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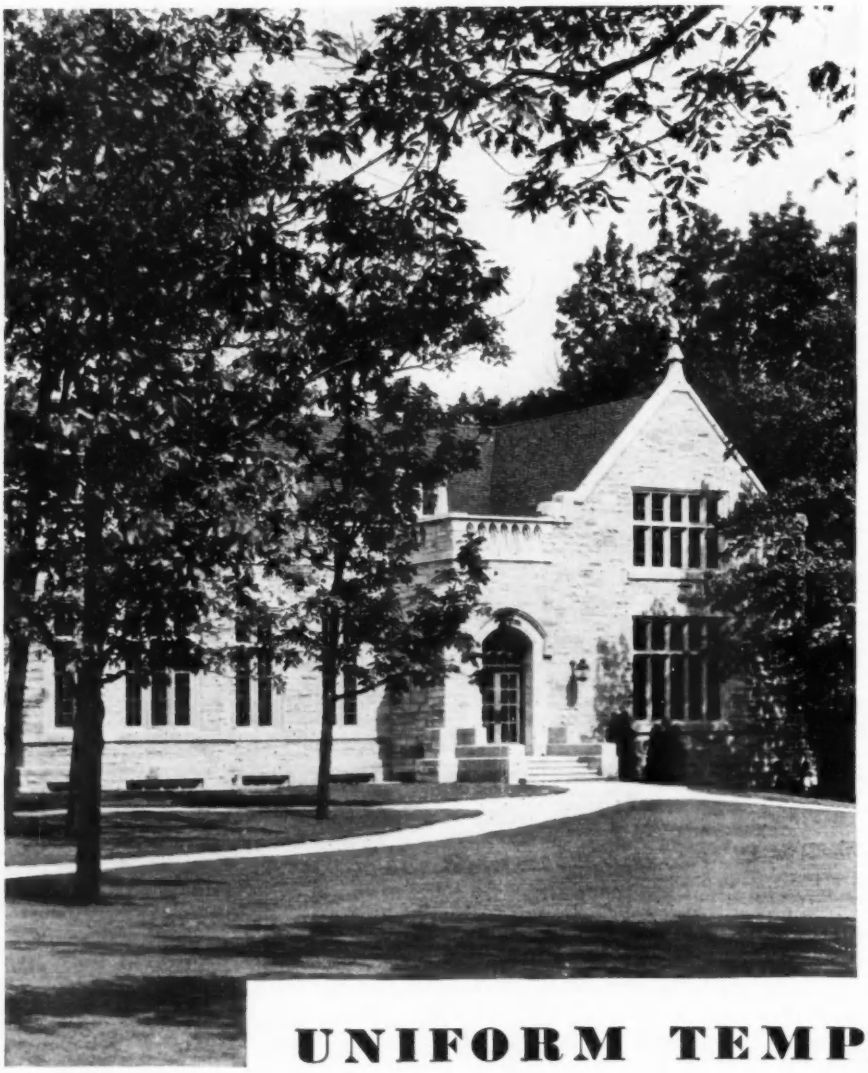

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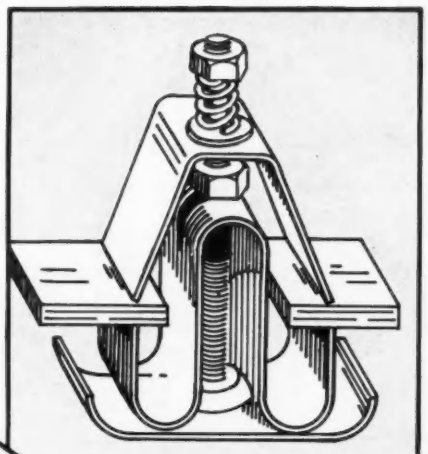
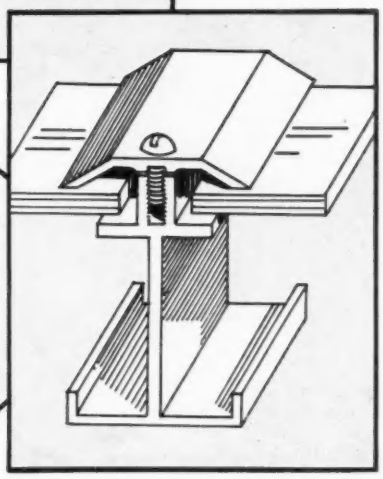
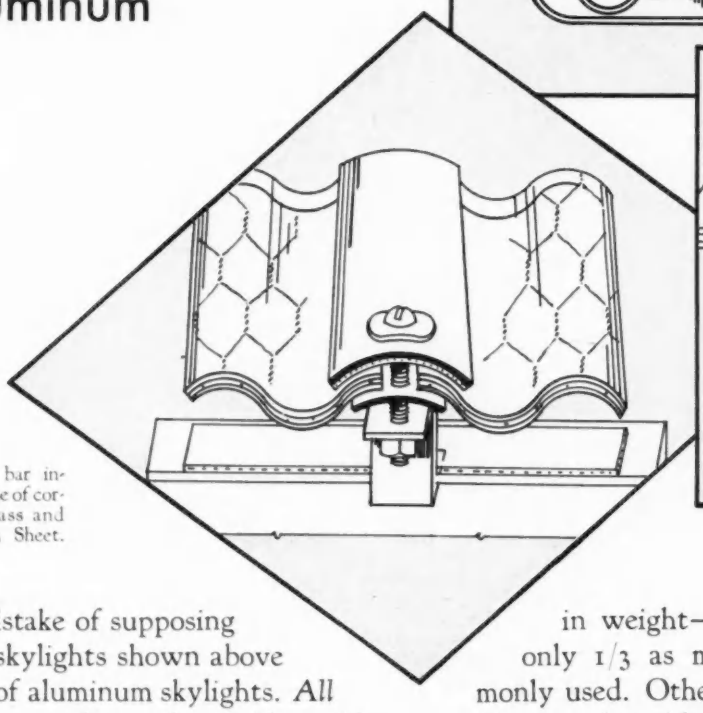


Typical skylight bar made of Alcoa Aluminum Sheet.

(below) Typical skylight bar of Alcoa Aluminum Extruded Shapes.





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The ARCHITECT'S LIBRARY

GENERAL ENGINEERING HANDBOOK. Charles Edward O'Rourke, Editor-in-Chief. Published by McGraw-Hill Book Company, Inc., New York and London. 921 pages. Many line diagrams. Price $4.

This is a reference book for practicing engineers and students, containing tables, formulas, and condensed information concerning all branches of engineering. It has been assumed by the thirty associated editors that users of the book are familiar with general theory and practice, use of tables, and the mathematics involved.

A table of contents summarizes the information in the thirty-one sections of the book. Six sections are of importance to all engineers; eleven are primarily for civil engineers; nine for mechanical engineers; and five for electrical engineers. Each section concludes with a bibliography of the standard works on that particular subject.

THE DESIGN OF LETTERING. By Egon Weiss. Published by The Pencil Points Press, Inc., New York. 192 pages. 155 text illustrations; 29 supplementary plates. Price $5.

The author of this book presents a system of spacing letters which he calls the "net value" method. A description of this time- and labor-saving procedure appeared in Pencil Points five years ago. Other parts of this present work have also appeared in that publication.

The subject of lettering is treated comprehensively with chapters on history, equipment for letters, and many alphabets, including Greek and Hebrew, with construction and "net values" clearly indicated. Examples of old and modern decorative lettering on paper and as executed in different materials by methods described in the text demonstrate the application of the various alphabets. The book is completed by brief chapters on monograms, color, and drawings for reproduction.

THE PRACTICAL BOOK OF ARCHITECTURE. By C. Matlack Price. Published by J. B. Lippincott Co., Philadelphia and London. 367 pages. 267 illustrations. Price $7.50.

A new edition of a book for laymen. The first part summarizes origins and evolutions of architectural types, illustrated with many American resulting types as seen by an Englishman. The second part gives information designed to enable a prospective client to cooperate intelligently with an architect. A supplementary note on new developments includes photographs of buildings recently erected in New York City.

BRIDGE ON J. P. MORGAN ESTATE
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CHARLES W. LEAVITT & SON, LANDSCAPE ARCHITECTS

YEAR BOOK OF THE NEW YORK CHAPTER OF THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS. Catalogue of the Ninth Annual Exhibition, 1932. Published by The Architectural Catalogue Co., Inc., New York. 39 photographs. Price 50c.

Excellent photography of representative effects obtained by landscape architects of the New York Chapter.

THE VILLA MADAMA, ROME, A Reconstruction by W. E. Greenwood. Published by Wm. Helburn, Inc., New York. 29 plates. Price $20.

The Villa Madama lies at the foot of Monte Mario, facing the Tiber, a mile or two north of St. Peters, and not much further from the Porta del Popolo. It was designed by Raphael and built by San Gallo for Cardinal Giulio Medici. But the Cardinal became Pope Clement VII in 1523, and work must have ceased some few years later.

The papal hat appears only once in the decorations. The villa was planned on a magnificent scale, but only a portion was ever completed, and that has suffered severely with time. The most celebrated part is the decoration (walls and ceilings) of the great garden loggia, largely by Giulio Romano, and of some adjoining rooms.

Apart from the interior decoration, the villa would have little interest except for the drawings and plans that have been identified with it. Until recently only a few sketches by Romano were known, and the exact degree of Raphael's part in the matter is still uncertain. Probably he made the preliminary plan. Three of these drawings are given (Plates 27, 28, 29); the last represents the mature plan and is definitely assigned to San Gallo. From it the magnificence of the intention is quite evident.

After the death of Clement VII, the villa passed into the possession of the Farnese family, and from them to the Spanish Bourbons.

A. W. COLTON

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MINOR DOMESTIC ARCHITECTURE OF GLOUCESTERSHIRE. SERIES ONE. By Arthur T. Broadbent and Anthony Minoprio. Published by John Tiranti & Co., London. 19 pages of text; 5 pen and ink pages; 48 collotype plates. Price 21s.

This is the second work of the series, the first being "Minor Architecture of Suffolk" (by Dexter Morand, general editor of the series). Several other titles are in course of preparation.

The short introductory text gives information of a historical and architectural nature, explaining the evolution of the Cotswold style. The purpose of the series is to present a specially-made photographic survey by counties of the lesser-known architecture of England.

The French collotype plates seem particularly appropriate for the stone and brickwork illustrated.

DYNAMARHYTHMIC DESIGN. By Edward B. Edwards. Published by The Century Co., New York. 122 pages illustrated by many diagramatic drawings and design plates. Price $3.50.

A well-made book filled with designs drawn and analyzed by the author, a designer and illustrator of note, after the principles of Dynamic Symmetry rediscovered by the late Jay Hambidge. Of interest to architects, draftsmen, commercial artists, designers of textiles, tiles, ironwork, carving and books.

Disciplinary systems of design such as this and Claude Bragdon's projective ornament and magic squares require considerable imaginative taste in the application of form to the line pattern arrived at mathematically.

ACADEMY ARCHITECTURE AND ARCHITECTURAL REVIEW. Vol. 62—1931. Edited by H. W. Martin-Kaye. Published by B. T. Batsford, Ltd., London. 224 pages. 260 illustrations. Price 10s.

This annual is a collection of photographs, plans, interior and exterior renderings, of present-day British architecture. Most of this issue is devoted to the work of Sir Edwin Cooper, A.R.A., Royal Gold Medalist for Architecture, 1931.

DESIGNING HEATING AND VENTILATING SYSTEMS. By Charles A. Fuller. Published by The Scientific Book Corporation, New York. 272 pages. 112 illustrations. Price $3.

This revised third edition is practical for use as a reference by designers or as a text book by students of mechanical equipment of buildings. It explains the various systems of heating and ventilating in detail, gives theory, formulas, methods, and their application in practice. Information on allied subjects such as estimation of coal consumption, high-pressure steam for cooking, laundry, and process work complete the book.

THE COLLEGE LIBRARY BUILDING, ITS PLANNING AND EQUIPMENT. By James Thayer Gerould. Published by Charles Scribner's Sons, New York. 114 pages. No illustrations. Price $2.

