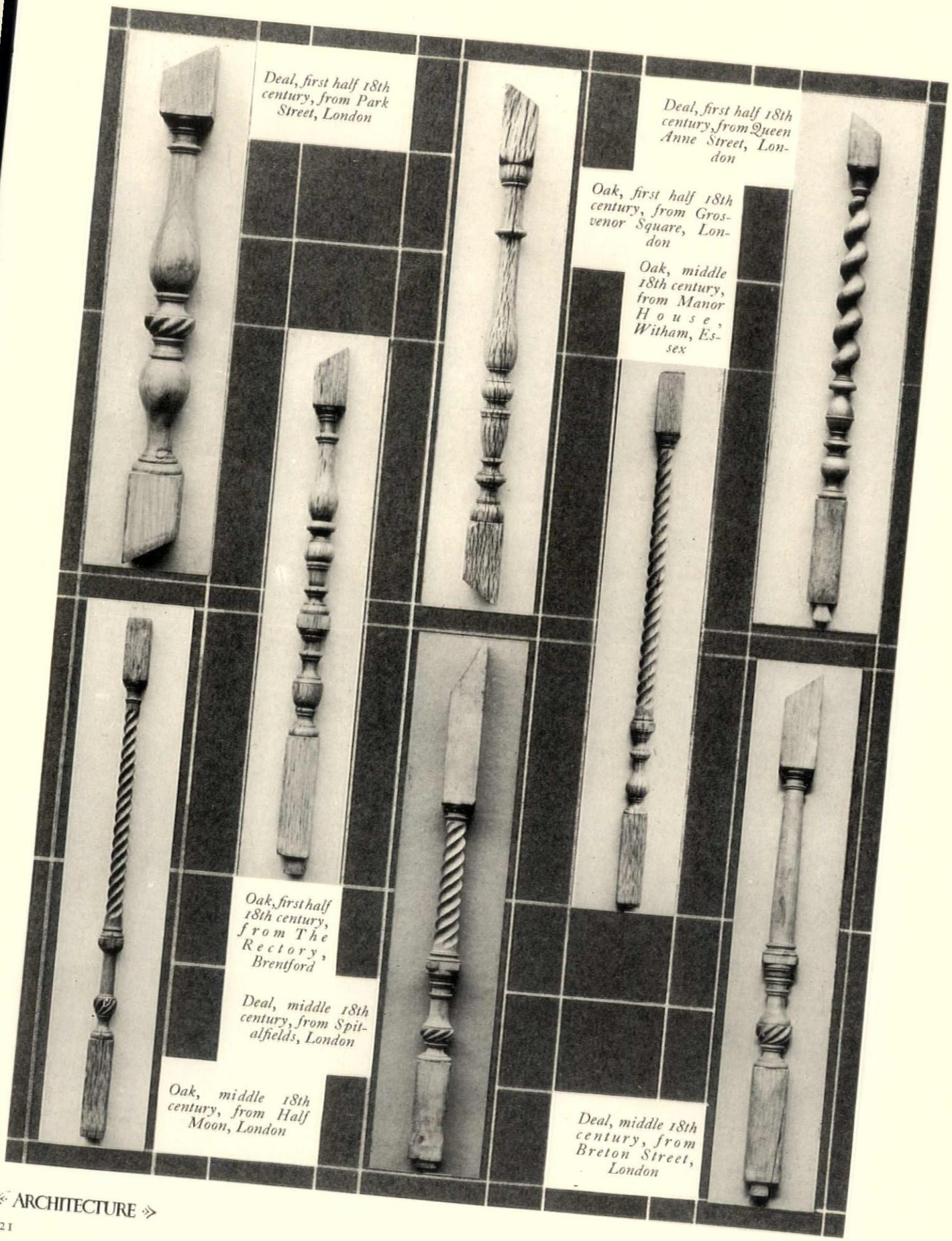
Walnut, late 17th or early 18th century, from High Street, Marylebon, London

Deal, late 17th or early 18th century, from St. Mary's, Hill Street, London

Oak, early 18th century, from Great George Street, London

Oak, early 18th century, from Curzon Street, London

Oak, early 18th century, from Spottsborough Hall, Doncaster



Deal, first half 18th century, from Park Street, London

Deal, first half 18th century, from Queen Anne Street, London

Oak, first half 18th century, from Grosvenor Square, London

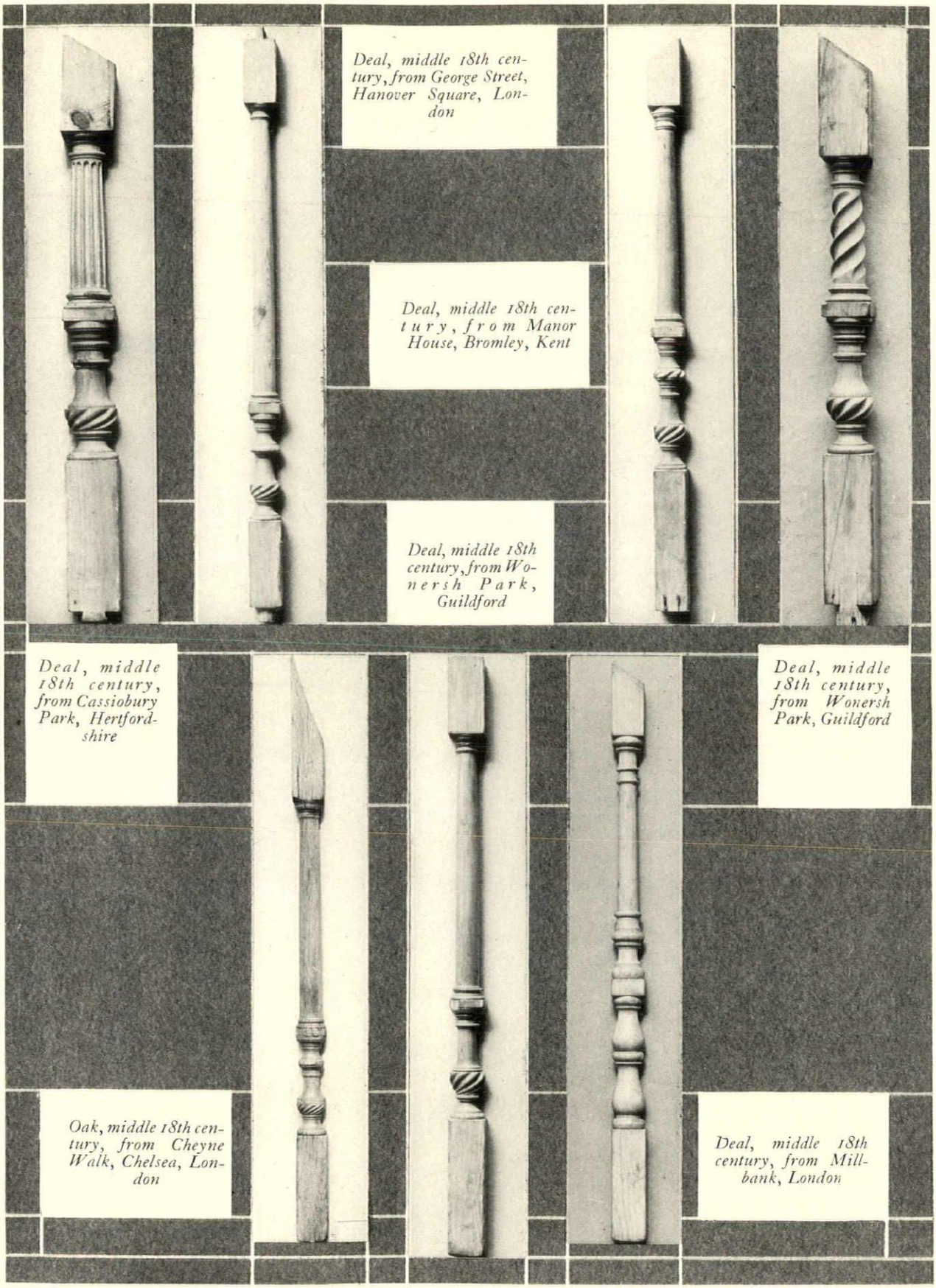
Oak, middle 18th century, from Manor House, Witham, Essex

Oak, first half 18th century, from The Rectory, Brentford

Deal, middle 18th century, from Spitalfields, London

Oak, middle 18th century, from Half Moon, London

Deal, middle 18th century, from Breton Street, London



Deal, middle 18th century, from George Street, Hanover Square, London

Deal, middle 18th century, from Manor House, Bromley, Kent

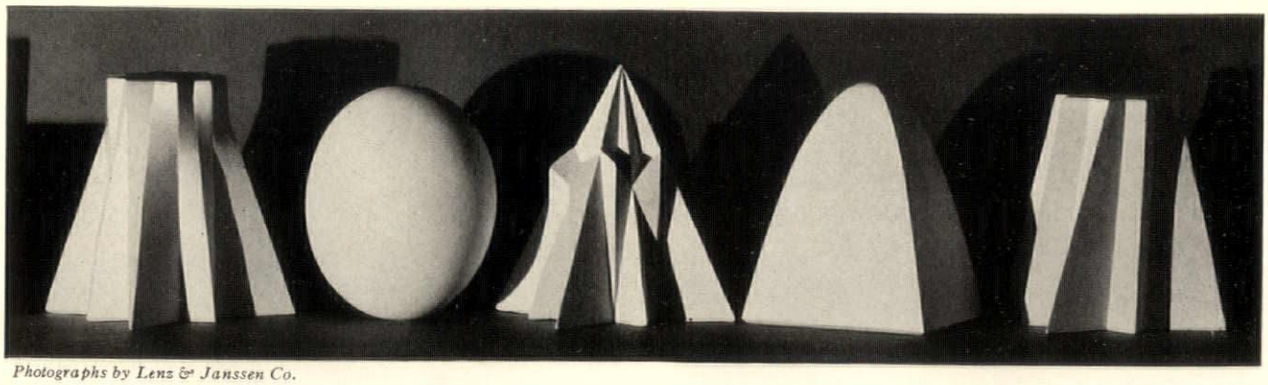
Deal, middle 18th century, from Wonersh Park, Guildford

Deal, middle 18th century, from Cassiobury Park, Hertfordshire

Deal, middle 18th century, from Wonersh Park, Guildford

Oak, middle 18th century, from Cheyne Walk, Chelsea, London

Deal, middle 18th century, from Millbank, London



Photographs by Lenz & Janssen Co.

Can We Invent New Forms?

By Rutherford Boyd

THERE is a familiar and yet a curious duality in the very nature of man—he demands variety or change and yet he admires order, system, or an equilibrium. These extremes of his experience through all the ages are imposed upon him in the paradox of his existence, so he has learned to like them; nor can he live without them. Long ago, out of sheer necessity he had to cope with change in *quantity* and, as he dealt with it in many circumstances and places, he invented in a haphazard way that great device, the system of Number.

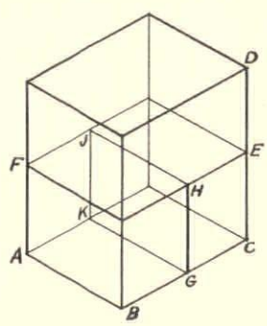
Centuries of the use of Number in barter and communication and in his "earth measuring" led him to invent another great instrument, "geometry." Meanwhile he was groping slowly, vaguely toward his first ideas of proportion, like the relation between five feet and eight feet, or of two units to three. So he invented another device for the relation of whole numbers to each other in architecture, and centuries afterward it is handed down, for good or for ill, by Vitruvius as the celebrated "modulus."

The Pythagoreans sought to trace the origin of all things to Number, investing certain integers, whole numbers, with extraordinary attributes. But the Greeks found that life was not so simple as all that. Eventually these ideas of integers in Proportion were perforce developed and expanded to include the more difficult group of numbers appropriately called the "irrationals," or incommensurables. In the tenth book of Euclid's Elements we have at last the complete system of a geometrical progression. Thus we have developed an instrument of change or, if you like, of ordered increase or growth, that has a curious duality in its own nature. It changes continuously (in size or magnitude) and yet is always the same (in ratio or proportion).

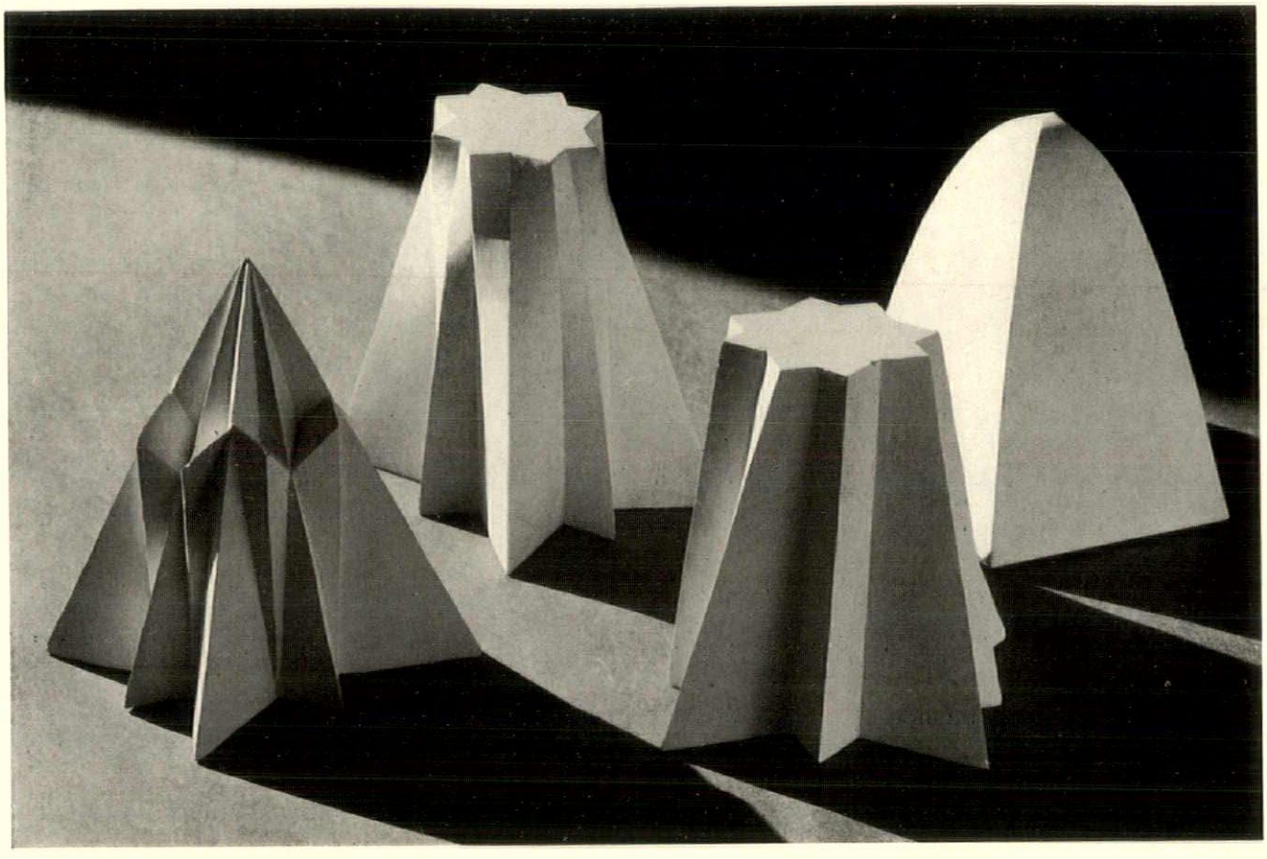
Quite recently developed and applied in tridimensional form, this device—increase in magnitude by a constant ratio—becomes the basis of a system of proportional rectangular volumes, called "Ratio-Envelope of Form."

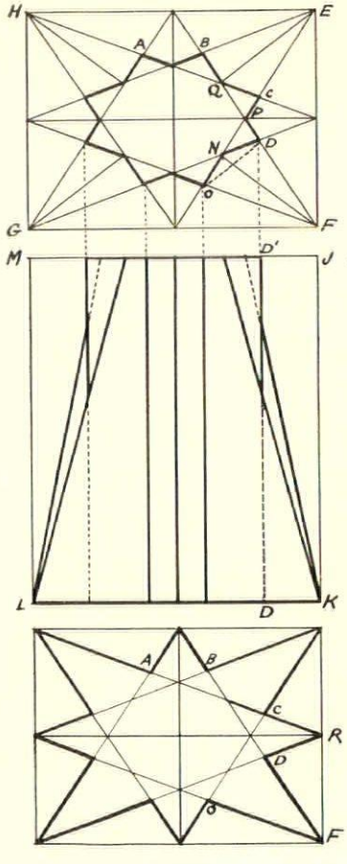
Having read faithfully all that has so far been said about this device, the friendly architect interrupts with a difficult question: "Admitting the logical development of such a series as the 'Ratio-Envelope of Form,' can we actually evolve from it new form-ideas?" And without waiting for the answer, he asks another, "If these new forms can be created consciously, how can this be done?"

Fortunately for the author's peace of mind, just those questions had been anticipated! Experimenting and modelling in the clay and then carving in



All these models are evolved within the "bisection-volume" of the rectangular "ratio-envelopes of form." In this shape if the longest dimension D C is bisected at E, the half-volume E C B A is similar in shape to the whole rectangular envelope. Similarly when C B is bisected at G then the quarter-volume H G B A F is similar to the half and the whole volume. See the January issue of ARCHITECTURE





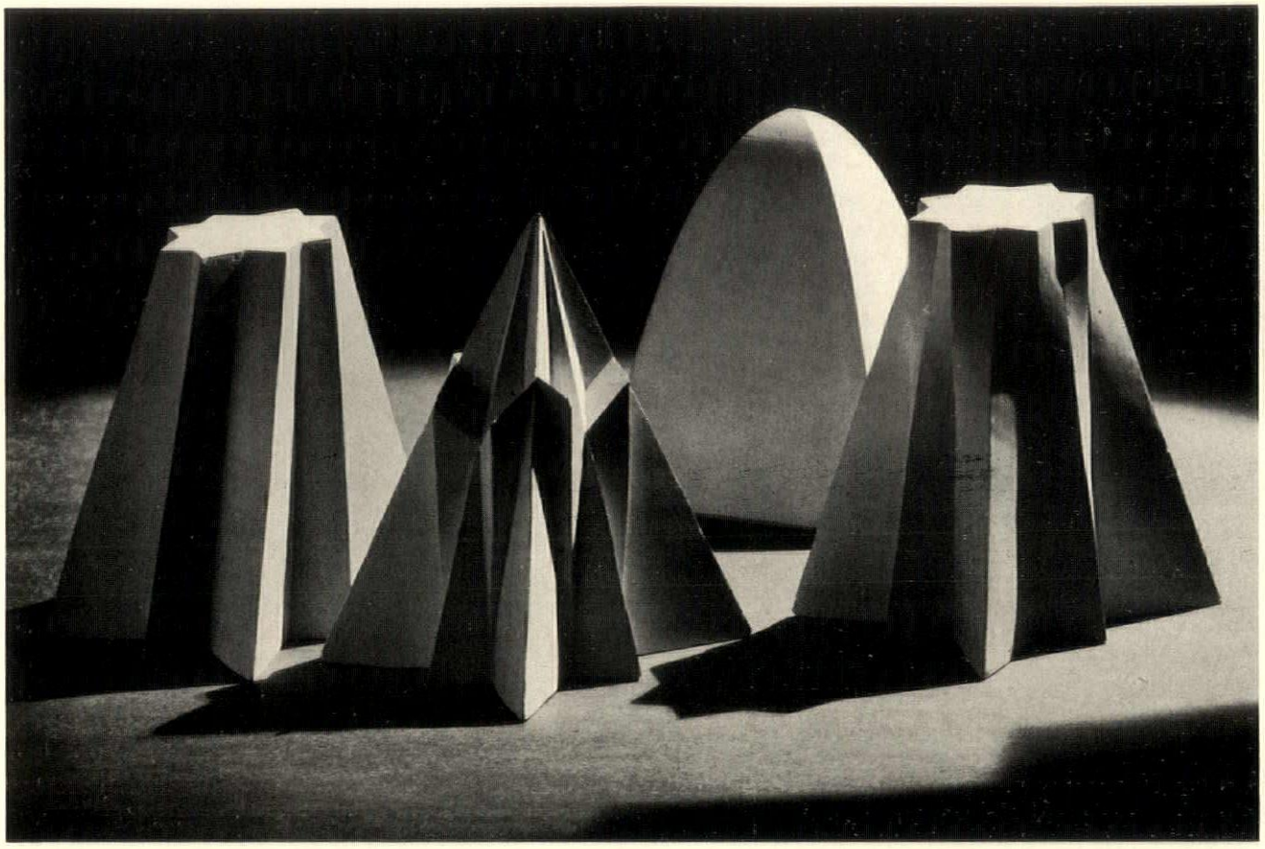
Three of the models shown on these facing pages, developed from an identical base pattern (lower diagram), have as an envelope the bisection-volume, the diagonals of the bisected rectangles forming the inscribed star. The first diagram shows the top plan of two models. Note that the re-entrant angles of the base are identical in plan position with the corresponding points A B C D O of the top. The model behind the "pyramid" has sixteen warped surfaces rising from base star to top star. In another model projecting edges are straight lines joining base star to top star, the inner edges being straight lines joining the corresponding re-entrant angles.

The pyramidal model involves a secondary de-

the plaster, he sought an answer to those questions in this group of seven models. It is only a tentative answer, certainly incomplete, yet suggestive of the potential wealth of this new source of form-themes. The group of plaster models presented here is strictly structural in every detail. They are all developed from and contained within the same "ratio-envelope of form," the "bisection" volume, as defined in this diagram (bottom of page 323).

These plastic compositions are carved all to the same scale and each form-theme emanates directly from the spatial anatomy of this particular "envelope." The models demonstrate only a few selections from the great variety in form-themes which can be generated structurally by this approach to Design in tri-dimensional form. The captions and diagrams fully describe the principal themes of these proportional shapes.

Remember that these models exhibit variations on some only of the main planes and divisions within this particular envelope. Also that each different proportional shape in this series of "ratio-envelopes" can be likewise manipulated and controlled by a discriminating seeker after its secrets, many of them as yet un-



explored. For in this series we have an instrument for the synthesis of form-organization the possibilities of which have not yet been reached or defined.

Which leads us again to consider the question: Can we hope ultimately to create or invent new Form?

It seems to have been our custom, when the tradition of a great style wanes, to seek in many places. Sometimes we return directly to nature's infinite variety of form. Borrowing here and adapting there we arrive somewhere, somehow, and a new style is proclaimed! Inevitably the adaptations from natural and other form-sources become conventionalized anew into a group of abstract forms, often without much ancestral resemblance.

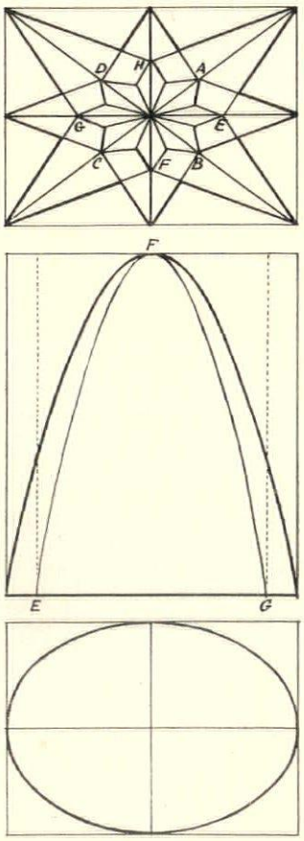
Every phase in the art of the past exhibits this phenomenon—a few basic forms repeated, refined and redesigned. Around and in these basic design-ideas we create a style, in which, being very human, we incorporate the human figure with greater or less variety. One is tempted, when considering the evolution of style, to use the phrase "an accident of chance!"

Certainly our retrospective view of Design can never be from the viewpoint of its creators

velopment intersecting the edges one third down from the apex (see diagram at right). The points A B C D are the focal points of the ratio-envelope. These interrupting planes intersect the other alternate star edges at the mid points E F G H. The form is completed by verticals rising from the eight re-entrant angles of the base.

The fourth model involves the parabola, and may be called a rectangular paraboloid. In the middle diagram at right, the parabola E F G is the vertical section through the shorter dimension, the other parabola through the longer dimension of the base.

The diagram at right shows the ellipsoidal model pictured on the next page



or even of its contemporaries. Those pressures and influences that overwhelmed a style and overturned its traditions, seem to have varied from an emperor's edict to the fancy of a courtesan. More likely, in sober truth, a complex of political, religious, social, and economic causes profoundly affected each transition in style. What faint vestiges of the glitter and glory of a court or of the pomp of chivalry that now remain to us, are only the faded glory in the tapestried background of art in its long history.

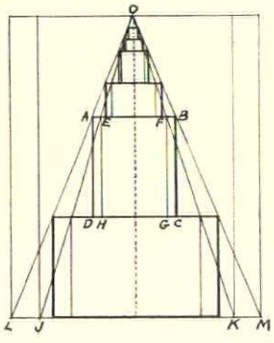
What does not change, what is the same vision to our eyes as for those who worked in the arts of old, is the great Form itself, be it cathedral, or pyramid. The chemistry of change may produce new beauty in a patina or a tonal and chromatic harmony that is far from the designer's original intention in color. The foliated spire, great Theseus in his pediment, a fragile kylix or rock-hewn colossi—all impress us with their innate proportions, the inevitable majesty of their great Form—as much the property of ourselves as it was theirs in the past.

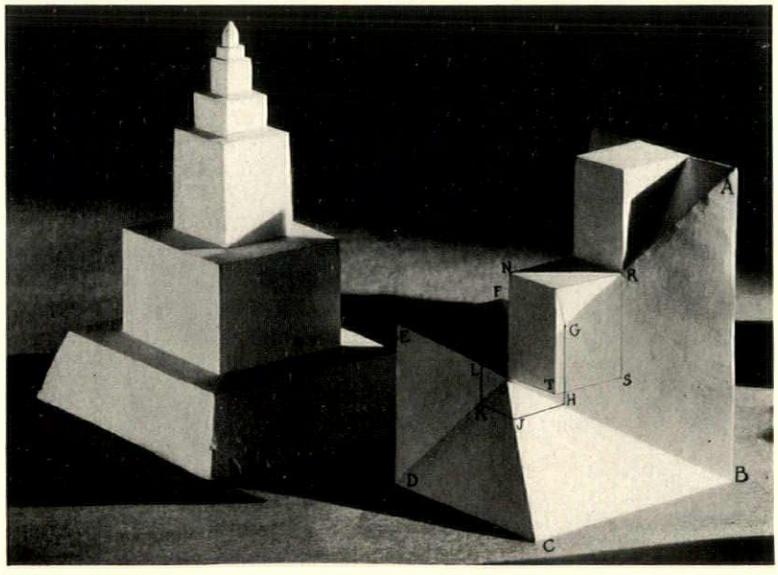
Our contemporary scene exhibits, however, an amazing variety of sources, creeds, trends, and what-not in the criteria of our taste. To generalize, there seems to be a definite drift away from over-elaboration of ornament, wherever derived, toward a greater, more "intelligent" designing of simpler surfaces, plane and curved, with a studied contrast of materials and of their textures. In other words, today we appear to have taken another step or two in departure from the *appearance* of nature toward abstract formal organization. Perhaps too often dominated by the conventional engineering viewpoint or some "ism" of the moment, yet our contemporary style is evidently more abstract, more geometrical, than ever before.

In the arts men of courage now urge with foresight less adaptation, less of the eclectic procedure, an approach to each problem with full consideration of all that function, materials —that every integral factor of the design problem—can yield to artist or architect and to serve broadly as the basis of his inspiration.