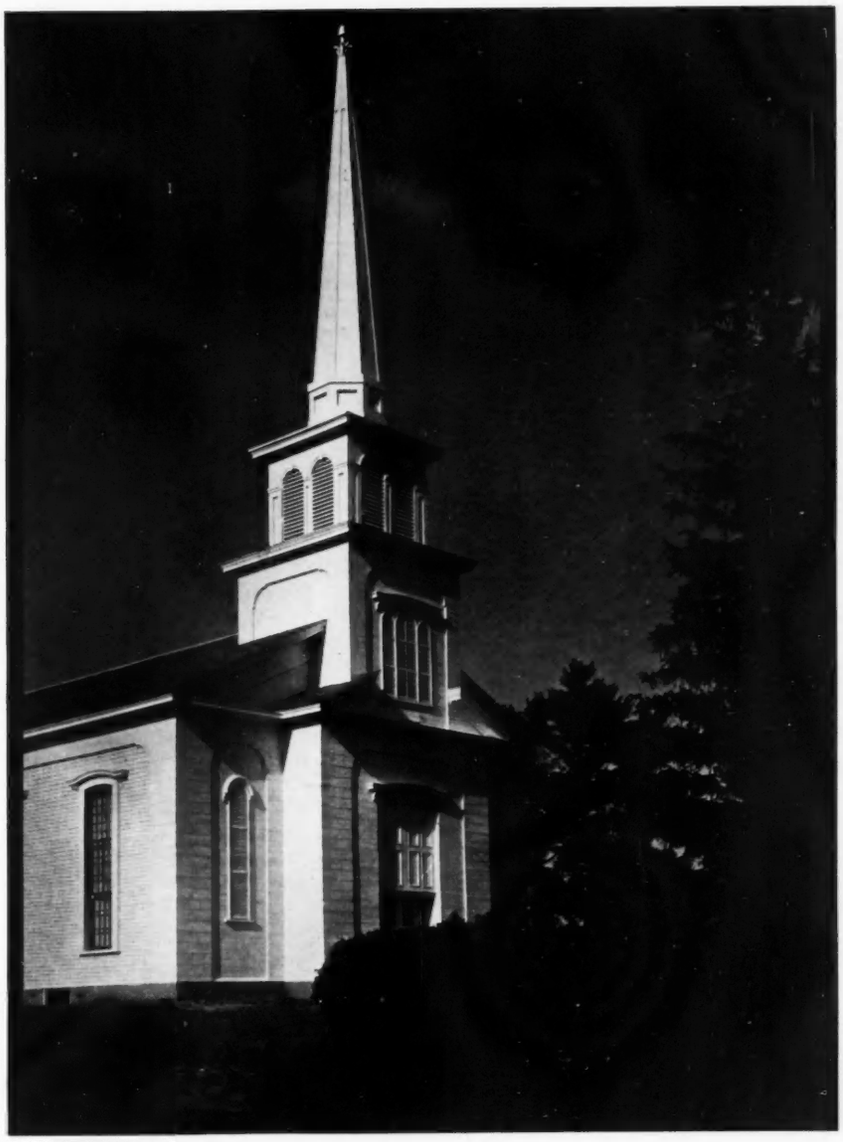
Under the auspices of the Carnegie Corporation Mr. Gerould has visited more than fifty representative American colleges and analyzed the library development of each. In this book he illustrates by examples and tables the prime necessity of planning for growth and expansion in every working library design. Neglect of this has resulted in great waste of money and educational efficiency in this most important unit of a college plant.

He stresses his ideal of centralization of books and proper relation of library to other buildings. He shows the need of considering the peculiarities of each individual college library problem with respect to site, climate, and student body. Methods of estimating relative and square-foot sizes of rooms for various purposes are noted. The different types of rooms are described with full details of the especial contribution of each to the efficiency of the whole.

The subjects of equipment, with its standard dimensions, lighting, acoustics and other constructional details are treated sufficiently to be informative to a lay member of a building committee or to an architect unacquainted with the latest developments in library design. Cost analyses of three libraries showing the percentage relation of various parts of building and equipment complete the study.

LUMBER AND ITS USES. By Royal S. Kellogg. Published by The Scientific Book Corporation, New York. 378 pages. Many tables, charts and illustrations. $4.

This comprehensive manual on lumber, now in its fourth edition, is valuable to any one using wood for any purpose. It lists physical properties, uses, kinds, sources, and gives specification and design information, as well as describing finishes, fire resistance, seasoning and preservation. The author also gives an account of the actual production of lumber and a review of the industry.



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EXHIBITIONS AND EVENTS

September 29-October 14	Exhibition of model housing for hillside groups at the Architectural League, New York City. Drawings and plans prepared by a summer study group of graduate students and university instructors under the direction of Mr. Henry Wright. These projects will be illustrated in the October issue of The Record.
Until October 1	"The Designer and Industry"—exhibition of The National Alliance of Art and Industry at the Art Center Building, New York City.
October	International Congress for Modern Architecture at Moscow, U. S. S. R. Program: "The Functional City."
October	Shortly after first week of this month the Associated General Contractors will meet in Washington. Dates to be announced later.
October	National Conference on construction to be held in Washington. See later announcement for dates.
October 3-7	Twenty-first Annual Safety Congress of the National Safety Council in Washington.
October 5-8	Meeting of the American Society of Civil Engineers in Atlantic City.
December 5-10	Tenth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

BRITISH ARCHITECT TO LECTURE HERE

Clough Williams-Ellis, an English architect, will be in the United States to give a series of lectures at educational institutions this fall, it is announced by the Institute of International Education which is arranging his speaking tour.

Mr. Williams-Ellis is president of the British Design and Industry Association, and has for several years been a leading figure in movements against urban and rural ugliness and discomfort.

A. I. A. TO PROMOTE RELIEF PROJECTS

Speakers will be sent out by the American Institute of Architects to urge new housing commissions, explain the possibilities of the $2,000,000,000 emergency relief measure passed by Congress and promote model housing programs (described in this issue of The Record), it is announced by Robert D. Kohn, a member of an institute committee and also president of the Construction League.

HOUSING FOR EAST SIDE OF NEW YORK

Under the direction of Julian Clarence Levi, president of the Architectural League, plans are being worked out for remodeling several block fronts of partially vacant or totally vacant tenement houses on the lower East Side of New York City so as to make them habitable at a low cost.

A limited dividend corporation is also being formed in New York City by Robert W. Aldrich Rodger of the real estate firm of Brown, Wheelock, Harris and Company, to construct thirty-six apartment houses on the lower East Side of Manhattan Island. Mr. Rodger has applied to the Reconstruction Finance Corporation for a loan to be applied to the cost of the enterprise. The project as planned would involve an expenditure of about $45,000,000. It would be constructed under provisions of the New York State Housing Law and under Supervision of the State Board of Housing, with limited rentals and limited dividends on the capital invested.

ANNOUNCEMENTS

Harry B. Aarens, architect, announces the removal of his offices to Hollywood Professional Building, 7048 Hollywood Boulevard, Hollywood, California.

John J. McNamara has changed his address from Erick Avenue, Hewlett, N. Y., to 230 Mott Avenue, Inwood, Long Island.

U. T. Berg has moved from 8 Clark Street to 537 Ovington Avenue, Brooklyn, N. Y.

Bayard C. Noble, architect, has opened an office at 264 E. Meehan Avenue, Germantown, Philadelphia, Pennsylvania.

Harold H. Ehlert, registered architect, announces his new address as 2437 Tyler Avenue, Detroit, Michigan.

Edward W. Helms, architect, announces the opening of an office at 317 Franklin Avenue, Ridgewood, New Jersey, for the practice of architecture.

The eighth convention of Alpha Alpha Gamma, Women's National Honorary Architectural Fraternity, was held July 5-9 in Los Angeles. Barbara Jenkinson Hanley (University of Illinois), National Vice-President, presided at all meetings. The officers elected for the coming two years are: President—Irene McFaul; Vice-President—Alice Linsmayer; Secretary—Lois Dilworth; Treasurer—Anna Louise Eckhardt; Historian—Rosabel Grabek; and Keystone Editor—Mabel McCutcheon.

MEDARY SCHOLARSHIP AWARD

The Milton B. Medary Memorial Scholarship for graduate study in architecture has been awarded by the American Institute of Architects for 1932-33 to Frederick S. Webster of the Department of Architecture of Syracuse University, according to an announcement by Charles Butler of New York, chairman of the Committee of Award.

ION LEWIS SCHOLARSHIP AWARD

The second award of this Scholarship has recently been made to Henry Abbott Lawrence, who received the degree of M. F. A. at the School of Architecture of the University of Oregon in 1929.

FIR PLYWOOD AWARDS

Twelve new prizes of $25 each have been awarded by Douglas Fir Plywood Manufacturers for "design ideas" embodying this material. The winners are M. A. Johnson, Anthony J. Wildman, Clayton S. Hoyle, Raymond F. Gauthier, Harry G. Walker, E. C. Dindorf, Augustus J. Roeder, Robert Walling, C. A. Bottum, E. Colonna, J. Selckmann, Roy Phinney.

BAUHAUS CLOSED BY NAZIS

The Bauhaus of Dessau will close its doors on October 1, according to a news item in the N. Y. Herald-Tribune. The Dessau Board of Aldermen has passed a National Socialist resolution providing for the closing of this school of architecture and the dismissal of its teaching staff. The Bauhaus has been denounced as the source of what the Hitlerites called "Kultur Bolshevism" and the spirit of modernism as against old German traditions.

The school was founded in 1926 by Dr. Walter Gropius and includes, at present, 33 foreigners among its 166 students.

Galloway

PARK AVENUE IN NEW YORK CITY
VIEW SOUTH FROM FIFTIETH STREET

THE ARCHITECTURAL RECORD SEPTEMBER, 1932
VOL. 72—NO. 3

AN OPPORTUNITY FOR ALL ARCHITECTS AND CITY PLANNERS

By HAROLD S. BUTTENHEIM,
Editor of "The American City"

The adoption by Congress, followed on July 21 by President Hoover's approval, of the "Emergency Relief and Construction Act of 1932," brings to architects and city planners a unique opportunity for advancing their professional interests while rendering public service of fundamental importance.

Under Title II of the new act the Reconstruction Finance Corporation is authorized to provide Federal aid up to a total of $1,500,000,000, for various purposes, the most important of which to readers of THE ARCHITECTURAL RECORD are:

"To make loans to, or contracts with, States, municipalities and political subdivisions of States, public agencies of States, of municipalities, and of political subdivisions of States, public corporations, boards and commissions, and public municipal instrumentalities of one or more States, to aid in financing projects authorized under Federal, State, or municipal law which are self-liquidating in character . . . and

"To make loans to corporations formed wholly for the purpose of providing housing for families of low income, or for reconstruction of slum areas, which are regulated by State or municipal law as to rents, charges, capital structure, rate of return, and areas and methods of operation, to aid in financing projects undertaken by such corporations which are self-liquidating in character."

The act stipulates that "a project shall be deemed to be self-liquidating if such project will be made self-supporting and financially solvent and if the construction cost thereof will be returned within a reasonable period by means of tolls, fees, rents, or other charges, or by such other means (other than by taxation) as may be prescribed by the statutes which provide for the project."

"SELF-LIQUIDATING" PROJECTS ELIGIBLE FOR FEDERAL AID:

Water Works
Electric Light and Power Plants or **Electric Distribution Systems**
Gas Plants
Transit Systems (subway, elevated, street railway or bus)
Toll Bridges, Tunnels, Viaducts and **Canals**
Piers, Docks and **Markets**
Street Paving and **Road Building** (if amortized from gasoline taxes)
Street Opening, Widening, Paving and **Lighting Installations** (if paid for by special assessments on benefited property)
Sewers and **Sewage Disposal Plants** (if paid for by rents or assessments)
Garbage Disposal Plants (if paid for in part by charges to householders for garbage collection and in part by power generated or material salvaged through incineration or reduction)
Public Recreation Facilities for which fees are charged, such as Swimming Pools, Bathhouses, Bathing Beaches, Tennis, Golf, etc.
Reforestation
Shade Tree Planting (if paid for by assessment on abutting property)
Irrigation, Drainage and **Reclamation Projects** (if paid for by assessment on benefited property)
Public Buildings (where these will replace quarters for which rent is now being paid)
Public Comfort Stations (made self-supporting by fees charged and rent of concessions)
Airport Improvements (if maintenance and amortization can be covered by contracts for the use of the field, or by concessions, automobile parking charges, etc.)
Housing (under conditions mentioned in the Act)

It seems possible, also, that such buildings as **libraries, school and college buildings, hospitals, health centers,** and **charitable and correctional institutions** would be regarded as self-liquidating if pledges were received from local citizens to amortize the cost of the buildings over a period of years by voluntary gifts.

How broadly the Reconstruction Finance Corporation will interpret the foregoing definition is not yet known. As an aid to city planners, architects, engineers and municipal officials—and to the Reconstruction Finance Corporation in ruling on border-line cases—*The American City* in its

Galloway

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TYPICAL PROJECTS AUTHORIZED BY R. F. C.

Among the "self-liquidating" relief projects which can now be financed by Federal loans are public recreation facilities like—

Playland Pool at Rye Beach, New York. Jay Downer, Chief Engineer. Gilmore D. Clarke, Landscape Architect.

The Bathhouses and Refreshment Terraces at Jones Beach, Long Island. Herbert A. Magoon, Architect. W. Earle Andrews, Engineer.

The Municipal Golf Course at Balboa Park, San Diego, California.

August issue publishes the accompanying list of types of public works which its editors believe to be eligible for Federal aid as "self-liquidating" projects.

In the great field of slum clearance and large-scale housing projects there is need in every state of the Union for new legislation or municipal ordinances, or both, to meet the very proper safeguards (quoted above) which Congress set up as a condition for Federal aid. To this end an important service has been rendered by a Sub-Committee on Housing Laws of the Committee on Economics of Site Planning and Housing, of the American Institute of Architects, in preparing a draft of the principles which it is recommended should be embodied in a state housing law.

There seems every reason to believe that the huge Federal funds to be released under the terms both of the Emergency Relief and Construction Act and of the new Home Loan Bank Act will give widespread stimulus to the planning and building of needed public works, public buildings and large- and small-scale housing developments. Recent reports from state finance commissions indicate that, notwithstanding real or alleged inability to float new bond issues, large numbers of municipalities and counties are well under their legal limits of borrowing capacity. This means, in many cases, that local public projects can be undertaken, even without the aid of Federal funds, if the necessary local backing can be secured.

Here is a real challenge to the leadership of architects, engineers and city planners in the creation of sound, progressive public opinion—both as citizens interested in the relief of distress and the hastening of good times, and as the group having the skill essential to the wise planning which should always precede public or private building.

PRINCIPLES TO BE EMBODIED IN A STATE HOUSING LAW

**Prepared by the SUB-COMMITTEE ON HOUSING LAWS,
Committee on Economics of Site Planning and Housing,
American Institute of Architects**

In the encouragement of projects for low-cost housing and slum clearance this Emergency Relief and Construction Act of 1932 is likely to make history. Never before, except indirectly, has the Federal Government shown the slightest interest in this nation-wide problem. We know, to our sorrow, the result of leaving the growth of cities and the living conditions of their workers to the "rugged individualism" of its frequently ignorant and generally narrow-minded "developers." The results of this process are well known. It is as if public education had been left in each State to be supplied by the lowest bidder, he in turn to make his profit on "all the traffic would bear." Under the incentive of paragraph (a2) of section 201 of the Act it is hoped that States and municipalities will at least start to explore the possibilities of reforming their blighted areas and providing decent living quarters for the lower income groups, heretofore forced to take the left-overs, the inadequate, insanitary housing abandoned by the better-offs. Even where State legislatures are not in session and may not meet for some time, municipalities may have in some cases the constitutional power to act. But everywhere studies ought to be started in preparation for legislative action.

At the request of the Construction League and as a help towards such studies a Committee of the American Institute of Architects has prepared a document for general distribution called "Principles Which It Is Recommended Should Be Embodied in a State Housing Law." It is believed that this will be found useful to those who wish to awake local interest in studying housing conditions and slum clearance possibilities.

ROBERT D. KOHN, Past President of the A. I. A.

At a meeting of the Policy Committee of the Construction League of the United States held in St. Louis in March the delegates of the American Institute of Architects were asked to prepare for the other members and for general distribution a draft of a model law for a State Housing Commission. In view of the variations in the form of such legislation which would be necessitated by the basic views of the several states the Committee which prepared the attached document preferred to draft not a "model" housing law, but a list of the major features which such a law ought to incorporate.

This report would appear to be timely. In view of the inquiries being received now from all parts of the country from those who believe that many of the States will wish to avail themselves of the help probably made available by the provisions of Federal "relief" legislation, it should also be suggestive and helpful. This draft has not received the official approval of the Institute of Architects, nor (because of the urgency) of its entire Committee on the Economics of Site Planning and Housing, though issued in its name.

Since New York had the longest experience with the actual workings of a State Board of Housing the Committee drew largely on that experience and was fortunate in securing for the Committee's work the leadership of Mr. Carl Stern, Counsel, and Mr. George Gove, Secretary of the New York Board. The other members of the Committee were Clarence S. Stein, A.I.A., former Commissioner of Housing and Regional Planning, New York State; Dr. Carol Aronovici, City Planner, and Robert D. Kohn, Past-President of the A.I.A. and Chairman of the Construction League of the U. S.

General

The purpose of the law is to obtain substantial housing, at the lowest possible rentals, planned, constructed, financed and operated by public utility housing corporations under state regulation.

The low rentals are secured by efficiency of design, prevention of excessive land costs, large-scale building operations, elimination of waste, reduction of financing charges, exclusion of speculative profits and the regulation of overhead expenses.

Sound values, sanitary construction and adaptation to environment are secured by the requirement for the approval, supervision and control of a State Commission as to the plans, specifications, construction, financial set-up and operation of the projects.

HOUSING AND PLANNING COMMISSION

There should be not over nine members.

The members should serve without pay, but should be entitled to their expenses, including a limited amount of travel outside of the state to obtain familiarity with existing projects.

The terms of the members should overlap.

The terms should preferably be not less than five years.

The membership should include an architect, an engineer with building experience, a person interested in the financing of public and private construction, a person experienced in social service, having a knowledge of housing conditions, and a representative of organized labor.

Technical Staff

The technical staff should include:

(1) A director familiar with housing and community planning.

(2) A statistician.

(3) A supervising architect to pass on plans and supervise construction.

(4) Accountants.

(5) An experienced counsel.

(6) Clerical staff.

Members 3, 4 and 5 may be employed on a part time basis or on a per diem basis when needed. It may be sound policy to charge against the respective projects an inspection and supervision fee.

The Commission, including counsel, should be independent of other State departments.

Functions

The investigation of housing needs and conditions, and the distribution of population in relation to location of industry throughout the State.

Devising of ways and means of improving housing and housing conditions and of securing economies in construction.

The replanning and replacement of areas that are a social or economic liability to the community.

The collection and dissemination of information relating to housing and specifically, the education of the public with reference to sound housing and planning standards.

Cooperation with local housing city planning (and zoning) boards.

The promotion of low-cost housing projects. The passing upon the applications to construct such projects submitted by public utility (limited dividend) housing corporations. The supervision and regulation of the construction and operation of such projects, including:

(1) Passing upon architectural, engineering and site plans.

(2) Consideration of financial structure and feasibility of the project.

(3) Supervision of construction of buildings.

(4) Supervision of operation, management, and of operating expenses.

(5) Fixing of rents.

Fairchild

Nowhere is the architect's recognition of community requirements more seriously needed than in the planning of large-scale housing.

Powers

The Commission should have full powers of investigation, inspection and examination, including the power to subpoena and require the attendance of witnesses and the production of papers.

The Commission should be authorized to exercise these powers through a single member or the executive officer of the Commission.

The Commission will be specifically empowered to do everything necessary to enable it to carry out the functions heretofore described in connection with the approval and operation of projects, including the right to issue orders and make rules and regulations and enforce obedience thereto by application to the courts.

HOUSING PROJECTS

All housing projects should be large-scale developments and preferably forming a complete integrated neighborhood community, with adequate recreational areas.

They may be for groups of single family houses or multifamily dwellings or both.

In order to facilitate control, they should be rental and not sale projects. Tenant ownership may be achieved by the ownership of stock in the housing corporation.

The projects must conform to proper standards with regard to land coverage, light and air, suitable and efficient construction, and must conform to the general plan of the locality as a comprehensive neighborhood community.

The projects designed primarily for housing may benefit by permitting a strictly limited portion of the buildings, or, in the case of a group of single-family houses, a strictly limited portion of the area, to be used for stores, offices, commercial, co-operative or professional purposes. (Under the New York State Housing Law such uses are permitted on ground floor and below and on roof.)

The rentals for the commercial portions may be

fixed on the basis of current market rates, enabling thereby a corresponding reduction in the rentals applying to residential use.

Rentals

The law should specify an *average* maximum rental. An *average* rental is suggested because certain apartments must of necessity be more desirable than others.

The exact rent schedule within the maximum specified by the law should be fixed in each instance with the approval of the Commission.

The maximum rental may be higher in certain locations than in others. It may be deemed advisable to vest in the Commission the power to fix higher maximum rentals in congested areas where it may be desirable to operate but where land costs are higher than in outlying areas.

(The rental basis adopted under the New York State Housing Law is a maximum average per room per month.)

Any excess earnings, after expenses, amortization, proper reserves, dividends and a reasonable transfer to surplus, should be used to reduce rentals.

Financial Structure

There should be a minimum requirement with respect to the amount of equity represented by stock of the corporation.

Mortgages on a sufficiently conservative basis may be made legal for savings banks, insurance companies and trust funds.

Returns should be limited:

(a) The interest charges on senior financing should be limited to five per cent or six per cent.

(b) The rate of return to the stockholders should be limited to the amount fixed in certificate of incorporation—not more than six per cent, and the dividends should be made cumulative.

(c) Overhead, supervision and financial charges should be subject to the approval of the Commission and reduced to a minimum. To this end arrangements should be made for the disclosure of any possible affiliation of companies making contracts with the housing corporation.

(d) If there is a liquidation of the housing corporation or if the corporation is permitted by the Board to sell its property to a purchaser other than a public utility housing corporation, any surplus over a return to the stockholders of their investment plus the limited dividend should be divided between the State and the Municipality.

Selection of Tenants

Provisions should be made under the regulations of the Commission, so that the tenants are selected from families with modest incomes. This requires investigation of the applicants.

Land Costs

Speculative profits on the land are avoided and excessive land costs checked by requiring the ap-

POWER PLANTS . . . BRIDGES

ALSO AMONG THE BUILDING PROJECTS MADE POSSIBLE BY FEDERAL FUNDS

Rittase

NEW POWER PLANT AT BREMO POINT, VIRGINIA
VIRGINIA PUBLIC SERVICE COMPANY
DESIGNED AND CONSTRUCTED BY ELECTRIC MANAGEMENT AND ENGINEERING CORPORATION

Gottscho

APPROACH TO WEST SIDE HIGHWAY
NEW YORK CITY
SLOAN AND ROBERTSON, ARCHITECTS

VICTORY BRIDGE
STATE HIGHWAY NO. 4, PERTH AMBOY
NEW JERSEY STATE HIGHWAY COMMISSION

praisal of the Commission, and in addition, by conferring the power of eminent domain after the issuance by the Commission of a certificate of necessity.

Use of City Lands

Provision may be made for the lease or sale of lands not needed for municipal purposes to public utility housing corporations.

Where lands are leased to housing corporations, the buildings should become the property of the city subject to the provisions of the lease. The City should be empowered to permit the corporation, under due safeguards, to mortgage the land and buildings in order to obtain financing on a conservative basis.

To safeguard the city, there should be the right of recapture at all times on the payment of a sum sufficient to retire the investment at the then amortized cost plus six per cent and the expenses of liquidation. All profits in liquidation or sale, over and above the return of the investment plus six per cent, should go to the City.

PUBLIC UTILITY HOUSING COMPANIES

These corporations may not be organized, except with the approval of the Commission in connection with a project approved by the Commission. Their directorate must include a member appointed by the Commission.

They must at all times act subject to the law and regulations and orders of the Commission.

The stockholders may not earn more than the limited dividend specified in the certificate of incorporation.

Any surplus on the sale or dissolution of the corporation after repayment to the stockholders of their investment plus the authorized dividend and any accumulations thereof should be divided between the State and municipality.

The companies may not sell or lease their properties except with the approval of the Commission and subject to the regulations imposed by the Commission, nor may they dissolve or be reorganized without such approval.

The company's salaries and overhead expenses, its contracts, obligations, and securities are subject to the control of the Commission.

COOPERATION WITH LOCALITIES

Arrangements consistent with the administrative law of the particular State should be made for the cooperation of the State Board with localities, so that the projects may be worked out with due regard for street openings and closings, alteration of the city plan, establishment of schools and kindergartens, maintenance of parks or playgrounds and day nurseries.

EMINENT DOMAIN

The companies should be invested with the power of eminent domain where the Commission certifies to the necessity thereof.

It may be deemed advisable to have the power exercised for the housing corporation by the municipality in which the project is situated upon suitable indemnification by the housing corporation.