But much of our "inspiration" is a discrimination constantly active in form-selectivity as we accept and discard, as we analyze and synthesize in design. With more than inspiration, more than conviction, we must penetrate to that acute perception of *Form* which lies in a conscious appreciation of what may be done by us, not only what has been done, by nature or by man.

So much toward the ideal, so much that is well known, but beyond all this, even beyond the individual concept that dominates the design, is an immutable geometry of the proportions or dimensions of the "envelope," the great Form inclosing the project. Not the outward shape alone, but the study and understanding of the generation of interrelated forms and in the spatial design of the inclosing Envelope of Form. This will be in itself the creation and invention of new Form.





At left of the photograph, a model showing a series of bisection volumes within a "pyramid" of similar proportions as shown in the diagram above.

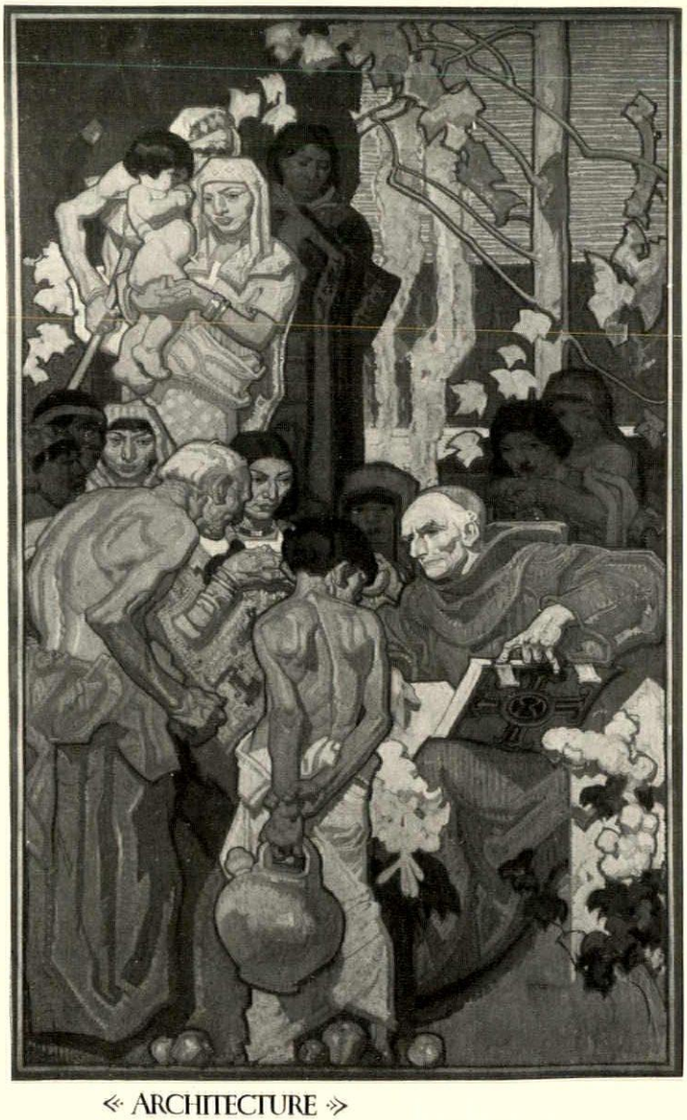
The other model is a remarkable demonstration of many surprising relationships, among which we mention only a few: A B is the greatest dimension, B C the next, and C D the shortest dimension of the rectangular envelope; D C is half of A D, E F is half of B C, and F G is half of C D. These lengths are six terms in this proportional series, and the point G is the precise centre of the form. G H is on the same plane and parallel to A B and is one quarter of it, also half of D E. Again, H J is one quarter of B C, J K one quarter of C D, and so on

These murals are now completed and placed in the central rotunda of the Los Angeles Public Library, of which building Bertram G. Goodhue was the architect, with Carleton Monroe Winslow associated architect. Mr. Cornwell started the work on this series nearly five years ago, his purpose being to express the history of California from the days of the Spaniards. In a problem so dependent upon color unity, obviously these black-and-white approximations must fall far short of conveying the effect on the walls

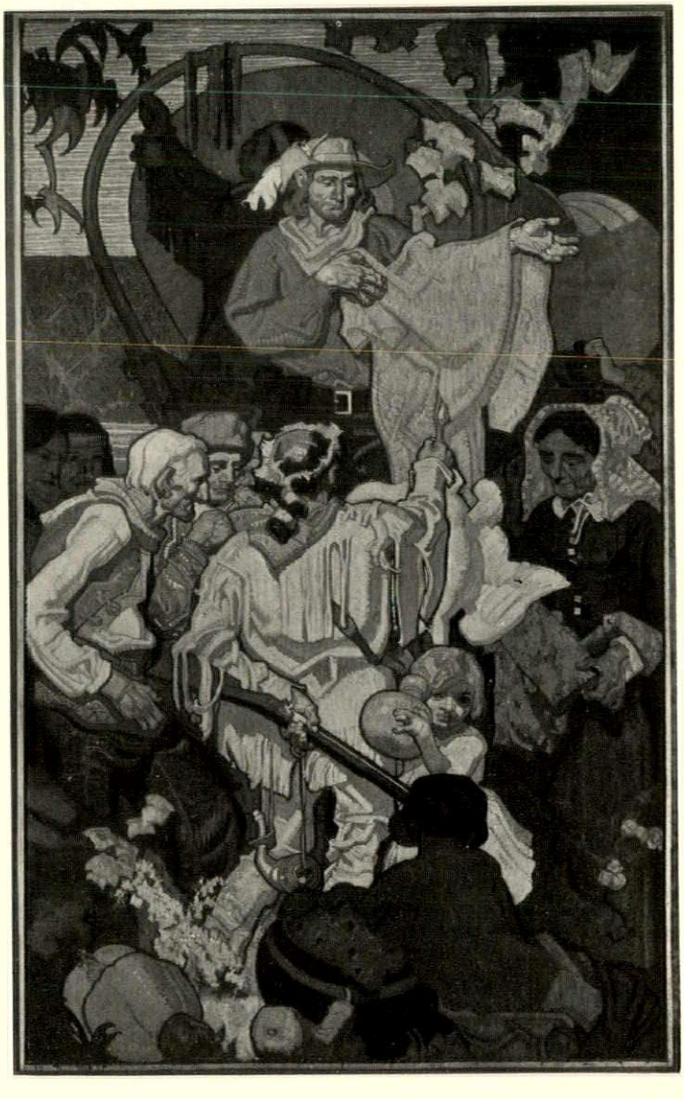
Dean Cornwell's Murals for the Los Angeles Library

THE MISSION ERA

EDUCATION—the monk

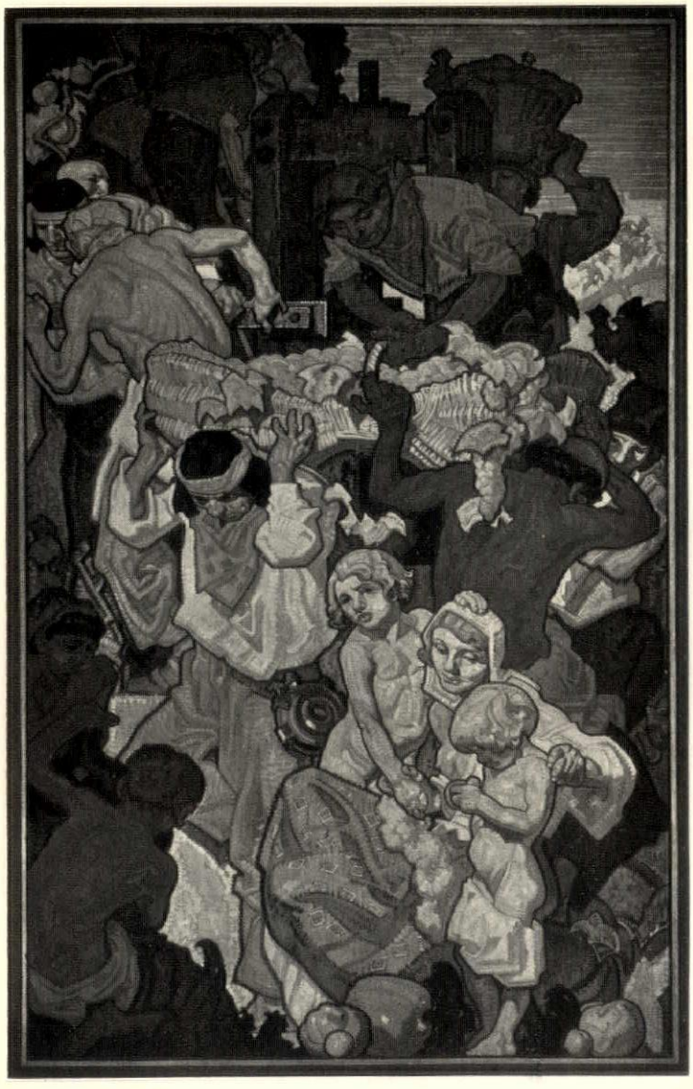


COMMERCE—the Indian trader

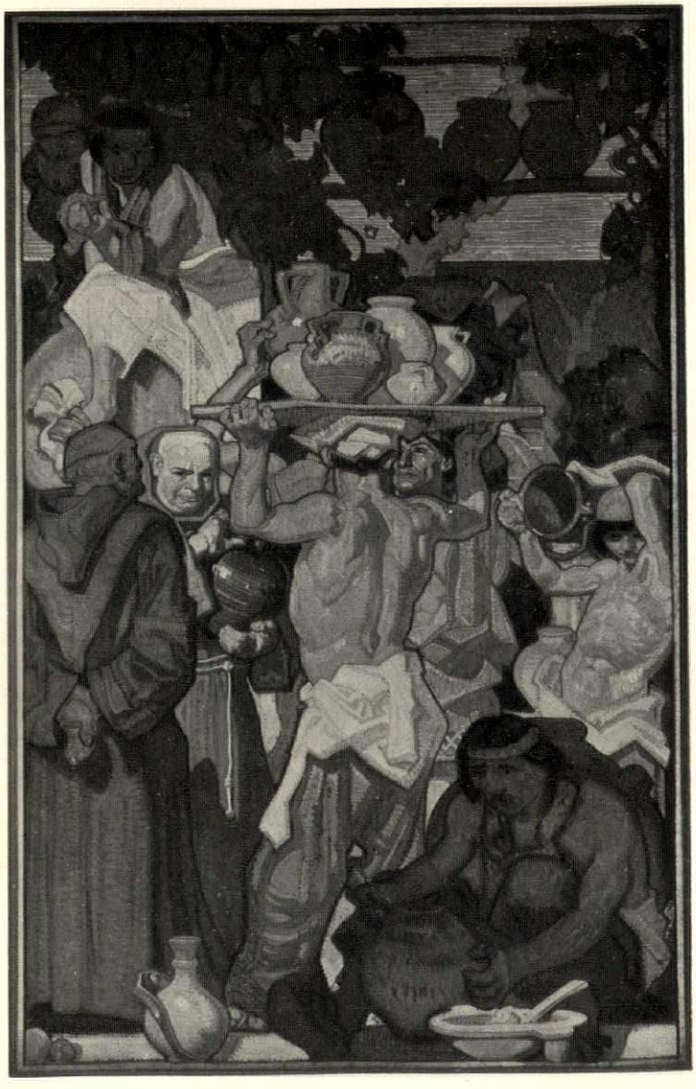


THE AMERICANIZATION OF CALIFORNIA

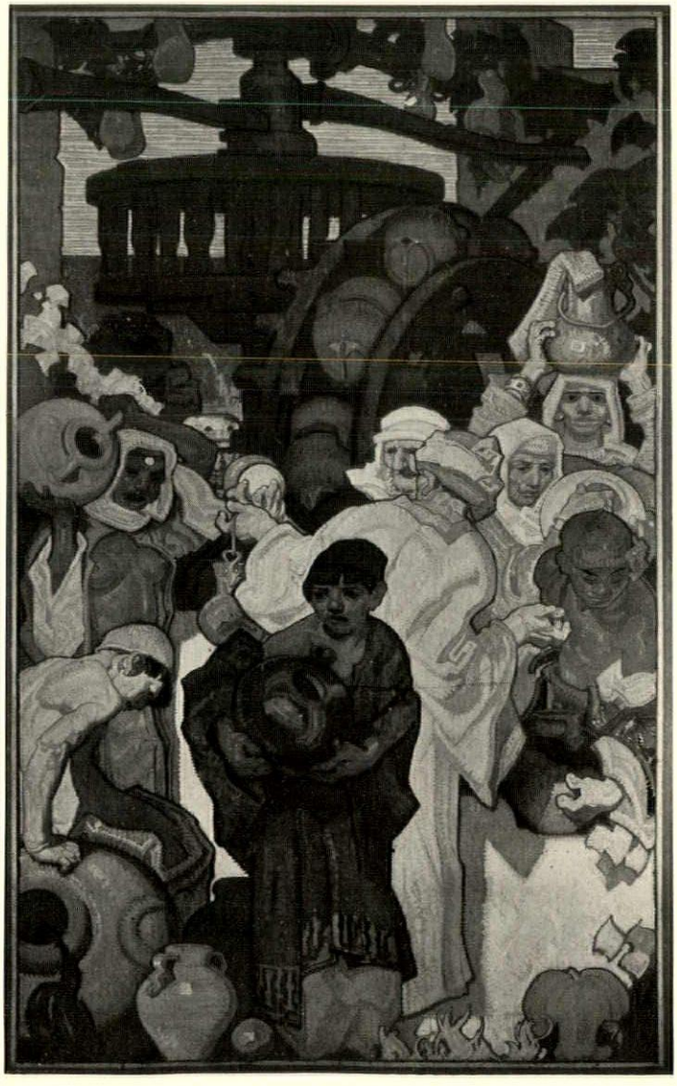
AIR—the fruits of the earth



FIRE—the potters



THE FOUNDING OF LOS ANGELES



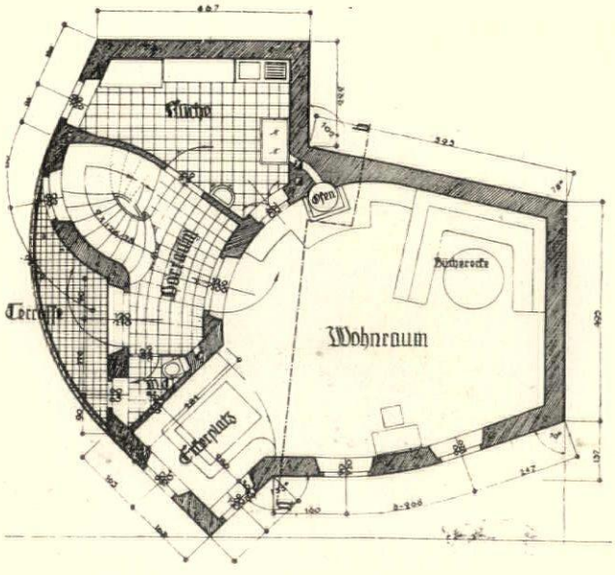
WATER

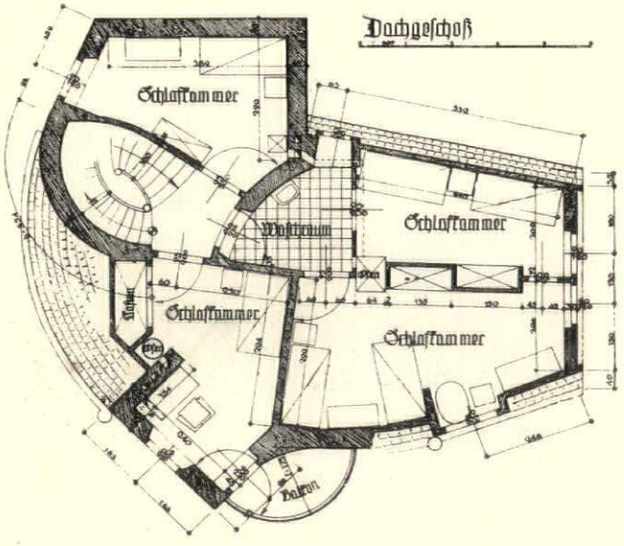
Origin of irrigation—
Moorish water wheel

Ein Landhaus

Devotees of modern architecture have produced many wondrous things in their creative heat of recent years, but here is a country home in Dürnstein which seems to represent nearly the ultimate in effects without apparent cause. The architect is Hofrat Professor Dr. Karl Holey of Vienna. We have not been able to interview him as to this creation, but it would be particularly interesting and instructive to learn just why he has produced this combination of two-dimensional and three-dimensional forms. The shapes of the various rooms interest us particularly with a degree of wonder not only as to why they are shaped thus, but also as to how the workman with his try-square ever managed to construct them.

Our illustrations are reproduced from Der Baumeister





BOOK REVIEWS

PLANNING PROBLEMS OF TOWN, CITY AND REGION. 158 pages, 6 by 9 inches. Philadelphia: 1932: William F. Fell Co. $3.

Here are the papers and addresses presented at the twenty-fourth National Conference on City Planning held at Pittsburgh, November 14 to 16, 1932. One of the most significant points discussed was the fact that every large city in this country lost population in its central areas between 1920 and 1930.

STRENGTH AND STABILITY OF CONCRETE MASONRY WALLS. Report of an Investigation conducted by The Engineering Experiment Station, University of Illinois, in co-operation with The Concrete Masonry Association, The Portland Cement Association, The Western Brick Company. By FRANK E. RICHART, ROBERT B. B. MOORMAN, and PAUL M. WOODWORTH. 38 pages, 6 by 9 inches. Illustrations from photographs and graphs. Bulletin No. 251. Pamphlet binding. Urbana, Ill.: 1932: University of Illinois. 20 cents.

ÆSTHETIC MEASURE. By GEORGE D. BIRKHOFF. 226 pages, 8¼ by 11¼ inches. Illustrations from diagrams, vase forms in color, line drawings, and photographs. Cambridge, Mass.: 1933: Harvard University Press. $7.50.

The author, a mathematician, attacks the formidable task of measuring by means of mathematical formulæ our appreciation of two-dimensional forms and melodies, starting with the basic formulæ M equals O/C in which M, the measure, is equal to Order divided by Complexity. He carries us through a discussion in which one is amazed to find how well within reach is actual measurement of æsthetic impulses.

DECORATIVE ART. The Studio Year Book. Edited by C. G. HOLME. 140 pages, 8¼ by 11¼ inches. Illustrations from photographs and drawings, some in color. Printed in Great Britain. New York: 1933: The Studio Publications, Inc. Cloth, $3.50; wrapper, $2.50.

The latest in a long and dependable series of pictorial reviews marking the progress of English architecture, decoration, and the crafts, this time with more than the usual emphasis, perhaps, on the work of the modernists.

THE COLONIAL AND FEDERAL HOUSE. How to Build an Authentic Colonial House. By REXFORD NEWCOMB. 174 pages, 7 by 10 inches. Illustrations from photographs, plans, and drawings. Philadelphia: 1933: J. B. Lippincott Co. $3.50.

Dean Newcomb's experience in teaching architecture, and his ability to express himself clearly and concisely, has here been utilized in a good cause. The author explains the essentials of what we know as the Colonial and Federal styles in planning, materials, and details, inside and out. We might wish for a better presentation of the illustrations than the grouping together of small photographs on a mount and illustrating it as a whole.

THE CARPENTER'S TOOL CHEST. By THOMAS HIBBEN. 209 pages, 6¼ by 8 inches. Illustrations from line drawings. Philadelphia: 1933: J. B. Lippincott Co. $2.

Thomas Hibben, well-known architect, has performed a magnificent job in tracing, for his and other people's children, the history of tools, how they are used, and what has been done with them from the Stone Age to the present time.

HOW TO JUDGE A HOUSE. Report of the Subcommittee of the National Committee on Wood Utilization. 85 pages, 6 by 9 inches. Illustrations from photographs and diagrams. Pamphlet binding. Washington: 1931: U. S. Department of Commerce, Superintendent of Documents. 10 cents.

N. Max Dunning is chairman of the committee which has prepared this guide for the prospective home-builder, pointing out details of construction and design.

ALUMINUM IN ARCHITECTURE. 234 pages, 5¼ by 8¼ inches. Illustrations from photographs and drawings. Pittsburgh: 1932: Aluminum Company of America. $1.

A handbook made necessary by the wide and more varied use of the metal, telling of its properties, its available forms, and the technical details of its employment in building.

LIFE INSURANCE HOME OFFICE BUILDINGS. A Study of the Problems of Building Construction. 156 pages, 8½ by 11 inches. Illustrations from photographs and diagrams. Fort Wayne, Ind.: 1933: Life Office Management Association. $5.

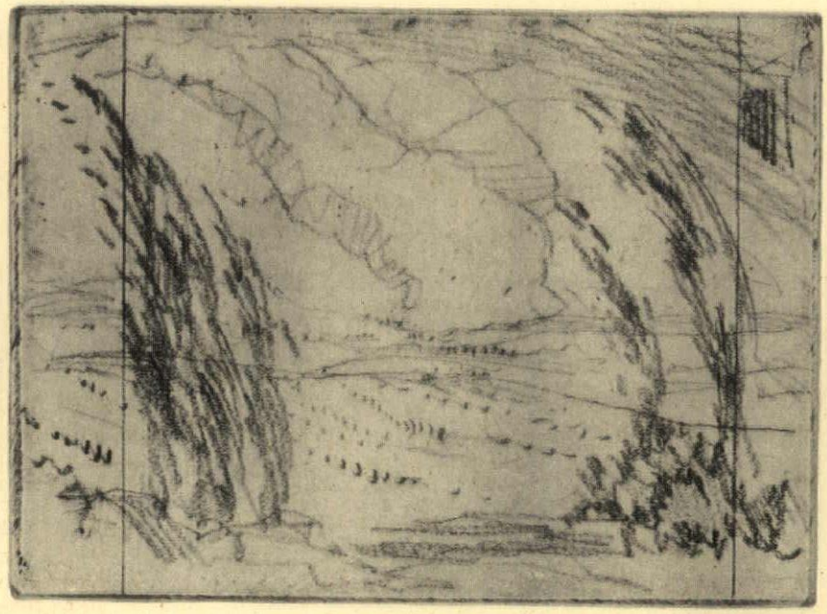
A compilation of a committee representing the insurance world, and consisting of an elaborate and comprehensive check list of requirements—an indispensable aid to any architect who happens to be designing an insurance company's home office building.

THE EVOLVING HOUSE. A History of the Home. By ALBERT FARWELL BEMIS and JOHN BURCHARD, 2D. 502 pages, 6¼ by 9¼ inches. Illustrations from line drawings and plans. Cambridge, Mass.: 1933: The Technology Press. $4.

A serious effort to trace the whole development of domestic architecture from earliest days to the present. The work will be in three parts, of which Vol. I only is now published, bringing the review of the evolution of the home, together with the social and economical forces which have governed it, up to the present time. The second and third volumes will deal with current housing conditions and methods, looking somewhat into the future.

Soft-ground Etching— the Architect's Medium

By Gerald K. Geerlings



This is the first small experimental plate the author did, reproduced at exact size of original. It illustrates his point about using small pieces of copper to get accustomed to the medium. The pencil went through the tracing paper in the lower left-hand corner. The vertical pencil lines near the sides show where the plate was cut later

THE "itch to etch" is a common complaint. The pressure of lots-of-busyness is the usual preventive. But the infection is likeliest to become malignant when there is a dearth of clients. After a summer of outdoor sketching the mere sight of etchings is apt to bring on a rash and drive the patient to copper. If the results are encouraging the after effects may be entirely beneficial, both as revitalizing personal enjoyment, and as a means of lowering the resistance of clients. However, when the effects are discouraging, the patient may be reduced to an irascible disposition. In order to prevent the latter, the following prescription is respectfully submitted, based on notes made while attending the Royal College of Art, London, and some subsequent clinical experiences.

Usually the treatment, but not the cure, consists in taking an etching needle in hand, and drawing on a plate prepared with a wax ground. The difficulty is that one does not ordinarily draw with as fine-pointed an implement as a darning needle, nor is one accustomed to bright red lines showing against a field of black. To locate black lines on white paper is difficult enough usually. Even with every possible detail going according to Hoyle from start to finish, the resultant print looks like a combination of so many thin wires, instead of so many sympathetic lines. Although a pen-with-ink may be a frequent means of architectural expression, an etching needle is by no means a twin spirit. The best of pencil sketches translated literally into a line-etching is doomed to failure because there is no conceivable similarity between a pencil line and an etched line. Actually, to produce a good etching involves conceiving of the pencil drawing as merely a preliminary guide, and not the model which the etching is to simulate. The realization of this fact is singularly disregarded, even by some seasoned etchers.

The treatment which will yield better results is *not* to attempt a line etching (at least at first). A more sympathetic medium is the so-called "soft-ground" etching. The tool is not the sharp darning-needle point, but an ordinary pencil used over ordinary tracing paper. Any one accustomed to manipulating the pencil, and desiring to etch, can succeed. This article attempts to describe how the tyro can sally forth on adventure bent. In effect a soft-ground etching combines the pencil quality of a lithograph print, with the distinctive printing quality and plate-mark of an orthodox etching.

With all the other forms of etching, if there is anything which goes wrong, it can always be mended in one way or another. Not so with the soft-ground medium. While it is possible after much experimenting to work over a plate with a second ground, it requires personal instruction. The descriptions given here have been gone into fully so that if carefully followed the plate would be complete when taken from the acid and the ground removed. If you wish to burnish down certain parts to reduce them in value, or to make other parts darker, all that is a long story, and not as readily related as demonstrated. Even when done the result would not likely be as satisfactory as doing the plate over and getting it "to come right" without any patching.

SUCCESSIVE STEPS IN SOFT-GROUND ETCHING

Note: The numerals in parentheses after each "Step" refer to corresponding numbers under "Materials," pages 336, 337 and 338. Perhaps it would be advisable to glance over these requisites first before reading further. Then when you are ready to begin a plate, spread out these two pages before you, and carefully follow directions.

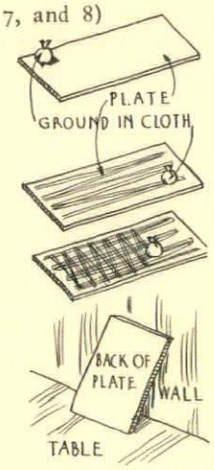
FIRST STEP: THE DRAWING (1 and 2)

Select a subject which you want to draw, and can draw, better than any other. Reduce the composition to its simplest terms. Speak only one sentence but say it clearly; reserve long paragraphs and sentimental speeches for a future date. Try to constrict the drawing to a small area, perhaps 5 by 8 inches for your first essay. Make a complete drawing of the effect you would like to see in a print. Then do a simplified tracing of the main elements only, using a red chalk pencil lightly. Don't use more red guide lines than are actually needed to act as a skeleton for the drawing, because too many will cramp your style and result in a cautious, stiff production. Trim the drawing so that it is about one inch larger around all margins, than the size of the copper. Put this drawing away in a safe place.

SECOND STEP: PREPARING THE COPPER PLATE (3, 4, and 5)

Get a piece of copper the size of your drawing. Take the plate to a work table alongside the sink and bevel the edges with a file. All copper filings must be thoroughly brushed off. This is essential because rubbing one speck of copper about on the surface can cut devilish scratches. Wet the plate under the running water. Dip a piece of felt into the whiting paste, and rub the surface of the plate. Replace the felt in dish. Wash plate with running water. Dip the other piece of felt into the vinegar-salt solution and rub plate. Repeat each operation twice more. Rinse plate under water thoroughly. Be certain hands are not greasy, but do not touch the top surface. Place plate between clean blotters and dry. Use a clean handkerchief to rid surface of any slight fuzz which lingers.

THIRD STEP: LAYING THE GROUND (6, 7, and 8)



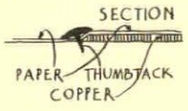
It is absolutely essential that this step be done quite perfectly, or all the work which follows may be useless. The purpose is to coat the copper with as thin a breath of wax ground as possible, so that when submerged in the acid, the copper will be protected from corrosion. From this point on never touch the top surface of the plate; get in the habit of holding or carrying it poised on the tips of the fingers and thumb of your left hand, like a waiter carrying a tray. Shut all windows and doors so as to prevent the movement of air from depositing dust. Each speck which settles on the plate results in puncturing the wax film, and allows the acid to bite through later.

Place the copper on the heating plate, and regulate the gas to a low flame. When the copper plate has become warm, take the cloth-encased ground, place it on the plate, and wait until it begins to melt. Then rub it gently to and fro over the entire surface of the copper until the latter appears to be covered. Don't worry about its not being evenly distributed. Don't let the copper get so hot that the ground sizzles; if the plate is getting too hot, remove it for a few moments. Use the dabber in gently dabbing the plate all over until the ground is evenly spread, or use the roller to accomplish this same end. This will require a little practice until you can do it quickly and well. When employing the dabber or roller, start at one end and methodically finish an area parallel to that end before proceeding to the adjacent strip. Continue until the entire plate has been completed. Take the plate from the heater and let it cool, face inclined downward so that dust cannot settle on it. Prop it so that it can't slip and thereby ruin the ground. After it is cool place it on the table where you intend doing the drawing.

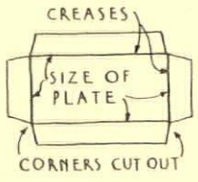
FOURTH STEP: AFFIXING DRAWING TO PLATE (9)

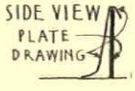
There are two methods for securing the tracing-paper drawing over the plate.

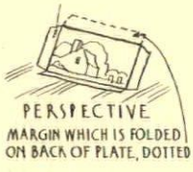
(1) Put the copper plate on a drawing-board in a position where it will be most comfortable for drawing, then place the tracing over it so that it fits exactly. Use large thumbtacks all along the edges so that both are held firmly. That is all. This is the simplest method and is fairly satisfactory, except that the paper cannot be stretched absolutely tight. (See sketches to right.)

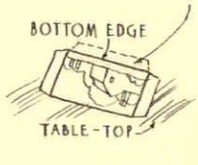


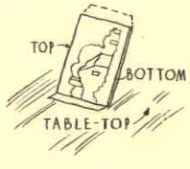
(2) Another method—first cut out the corners of the tracing as shown in the sketch below. Crease the drawing so that these folds enclose an area equal to the size of the plate. Tilt the plate up on the bottom edge, until it stands in a nearly vertical position. Put some paste or rubber cement on the back of the plate along the top edge. Place the drawing over the plate so that its top edge will correspond to that of the plate, and press the overhanging margin so that the paste will adhere. Then tilt the plate up on its bottom edge until it is vertical, put paste on the back of the plate along this edge, stretch the drawing taut and hold until the adhesive dries. Repeat on the two remaining edges. The object is to paste the margins of the drawing to the back of the plate without letting your fingers touch the front. Put the plate, with the drawing-side up, somewhere so that it is horizontal, and blow a fine spray of water on it. The drawing will dry out quite taut, perfect for drawing. If the corners dry out with serious wrinkles, restretch the paper.







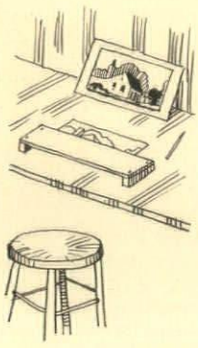




FIFTH STEP: DRAWING ON THE TRACING PAPER (10)

The preceding steps may sound tedious, but they should not take over a half-hour (excluding the first step), once you have the materials in readiness and have gained a little experience. Up to this point all has been preparatory; this fifth stage represents the actual problem. All that precedes and follows is chemistry; this step is purely artistic. It is here that the real quality of the print will be principally determined. If you are not feeling up to par, put the plate away until you are. Only if you are snorting with impatience to draw, should you tackle it. With vigor and spirit the job will be complete in a few hours with a vital freshness which persevering doggedness can never equal.

Place your final study before you, and the handrest so that its cleats clear the sides of the plate. Sharpen the 2B pencil. Then draw boldly, without a thought or worry over copper. *Remember*, you can make no erasures, and the pencil point only must touch the surface of the paper. *Forget* everything except that you are bending all your artistic talents to produce your best pencil-drawing to date.



The print will look approximately like whatever you put on paper. Try for directness, rather than building up tones by successive strokes. You should have studied your subject so well that you know exactly how to draw it without any hesitation. The resulting print will show precisely how well you know your subject, and how sure you are of your drawing. There is no luck in this connection. If in the midst of the drawing you feel uncertain how to delineate a certain passage, take time off and determine how best to do it by trying several methods on a separate piece of paper.

A few precautions: (1) Don't press so hard as to tear through the tracing paper; if you do the resultant mark will have to be "stopped out" before the plate goes into the acid bath, as described in the next step. (2) Try to work where the temperature will remain the same from start of drawing to finish, and during the middle part of the day when natural changes of temperature are less than those from early morning to midday; otherwise the wax, being softer during the warmer periods, will adhere more to the under side of the paper than you suspect. (3) Don't work in the sun.

SIXTH STEP: REMOVING THE DRAWING (11)

When you are certain you have drawn all that you should, cut the drawing off around the edges. Work from the back of the plate so that a slip of the knife will not damage your work. Put the plate down again, face upward. Beginning with one corner, carefully peel the drawing off. What has happened is this: wherever you have used pencil, the ground has adhered to the paper. Where you have borne down hard nearly all the wax will come away from the copper, so that when the plate is in the acid, the line will be bitten deeply. Where you have made a light line, only a fraction of the wax has come off, thus allowing the acid to attack the copper less vigorously. Keep the drawing for reference.

Wherever you see the pencil has pierced the paper, or where finger prints are in evidence, or flecks of dust seem dangerously large, dab on the stopping-out varnish with a small, wornout water-color brush. Paint it on as though it were water color. It will render the surface acid-resistant. Use it wherever the ground looks as though it might not be acid-proof. In general, it is advisable to paint out sky areas, and such other locations which you wish to make certain will print white. Also, cover the entire back and edges of the plate with stopping-out varnish—don't forget this.

SEVENTH STEP: BITING THE PLATE (12 through 18)

The plate is now ready to be submerged in the acid bath. Put the thermometer in the acid bottle to determine the temperature. If it is below 65 degrees you can raise the temperature readily and with safety, by standing the bottle in hot water *after removing the bottle's stopper*. Then pour enough acid in the tray so that it will generously cover the plate. Lift the copper plate by its edges, being careful never to touch the top surface, and put it in the acid. Make note of the time on a slip of paper. Bubbles will collect wherever the acid is biting the copper. Use the feather to swish them off gently as soon as they form. Be certain the feather is a soft one, or it may disturb the ground. If you see bubbles collecting where there should be no lines, record how many minutes the plate has been in the acid, take the plate out of the acid, and wash off under running water. Hold it on one edge until all the excess water has run off. Let the remaining moisture evaporate. When the plate is thoroughly dry, touch up the offending spots with the stopping-out varnish. When the latter is dry, put the plate back in the acid. Generally you will find that 15 minutes is a pretty good average length of time for the plate to remain in the acid. All the while it is in the bath, use the feather to dislodge bubbles. Take the plate out when the time is up, rinse under the faucet, or in a pail of water. Place it on one of the blotters. Blot the surface too—touching the surface will not do any damage now. Only the print will show whether the plate has been bitten just enough, too long, or not long enough. Keep a record so that you can profit by any mistakes.

EIGHTH STEP: REMOVING THE GROUND (19)

For better or for worse, the battle is just about over. Place the plate on an old newspaper and pour on some turpentine. Rub it around with your finger tips. If you feel any grit, stop rubbing and rinse off with running water. If the stopping-out varnish is reluctant about dissolving, heat the plate on the hotplate, then take it off and add more turpentine. Turn the plate over and with the aid of turpentine remove all the varnish here too. Clean the plate thoroughly, using a cloth at the end. Don't be careless with the turpentine near the gas flame.

Wrap up the plate in any paper which does not contain chemicals. Take it to some friend or a plate-printer who will pull a proof for you. Take along your original drawing from which you worked, as a guide for the printer.

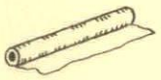
NINTH STEP: RESULTS (21 and 22)

When you see the first print, don't feel elated or depressed. Take it calmly—and try again. Keep on trying, for the real sport comes in finally succeeding after a run of failures. Clients and boards-of-directors may be lured into commitments by your etching presentation. Now, before the next boom, is the time to learn etching and enjoy life.

MATERIALS FOR SOFT-GROUND ETCHING

If you have access to a friend's etching workroom, the problem is much simplified. Better than any amount of reading, far-and-away the best method of proceeding will be to have some one show you how to manipulate the materials. If you care to do some reading on the subject, one of the best works for completeness, clarity, and brevity is that by E. S. Lumsden, entitled "The Art of Etching." If you are starting out entirely on your own, the materials described in the ensuing paragraphs are necessary. Except for numbers 7 and 9 all these materials are used for all forms of etching. Their total cost would be about five dollars, excluding hotplate (6) and copper.

1 —TRACING PAPER

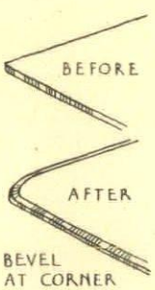


To start with, the best quality of tracing paper will give the most satisfactory results. While it should be fairly smooth, it should not be devoid of slight "tooth." Various Japanese papers will yield interesting results, depending upon the suitability of grain running in one direction more than in the other. The quality and texture of the paper will be a matter to be decided by the subject matter to some extent, because the more texture, the more the print will resemble a drawing on a rough piece of illustrating board.

2 —PENCILS

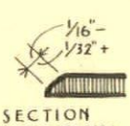
A colored pencil, such as sanguine chalk (*not* crayon), and an ordinary lead pencil about 2B grade, are all that are necessary.

3 —COPPER



This is sold by the square inch, and, while not prohibitive in cost, is not to be lightly consumed like sketching paper. Try out some experiments on small pieces of copper first, before doing a large job. John Sell Cotman (1784–1842) did some notable soft-ground etchings no larger than 3 by 4½ inches. The copper should be delivered to you free from any scratches, and you have a right to insist on its being practically flawless. There will be minute, multitudinous marks completely covering the surface from the mechanical polishing it has received, but these are innocuous and to be expected. Copper plates are usually cheapest when bought in stock sizes; find out what they are and have a small plate cut up, if necessary, rather than ask for an arbitrary size. Sometimes very small pieces are yours for the asking if you visit the works. 18 gauge is recommended.

4 —FILE



Any file which is not too coarse can be used to bevel the edges of the plate. It is well to do the filing first, so that if there are any slips of the file across the plate, your work will not be there to ruin. File the edges to a bevel so that a generous 32d, or a scant 16th, of an inch exists on the 45-degree face. Unless the edges are bevelled they will cut through the printing blankets, as well as the paper, when printed.

5 —CLEANING AGENTS

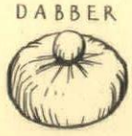
Unless the copper surface is absolutely free from all impurities such as grease, the ground will not adhere and the whole process is doomed to failure. There are various means of rendering the copper quite clean, but the following materials are easily obtainable, inexpensive, and will do a thorough job. Get ordinary gilder's whiting, put some in a medium-sized dish or bowl, and moisten it with a solution of water which contains enough ammonia so that you can smell it (5 per cent solution in water is ample). Keep this solution in a glass-stopper bottle. In another container make a solution of vinegar and salt; a teaspoonful of salt in about a half-pint of vinegar is ample. Have two old pieces (about 3 to 4 inches on each side) of thick flannel, felt, or like durable material, with which to apply them.

6 —HEATING PLATE

In laying the ground the usual etching equipment includes a "hotplate," which is merely a sheet of metal on a frame having legs, and supplied with a gas-ring underneath. Lacking this, use your ingenuity in rigging up a cake-tin, or something in the nature of a piece of sheet metal, over the gas range. Turn on the gas flame only a small amount, or the heat will be too concentrated in the centre, and too hot for your purposes. The heating plate should be large enough to allow you to work comfortably, perhaps 12 by 18 inches, and firm enough to afford a sound foundation for the dabbing you will do. A table in close proximity will be necessary.

7 —WAX GROUND

If you can purchase a "ground" especially made for soft-ground etching, it will save time and trouble. Otherwise get Rhind's standard ground, also a piece of mutton fat about the same size (cut it off before the chop is fried for dinner), and melt the two together in a small, clean, cooking utensil. Before it hardens from cooling, mould it into any shape, wrap a piece of silk, muslin, or other cloth material, around it, and tie the gathered ends together. When used on the copper this cloth casing will make it easier to hold and to manipulate. In warm weather perhaps one-third mutton fat with the ordinary ground, may be better than one-half.



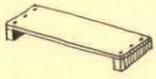
8 —DABBER OR ROLLER

In order to lay the ground you will need either one of these two. The dabber will cost less, and can be homemade if you care to do so; it is perhaps the more easily manipulated, once you get the hang of it. Don't use this particular dabber for laying an ordinary ground later, but reserve it for soft-ground etching only.

9 —PASTE

The tracing paper can be thumbtacked around the edges of the plate, but there is always the likelihood of one or the other moving. In a landscape this may not be detrimental, but in an architectural subject it may do considerable damage. Therefore use paste, or better still, rubber cement, to hold the tracing securely in place (see Fourth Step).

10 —HANDREST



While working on the plate after the ground has been laid, it is of the utmost importance that *nothing* should touch the surface. If it does so that the ground is disturbed, remove the latter with turpentine, clean the plate anew, and relay the ground. When the tracing paper is fastened in place, nothing except the pencil must be allowed to touch the paper. If your finger imbeds the paper into the ground, it will have the same effect as though you had done so with a pencil point, and the evidence will show on the print. Therefore, in order to draw with absolute freedom, it will be advisable to have a handrest, unless the plate be so small that you can reach all parts of it easily without making your hand stir from a single position. Take any piece of thin board, like three-ply wood, and nail cleats at the ends. If the cleats hold the board a half-inch above the table top, it will be sufficient. Don't have them so far apart that the board will sag in the centre and "let you down." A slight downward, forward slope of the cleats may be of advantage.

If you don't want to go to the trouble of making a handrest, use any stiff, thin board and let it rest on two cleats or books at the sides of the plate.

11 —STOPPING-OUT VARNISH

Get a small bottle of this quick-drying varnish; it will cost about fifty cents. It can be applied to the plate with worn-out water-color brushes, very small ones for delicate touches, and a large one for painting on large areas, such as the back of the plate. Some products are not rapid in drying—get a type which is. Rhind's is one of the best. Don't ever plunge the plate into acid or water until the varnish is thoroughly dry.

12 —ACID

For this type of etching the nitric bath is best, because when the copper is submerged in it, bubbles will form wherever the acid is biting. Consequently, if there have been any finger prints, or other accidental marks, they will disclose their existence. Then the plate can be taken from the acid, and these spots blotted out with varnish as described in the Sixth Step. In making up the acid solution, a good working proportion will be to use 3 parts of nitric acid to 5 parts of water; a 32-ounce bottle will give you a good working quantity. *It is of the utmost importance, in mixing acid and water, to add the acid to the water*, not the reverse. Otherwise there would be so much heat generated that the glass container will likely crack, among other disasters. Keep the acid in a glass bottle having a glass stopper. Often the latter has a way of refusing to come out; put a cloth in hot water, then wrap it around the bottle top, and after a little heat treatment of this sort it will yield readily. Don't try to force the glass stopper.

13 —THERMOMETER

After several years of etching you may be able to judge how well the acid is biting, by taking the plate from the acid and squinting against the light to determine the depth of the bitten areas. But for the first few years a thermometer is a valuable aid. Acid will work for you best between about 65 and 70 degrees Fahrenheit. Experiments will be of great aid to future plates if you record what the temperature was when you bit the plate. Later on you may meet a similar problem where this information will supply the correct answer at once, instead of guessing badly and being compelled to do it all over. It takes only a moment to jot down the conditions under which a plate is bitten, while it may take days to make over an entire plate.

14 —TRAY

The container must be acid-proof, so don't use enamel ware over metal, unless you give it several coats of acid-proof enamel or lacquer first. Any rectangular porcelain or china tray that has a flat bottom will do admirably.

15 —FUNNEL

In order to pour the acid from the tray back into the bottle you will need a funnel; get a glass one preferably.

16 —FEATHER

Take one or two soft ones from a duster, or other source.

17—BLOTTERS

At various intervals along the way these will be necessary. Get them white and of the most absorbent quality possible. Sometimes desk blotters do everything except absorb moisture.

18—RUNNING WATER

The business of placing the copper plate in, and removing it from, the acid, is best done in the vicinity of running water. If you drop acid on the plumbing-fixture enamel, fittings, etc., wash it off promptly before it stains them. It delights in attacking clothes and shoes, taking out the color and making holes. Be most careful not to splash any on your face, particularly in your eyes. Half-strength nitric will not hurt your hands as you merely manœuver the plate in and out the acid bath, providing you wash it off immediately. Use rubber gloves if you have any open cuts, or the acid will burn smartly.

19—TURPENTINE AND CLOTHS

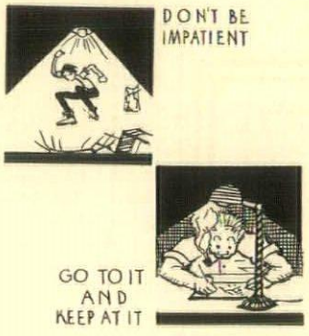
The latter should be free from grit, buttons, hooks-and-eyes, etc.

20—SMOCK

When it comes to the acid operations it is advisable to wear something to protect your clothes. Have your sleeves rolled up and out of harm's way.

21—PATIENCE

This is an important ingredient, and quite essential if your first experiment is not to be your last. Approach soft-ground etching as a game that requires a certain amount of technique before you can conscientiously expect to put over blazing aces. If your first small experimental test plate is not what you expected, it will augur better for future success than though it had turned out so well that you felt there was not much more to learn. Every plate is a new adventure, and while past experience is of inestimable value, there will always be sufficient new problems to keep your interest intense.



22—LUCK

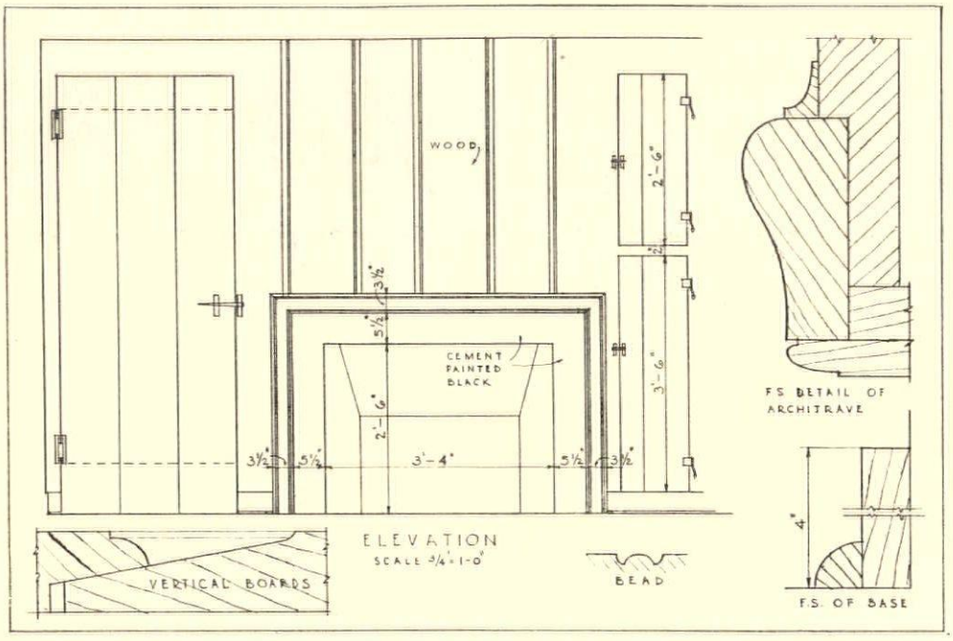
Don't try to lay in a supply. There is occasionally some to be had in etching, but not much. The laws of chemistry are immutable, not temperamental. For example: the copper is clean and the ground stays on, or the surface is greasy and the ground comes off. There is no luck one way or the other. The tracing paper is put on carefully so that nothing but the pencil point touches the paper, or it is put on carelessly and finger prints show up on the print. Just a matter of technique—not luck. From a small test plate you find out how long the plate should remain in the acid, or you make a poor guess based on no information at all. That is a matter of taking an hour's time to find out, not a lack of luck. Where luck sometimes does figure, however, is in this manner: In a small test plate you decide that a certain degree of pencil blackness on the tracing paper will give exactly the tone you want, after the plate is bitten fifteen minutes. Then, without realizing it, you bear down on the pencil a bit heavier than you realize, the rising temperature of the room makes the ground adhere to the paper more than it did on the test plate, and presto! the print shows that while all is blacker than you intended, the thunderous effect is an improvement over your paler study. Or, perhaps a thumbmark gives a foreground smudge which is a better imitation of a dried-up mud-puddle than you could have drawn.

Reproducing at the original size a portion of the soft-ground etching in color, "Rue St. Jacques," by T. F. Simon

By courtesy of Kennedy & Company

FAVORITE FEATURES

CHARLES S. KEEFE



In almost every piece of work that an architect designs there is, when it is finished, something that he would prefer to have otherwise. Once in a long while, however, he rings the bell so clearly that even his sophisticated eye finds it good. The architect tells himself that it worked out as he has hoped, and he would not change it if that were possible.

Here is another in this series of "Favorite Features," a bedroom chimney corner in the guest house of Constantine Hutchins, Needham, Mass., which satisfies Mr. Keefe

The Editor's Diary

Friday, March 31.—Lunched with H. T. Lindeberg, discussing the myriads of efforts toward standardization in building. Two things stand out as rather obvious facts: first, that standardization in building must concern itself with units of construction rather than with buildings as a whole—at least, above the size of a gasoline-filling station or portable garage. Second, a real progress in the achievement of proper standardization of parts is very definitely handicapped through the fact that each industry, if not each individual manufacturer, is trying to make a material or a device out of the raw materials with which he alone works. There is no correlating agency to select and further the most likely combination of materials and methods; just as there is no one to persuade the lumber industry, for instance, that it is wasting its time and efforts in attempting to prove that one should build a house out of nothing but wood.

Saturday, April 1.—Chicago's North Shore Real Estate Board recently conducted a competition for the design of an "average American home" with a first prize of one thousand dollars which was awarded to Robert S. Arnold, of Winnetka. The jury, in its report, bewails the fact that it expected one thousand entries and got about one hundred. There seems to have been something wrong with the publicity. The sponsors say that they notified every chapter of the A. I. A., and *The Chicago Tribune* gave the matter considerable mention. Nevertheless, so far as I can find out none of the architectural magazines was invited to help spread the news, so that the competition naturally remained a local matter.

Monday, April 3.—Robert D. Kohn has almost acquired the status of a commuter between New York and Washington where he has been in close touch with Senator Wagner; Lester Douglas, Director of the Budget; and Miss Frances Perkins, Secretary of Labor, working toward the inauguration of a really comprehensive construction programme to put the unemployed back to work. Mr. Kohn figures that we have lost practically a year in our failure to take advantage of the provisions of last year's Wagner Bill, and that even more forceful measures are now necessary. Incidentally, he brought before the leaders in Washington a detailed list prepared by the National Committee for Trade Recovery of more than two and a half billion dollars' worth of planned public improvements delayed or abandoned because of the depression, and probably in large part ready for inclusion at once in a public works drive on a war basis.

Wednesday, April 5.—Tonight the New York Chapter, A. I. A., awards to Louis Ayres, member of the firm of York & Sawyer, its Medal of Honor in recognition of "his prominent part in the many distinguished designs produced by his firm that have contributed to the moulding of public taste and to the honor of the profession, and for his faithful service to the public as a member of the National Fine Arts Commission"—a particularly popular and well-deserved award.

Julian Clarence Levi, retiring president of The Architectural League of New York, and chairman of the Architects' Emergency Relief Committee of New York, has, as many of us know, worked night and day in the past two years in a sustained and effective labor for others. The Chapter expresses its recognition of his tremendous and productive efforts in its citation read in tonight's annual meeting:

"The crisis through which the world is now passing has brought to many of our profession great privation and distress, the alleviation of which has become our chief concern.

"The work of relief has been organized and administered with so much sympathy, energy, and untiring devotion by one of our members as to merit our warmest approbation.

"As an expression of our grateful appreciation of this eminent service to his profession and his fellow men, the New York Chapter of the American Institute of Architects desires upon this occasion to bestow its highest commendation on Julian Clarence Levi."

Thursday, April 6.—The A. I. A. Board of Directors straddled the fence very neatly in their statement that the Board "recognizes and commends proposals for mass or factory production of small houses. Nevertheless, attention is called to the danger of obliterating the individuality and character of the house . . ."—which double statement might have been combined possibly in the more tenable theory that progress in housing will result from standardization of construction units rather than from standardization of houses, whether they are large or small.

Saturday, April 8.—Robert Wiseman is prompted by the reading of Carleton Ryder's articles to express his amusement over the position in which the philosophers and the scientists find themselves. Wiseman has been listening to some lectures by John Dewey in which the latter holds that experience is the only truth we know. At the same time he has been reading Max Plank, the German physicist, who arrives pretty nearly at the conclusion that human experience can go only so far, and then we must assume a truth until it is disproved. Wiseman finds very amusing the fact that the philosophers are, at the moment, putting their faith in the proving of facts, while the fact-finding scientists are apparently coming around to doubting the practicability or even the possibility of arriving at facts.

Monday, April 10.—J. C. Knapp, vice-president of the Otis Elevator Company, in a speech before The Architectural League today, voiced a hope which has for long been a pet one of ours. The architect who designs a building should, as a matter of course, continue his interest in the structure during its lifetime. As a specialist in buildings, and particularly in that building, the architect is best qualified to suggest changes and improvements to maintain its useful life. Of course, something like this is the case in England and in France. Perhaps we are at last coming to it.

Wednesday, April 12.—Frederick Heath, Jr., writes me that a photograph on page 227 of the April issue takes him back to about 1919. The illustration showed some scored hollow tile used in the wall of the penthouse on The Mission Inn at Riverside, Calif. Mr. Heath tells me that these brick were "Heath Units" as invented by his father, Frederick Heath, a Tacoma architect, some time prior to 1913. They were manufactured by the Los Angeles Pressed Brick Company, now Gladding McBean & Sons.

Friday, April 14.—W. E. Emmett, District Engineer at San Francisco for the American Institute of Steel Construction, reports that his investigations following the earthquake indicate that steel apparently held the record for stability. The only fallen piece of steel evident in the vast area of store buildings was an I-beam that dropped when the entire brick front and sides of the structure fell. On the other hand, many steel lintels are visible, due to the fact that the brick fire-wall was not properly anchored. There were some examples of brick construction badly wrecked, the fault apparently not of brick, but of poor construction. The highest structure in Long Beach, the Villa Riviera Hotel and Apartments, is of steel-frame construction, designed for dead and live loads

and fifteen pounds of wind. It came through with only a few plaster cracks.

Monday, April 17.—There is food for thought in the fact that while a sophisticated jury awarded the prize to a very modernistic flat in the Marshall Field Apartments, Chicago, the five thousand lay visitors voted overwhelmingly for a period room. The modern flat was designed by Mrs. John Root, with unfinished mahogany furniture and a yellow color scheme with white Venetian blinds at the windows. On the other hand, the popular vote was for an eighteenth-century English suite designed by Mrs. A. C. Cramer. The choice of the most livable apartment as voted upon by the public lay between an early American style, one combining Beidermeier and Directoire motifs, the English eighteenth-century, and the modern one.