Unless the law of the State otherwise provides, the eminent domain powers should permit the immediate taking possession of the property upon payment into court of a sum deemed sufficient by the court to cover a possible award, or in the alternative, if consistent with the provisions of the State law, by the filing of an appropriate bond.

Note: The foregoing is sufficient in relation to housing projects. For slum clearance projects, where it may be desirable to use part of the cleared areas for housing and part for other purposes, legislation should permit the condemnation of areas which are largely unsanitary, for replanning.

STATE OR MUNICIPAL ASSISTANCE

The effectiveness of legislation of this type is largely dependent on the character and extent of assistance offered by the State or municipality. The State or municipality may offer one or both of the following inducements in an effort to attain the lowest possible rentals in housing projects.

1. Use of government credit at approximately the same rate of interest paid by the State or the municipality plus cost of operation of the fund.

2. Tax exemption in various forms (in at least one State consideration is being given to exemption from capital stock tax for limited dividend corporations.).

In other countries public moneys are made available for low-cost housing.

New York State does not offer any direct subsidy nor does it authorize the use of public funds or credit for housing.

In New York, under the State Housing Law, there is granted exemption from various state taxes, e. g., franchises, organization, income, mortgage recording and other taxes and fees to the State or its officers; and municipalities are authorized to make exemption from local taxation.

Under this authorization, New York City has exempted buildings but not the land from taxation, for a period of twenty years.

The value and effect of tax exemption on improvements is discussed in the 1932 annual report of the State Board of Housing.

THE DRAFTING OF THE LAW

Many of the features referred to in this outline are embodied in the New York State Housing Law, to which reference may be of value in the actual drafting of the law.

The law should contain findings of the legislature as to the reasons for its adoption, similar to that incorporated in the New York State Housing Law. These findings are of importance in the statutory and constitutional interpretation of any law.

A REMODELED BRANCH BANK

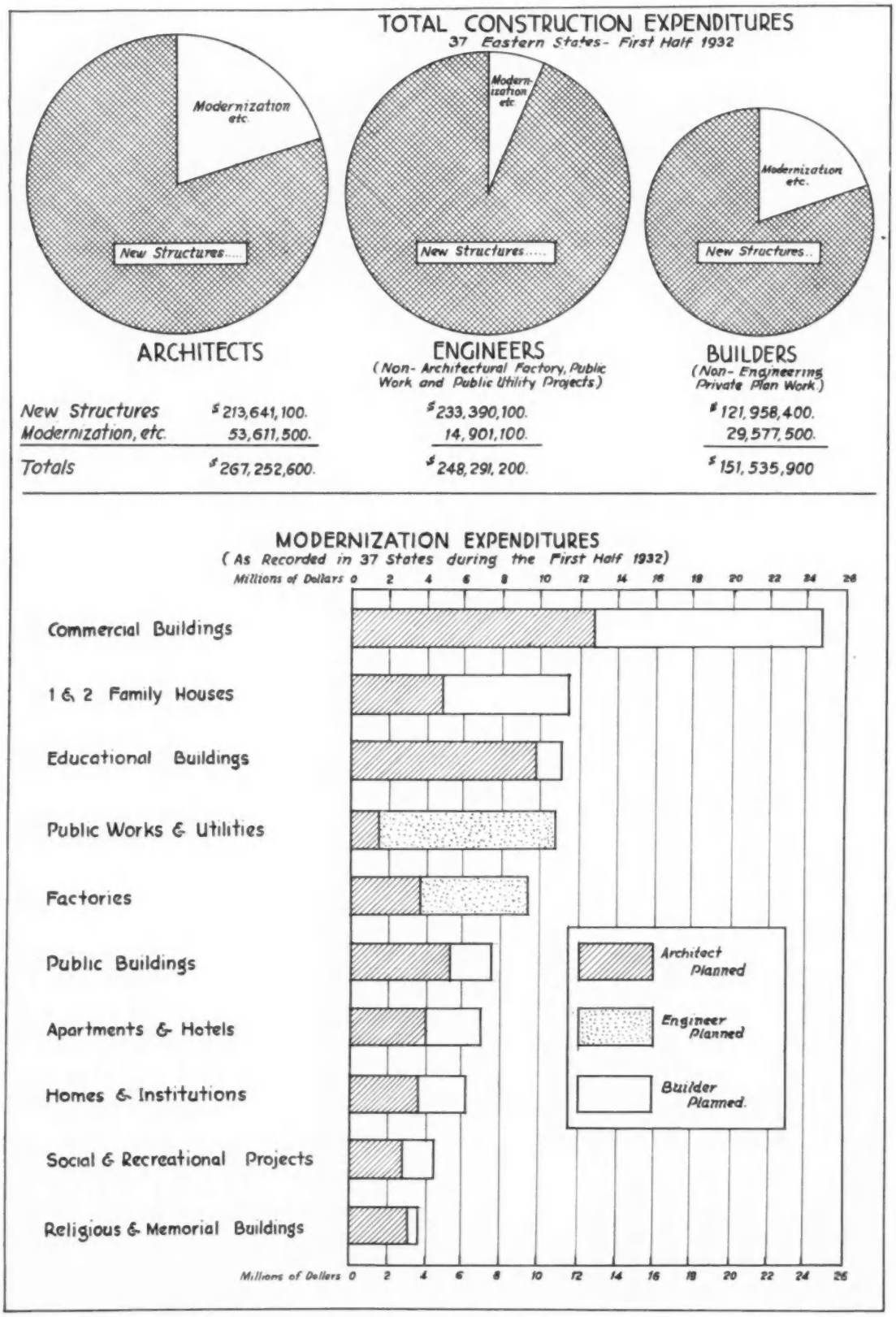
AARON G. ALEXANDER
ARCHITECT

INTERIOR OF BANK AFTER REMODELING

VIEW BEFORE REMODELING

BAY RIDGE BRANCH NATIONAL CITY BANK OF NEW YORK CITY

Only the interior was modernized in this building. The high counter screen, which formerly cut down window light, was changed only to the extent of cutting the mahogany superstructure in half, eliminating the heavy cornice and removing the high wire caging. New ceiling fixtures were substituted to give better light distribution. New flooring, new wall clock and a new coat of paint completed alterations. Cost approximately $4,000.



MODERNIZATION INCREASES IN IMPORTANCE

During first half of 1932 modernization projects provided a contract total of $98,090,100 in the 37 eastern states for which figures were recorded. Of this amount architects handled $53,611,500 or approximately 55 per cent.

ARCHITECTS RESPONSIBLE FOR INCREASE IN MODERNIZATION

(See The Architectural Record for May, 1932, for a statistical record of architects' modernization work in the first quarter of 1932)

By L. SETH SCHNITMAN

There was $7,000,000 more in modernization work done in the second quarter of this year than in the first quarter, and architects were responsible for the entire increase. This is shown by F. W. Dodge Corporation's statistical record for the 37 states east of the Rocky Mountains. Achitects were credited with $30,431,800 in modernization, alteration and remodeling work in the second quarter, compared with $23,179,700 in the first quarter. Modernization work planned by engineers and by builders amounted to $22,283,100 in the second quarter, compared with $22,195,500 in the first quarter. This factor, together with continued predominance of commercial building projects in the modernization record (see table below) is a strong indication of the trend toward modernization based on economic study of depreciated properties and technical recommendations for rehabilitating their earning power.

The importance of architects' modernization work is shown by the fact that the total of such projects in the first half of the year amounted to $53,611,500. This represented 55 per cent of the total modernization expenditures of the periods and 8 per cent of total construction expenditures, including all public work and engineering projects.

There is every reason to look for continued increase in such work by architects. The increasing number of surveys and technical studies along these lines is an indication of their growing importance. The fact that many property owners throughout the country have been "eating their fences," as the farmers say, during the past few years is now being borne in upon them by strong competition to secure tenants and they are increasingly anxious to atone for previous neglect and put their properties in shape to earn income. Considerably more than half of the architects' modernization projects were in income-producing types of buildings.

This work has also become increasingly important to architects. In the first half of 1932 they had 3,941 modernization projects compared with 6,339 new building projects. Nearly four out of every ten recorded architect-planned projects were modernization jobs.

The survey of the architects' influence in modernization covering the first half of 1932 indicates that architects were responsible for larger dollar volumes of modernization work than were privately-planned improvement projects in the following important general classes of work: commercial buildings, educational buildings, hospitals and institutions, public buildings, religious and memorial buildings, social and recreational buildings, and apartments and hotels. Even for factories where architects share their influence with engineers, architects designed a total of almost $4,000,000 worth of modernization work or 41 percent of the total value of all factory modernization projects.

Among the recorded small-house modernization jobs, architect-planned projects during the first half of 1932 averaged $5,259 while privately-planned modernization projects averaged only $2,637.

Classification	Architect Planned	Privately Planned	Architects' Per Cent of Total
Commercial Buildings	$12,833,500	$12,055,800	51.6
Factories	3,989,800	5,790,000	40.8
Educational Buildings	9,931,400	1,336,300	88.1
Hospitals and Institutions	3,965,300	2,227,800	64.0
Public Buildings	5,479,300	2,104,300	72.3
Religious and Memorial Buildings	3,215,400	708,500	81.9
Social and Recreational Buildings	3,082,800	1,694,000	64.5
Apartments and Hotels	4,213,100	2,854,800	59.6
One- and Two-Family Houses	4,969,900	6,596,000	43.0
Public Works and Utilities	1,931,000	9,111,100	17.5
Total	$53,611,500	$44,478,600	54.7
Total Number of Projects	3,941	7,091	....
Average Value of Projects	$13,603	$6,272	....

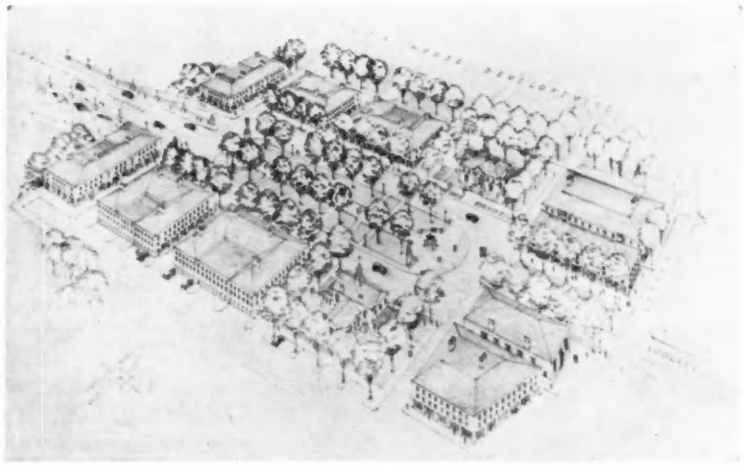
MODERNIZATION, ALTERATIONS AND ADDITIONS

(Included in F. W. Dodge Corporation's contract record for 37 Eastern States covering the first half of 1932)

ILLUSTRATED NEWS

JAMES RIVER COUNTRY CLUB
WARWICK COUNTY, VIRGINIA

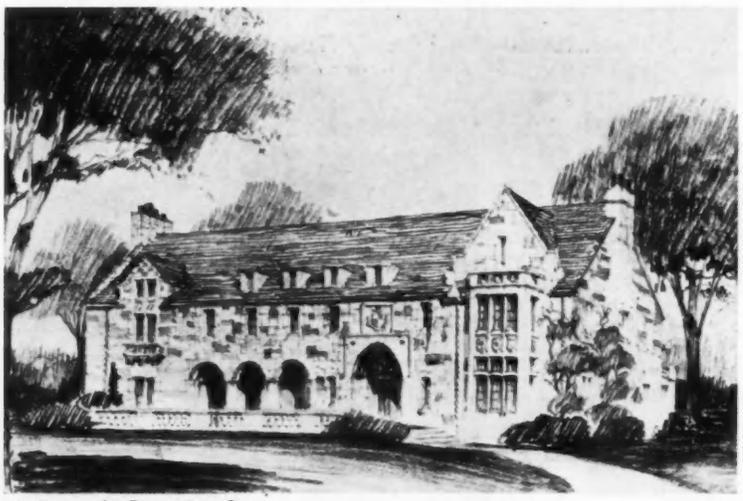
A. BYRON WILLIAMS
ARCHITECT



DEVELOPMENT OF EASTERN
EXTENSION OF LOOCKERMAN STREET
DOVER, DELAWARE

FRANK R. WATSON, EDKINS AND
THOMPSON, ARCHITECTS

The new Post Office will be on the south side of the square. The proposed City Hall will be opposite on the north side. The other developments are tentative. The Post Office was designed by Massena and du Pont of Wilmington, Delaware. The new legislative building at the eastern end of the plaza is now being constructed: E. William Martin, architect.