Tuesday, April 18.—Dropped in to see Henry Wright, only just back from studying housing abroad. Foreign methods of living differ materially from ours, and their housing must necessarily differ from ours. Nevertheless, there are lessons in the fundamentals that we may learn from their longer experience in government-subsidized work of this kind. These lessons, as Wright sees them, will soon be made available to the profession.

Wednesday, April 19.—O. H. Cheney, who directed the national survey of the publishing industry two years ago, has of late been devoting his analytical efforts to the building industry. Mr. Cheney's concrete suggestions are not particularly new, since many of us have been urging this sort of thing for months. Nevertheless, he does bring the problem out into the light of specific inquiry with the following twelve questions, suggested as the necessary preliminary to an immediate advance.

"What is the present supply of available accommodations in each class of building and use?

"What is being actually added and what planned?

"Exactly where are these old and new supplies?

"What economic and other influences are now at work which might affect particular neighborhoods and buildings?

"Is there a danger of oversupply of a certain type of accommodations in a given neighborhood?

"Of what kind of accommodations is there an inadequate supply and where?

"Why are tenants moving in or out of certain buildings or areas?

"What competitive accommodations are being offered in other parts of the city or metropolitan area?

"What are current returns on various types of property in various areas, and what are the causes of differences?

"What buildings are ready for demolition and what areas are ready for rehabilitation?

"What facts are necessary to determine the best use of any given piece of property?

"What are the extent and causes of current vacancies? (Not the sketchy, inaccurate and misleading so-called vacancy surveys which so many real estate organizations have made.)

"'With such facts at their disposal,' Mr. Cheney observed, 'owners of projected property need not be blind as to prospective returns and builders need not be blind as to the market for construction work.'"

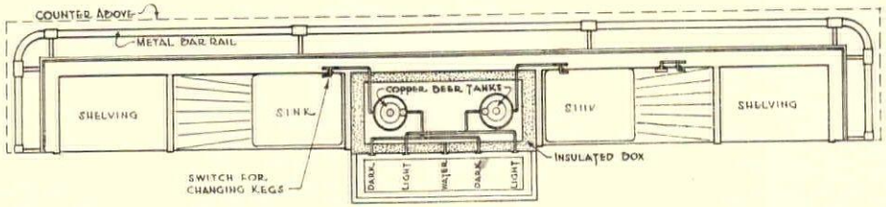
Friday, April 21.—Pierre Blouke in from Chicago by way of Washington, with the news that Chicago is, if possible, even quieter than New York, architecturally. He says the Fair is going to be worth seeing. Blouke, by the way, has just designed a sizable country house to be built with an exterior of copper, using for color contrast the silver gray of lead-coated copper, and the bronze that copper rapidly acquires. For pattern he is making use of the standing seam.

Saturday, April 22.—Diego Rivera seems to be leaving a trail of argument behind his mural painting as he proceeds from New York to Detroit and back again to Rockefeller Center. In Detroit his work in the garden court of the Institute of Arts is being attacked as being "communistic," "irreligious," and "satirical." In New York the newspapers are making gay over their contentions that Rivera is putting over, at Mr. Rockefeller's expense, propaganda for communistic ideas. All of which is probably the usual product of news gathering when real art news is scarce. Nevertheless, my own feeling is that Diego Rivera is a good painter—in Mexico.

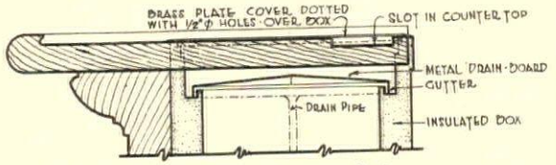
Monday, April 24.—George Sakier showed me today his carefully studied scheme for standardizing bathroom equipment. Sakier has taken a long step beyond the present state of affairs, in which plumbing fixtures are the commodity. In this new conception the bathroom is the commodity—not a fixed unit, but a series of wall panels in metal with which are incorporated the plumbing fixtures themselves. The scheme is so elastic that one may install a bathroom in an old building without breaking into the walls. In a word, it is a bathroom in sectional wall units which are easily joined, arranged in a multitude of combinations, and beautifully finished with the color baked directly on the steel. In these sections are combined not only the essential plumbing units, but medicine cabinet, lighting fixtures for over the lavatory, all the usual bathroom accessories, heat duct openings, and ventilating grilles. In other words, a plumber and a carpenter can assemble a bathroom complete almost as easily as one can now install the kitchen dressers.

Wednesday, April 26.—Hobart Upjohn was host to a distinguished company at dinner tonight at The Architectural League. The occasion was unique, and long to be remembered by all who were privileged to attend. Here was the celebration of one hundred years of architectural practice in a single family. Richard Upjohn, whose best-known work is Trinity Church at the head of Wall Street, New York City, was born in Shaftesbury, England, in 1802. He came to this country in his twenties, and soon attained recognition among the leaders of his profession. He found The American Institute of Architects in 1857, and served as its president for sixteen years thereafter. Richard M. Upjohn, his son, who was a contemporary of Richard Hunt and Stanford White, designed among other works the Connecticut State Capitol and the old St. Thomas' Church at 53d Street and Fifth Avenue, New York City. He had five sons. Four of them tried to follow in their father's professional footsteps, but found it hard going under a master who believed in a rigorous enforcement of traditional apprenticeships. Hobart Upjohn, the youngest of the sons, approached architecture from the engineering school. His latest church, All Souls, New York City—a distinguished work—is one in a long line of more than one hundred Upjohn churches in the United States, largely in the east and south.

Among the distinguished guests at the dinner were Dean Milo H. Gates of the Cathedral of St. John the Divine; former Governor William T. Gardiner of Maine, for whose grandfather Richard Upjohn built one of his first country houses; Royal Cortissoz; Dr. Ralph Adams Cram; Charles H. Higgins, president of the New York Chapter, A. I. A., who presided as toastmaster; Julian Clarence Levi; J. Ernest Russell, president of the A. I. A.; Dean William T. Boring of Columbia; D. Everett Waid, past president of the A. I. A.; and others to the number of fifty. Unfortunately I was compelled to leave the dinner before some of the speeches which, as a whole, constituted a love feast in praise of architectural tradition. Cram and Cortissoz, among sympathetic friends, voiced with all their vehemence the further development of traditional forms as the only tenable road of progress for architecture.



·PLAN·A-A·



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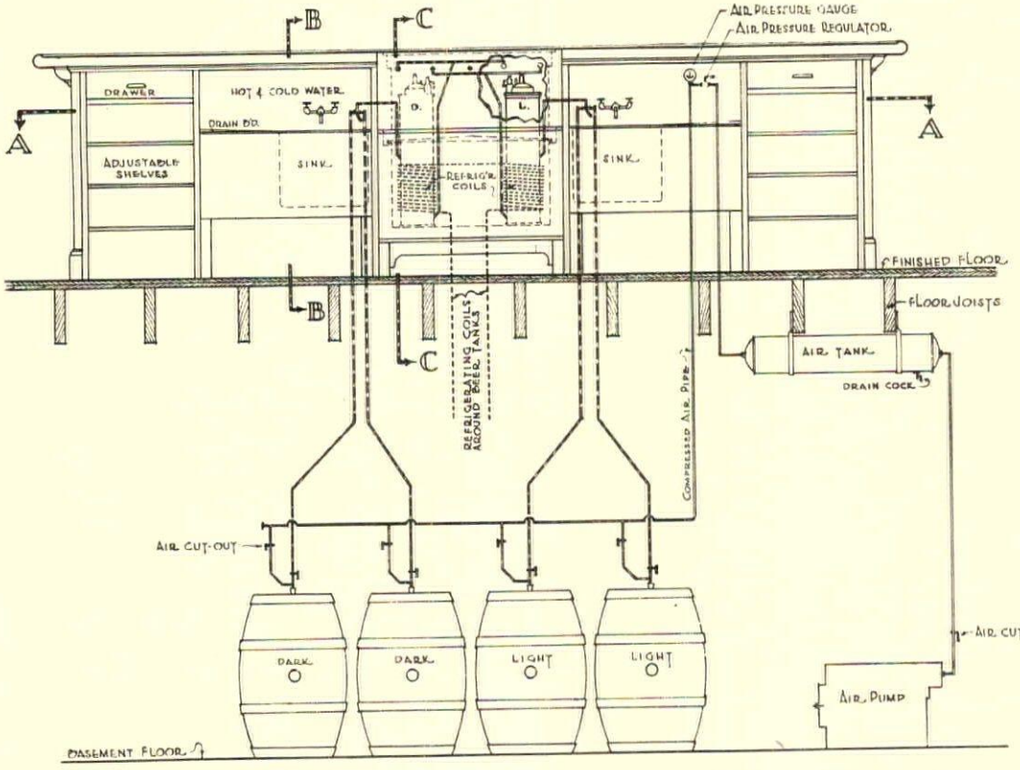
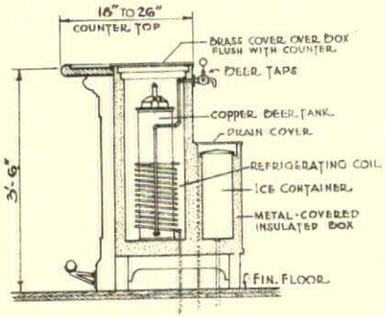
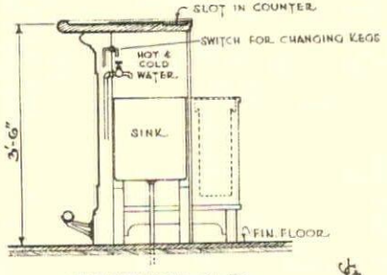


·REAR·ELEVATION·



·SECTION·C-C·



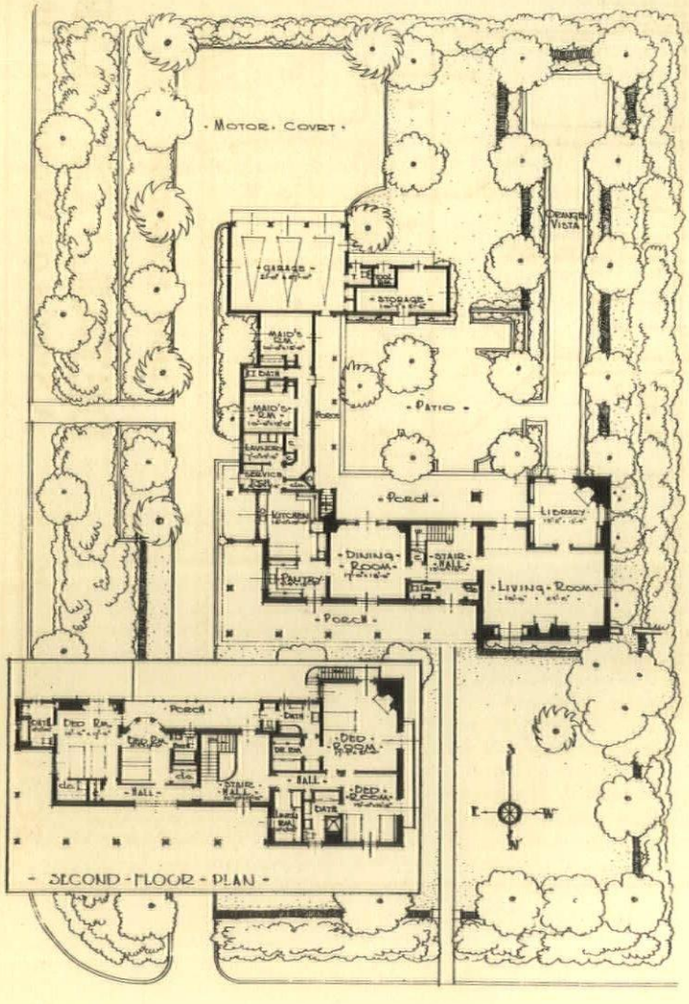
·SECTION·B-B·

·DETAIL·OF·BAR·CONSTRUCTION·

A SERIES OF WORKING DRAWINGS BY JACK G. STEWART

·SCALE: 0 3" 6" 9" 1'0" 2'0" 3'0"

·PLATE·Nº·37·

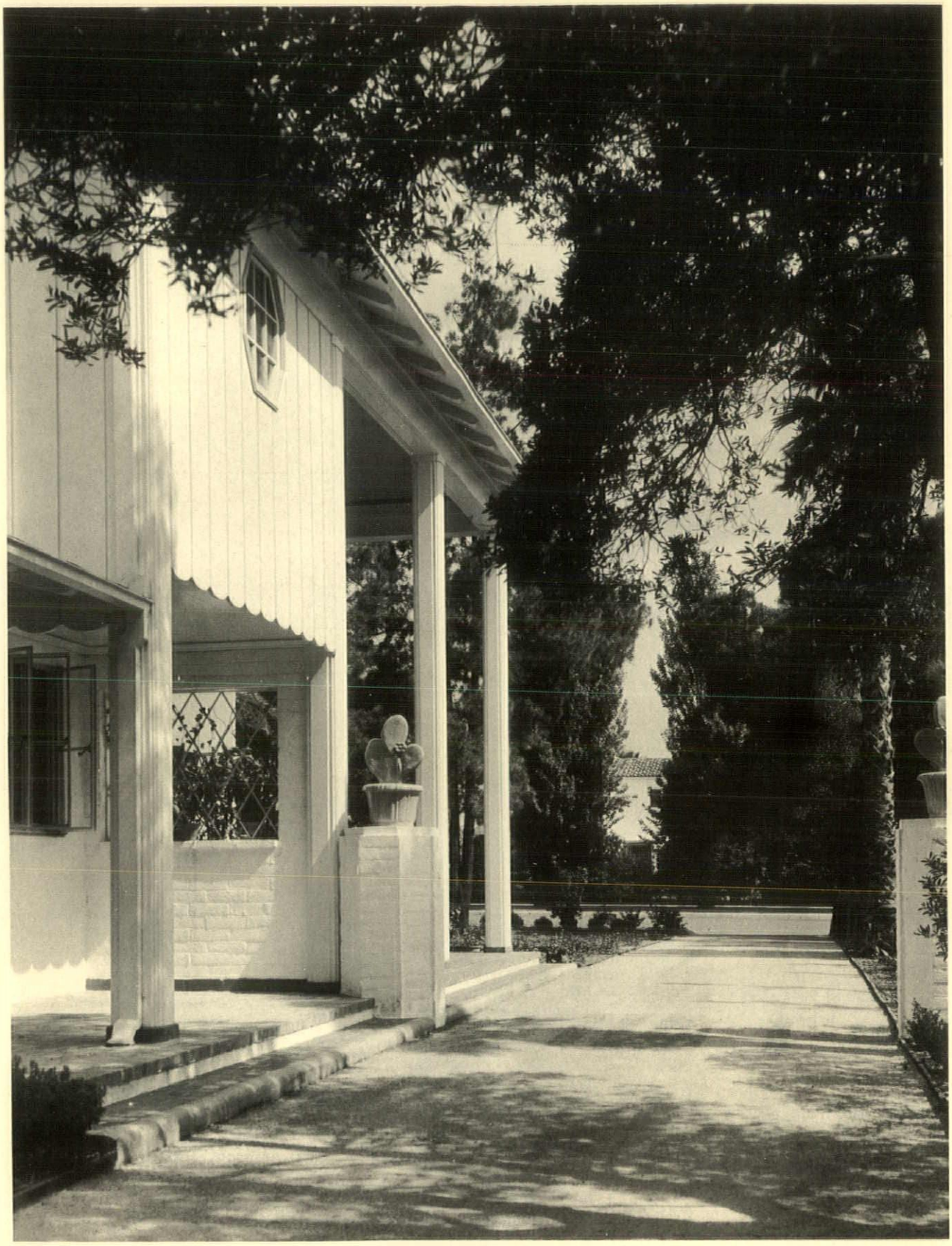


One of the most interesting features of this house is the color treatment of the exterior. The dado, which shows very indistinctly in the above photograph, is green with a dull yellow band at the top. Elsewhere the exterior walls are white, but the ceiling of the porch is also green with a darker green band outline, and the small cement bases of the columns are the same green. The roof is pure blue

Photographs by George D. Haight

House of Edward H. Heath, San Marino, Calif.

ROLAND E. COATE, ARCHITECT



A detail along the side of the house at the driveway entrance. The glazed terra-cotta ornamental pots are greenish blue, holding cactus of terra-cotta color

A corner of the patio, showing under the roof the flower sink lined with green and yellow tile. The steel casements are painted a straw color

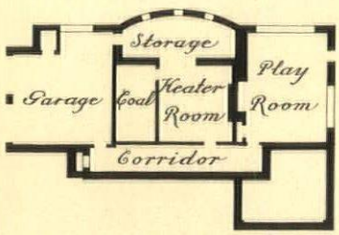
At left, a detail of the porch along the north front. The walls are of stone tile, painted white. The green ceiling with its darker green border is vaulted

At right, the library fireplace. Incidentally, here may be seen an ingenious scheme of framing for the purpose of reconciling a horizontal composition to a vertical panel space. This house was awarded a prize in the House Beautiful Contest last year

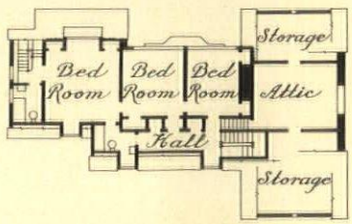
The north front and entrance garden. On the other side, the south, the land drops abruptly to the valley of Crum Creek, about 150 feet below

House of Edward Wright Moylan, Pa.

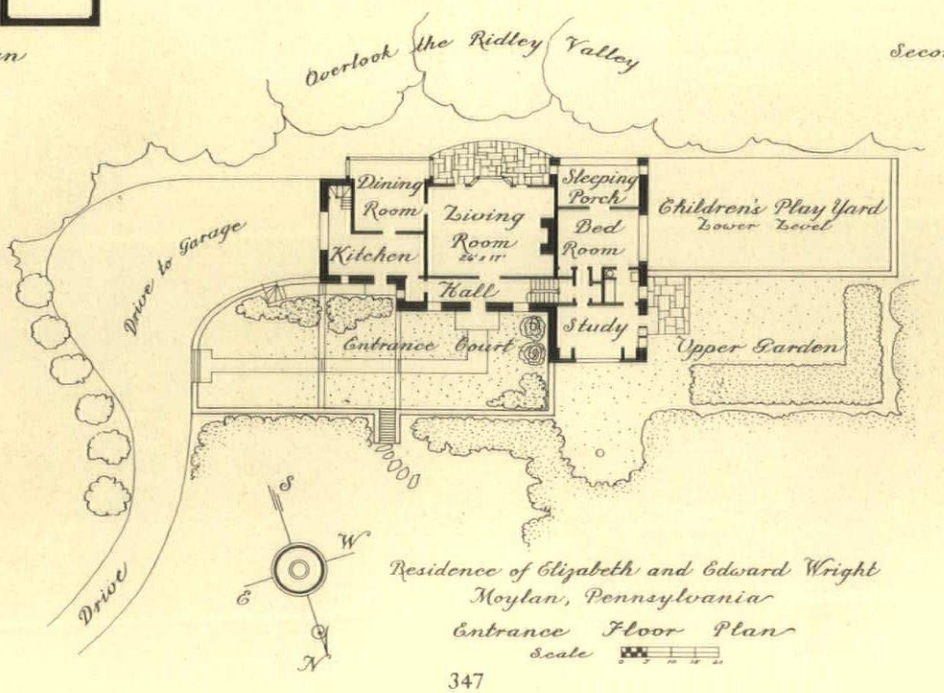
DAVIS, DUNLAP & BARNEY, ARCHITECTS



Basement Plan



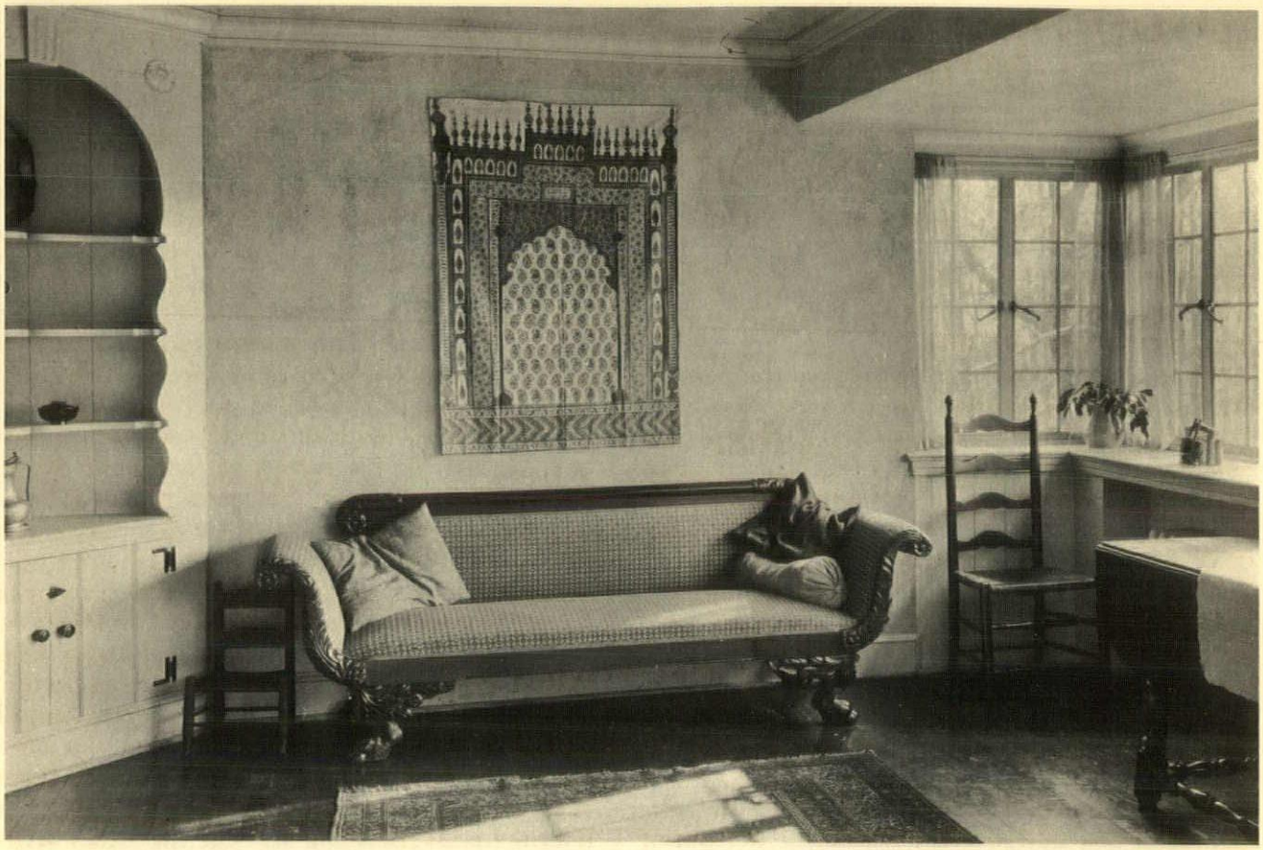
Second Floor Plan



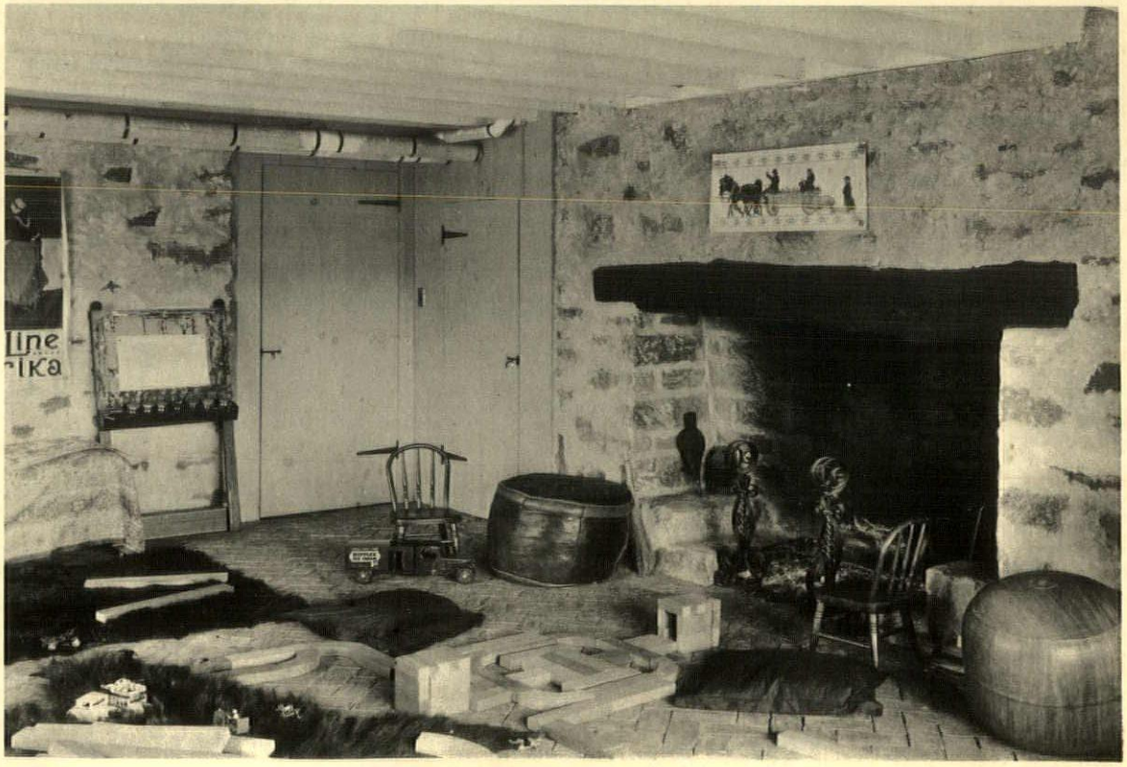
Residence of Elizabeth and Edward Wright
Moylan, Pennsylvania
Entrance Floor Plan
Scale

Two views of the living-room. Virtually the whole south side of this room is taken up by a range of casement windows. The fireplace is faced with native stone. Walls are of sand-finish plaster, tinted buff. All the woodwork is cream

Main entrance on the north side, the carved date stone above the door being of limestone bearing a cipher devised from the names of the owners



Above, the dining-room. Here again the entire south side of the room extending around the corners is opened up by casement windows. Below, the children's playroom on the basement level at the west end of the house. The steep slope permits here, also, long ranges of casements on the south and west



Some Pitfalls in Supervision

By W. F. Bartels

XXXII. MECHANICAL APPURTENANCES

(CONTINUED)

THE control board for the pumps must be clear of all water lines, and not under locations where serious leaks may occur without due precaution being taken for the protection of the board. It is advisable to provide that *both starters may control either pump*, if two pumps are provided. Particularly is this true of sump pumps. To illustrate: let us number the pumps 1 and 2, as well as their starters numbered 1 and 2. If *starter* 1 breaks down and *pump* 2 breaks down, number 2 *starter* can operate number 1 *pump*. This is a very simple matter to arrange and the cost is negligible as compared to the margin of safety it affords. In short, by means of a throw-over switch number 1 starter will operate either pump, as will also starter number 2.

The superintendent should secure the approval of the design and location of the pump foundations before he permits the contractor to proceed with the subsequent installation. The contractor is apt to argue that if the pump is a good one it will be balanced, have little vibration, etc.; but the instructions of the manufacturer should be meticulously adhered to. Any special features, such as cork foundations, should be carefully carried out according to details.

The capacity of the pump is important in relation to the work it is expected to perform. It should first be checked against the manufacturer's rating book, to make sure it is the one ordered. Then the head against which it must work, if it is pumping fluids, should be checked. Many times the plumber figures the head from the bottom of the tank or the floor. This obviously is incorrect, because the water enters the top of the tank, and in some special instances might have to go higher in order to get into the tank. A test should of course be made to check the capacity, at which time other items, such as bearing temperature, speed, etc., may also be investigated. If run by electricity the motor and pump should be connected by a flexible coupling so that the errors of the human element may be kept to a minimum in aligning the drive shaft. A slight amount of disalignment here will cause all sorts of trouble later. It is a good plan, when two pumps are installed for the same purpose, and where one is regarded as a spare, to have them so arranged that they alternate automatically. This keeps both pumps tuned up and the man in charge can always be sure that the other one will work if it is called upon to do so.

The superintendent should see that all spare parts called for are furnished, and that the engineer who will be in charge is thoroughly acquainted with all aspects of service that will be necessary for the continuous and efficient operation of the pump. It is important—extremely so—to know how far away the nearest service station is, and how soon help will come when needed in an emergency. Many a dealer with a good pump has lost a sale because the answer to this question was not satisfactory.

The smooth functioning of a pump is to be desired, but because it does work well is no reason for overloading it. On the other hand, some types should not be underloaded. For example, a centrifugal pump working against a lesser head than it was designed for is inclined to race, with the resultant consumption of unnecessary power and possibly burned-out windings. While pumps must be run to do the work required, good practice demands that the pump be not run more than 35 or 40 per cent of the time without being given a rest. The connections from a pump delivering water should not be at sharp angles, nor should there be more angles in the line than are absolutely necessary. The reasons for this are obvious.

The testing of pumps has been mentioned, where there was a receptacle to catch the water. Where there is none, and a test must be made, such as a test of a fire line on a roof, an instrument known as a Pitot tube is used. This tube gives the pressure with which the water is leaving the hose nozzle; knowing this and the size of the nozzle, the amount of water may easily be computed. The tube is a hook-shaped affair, the end of which is put over the discharging nozzle.

In the testing of fire lines on a roof I once

encountered an interesting fact. The pressure was well up on the pump gage; the valve at the hose was turned on, but no water appeared. Telephoning the engineer, the latter reported a steadily mounting pressure. Still nothing resembling water appeared at the hose end except a sorry dribble. Cutting the pump off and taking the last connection off, it was found that a workman's leather glove had gotten in the fitting and was effectually cutting off the water and causing the plumbing contractor no little worry.

If the superintendent is not familiar with motors he should not hesitate in asking assistance when inspecting them. They are complicated if inspected minutely, and none but an expert can detect all of the hidden or likely defects. The manufacturers as a whole do not wish to misrepresent or deliver a product that is unlikely to give satisfactory service. But this does not prevent an unscrupulous dealer from switching name plates or anything else that may suit his convenience or profit. Most motors have a plate put on them by the maker, giving the pedigree of the article. Motors are generally 40° or 50° Centigrade. This means that in four hours continuous running they will not heat up more than 40° or 50° C., respectively, above the room temperature. Of course they must not be expected to perform this in a very small room without ventilation. A superintendent was once on a job where a majority of motors were 40° C. Coming across one that was well covered, but at its visible points had a shabby appearance, he looked more closely at its tag. It was a 55° C. motor. Checking back against the specification, he found it loosely written at this point and of no definite requirements except to provide for "a motor twice as strong as necessary to do the work." The question arose as to what the amount necessary was to do the work. Feeling that a technical advantage had been unjustly taken, the superintendent third-degreed the contractor. The latter finally admitted that not only was the 55° C. wrong, but that the entire plate was incorrect, and that the motor had been rewound. Finally after much guaranteeing and verbosity as to the soundness of the motor, it was installed, but it is doubtful if the owner really got what was intended by the specification writer. Then, too, the horsepower of a motor may be changed (as far as a superficial inspection goes) by changing the plate. Thus a motor with a certain rated horsepower at 40° C. may be stepped up in horsepower by changing the plate to read 50° C. These methods and tricks are not resorted to by the well-known manufacturers, but by the unscrupulous firms interested only in quick profits and a quicker getaway.

When the motor is tested it should previously have been running at least two hours. Then its revolutions should be measured by means of an instrument called a tachometer. The voltage should be read, as well as the wattage and amperes.

The following story will illustrate what care a superintendent must exercise. I was to witness the testing of a motor by the contractor's "electrical expert." Various features of the machine were tested, but no watt meter was in evidence. Thereupon I asked that one be produced in order to ascertain the wattage. Imagine my surprise when I was told that it was not necessary to know the wattage, because they could work back from the assumed factor of the motor and arrive at it. But it was this assumed factor of the motor that was to be determined, and hence the wattage was necessary in obtaining this. What the "electrical expert" either did not know or "lost sight of" was the fact that I desired to have it proven to me that the stated efficiency was correct in order that the owner's maintenance bills should not run higher than necessary. Such seemingly insignificant factors, while not stupendous in themselves, mount up if not checked, until the owner is eventually swamped with costs, and wonders why he is making no profit on a supposedly first-class job.

CONTACTS

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

A Constructive Policy for the Construction Industry

By Lewis H. Brown

President, Johns-Manville Corporation

THE construction industry, taken in its broadest sense, is one of the largest industries in this country. To adequately outline a constructive policy for this great industry in such a short time allotted, calls for brevity and condensation.

In order that we may get a perspective of the building industry, may I take a cross-section of it—a typical city—the city of Chicago, Ill., and, using building permits as a measure of activity and extent of the construction industry, give you a thumbnail sketch of what happened.

In 1882, building permits in the city of Chicago amounted to $16,286,700. The average per year in the 1880's was $21,000,000.

In the decade after 1890, the average per year was $35,000,000, the increase being stimulated by preparation for the World's Fair. In the last year of the decade, building permits were $20,000,000.

In the next decade, beginning with 1900, the average building permits per year were $53,000,000, increasing every year and reaching a top figure of $90,000,000 in 1909.

The next ten years covered the war period. The average was $87,000,000 per year. In 1911, 1916, and 1919 building permits exceeded $100,000,000 per year. 1917 and 1918 were relatively poor years for this decade.

But in the next decade, from 1920 to 1929, something happened. The average normal building permits were $265,000,000. Even for the two years of the terrible depression of 1920 and 1921, the average was over $100,000,000 a year. From then on during the remainder of the decade, nothing less than $200,000,000 or $300,000,000 figures were tolerated. 1926 was the peak year with $366,000,000 of building permits in the city of Chicago only.

Mr. Brown rearranges and revivifies our perspective of volume in construction—what it is, what it has been, and what it may be. The article is adapted from his talk on March 16 last before a joint meeting of the Producers Council Club and the Architectural League of New York.—EDITOR.

What happened to the construction industry? Something certainly did happen. Most of us are inclined to answer that question with a statement about housing shortages created as a result of no building during the war. But this is one of those fallacies of history.

In Sinclair Lewis's latest book, "Ann Vickers," one of his characters, an instructor to a group of young ladies in a girls' school, tells them that they have all heard about the "Fall of Rome." Then he tells them the various reasons advocated by various people as to why Rome fell. And then he tells them that that's another fallacy; that, in fact, Rome never fell. Rome simply changed. At the height of its glory, it was a little city. Today it is the tenth largest city in the world.

And so what happened to the city of Chicago, in reference to the construction industry, was what happened to the construction industry all over the country.

In the first twenty years of this century a new means of transportation was made available to the people. And just as a new means of communication had revolutionized the world in the decade preceding, this new means of transportation—the automobile—revolutionized our entire conception of life in these United States of America.

Where before people had to live within three miles of their place of business, they could now, with this cheap, fast means of transportation, live within thirty miles and get back and forth in approximately the same time. A great and rapid migration took place from the congested centres of population to the outlying suburbs. This required new homes, new roads, new sewers, extension of public utilities, such as light, telephone, power, gas; new stores, new banks, new theatres, new parks.

At the same time there was a great migration of people from the farms to the cities, intensifying this movement. Four million men had been taken out of their normal channels of existence and shown new sights and new scenes during the war. When they returned, the farm and the little village from whence they came looked small and unimportant. These men were restless, used to action and noise. They gravitated to the cities.

Upon the construction industry of this country fell the burden of meeting in this short space of time the needs of this tremendous migration.

We are inclined to believe that the depression began in the fall of 1929. Actually it began in 1927, for it was at that time that we had really caught up with the actual needs of the changing times.

In 1930, building permits in the city of Chicago dropped to $79,000,000; in 1931 to $46,000,000; and in 1932 to approximately $5,000,000.

Now I have taken your time to

give you this perspective of a cross-section of the construction industry because I do not believe that any of us can adequately prescribe a constructive policy for the future without a real understanding of the facts concerning the past. If you are looking to reconstruct exactly the good old days of 1920 to 1929, then I think you are seeking the impossible. Those conditions were absolutely abnormal. In my judgment they will not be produced again, because the cause that brought them forth will not again be operative in the same way.

Today general business activity is measured by the Annalist Index as, roughly, 58 per cent of the 1928 volume of business. Total construction of all classes in 1932 was valued at 18 per cent of the 1928 volume. And the decline continues into 1933.

However, during the past two or three years, home construction has barely been sufficient to take care of the losses by fire and obsolescence. The 350,000 new families created in every year have not been provided with new homes. This has been offset in part by the temporarily reduced standard of living that has forced thousands of families into unsatisfactory living quarters. The conditions of the last three years are not normal.

What, then, can we expect? I am not given to making predictions. But it seems logical that after what has taken place during the past three years, we must expect that it will require two or three more years gradually to work out of this depression. And then it would seem to me reasonable to expect a volume of construction necessary to take care of the normal growth of our population and its normal needs in terms of replacements of obsolescent structures and the requirements of rehabilitation and repair which are going to be of considerably more importance in the years that lie ahead than they have been in the past.

This seems the more logical when we consider that statistics clearly show that the ratio of population growth is slowing down.

But is this a pessimistic outlook for the construction industry? I do not think so. Rome has not fallen. It is simply changing.

The task that lies ahead is a more difficult one, but for those with vision and courage I believe that it offers an opportunity to build a more solid foundation upon which the construction industry of the future can profitably stand.

And now let me outline, in the briefest possible way, a suggested constructive policy for the construction industry.

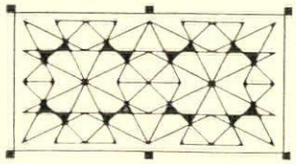
1. First, let every one extract from his mind the picture of the construction as it existed from 1920 to 1929. Let's replace that with a clear-cut and logical picture of what may be required and expected of the construction industry from 1935 to 1945.

2. Second, let's all determine to keep out of the figures and out of our minds the temporary and abnormal construction work of the Federal Government that may be done to alleviate unemployment and stimulate business. While this is a welcome addition in these times to the activities of the construction industry, it will only confuse us in laying our basic plans for the long-range future unless we keep this work in a separate category.

3. Let us recognize that for several generations in this country, the owning of a home or real estate was not only a mark of distinction and stability, but almost inevitably resulted in a profit. Today, thousands of people have lost their faith in real estate.

The construction industry must co-operate in clearing away the débris that has resulted from the unsound period that has gone before. We must lay a foundation that will again make the owning of real estate and the building of buildings a sound investment. We must then again prove to people that the owning of a home or an investment in real estate is a sound investment.

4. It is unfortunate that the construction industry is not better organized and better prepared today to take an active part in the reconstruction of our financial system in such a way that it would provide a sound uniform mortgage financing system. This is the keystone and the arch that, after the present depression is over, will help to bring the construction industry back on a sound basis. I suggest that the methods of handling mortgages in France might be helpful to us in this country.



In this connection, the Federal Home Loan Bank System, which was authorized by Congress a year ago and is only now beginning to get into operation, is a real start in the right direction. The plan itself is not yet perfected. But what it needs more than anything else is real leadership and vision. The plan itself can be moulded to meet the needs of the country. The foundation, however, has been laid.

The construction industry should recognize clearly that the building of a sound construction, financing, and mortgage loan structure for the future must be done to attract new capital into this field and to re-establish the confidence of the ultimate purchaser.

5. And then, when we have gotten ourselves out of this depression and laid a sound foundation for the future, we must all concentrate our efforts on evolving a new type of construction for the future. We must find a way to build better and cheaper homes and buildings for the future. The example set by the automobile industry in giving greater value for less money must be followed by the construction industry.

I do not suggest that we attempt to revolutionize the methods of building over night. But the old traditions and the old methods must change. If the labor rates for erection on the job cannot be greatly reduced, then we must find means of altering the methods of erection. If we cannot reduce the total cost with the use of present types of materials, then we must find ways to create new materials.

It is in this direction that opportunity lies. In my judgment the architects of this country must lead the way. Many of the manufacturers have been working in this direction for several years. In my judgment it is in this direction that the real future of the construction industry lies.

THE EIGHTIETH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

ARCHITECTURE'S PORTFOLIO OF

EAVES RETURNS ON MASONRY GABLES

Subjects of previous portfolios are listed below at left and right of page

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

Below are the subjects of forthcoming Portfolios

Exterior Lettering
JULY

Entrance Driveways
AUGUST

Corbels
SEPTEMBER

Pew Ends
OCTOBER

Gothic Niches
NOVEMBER

Curtain Treatment at Windows
DECEMBER

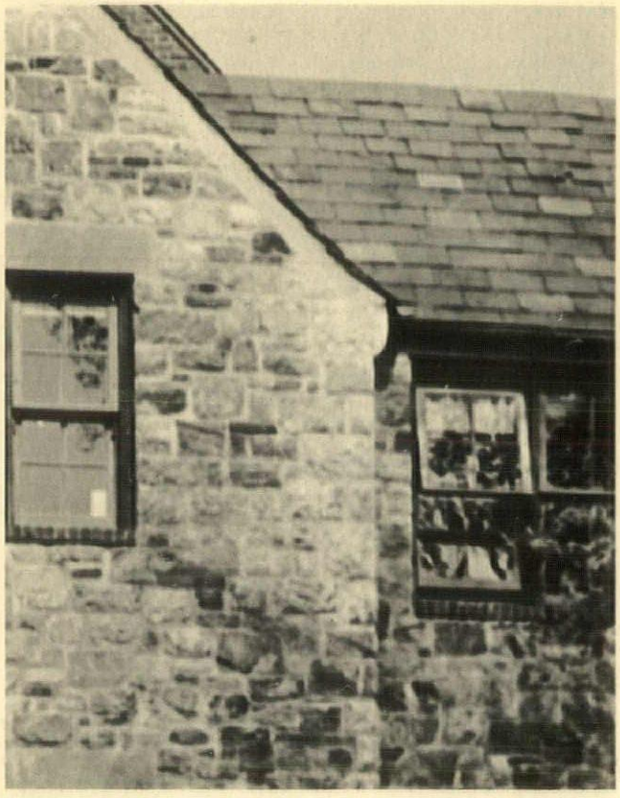
Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.

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

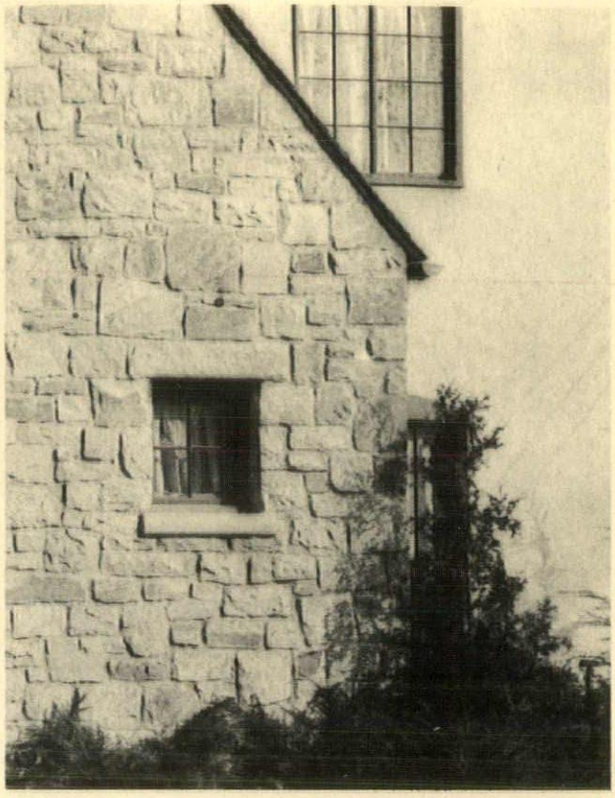
1931
- BANKING-ROOM CHECK DESKS
- SECOND-STORY PORCHES
- TOWER CLOCKS
- ALTARS
- GARAGE DOORS
- MAIL-CHUTE BOXES
- WEATHER-VANES
- BANK ENTRANCES
- URNS
- WINDOW GRILLES
- CHINA CUPBOARDS
- PARAPETS

1932
- RADIATOR ENCLOSURES
- INTERIOR CLOCKS
- OUTSIDE STAIRWAYS
- LEADED GLASS MEDALLIONS
- EXTERIOR DOORS OF WOOD
- METAL FENCES
- HANGING SIGNS
- WOOD CEILINGS
- MARQUISES
- WALL SHEATHING
- FRENCH STONEWORK
- OVER-MANTEL TREATMENTS