Indianapolis Engraving Co.

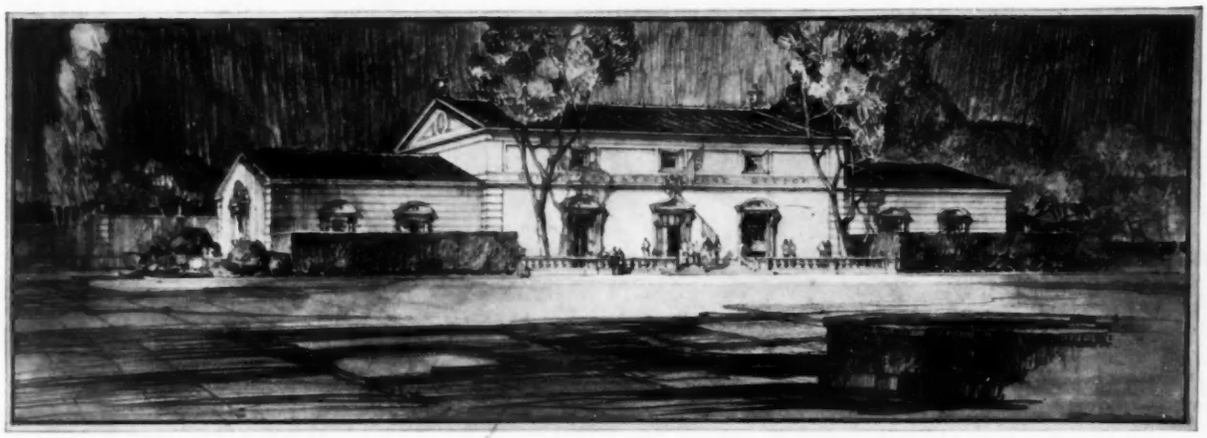
DELTA TAU DELTA
FRATERNITY HOUSE

BUTLER UNIVERSITY
AT INDIANAPOLIS

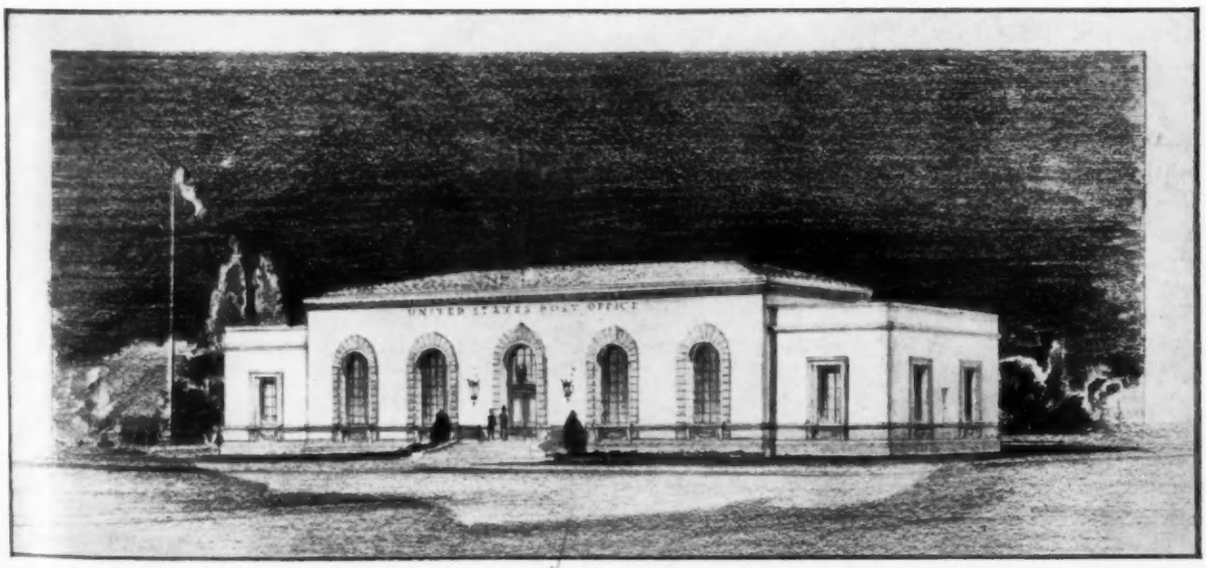
LEE BURNS AND
EDWARD JAMES
ARCHITECTS

Dreyer

FEDERAL BUILDING FOR BRIDGEPORT, CONNECTICUT
CHARLES WELLINGTON WALKER, ARCHITECT JOHN MEAD HOWELLS, CONSULTANT
JAMES A. WETMORE, SUPERVISING ARCHITECT



GOVERNMENT POST OFFICE FOR BEVERLY HILLS, CALIFORNIA
RALPH C. FLEWELLING, ARCHITECT
ALLISON AND ALLISON, CONSULTING ARCHITECTS



GOVERNMENT POST OFFICE FOR MERCED, CALIFORNIA
ALLISON AND ALLISON, ARCHITECTS

L'ENFANT'S WASHINGTON

By ELBERT PEETS, Architect

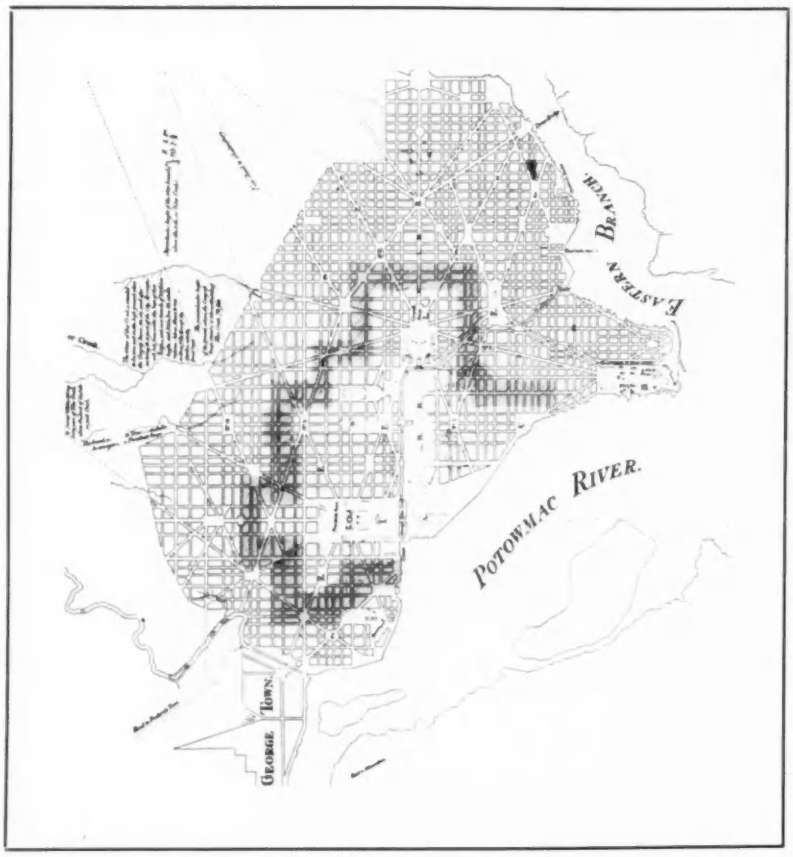
NOTES ON A REDRAFTING OF THE AUTOGRAPH PLAN

L'Enfant's design is still a living issue, an active factor in the current city planning problems of Washington. It is nevertheless a fact that our knowledge of the famous plan is far from complete. Many of its provisions remain almost unnoticed. There is not even a satisfactory drawing of it. The present city map, naturally, gives a good general idea of the design, but there is much in it which is not L'Enfant. So many changes were made from his plan that it is unjust to let the existing city limit our conception of his skill as a designer. The official engraving made at Philadelphia in 1792 has an unrealistic atmosphere about it. Furthermore, L'Enfant viciously condemned it. There remains the plan usually used, the one now in the Library of Congress which is thought to be, except for the lettering, from his own hand. A tracing of it, made by the Coast Survey in 1887, is often reproduced. That plan, however, is very inexactly drafted, is now at many points illegible, and does not agree with the legends printed on it.

As a start toward a collation of what we really know about L'Enfant's intention, and also as a start toward a more accurate physical record of his design, I have prepared the accompanying recension of the central part of the autograph plan.

The streets were straightened, of course, and the avenues were widened to 160 feet, following the note on the plan. Many comparisons of distances were made, in order to bring out the principles on which the plan was constructed, such as the spacing of the cross axes. I also tried to find a key to the angles and terminal points of the avenues, but not with much satisfaction. In the capitol *étoile*, for instance, the simple thing would have been to bring all the avenues together at a single point. But that was plainly not L'Enfant's intention, is not what was done, and would entail, in the drawing, serious difficulties at other points. So I followed the autograph plan, averaging its inaccuracies. As for the block plans of the buildings, only in the case of the White House was there any credible evidence. The Philadelphia engraving, to be sure, contains elaborate-looking plans of many buildings, but on close inspection these prove to be crazy jumbles of poché. L'Enfant—if he contributed to this phase of the engraving—either gave the engraver some old plan as a model and told him to follow his fancy, or, as I suspect, he purposely made impossible plans in order to disconcert the architects who were already competing with him for the honor of planning the capitol and President's house.

The detailing of the Mall required much splicing of stray hints from the autograph plan, the engraving, and L'Enfant's explanatory letters to Washington. The houses bordering it would probably not be in continuous rows, as I have diagramed them. I made the rows equidistant from the axis as a matter of geometric logic, feeling sure that L'Enfant, when he came down to



The 1887 tracing of the plan of Washington believed to have been made by L'Enfant in 1791. It is inexactly drafted and in places illegible. The new plan by Mr. Peets on the opposite page overcomes these defects.

working drawings, would have seen the necessity of widening the southern flanking street to balance the wide street occasioned by the canal. The cross section of L'Enfant's "Grand Avenue" is uncertain. The tree rows, on the plan, scale about a hundred feet apart. The 400-foot width, which he gives in a note, was pretty certainly from fence to fence, covering an *allée* of two rows of trees at each side. The total width of the Avenue de Paris at Versailles is about 300 feet, with a central opening about 120 feet.

I was forced to make a change in the avenue connecting the points "u" and "m." L'Enfant seems to have hoped that he could make this avenue shoot across the enlargement of the canal near "z." I could not manage it and had furthermore to omit a short street, following the present street plan instead of L'Enfant's. The short length of avenue south-east of the Washington statue—on the line "m" to "x"—is not in the autograph plan, an error of drafting which obscured the symmetry of the scheme.

The layout below the Capitol must be taken as mere diagram. At 1320 feet to the inch—the scale of the original—it is not possible to show garden details. The axial arm of the canal is about 150 feet wide and 400 feet long, not unworthy of L'Enfant's expression "grand canal." The canal parallel to the Mall is not the narrow ditch that commercial canals were in those days—it scales nearly a hundred feet wide. It would have been a picturesque element in the city's life if steam had not come. One imagines a moonlight water pageant forming in the basin at the president's park, where, for 1500 feet, the canal is 300 feet wide. The barges row up the canal, past the successive open plazas and under the seven gaily lighted bridges. They gather in the pool below the Capitol, and there the *Président-soleil*—as L'Enfant would have made him—admires the cascade illuminated by a thousand flickering torches.

Streets sufficiently emphasized to be called minor cross axes divide the Mall axis into four sections. The first, from the Capitol to the judiciary building axis, is one third the way to the Washington statue.

The median cross axis, three quarters of a mile from the Capitol and the statue, is highly developed in L'Enfant's plan. Its north end—the end, at least, from this point of view—is the national church, a building ignored in the revisions of the plan. On Pennsylvania avenue this axis is marked by a square and a fountain. At the south side of this square are the market houses and a canal port. At the river, nearly a mile and a half from the church, is a triangular space containing a naval column which is the object of five vistas.