1933
- BANK SCREENS
- INTERIOR DOORS
- METAL STAIR RAILINGS
- VERANDAS
- THE EAGLE IN SCULPTURE

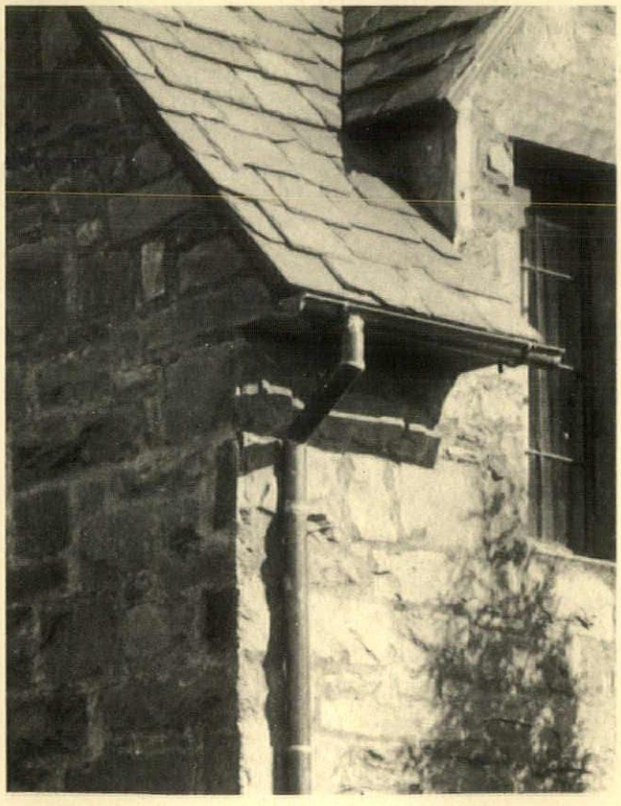


James Renwick Thomson

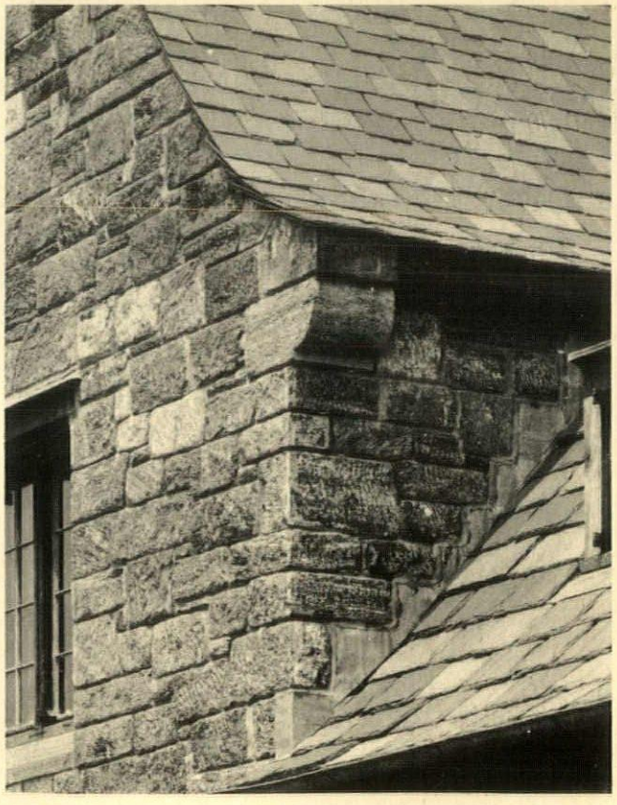


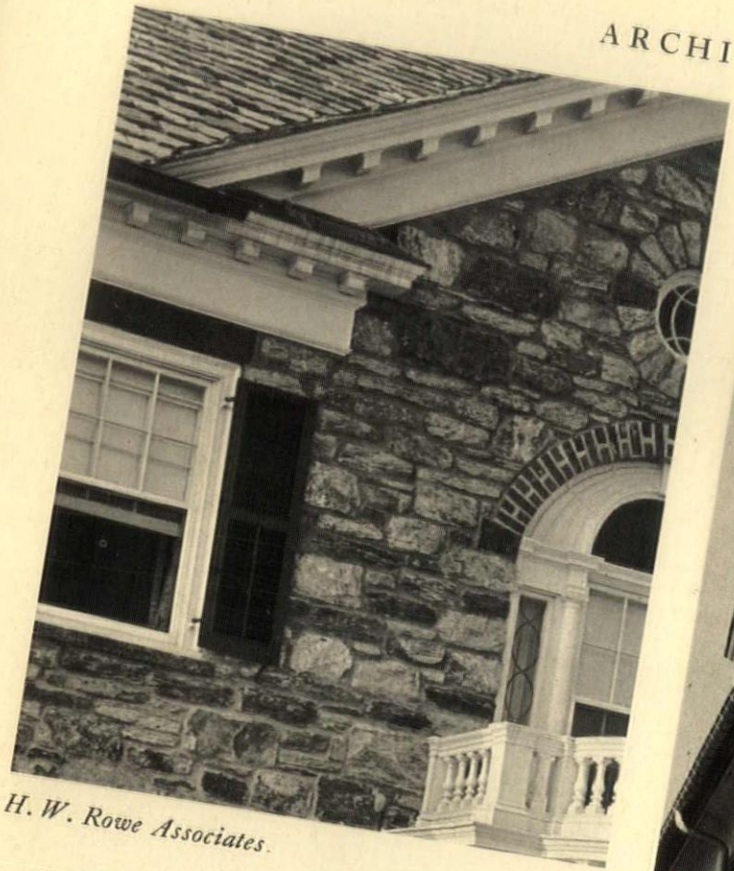
Eugene Lang

Linn Kinne

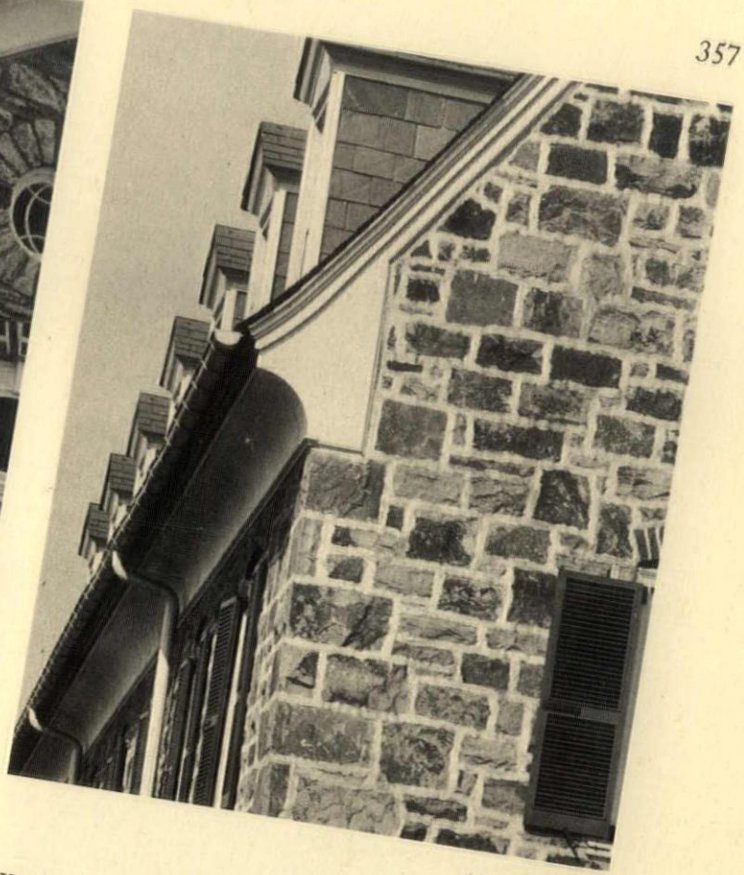


John Oakman





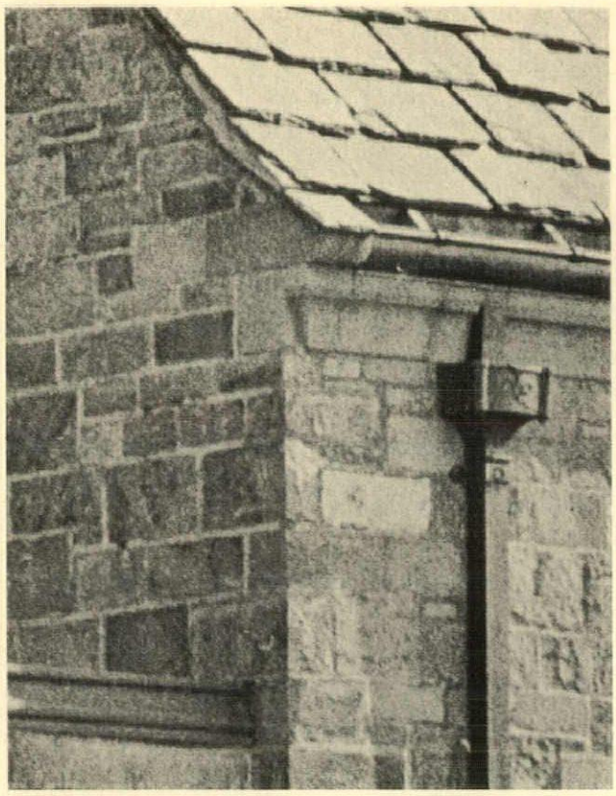
H. W. Rowe Associates



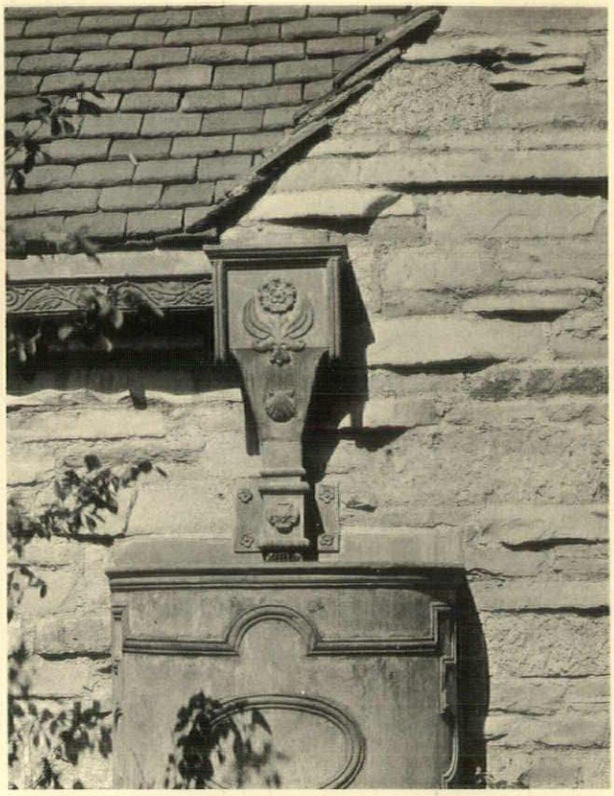
Karl Snyder

R. Brognard Okie

Wesley S. Bessell

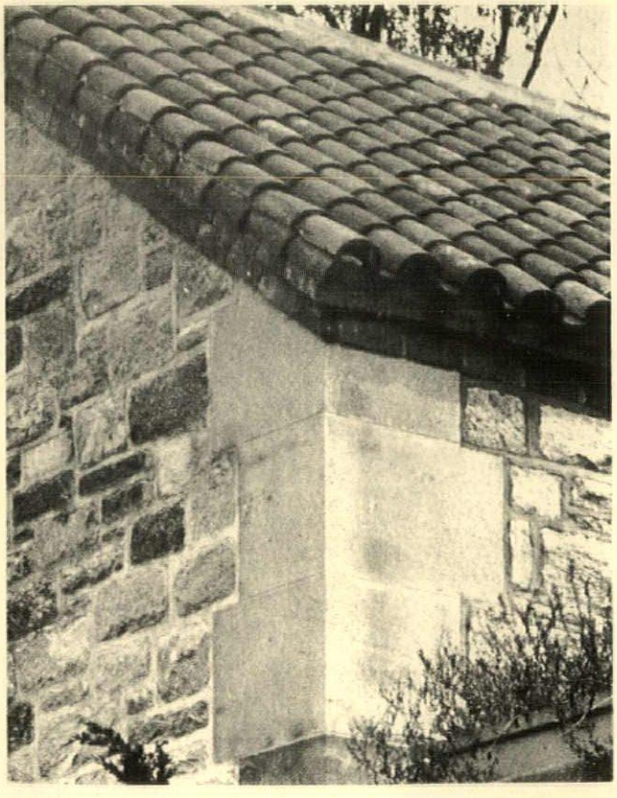


Bertram G. Goodhue



Richard Powers

Wesley S. Bessell



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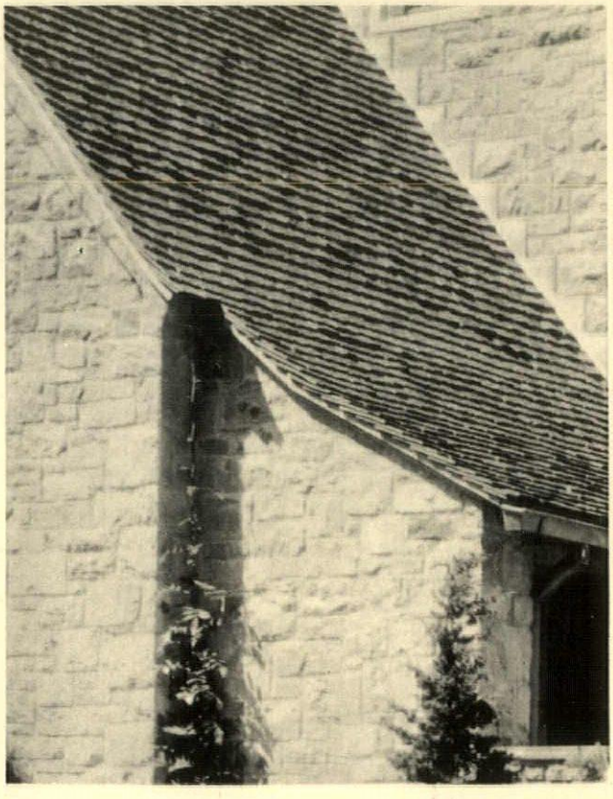
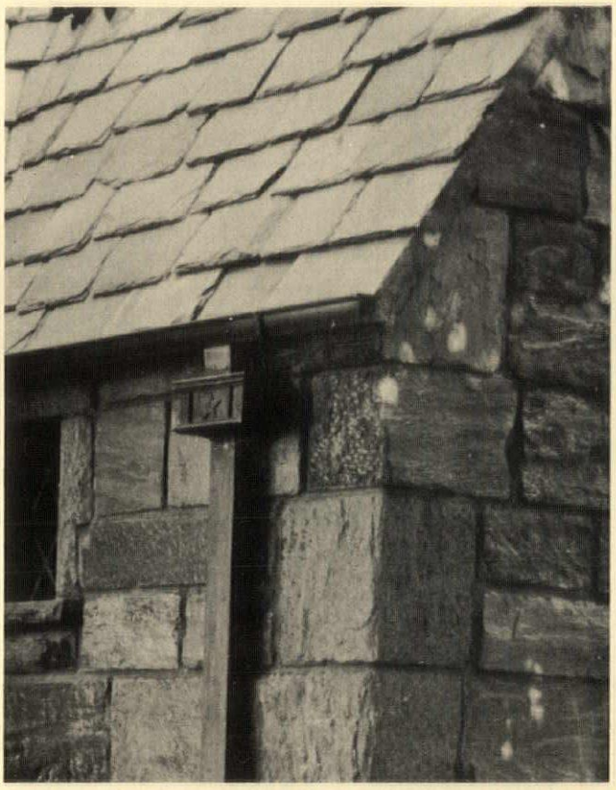


Henry Powers



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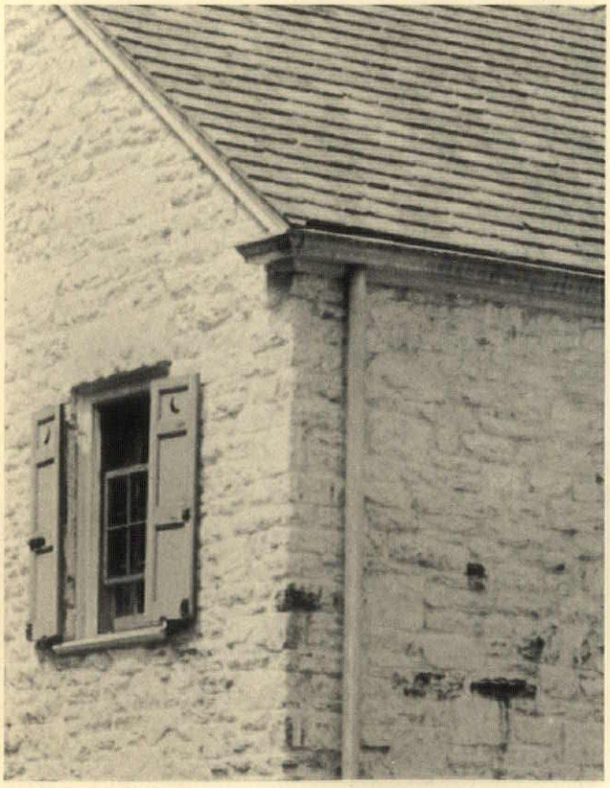
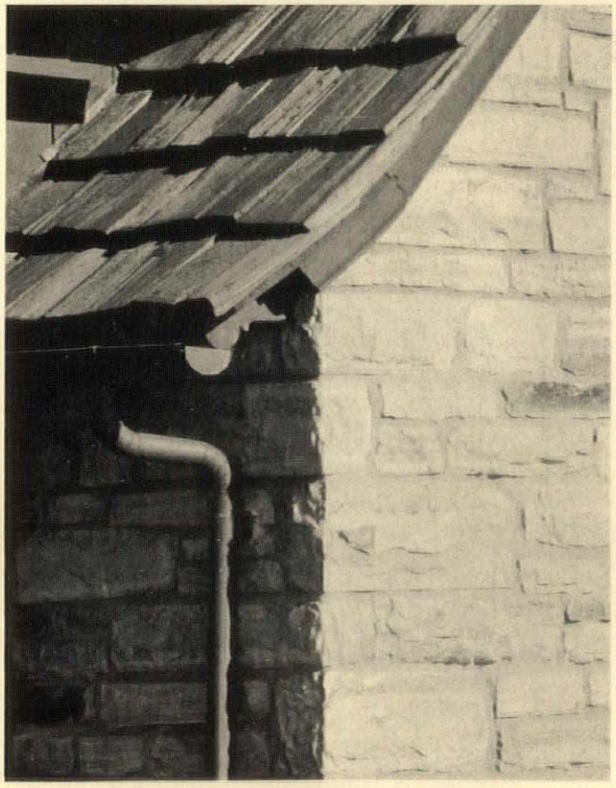
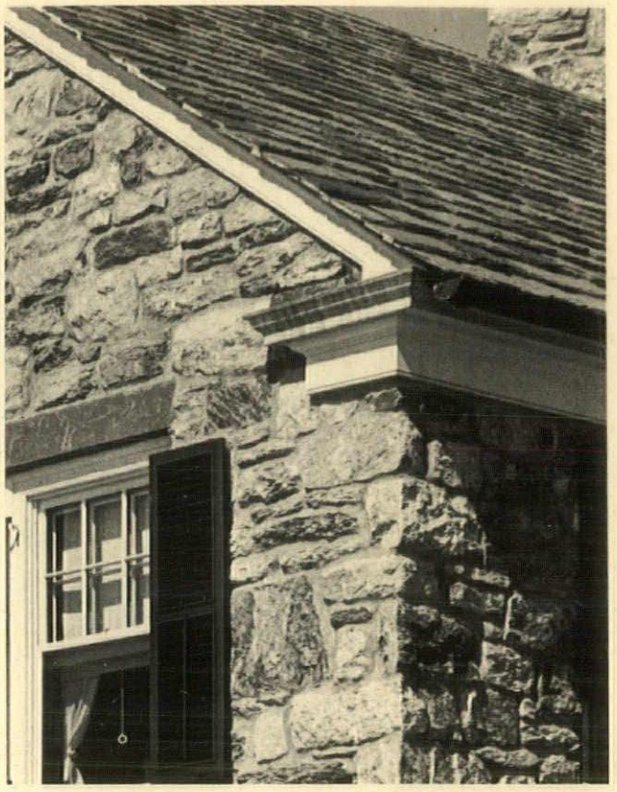
Electus D. Litchfield



Paul R. Williams

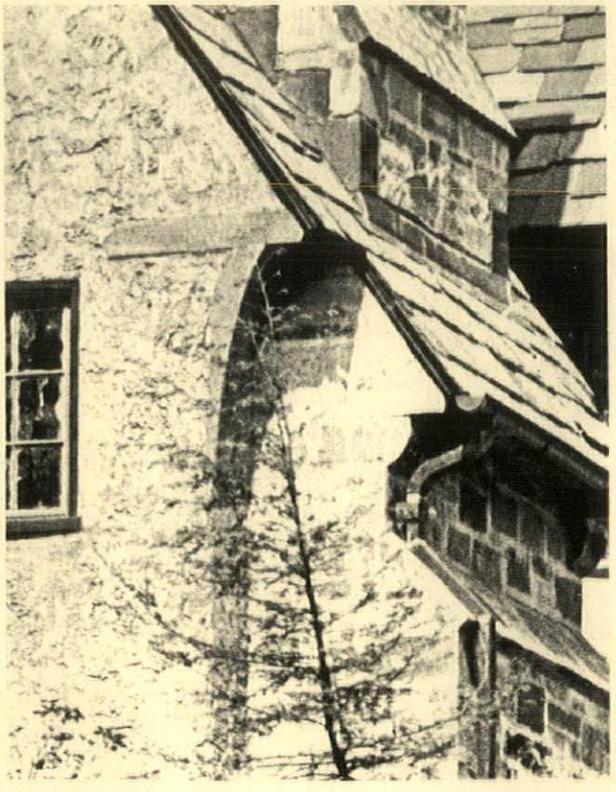


Warren, Knight & Davis

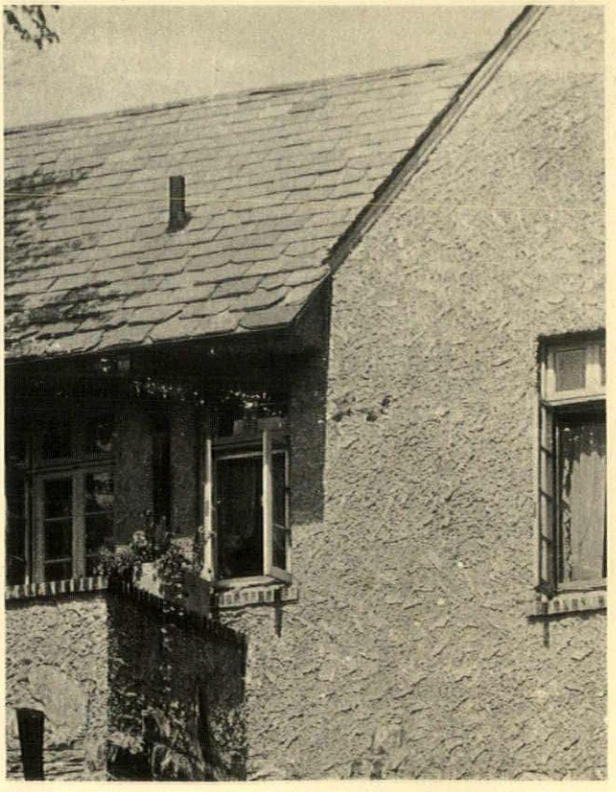


H. W. Rowe Associates

Clifford C. Wendehack



Brutus Gundlach



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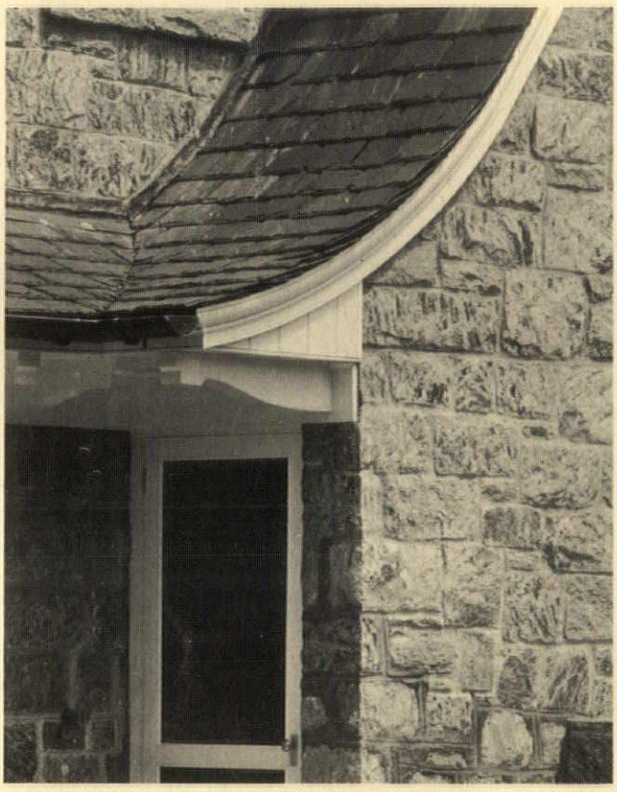
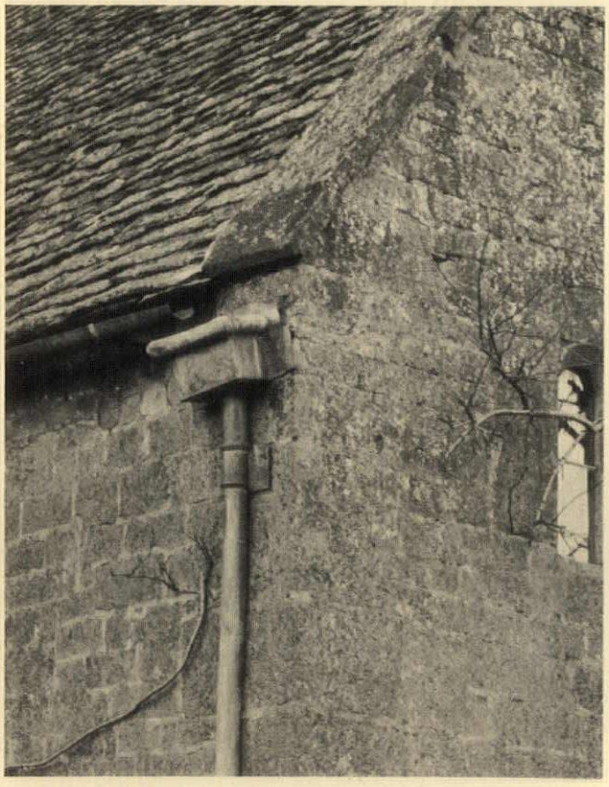
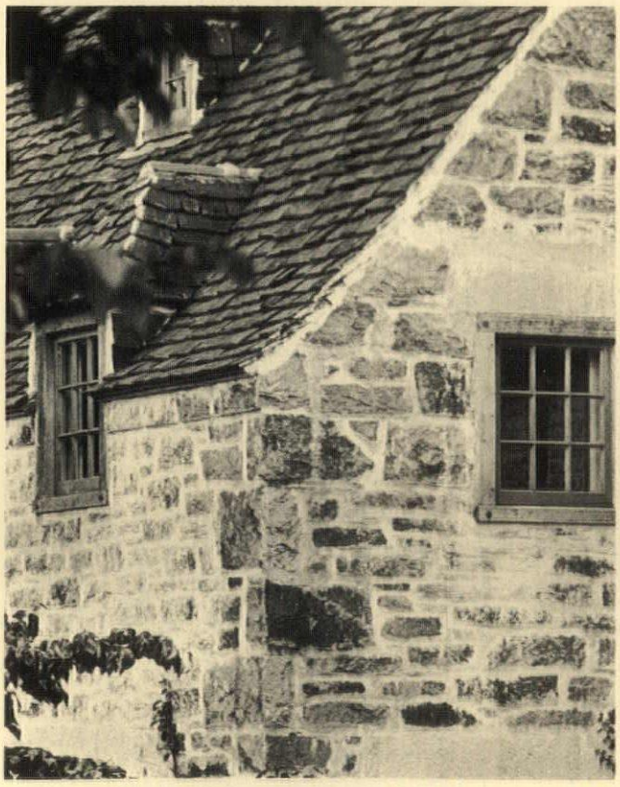


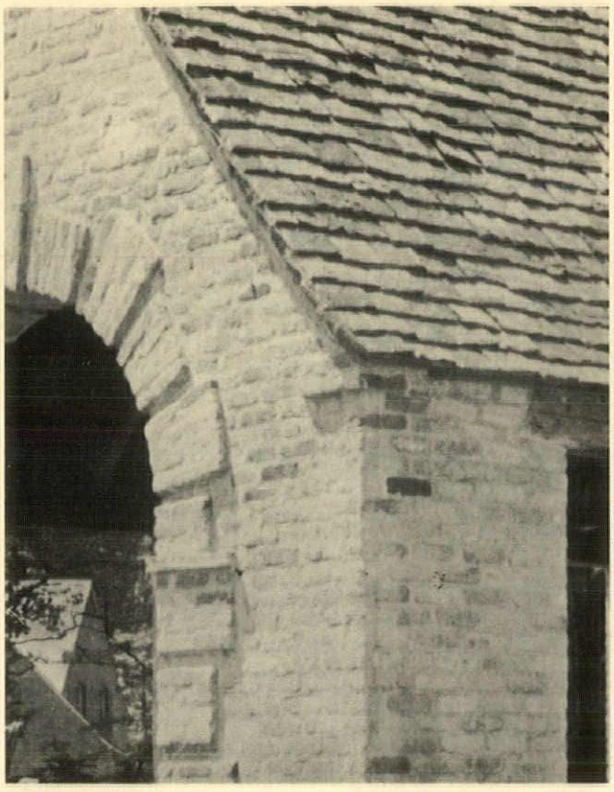
Leland Hubbell Lyon

In Gloucestershire, c. 1640

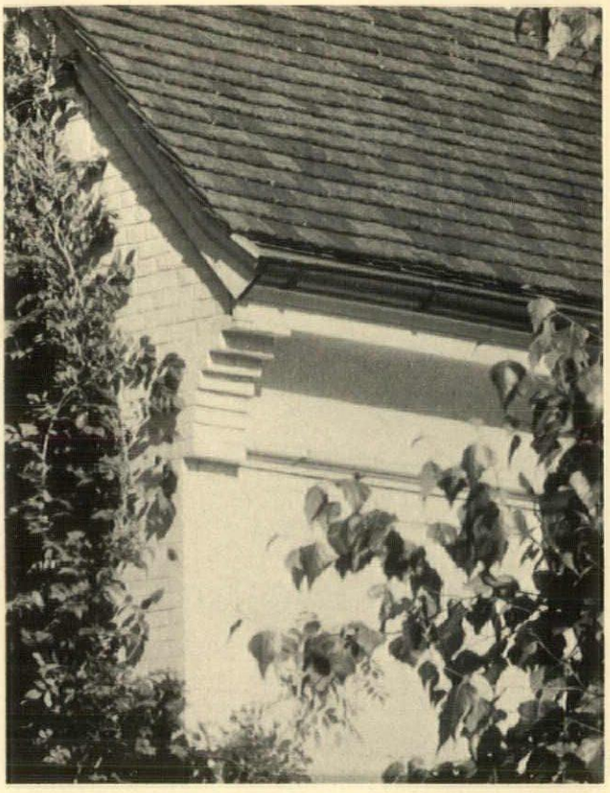


Frank J. Forster



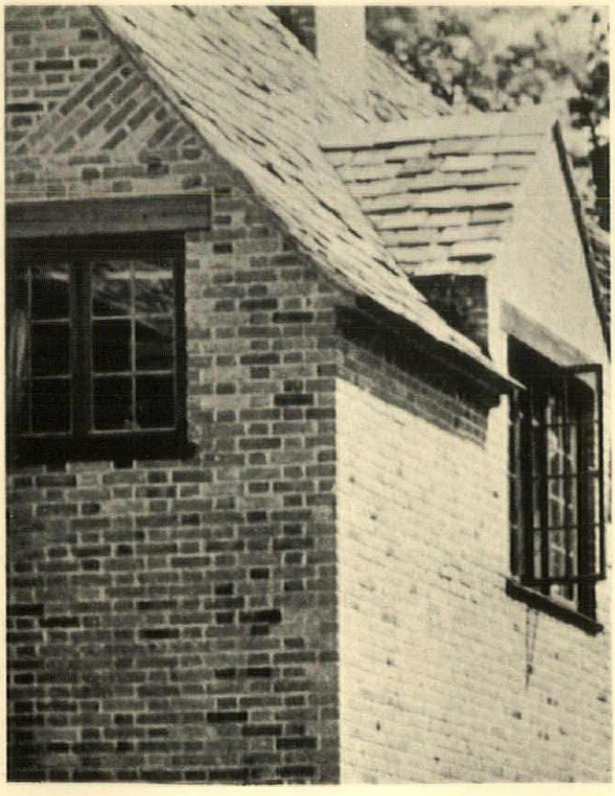


Frank J. Forster, R. A. Gallimore

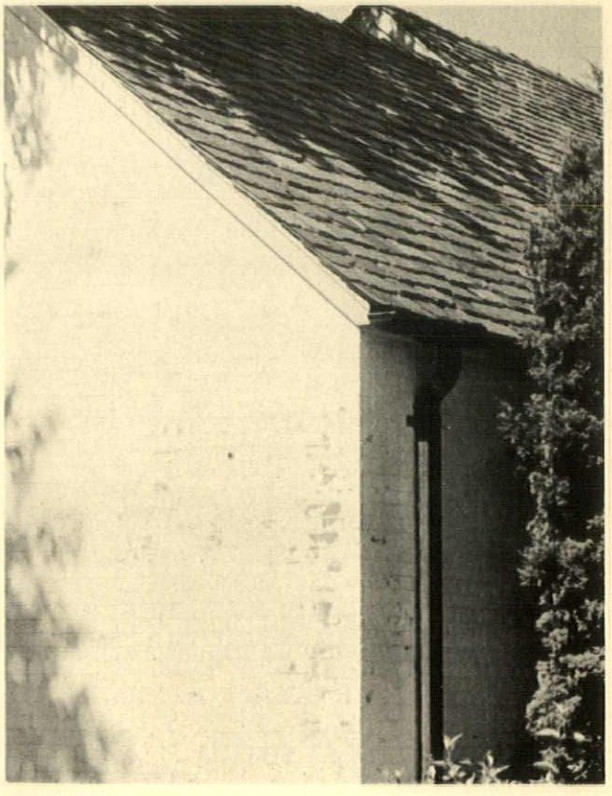


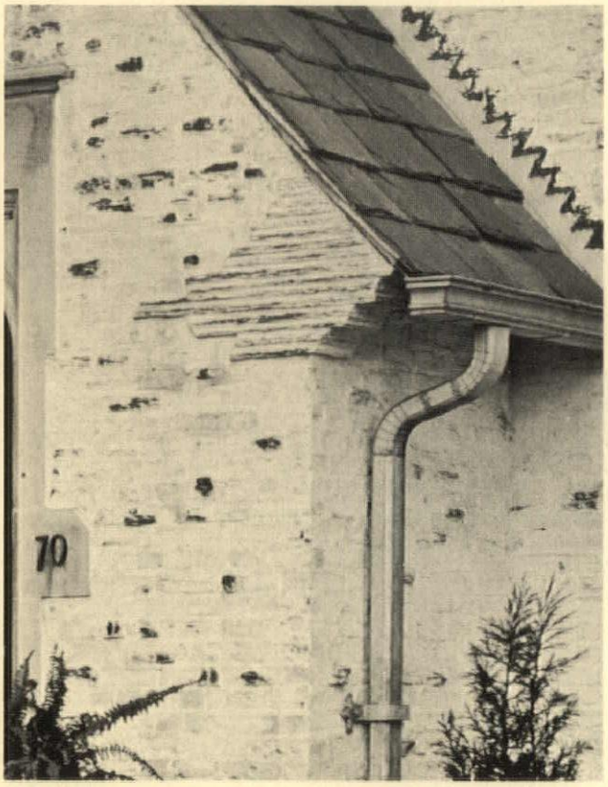
Richard H. Dana, Jr.