The next cross axis, which marks no even fraction of the Mall, is still more interesting. L'Enfant early discovered that the broad Potomac narrows and bends at Alexandria so that there is only one north-south line from Washington which carries through into the ten- or twelve-mile vista down the river. I am pretty sure that he wanted at first to put the President's house on that line. He mentions the view in his report, saying that a hill would have to be removed to open it up. Washington made him move the building farther west to higher ground. But L'Enfant did not take the axis off his plan—he developed along it two or three squares, a great esplanade—displaced by a building in the Philadelphia engraving—and a glorious avenue, 250 feet wide at the Mall and 200 at the river, commanding the long vista down the Potomac. Now a tapered street is a rare thing. L'Enfant of course knew the Rue de Tournon. But the Hauptstrasse in Dresden-Neustadt is a closer parallel to L'Enfant's street and may

Pennsylvania Avenue and the "President's Palace" on which L'Enfant intended to use a small dome in the manner of Vanbrough's Castle Howard.

have been known to him since it was part of an important scheme of fortifications. In St. James's Park the mall and the canal lay at a slight angle, producing on the map the appearance of a tapered avenue. But none of these streets commanded distant views. In this connection the arresting thing about L'Enfant's avenue is that its sides converge toward the view, probably because the view is quite narrow, not at all a panorama. The diminution would make the street seem longer and the hills more distant. On the whole I consider this the detail of L'Enfant's plan which is the best evidence of his skill in design. It was wiped out in execution, the topography being against it.

The south end of the tapered street is cut by a diagonal affording a vista, at about twenty degrees to the left of the axis, from the President's house. It just clips the south point of the city, where L'Enfant may have imagined a lighthouse or some such feature. The balancing vista to the southwest may be my own contribution, but there is nothing in the plan to prevent it.

The equestrian figure of George Washington, as the plan calls it, was probably intended to face south, along a broad *tapis vert*. Both plan and engraving show a circle of trees around the site of the statue but I have omitted it, feeling that it was only a device of rendering, to make the point more conspicuous. On the river front at the end of the Mall an architectural landing place of some sort was doubtless intended.

Around the White House are many doubtful points. The thing in the middle of the President's park must be a fountain, perhaps the fifth of the grand fountains promised by the legend on the plan. The President's house is enormous—its wings spread to about 770 feet. Vanbrugh's Castle Howard, a hundred feet less, resembles it in plan. Castle Howard has a dome and L'Enfant must have intended one for the "President's Palace," as he called it. Only a dome could fitly terminate the mile-and-a-half vista from the capitol, and L'Enfant meant the two buildings "exactly to correspond." The manner in which they were actually designed pleased him so little that he wrote in 1800 that they "ruined the most estimable part of the Scheme."

North of the White House is a semicircular area. Here the simple rectangle of the present Lafayette Square may seem better than L'Enfant's scheme, but he was thinking of his *étoile*, the five avenues radiating from the north façade of his palace. His plan, apparently, would bring the center lines of the avenues together just north of the façade, so that a man could stand there and command all five. The effect would be no less than stupendous.

Arcaded buildings on Capitol Square, looking up East Capitol Avenue toward the historic or itinerary column one mile away. Sketches by Elbert Peets.

Melmstrom—American-Swedish News Exchange

A COTTAGE AT SALTSJÖBADEN NEAR STOCKHOLM, SWEDEN

PORTFOLIO OF CURRENT ARCHITECTURE

FEATURING

LOW-COST HOUSES
A BANK BUILDING
SPECIALTY SHOPS
AN ATHLETIC BUILDING
A REMODELED RESTAURANT

Markham

HOUSE OF ORA L. MARKHAM
PORTLAND, OREGON
HAROLD W. DOTY, ARCHITECT

Living room, dining room, kitchen, two bedrooms and baths, and 2-car garage. Recreation room, kitchenette and dark room on basement floor. Cost $8,000.

Jourdan

The Morton residence has 7 rooms, costing $6,500; the Kuhn residence has 5 rooms on first floor and 2 rooms on second, costing $6,000. Both houses are in Portland.

(Above) HOUSE OF HOWARD MORTON
(Below) HOUSE OF PAUL M. KUHN
HAROLD W. DOTY, ARCHITECT

Shannon

DATA CONCERNING THIS HOUSE AND THE FOLLOWING THREE:

HOUSE OF PERCY O'GORMAN (Above)

House of frame construction. Sidewalls of 24" hand-hewn shingles. Wings of flush boarding. Shingle roof. Pine paneled living room. Old pine floors. Chair rail, cornice and corner cupboards in dining room. Two-car garage. Steam heat. Brass piping throughout. Cubage, 37,000. Cost, $12,900, or 35c. a cubic foot.

"CONNECTICUT SALT BOX" HOUSE (Page 166)

Exact reproduction of old house. Frame construction, using old oak corner posts, girts and frame. Exterior of hand-hewn shingles, nailed at the butts. Interior trim and woodwork of white pine. Old paneling purchased and reset in living room. Old reconditioned pine and oak floors. Handmade hardware. Steam heat, vacuum valves.

HOUSE OF GEORGE E. MUNRO (Page 165)

Main house of stone veneer; service and dining room wings of frame; garage wing, frame with flush siding. Side walls of wings of hand-hewn shingles. Interior trim and woodwork of white pine. Oak floors. Corner cupboards in dining room. Bedroom wall at fireplace, pine panelling. Shingle roof. Air conditioned heating system.

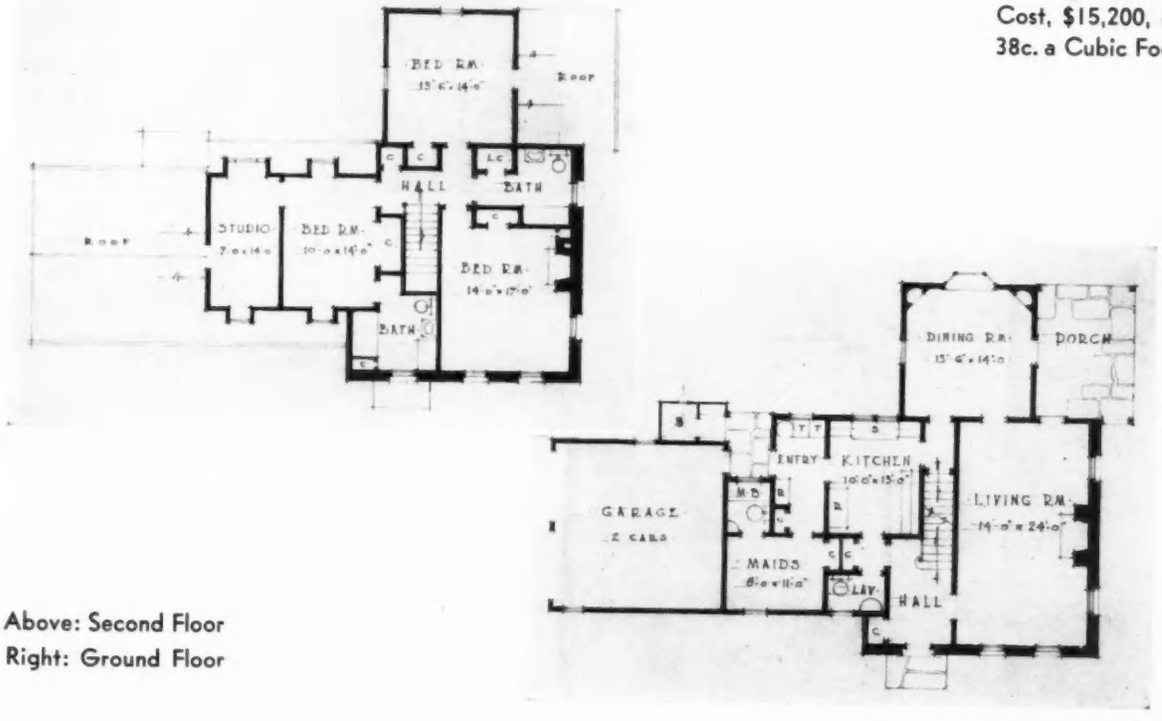
HOUSE OF C. R. WILMOT (Page 167)

Main building of frame; living room wing of stone veneer. Shingle roof. Sidewalls of 24" shingles 11" to weather. Interior woodwork and trim of white pine. Oak floors. Fireplace end of living room, pine paneled. Garage in basement. Steam heat and oil burner. Brass piping throughout. Standard brand of kitchen cabinets.