Peabody, Wilson & Brown



James W. O'Connor

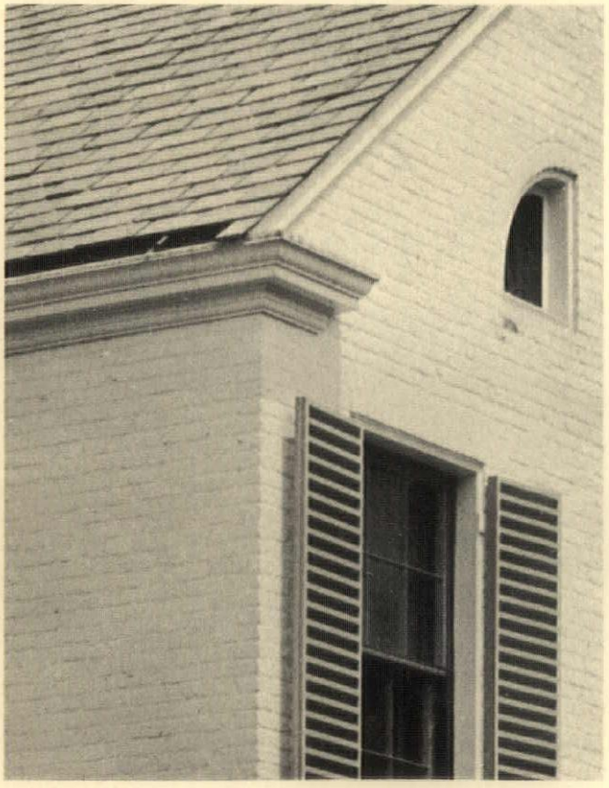




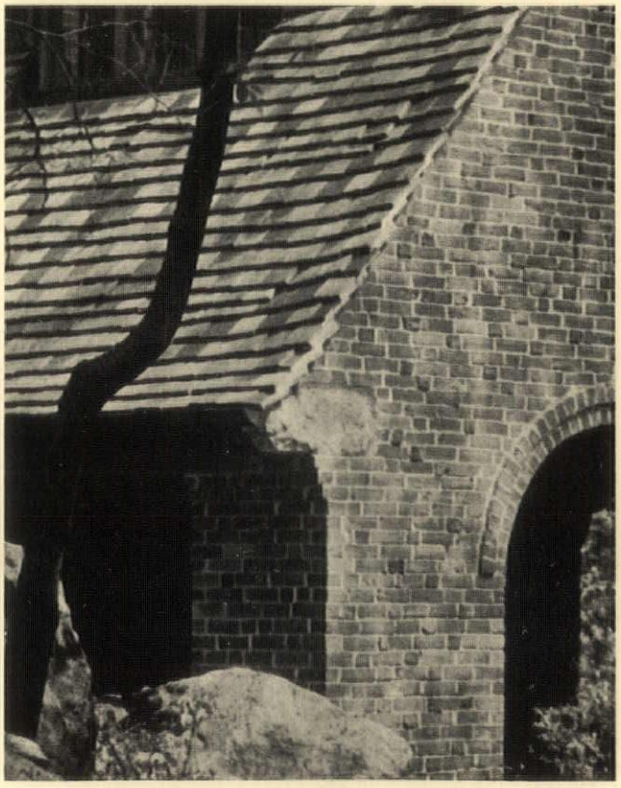
Guilbert & Betelle

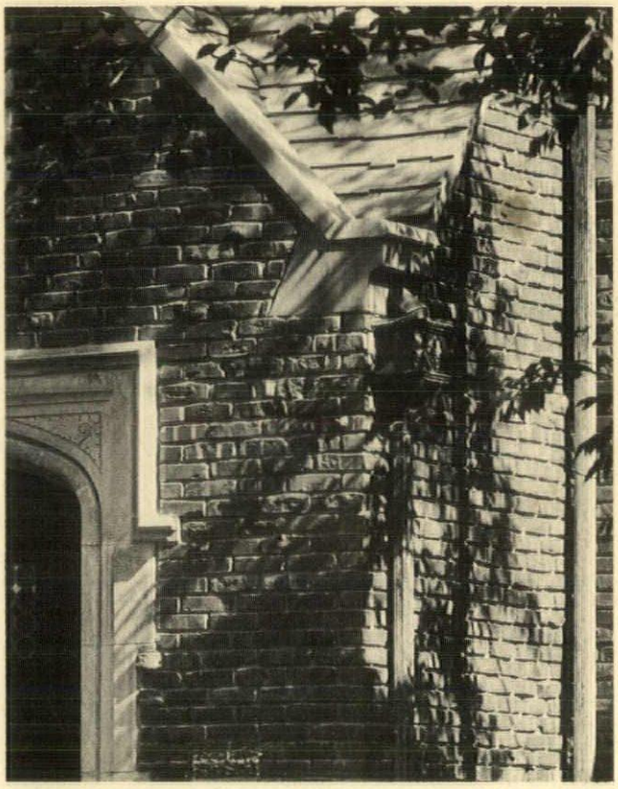
LeRoy P. Burnham

John M. Bell

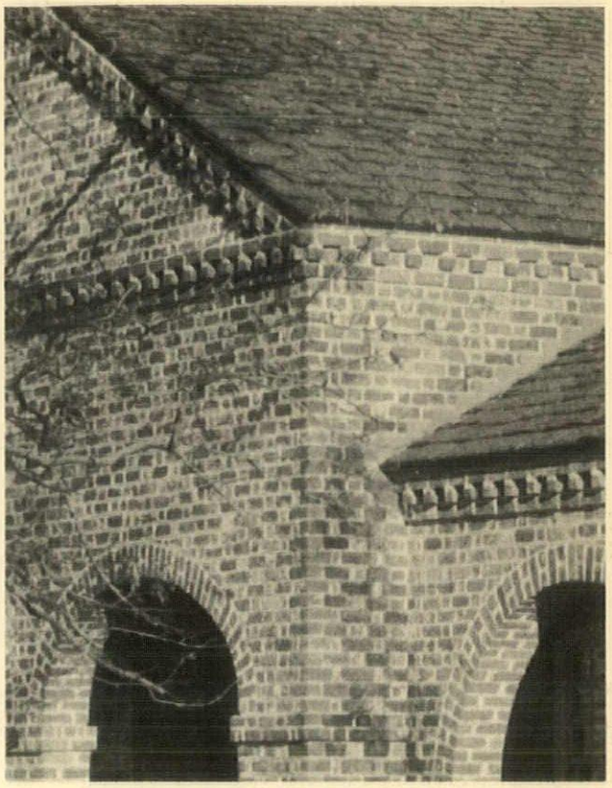


Julius Gregory



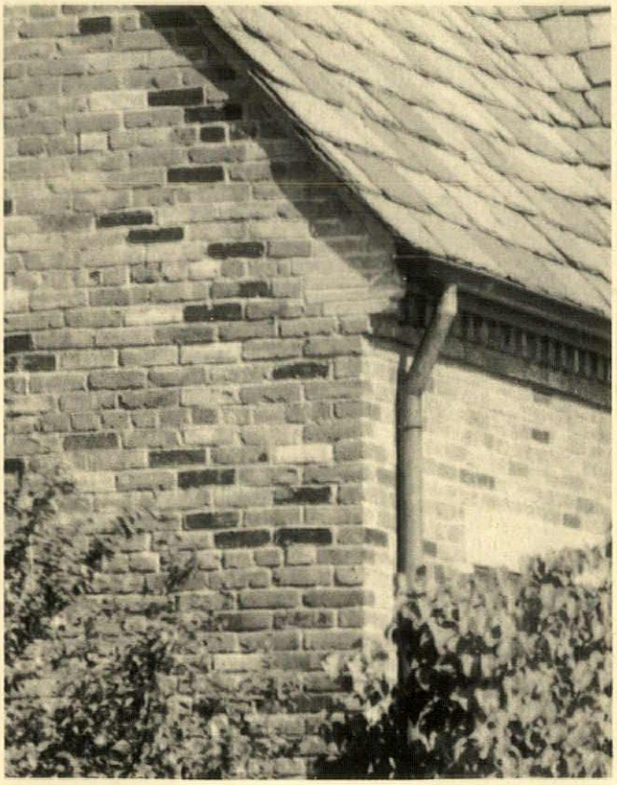


J. Ivan Dise

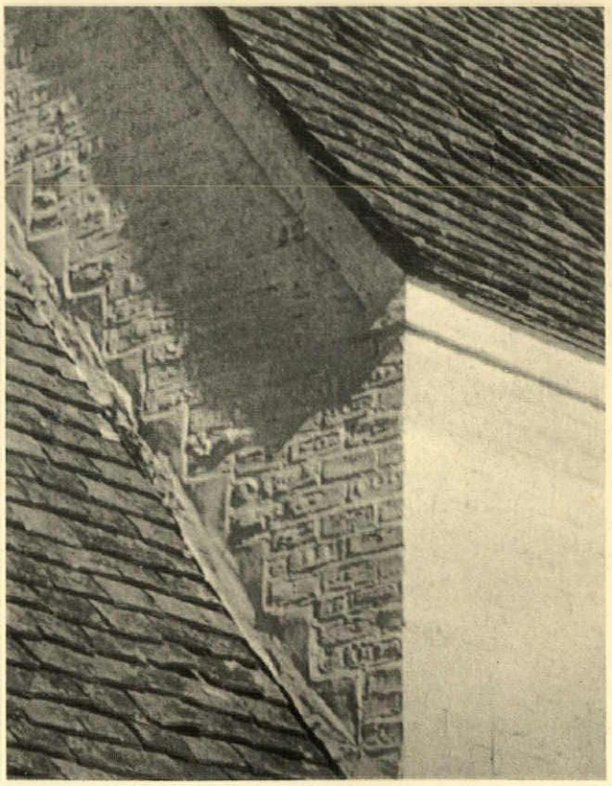


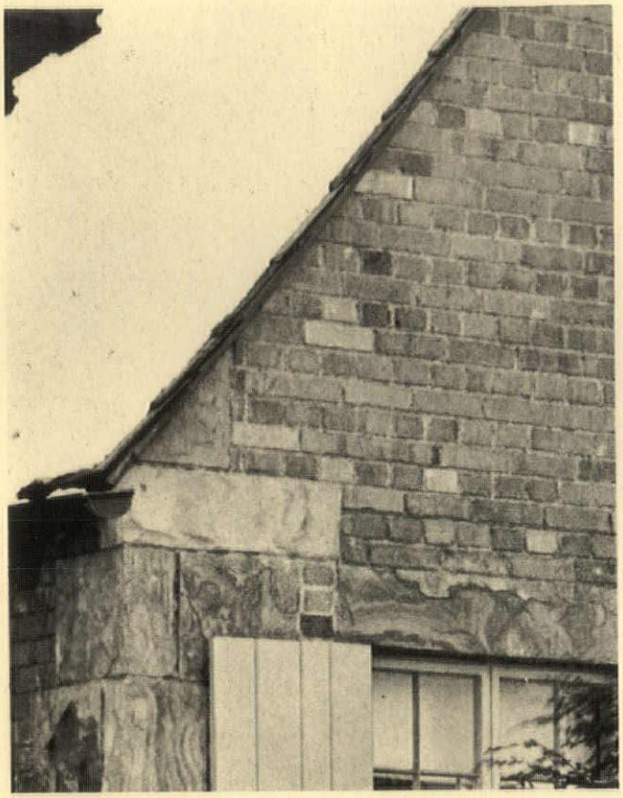
W. Duncan Lee

Dunn & Copper

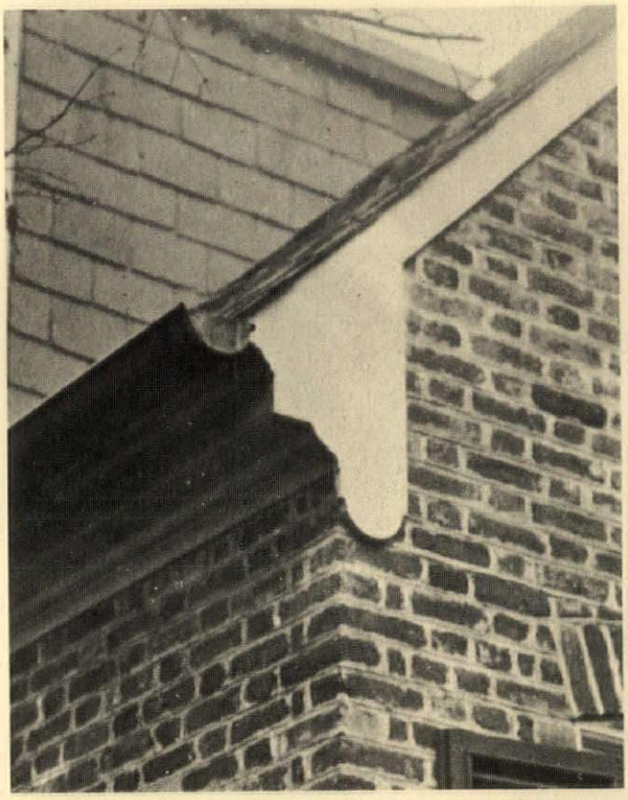


Frank J. Forster, R. A. Gallimore



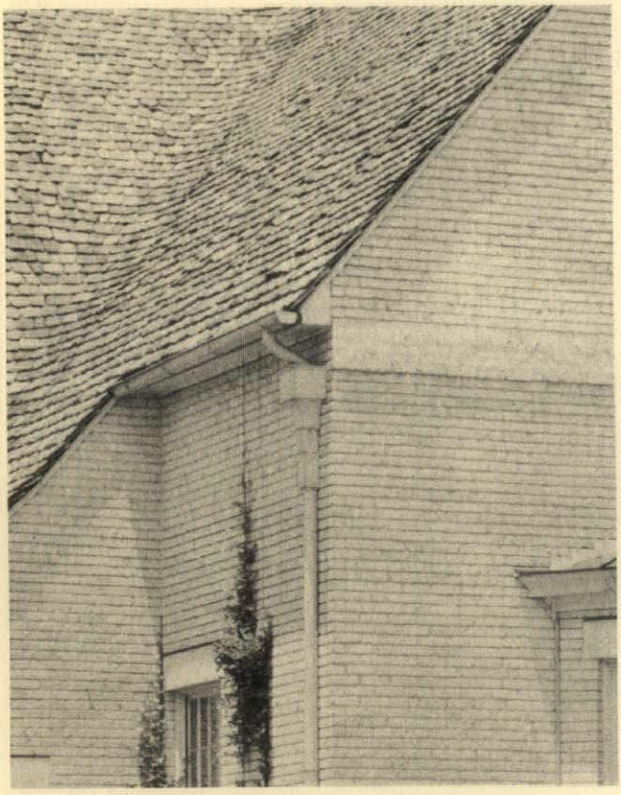


Andrew J. Thomas

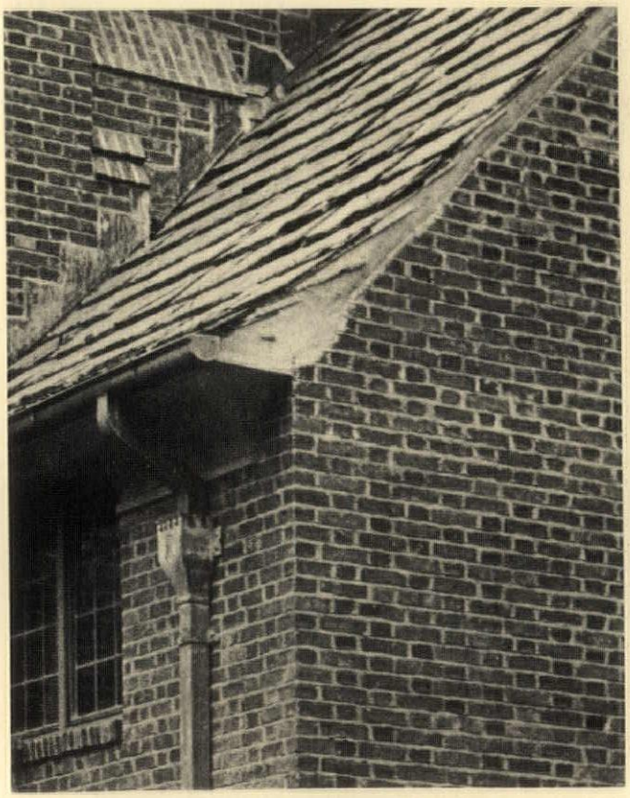


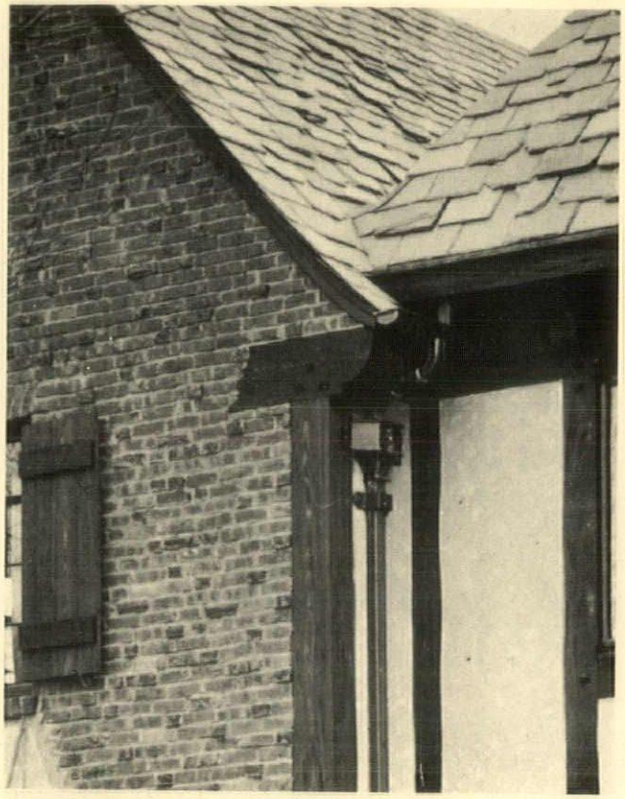
Washington's Headquarters, Fredericksburg, Va.

Hentz, Adler & Schutze

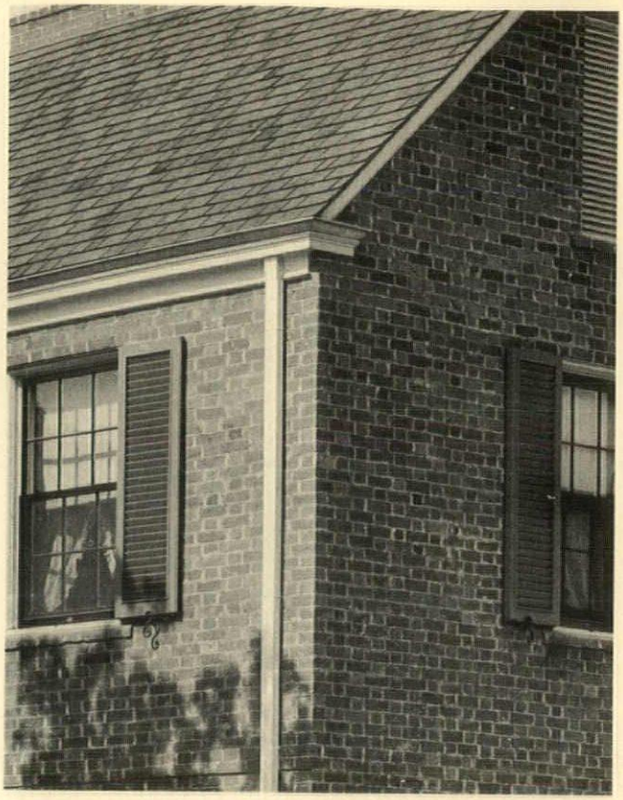


Bertram G. Goodhue



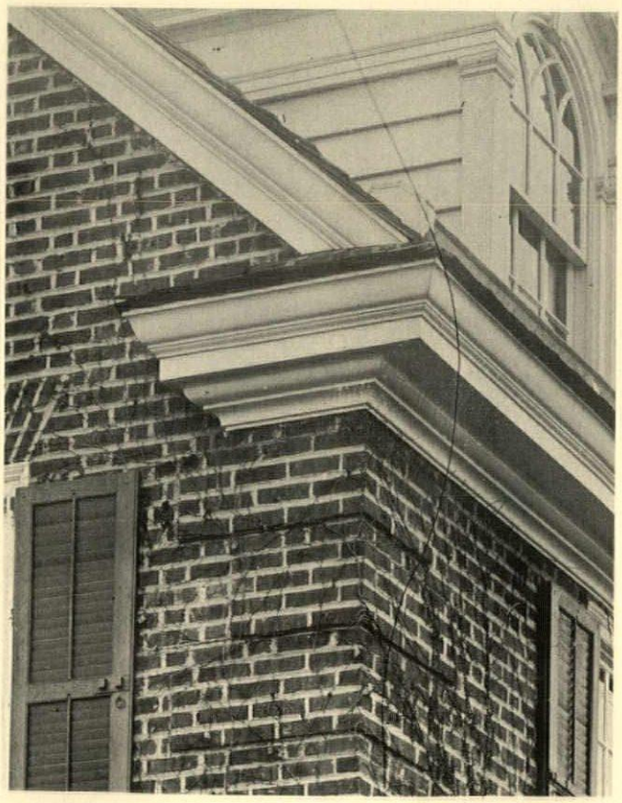


Olive Tjaden

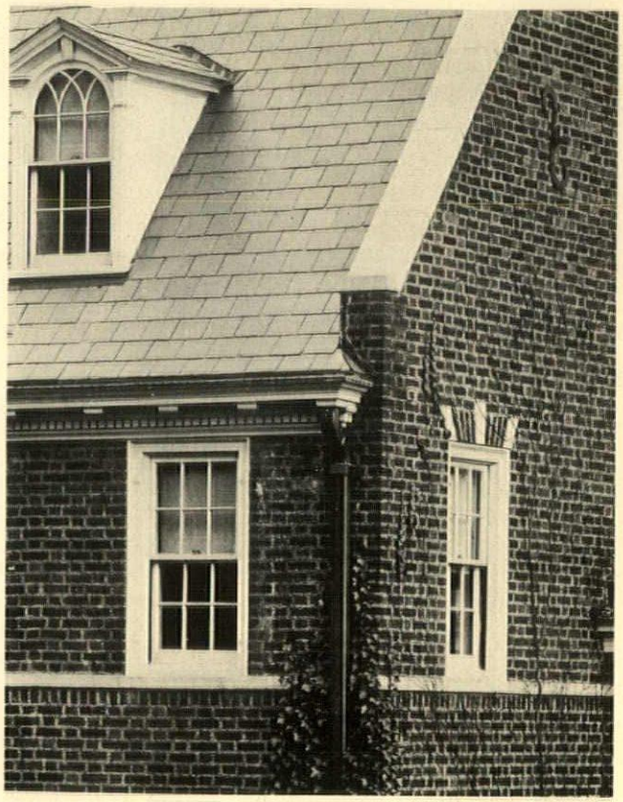


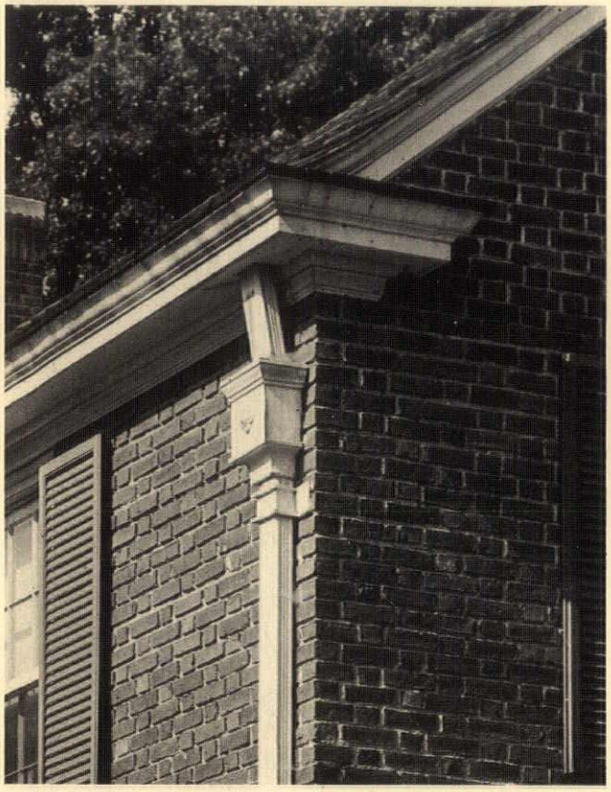
Edmund B. Gilchrist

Wood cornice over brick quoins

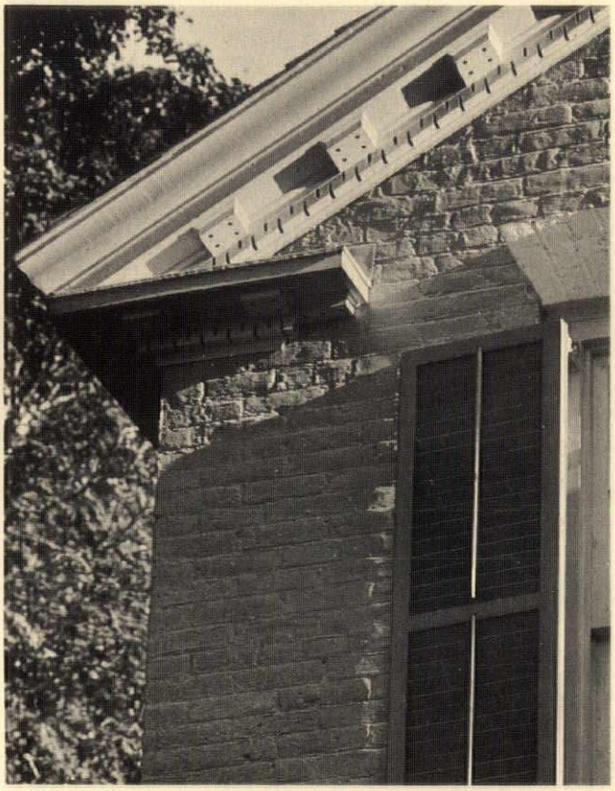


Wood cornice and the gable parapet



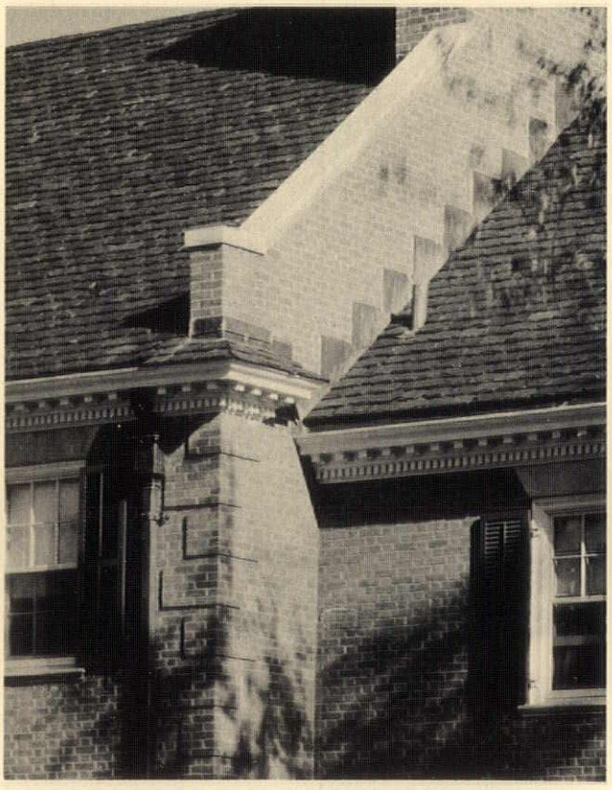


Dwight James Baum

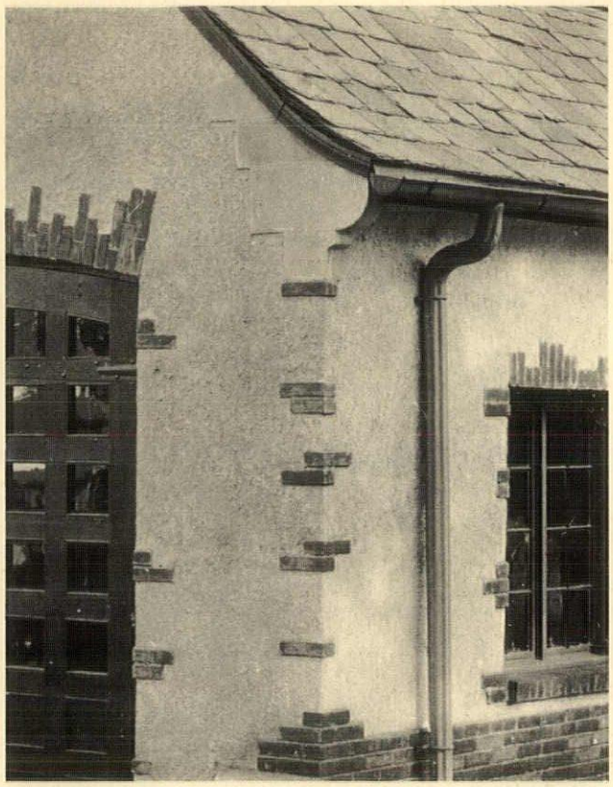


H. M. Woolsey

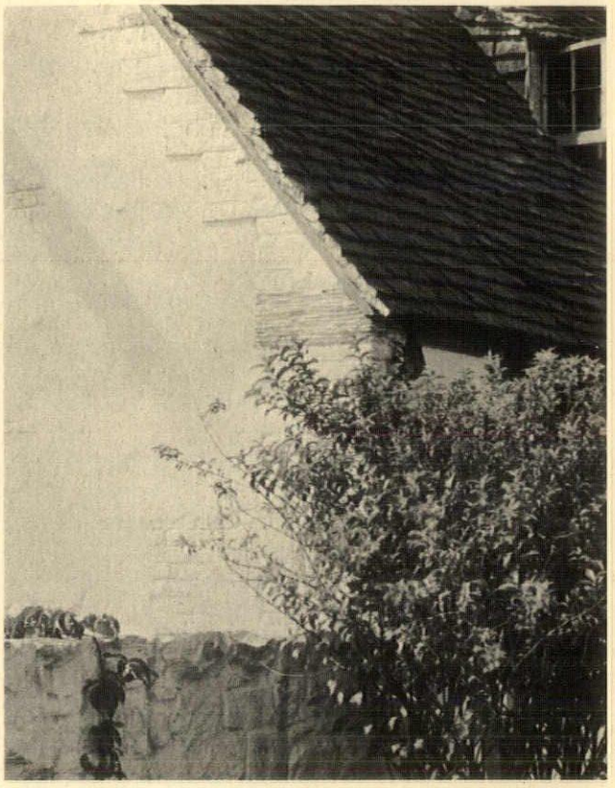
Slee & Bryson



Aymar Embury II

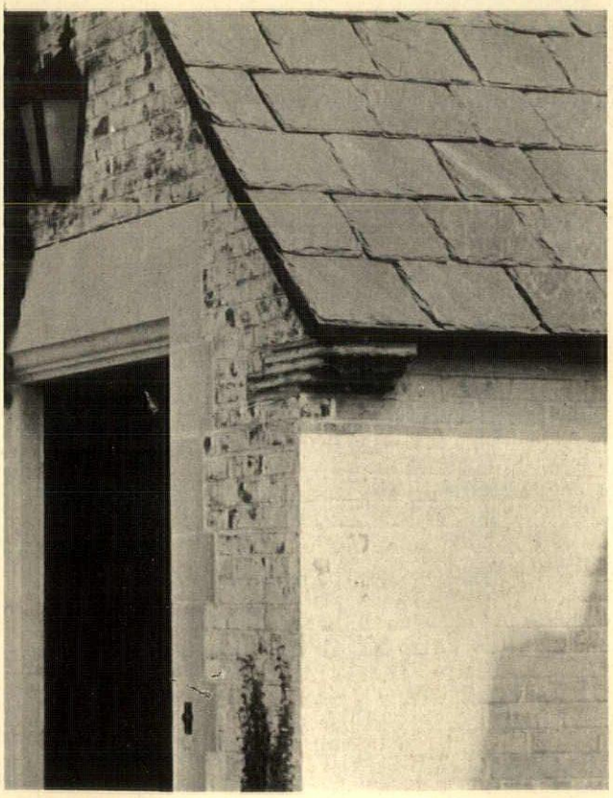


Schenck & Williams

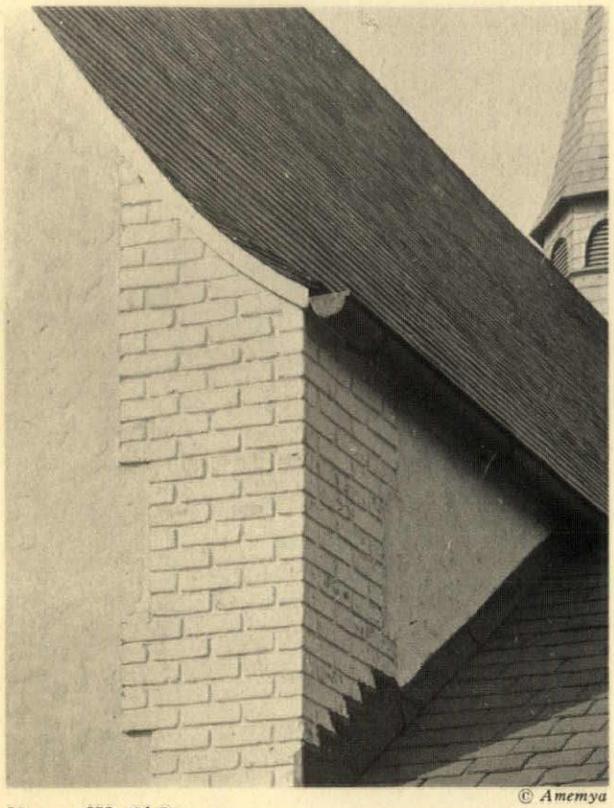


Greville Rickard

Roger H. Bullard

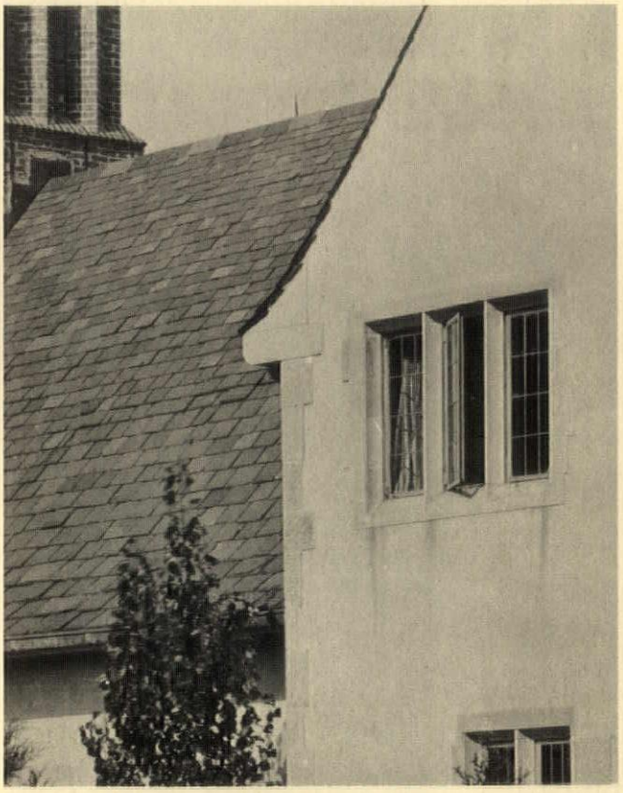


Near Bellac, France



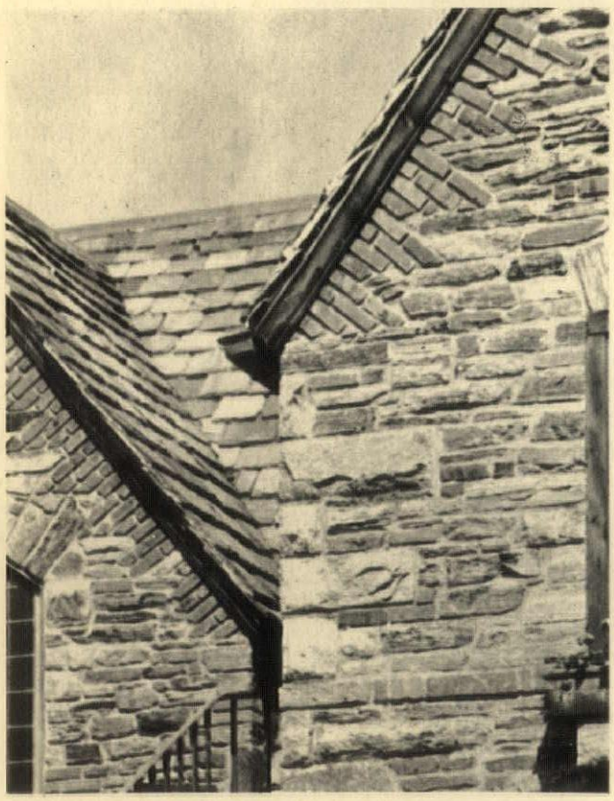
© Amemya

James W. O'Connor

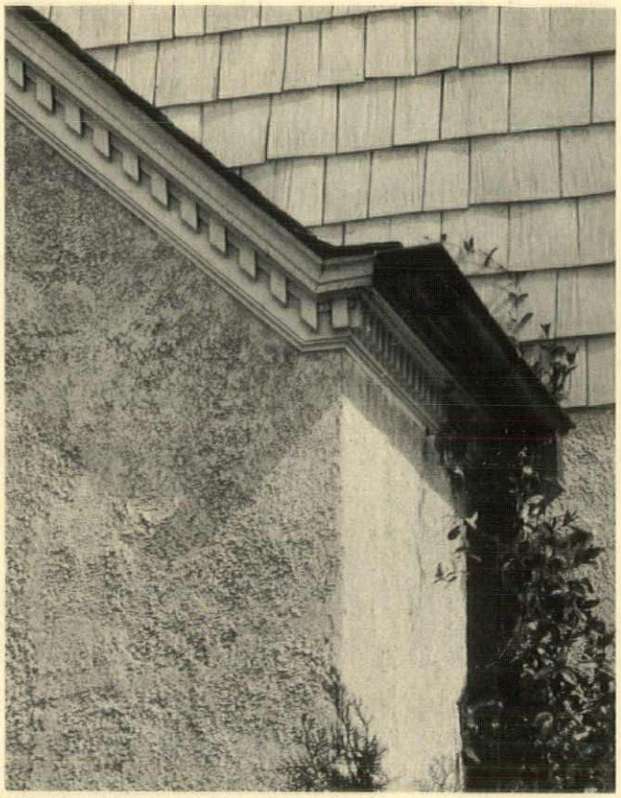


George D. Mason & Company

Office of John Russell Pope



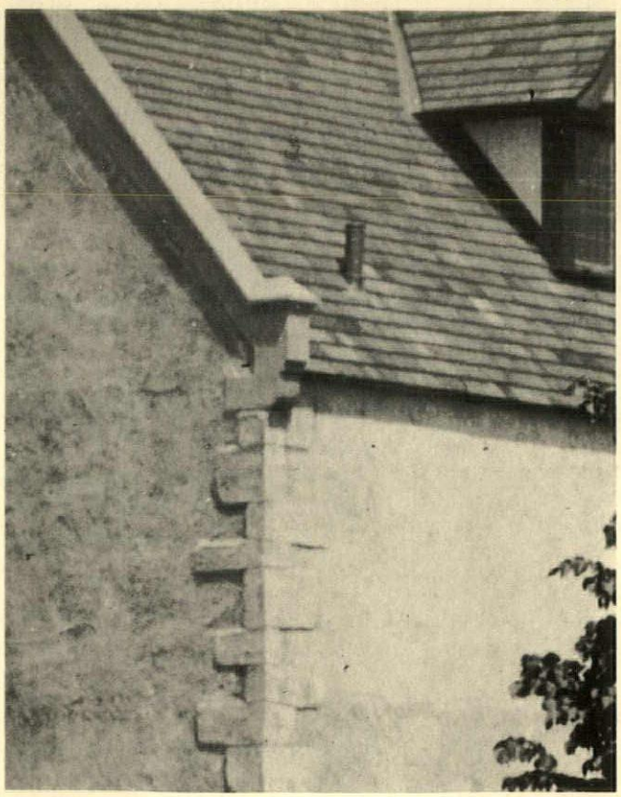
Greville Rickard



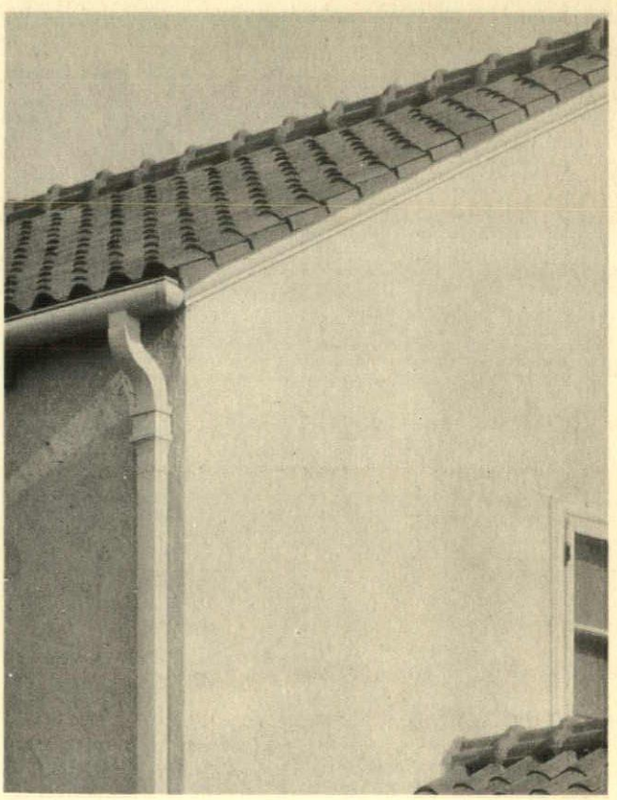
Moise H. Goldstein

William Heyl Thompson

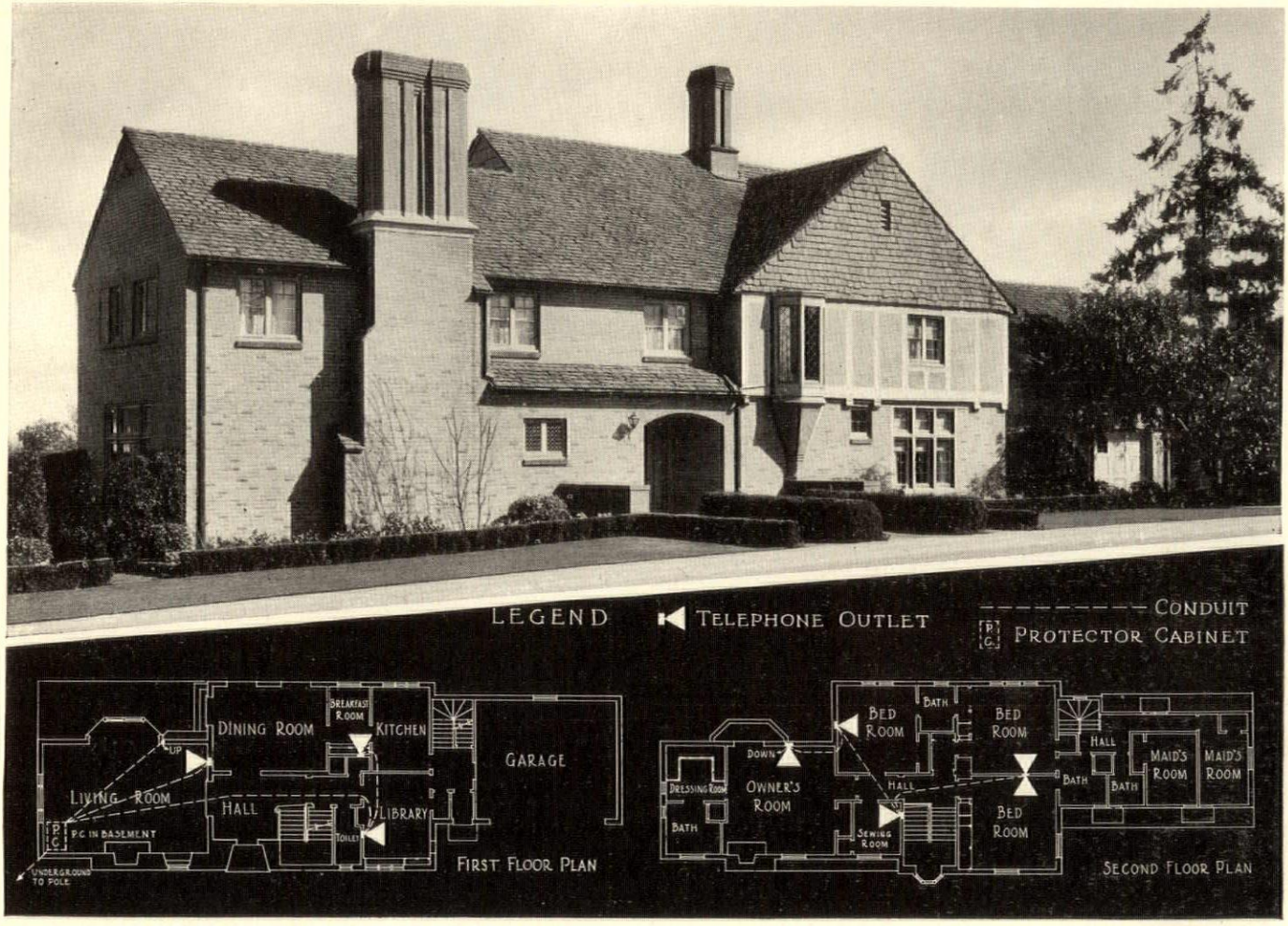
Sulgrave Manor, England



Adams & Adams



CONSIDER TOMORROW'S TELEPHONE NEEDS IN PLANNING FOR TODAY'S



The residence of William H. St. Clair, 1666 Shenandoah Drive, Broadmoor, Seattle, Washington, is equipped for telephone convenience with built-in conduit serving eight outlets. WILLIAM J. BAIN *and* LIONEL H. PRIES, Architects, *Seattle.*

THE telephone needs of any given residence change with the years — and the occupants. Proper planning in advance assures telephone arrangements that are flexible enough to meet almost any demands that may be made.

By specifying telephone conduit within walls and floors, outlets can be located at strategic points throughout the house. Then there are sure to be *enough*, and the owner can use any or all, exactly as they're needed. In addition, wiring is concealed and there is greater freedom from most types of service interruptions.

Let the local telephone company help you choose the right type of telephone equipment and installation for your residence projects. They'll do it gladly, without charge. Just call the Business Office and ask for "Architects' and Builders' Service."

(*Continued from page 5*)

WHAT IS VEOS?

It is the trade name for the new sink manufactured by the Youngstown Pressed Steel Co, of Warren, Ohio. It means "Vitreous Enamel on Steel." Veos sinks are steel sinks. Over their rugged, sturdy base of steel brilliant coats of white enamel are electrically fused. And they are light in weight. The combined attributes of light weight, strength, attractively designed appearance, and economy make Veos sinks worth investigating before you draw another specification. Send for a complete catalogue of the Veos line.

GOOD AIR

We have at hand an interesting brochure from the Air Conditioning Division of the General Electric Co., 120 Broadway, New York City. Why good air is essential and how to have it at all times is the message—and it is an essential one for any one who would undertake to design a practical modern home. Construction and operating details of the G. E. Air Conditioning System are given.

SAFETY TREADS

Recent release from the Norton Company, of Worcester, Mass., announces Alundum Rubber Bonded Safety Treads especially suitable for schools, stores, office buildings, and hospitals. The unit is supplied in various lengths and widths. It can be installed over wood, steel, concrete, or stone. This new Norton floor product is composed of Alundum Aggregate securely bonded in a reinforced base of hard rubber. Non-slip effectiveness is achieved at the very nosing edge—that is where the foot pivots—and is permanent. Additional data will be sent on request.

MAINTAINING ARCHITECTURAL ALUMINUM

The Skybrite Co., of Cleveland, Ohio, has issued a set of very useful and authoritative specifications covering the maintenance and protection of architectural aluminum. This in conjunction with the Aluminum Co. of America, whose research laboratories have tested and approved all the cleaning materials specified. With the increasing use and wide application of this versatile metal, such directions as these mentioned are indispensable.

"AGELESS" SCREEN CLOTH

News of a screen metal resisting corrosion and staining comes from the International Nickel Co., Inc., of 67 Wall Street, New York City. The screening is made of Inconel, a new alloy containing approximately 80 per cent pure nickel, 12 to 14 per cent chromium, and about 6 per cent iron. It is silvery white and when drawn into wire has a tensile strength more than sufficient for the requirements of wire fabric. Requiring no paint, upkeep is practically eliminated. Test data, cost detail, etc., will be gladly furnished on application.

THE NEW FRIGIDAIRE

Do not specify for refrigeration equipment until you have examined the new Frigidaire line. Send for data, etc., Frigidaire Corporation, Dayton, Ohio.

TRADE CUSTOMS—MARBLE

The Marble Industry Employers Association, of 270 Passaic Street, Newark, N. J., have compiled a useful booklet on their trade customs. It will come in handy when you are preparing marble specifications.

UNIT PANEL SYSTEM

The Bureau of Design Development of the American Radiator & Standard Sanitary Corp., 40 West 40th Street, New York City, has sent us descriptive material on the latest developments in unit bathroom panels and their application. Separate panels are provided for lavatory and bath, each complete with not only logical accessories but also integral chassis and plumbing casings. It is to be noted that these do not call for any change in plumbing technique or practice, but are a logical development in the trend toward fabricated houses and the correlation of housing elements. Adaptability and flexibility are virtues of the system. You'll be interested.

INTERIORS OF CHARM

A handsome and ideaful book comes from the Celotex Company of 919 N. Michigan Avenue, Chicago. It is an interesting exhibit of the progressive use of Celotex in obtaining interiors of both charm and comfort as well as efficiently insulated. It is easy to think we know just how a product can be used, but a book like this always shows the many possibilities overlooked or not thought of.

INDUSTRIAL MOTORS

The Minneapolis-Honeywell Regulator Co., of Minneapolis, Minn., has developed new types of industrial motors. Their catalogue gives full description and uses and includes important tables.

HEALTH GLASS

The Vitalite Co., of 500 Fifth Avenue, New York City, announces a flexible health glass known as Vimlite. It is made by embedding zinc-coated screen cloth in a thick transparent film of cellulose acetate, and transmits a high percentage of ultra-violet ray. The uses for this glass are many and varied. Data sent on request.

PRODUCERS' COUNCIL

The Research Bulletins on Building Materials and Appliances received regularly from the Producers' Council, 19 West 44th Street, New York City, are of immense practical value. No. 15 contains data on many items which enter into your daily practice. If you are not on their mailing list, get on; it will pay you.

YORK VAULTS

A. I. A. No. 189, York Fire Proof Vault Doors, is a most comprehensive book of specifications for York Vaults, received from the York Safe and Lock Co., of York, Pa.

OIL BURNER

Folder from the Wayne Oil Burner Corp., of Fort Wayne, Ind. The Wayne Oil Burner is described as attractive and clean enough to be installed in your living-room. That may be so, but our living-room is still a living-room—any way the Wayne product is quite a product and worth your looking into.

CENTRALIZED SOUND DISTRIBUTION

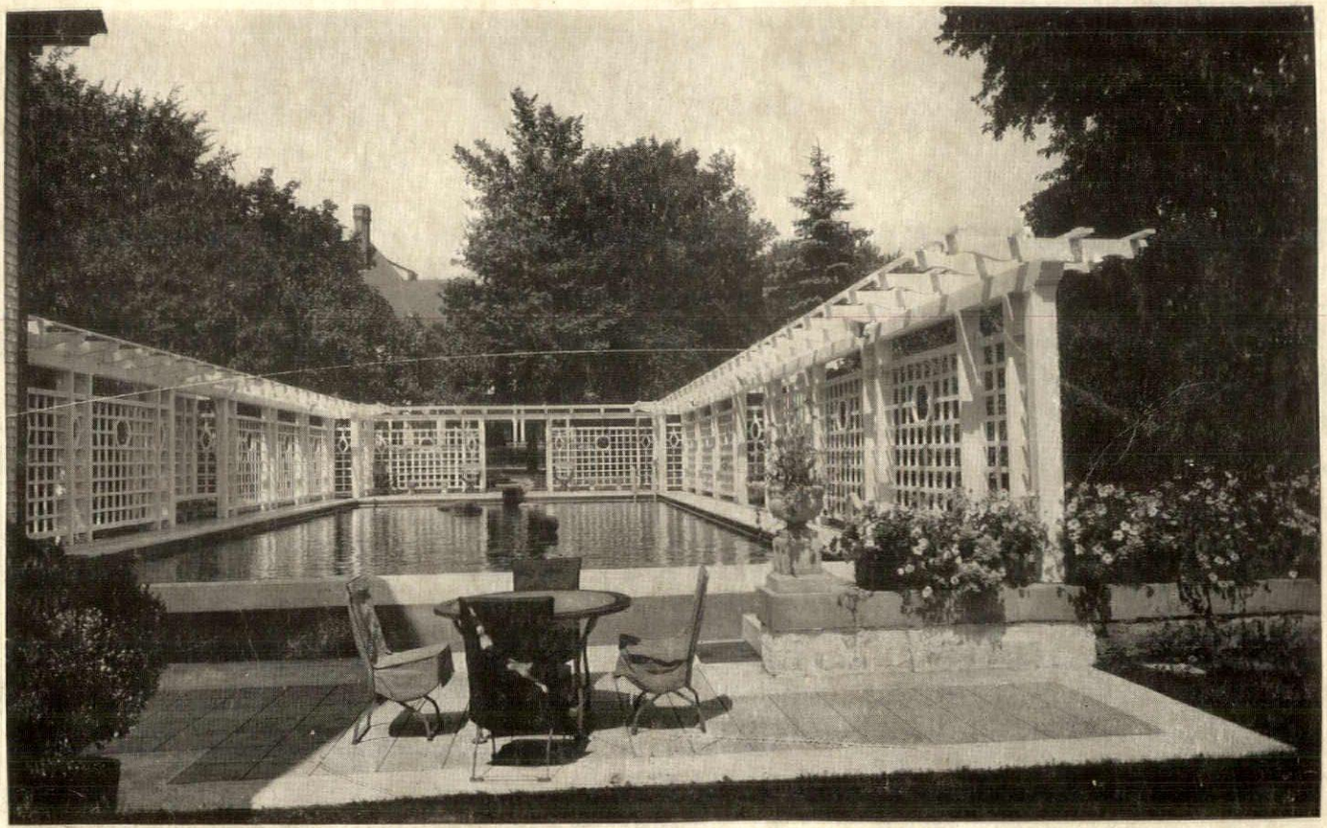
The RCA Victor Co., Inc., of Camden, N. J., will be glad to send you an Outline of Specifications for Centralized Sound Distribution Systems and sample specifications for Sound Reproducing and Projection Equipment. They are very comprehensive and will be exceedingly useful to those confronted with these problems.

GLASS

LIBBEY-OWENS-FORD GLASS COMPANY, TOLEDO, OHIO, manufacturers of Highest Quality Flat Drawn Window Glass, Polished Plate Glass and Safety Glass; also distributors of Figured and Wire Glass manufactured by the Blue Ridge Glass Corp. of Kingsport, Tenn.

Although the cost of glass constitutes but a very small fraction of the cost of construction, the quality of glass influences the appearance of a building perhaps more than any other single item . . . especially so when glass is used so profusely as it is in following the modern architectural trend. Bright, clear glass that gives even reflections emphasizes and enhances every other feature of design and creates an atmosphere that it is impossible to achieve by any other means. The fact that L·O·F Polished Plate Glass and Improved Quality Window Glass are used so generously in so many important pieces of construction is evidence of their superior quality. For details, refer to Sweet's Catalogues or to any Libbey·Owens·Ford district sales office listed therein.

LIBBEY·OWENS·FORD
QUALITY GLASS



A W & T Chlorinator Sterilizes the Private Plunge of Mr. C. H Good Moline Illinois

CHLORINATION IS THE FOURTH DIMENSION

Sixty feet long—30 feet wide—average depth 4 feet—and chlorinated. The fourth dimension that assures safe, sterile water. The swimmer is never away from the protection of residual chlorine. It is everywhere in the pool. Into every corner—and from top to bottom—chlorine carries a residual disinfectant—lasting protection against every source of contamination. That is why leading sanitarians and health authorities call chlorination . . . "by the use of proper apparatus . . . the most satisfactory method of pool disinfection."*

That W & T chlorinators supply the "proper apparatus" is attested by over 16,000 units used in all types of sanitary service. Over 3000 W & T chlorinators assigned to swimming pool disinfection repay their owners with accurate, dependable service—a service your client can have from W & T equipment.

*Article XVIII Report of the Joint Committee on Bathing Places of the American Public Health Association and the Conference of State Sanitary Engineers. Reprints of this report are available on request. Ask also for individual pamphlets on the purification of private, commercial, high school, college, country club, municipal, Y. M. C. A., hotel and apartment swimming pools.

"SWIM IN DRINKING WATER"

WALLACE & TIERNAN CO., INC.

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