HOUSE OF PERCY O'GORMAN
DARIEN, CONNECTICUT
COGGINS AND HEDLANDER, ARCHITECTS

Shannon

Cubage, 40,000
Cost, $15,200, or
38c. a Cubic Foot

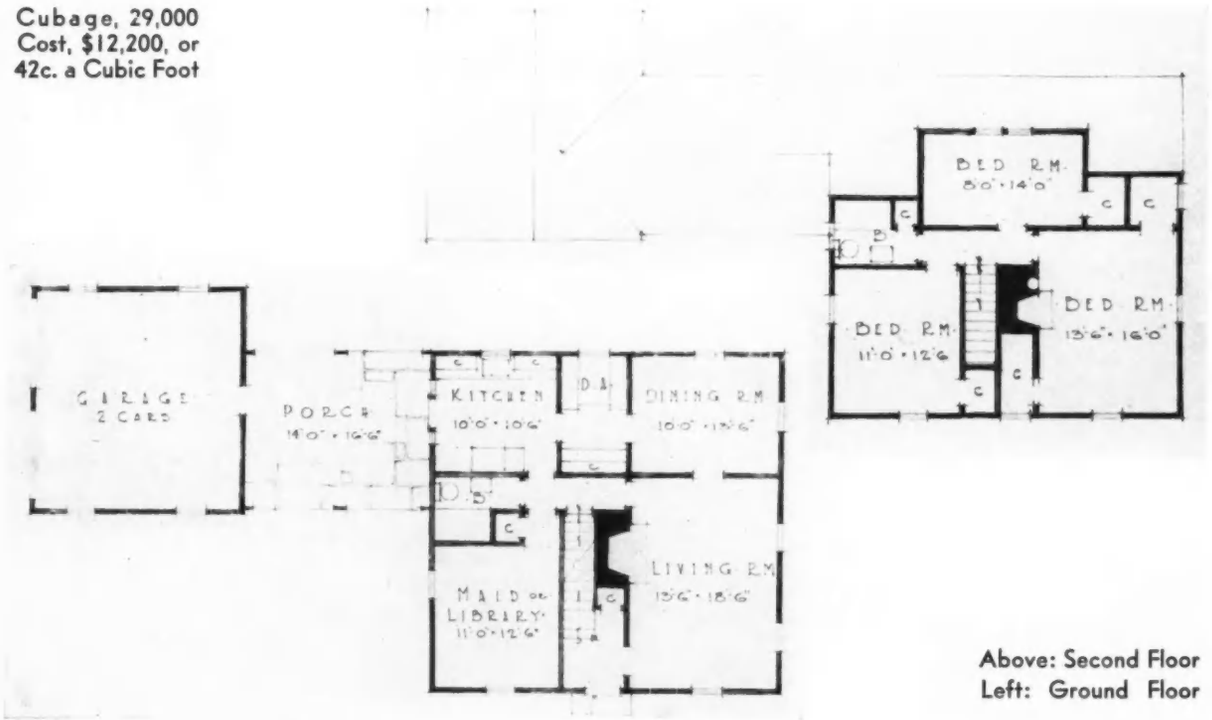


Above: Second Floor
Right: Ground Floor

HOUSE OF GEORGE E. MUNRO
OLD GREENWICH, CONNECTICUT
COGGINS AND HEDLANDER, ARCHITECTS

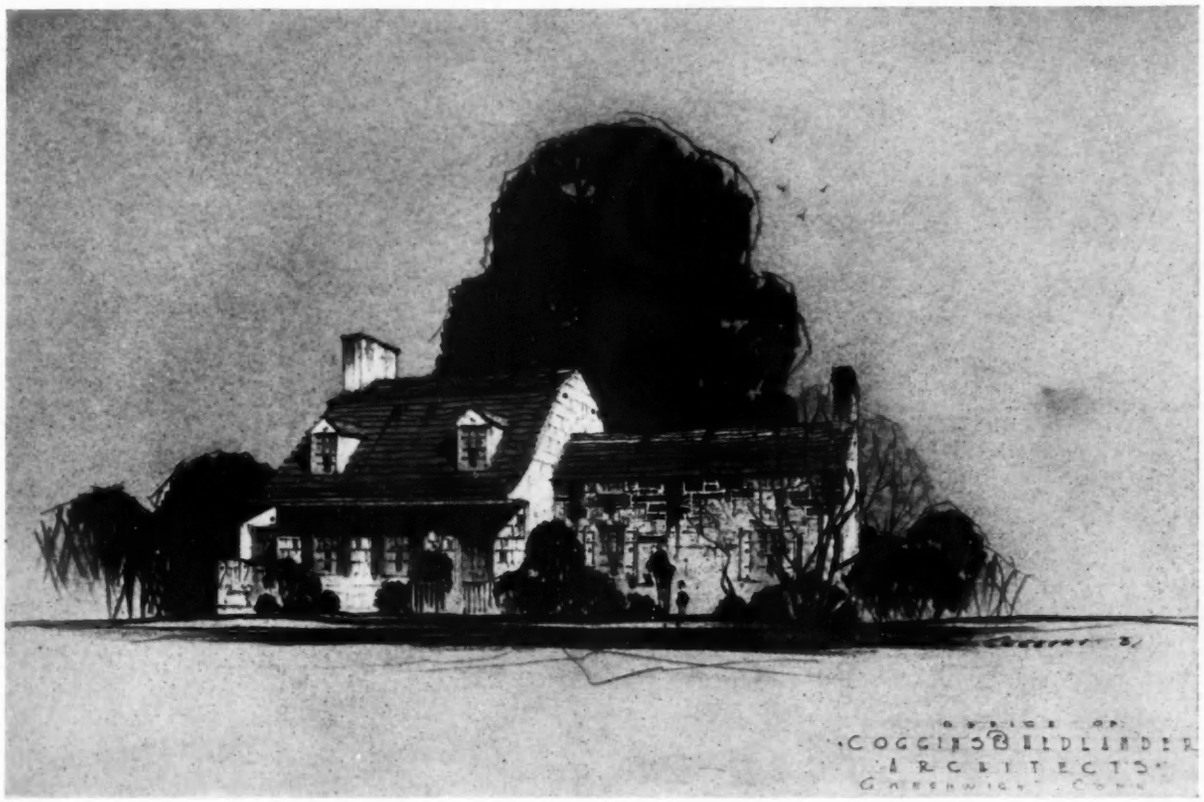
Shannon

Cubage, 29,000
Cost, $12,200, or
42c. a Cubic Foot



Above: Second Floor
Left: Ground Floor

"CONNECTICUT SALT BOX" HOUSE
GREENWICH, CONNECTICUT
COGGINS AND HEDLANDER, ARCHITECTS

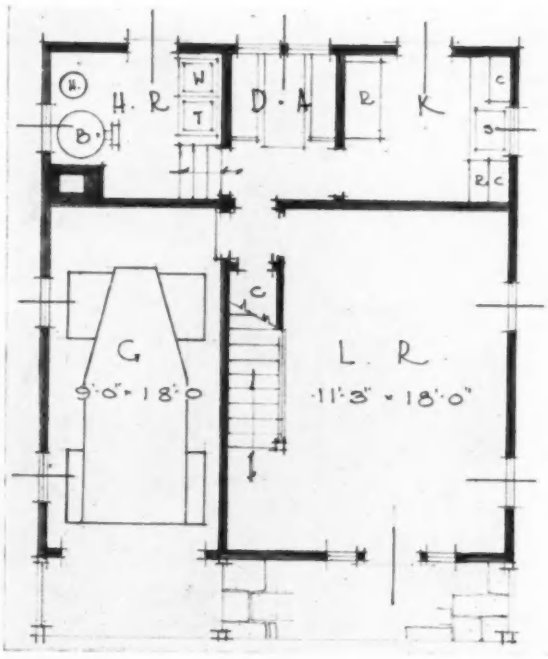


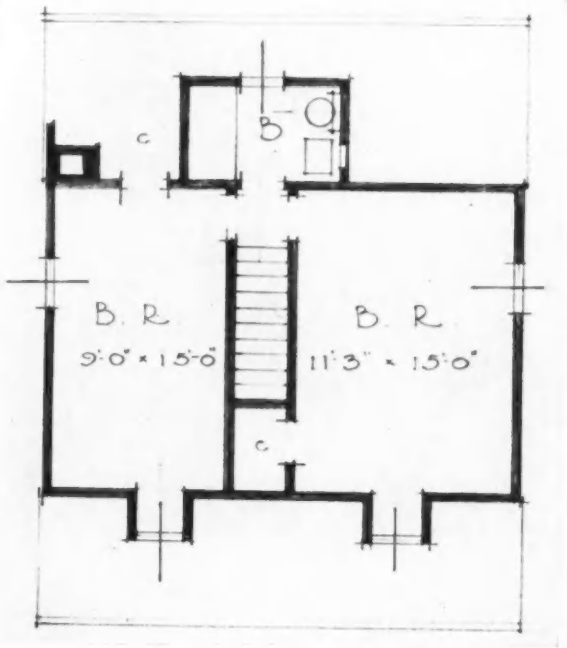
Shannon

Cubage, 34,000
Cost, $12,900, or
38c. a Cubic Foot

Above: Second Floor
Right: Ground Floor

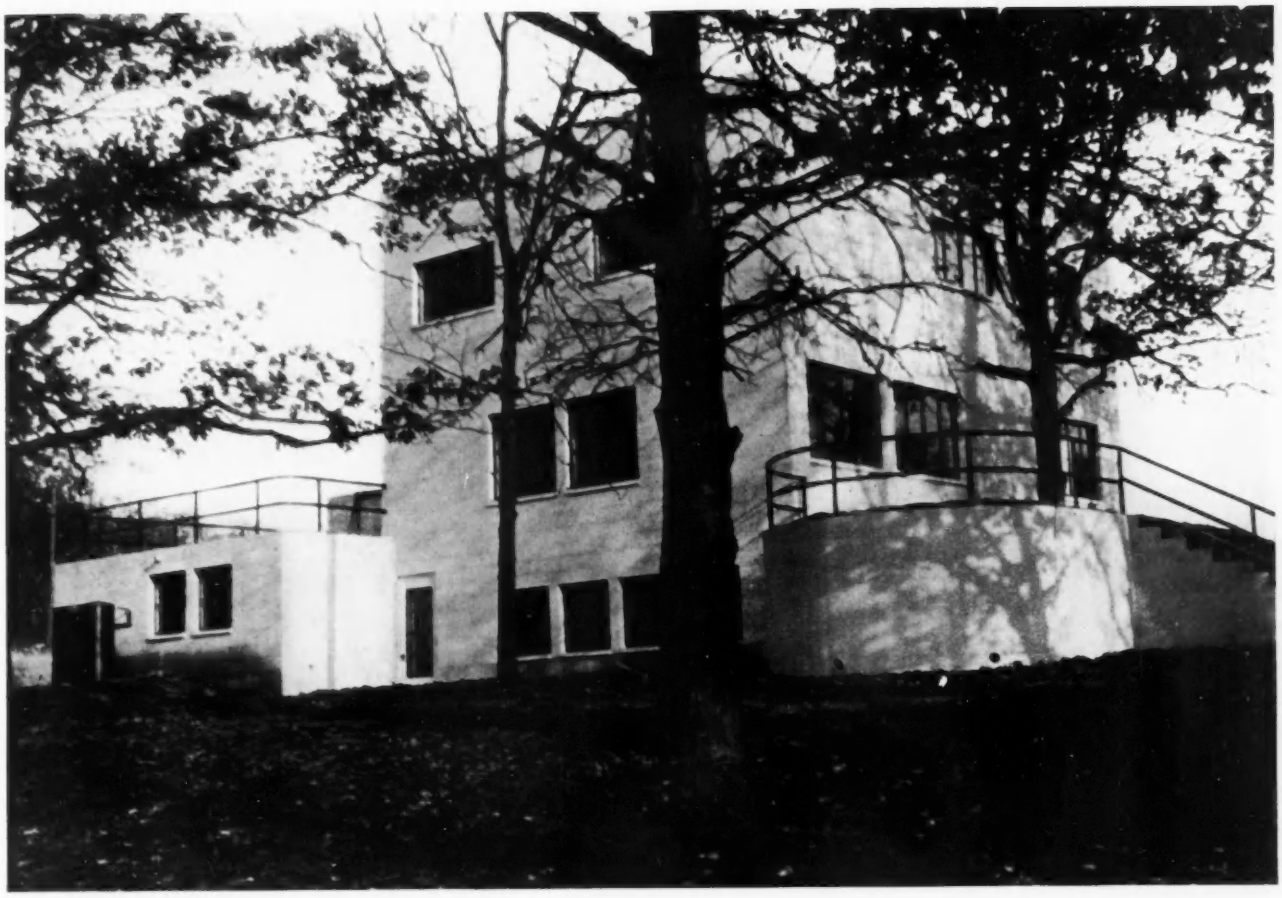
HOUSE OF C. R. WILMOT
OLD GREENWICH, CONNECTICUT
COGGINS AND HEDLANDER, ARCHITECTS



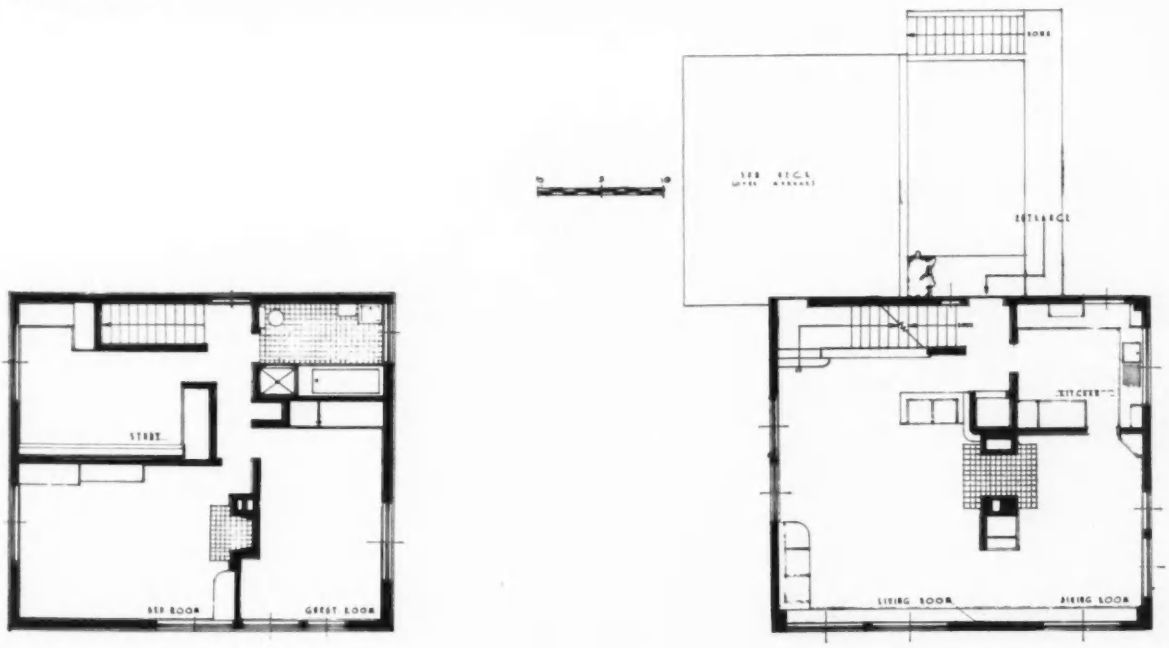


A LOW-COST HOUSE
COGGINS AND HEDLANDER
ARCHITECTS

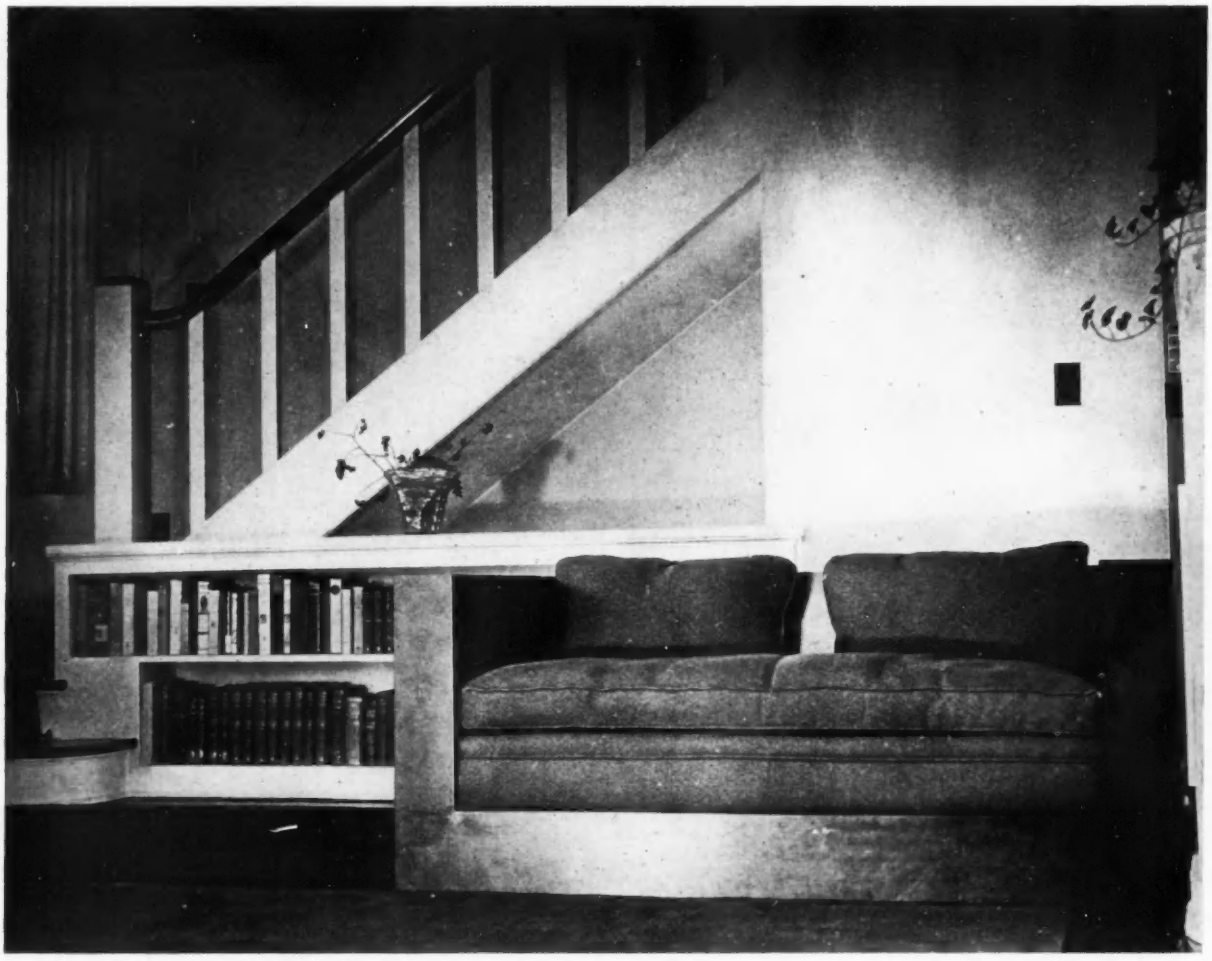
This house can be built for approximately $3,500. It is of frame construction with concrete block foundation. Stock shingles laid 11" to weather. One-pipe steam heating system with boiler located in heater room, eliminating cellar. Brass pipe used throughout. Interior wall finish of plaster board finished with wall paper. Trim and woodwork of stock pine erected at job.



View from garden.



HOUSE OF C. W. THOMAS
FROST WOODS, MADISON, WISCONSIN
HAMILTON AND GWENYDD BEATTY, DESIGNERS



Frederick Kaiser II

Detail of built-in davenport and bookcase in living room (above). Detail of dining room fireplace which also opens into living room (left).

Complete with oil burning hot air heating system, electric pumping plant, electric range, electric refrigerator, and water softener, the Thomas house cost 37.5c. per cubic foot. The Beatty house, shown on opposite page, cost 38.7c. These costs include finished grading.

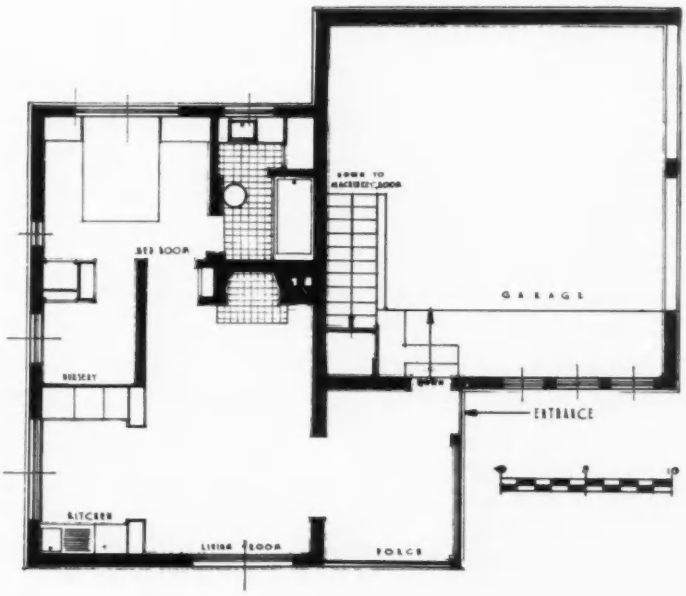
HOUSE OF C. W. THOMAS
FROST WOODS, MADISON, WISCONSIN
HAMILTON AND GWENYDD BEATTY, DESIGNERS

Frederick Kaiser II

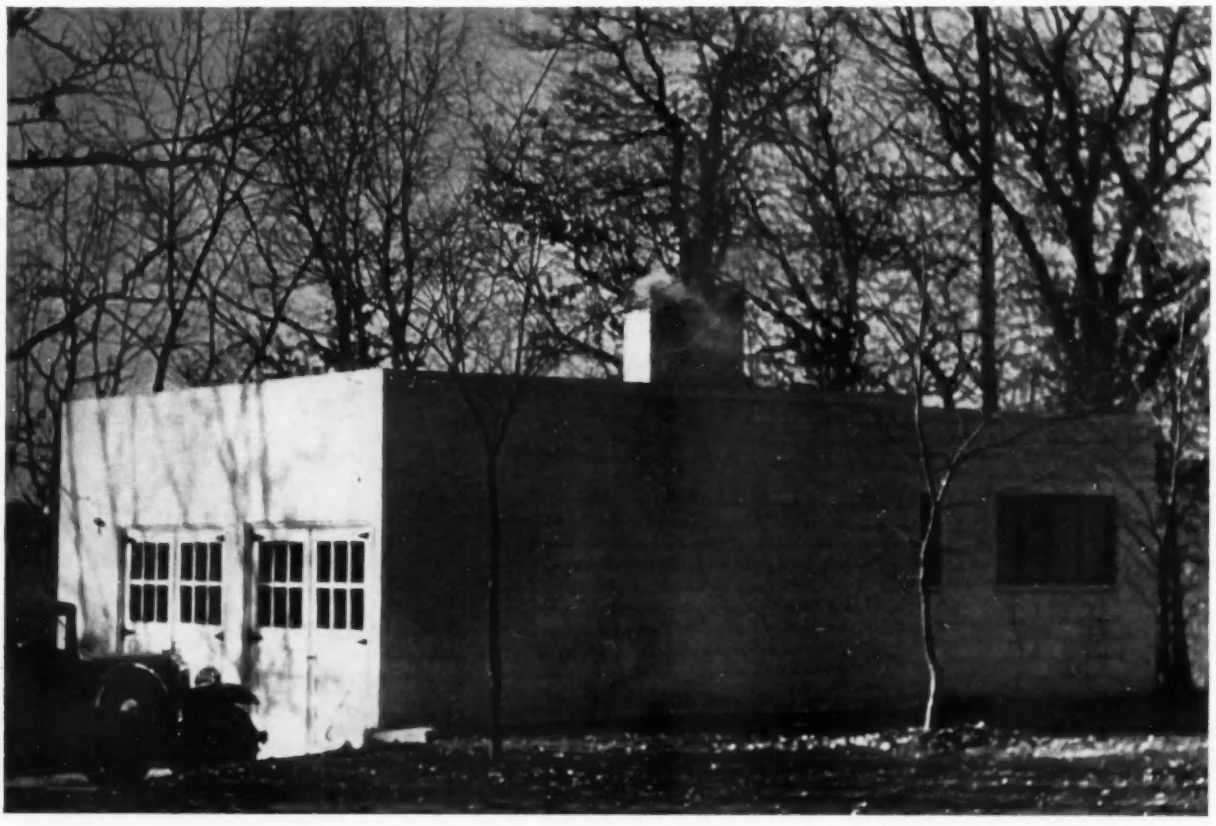
All exterior walls are lightweight slag concrete blocks. Steel casements are set directly in the masonry without wood frames.

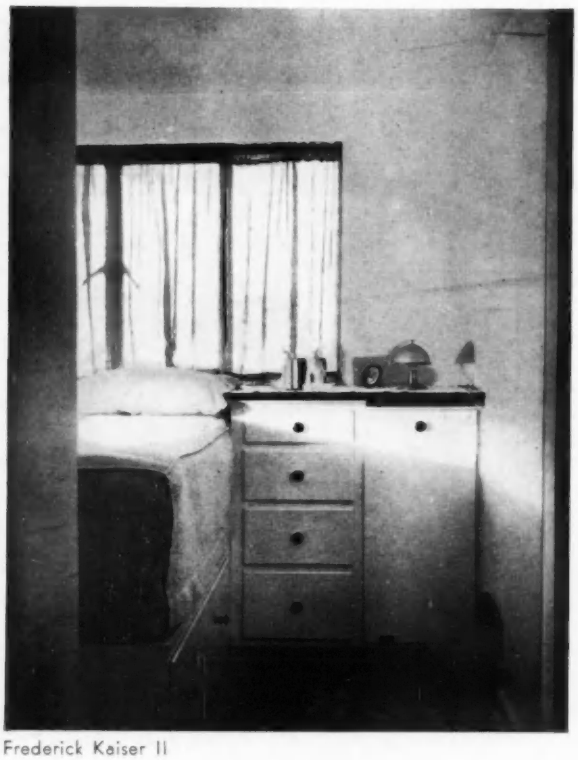
In the Thomas house the blocks are furred on the inside with strips and insulating plaster base, but in the Beatty house the plaster is applied to the blocks directly.

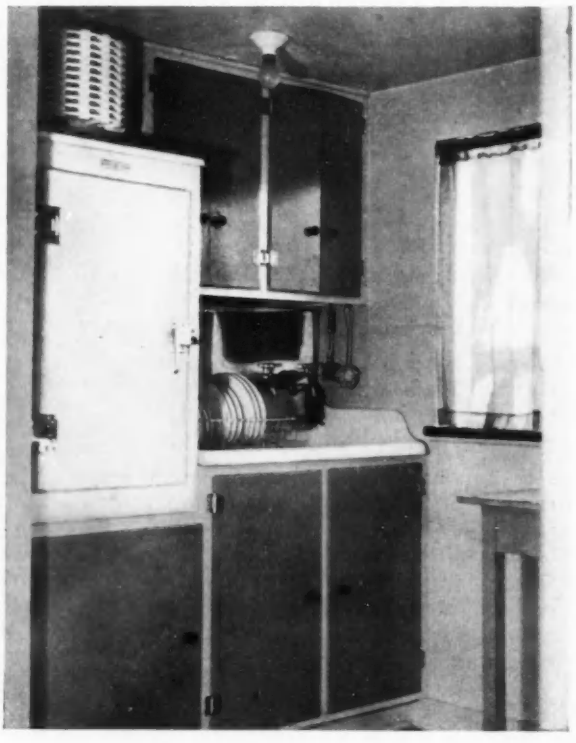
Flat roofs covered with built-up membrane roofing pitch slightly to a central drain from which a downpipe leads through the interior of the house, eliminating freezing. Dead air space between insulated ceiling and roof is provided with ceiling grilles and a ventilator on a special chimney flue for air circulation in summer.



HOUSE OF HAMILTON BEATTY
FROST WOODS, MADISON, WISCONSIN
HAMILTON AND GWENYDD BEATTY, DESIGNERS







Frederick Kaiser II

HOUSE OF HAMILTON BEATTY
FROST WOODS, MADISON, WISCONSIN
HAMILTON AND GWENYDD BEATTY, DESIGNERS

Interior views show bedroom with built-in bed and chest of drawers, and kitchen with built-in electric refrigerator and sink.

Fischer

EAST NEW YORK SAVINGS BANK
BROOKLYN, NEW YORK
HALSEY, McCORMACK AND HELMER, ARCHITECTS

Fischer

EAST NEW YORK SAVINGS BANK
BROOKLYN, NEW YORK
HALSEY, McCORMACK AND HELMER, ARCHITECTS

Fischer

EAST NEW YORK SAVINGS BANK
BROOKLYN, NEW YORK
HALSEY, McCORMACK AND HELMER, ARCHITECTS

Gillies

PALM BEACH CLOTHES DIVISION
GOODALL CO., INC., NEW YORK
ELEANOR LeMAIRE, INTERIOR ARCHITECT

Showroom 2. Rubber tile floor in gray, blue and black. Display table and built-in case of Australian black beanwood.

Gillies

Reception room.

PALM BEACH CLOTHES DIVISION
GOODALL CO., INC., NEW YORK
ELEANOR LeMAIRE, INTERIOR ARCHITECT

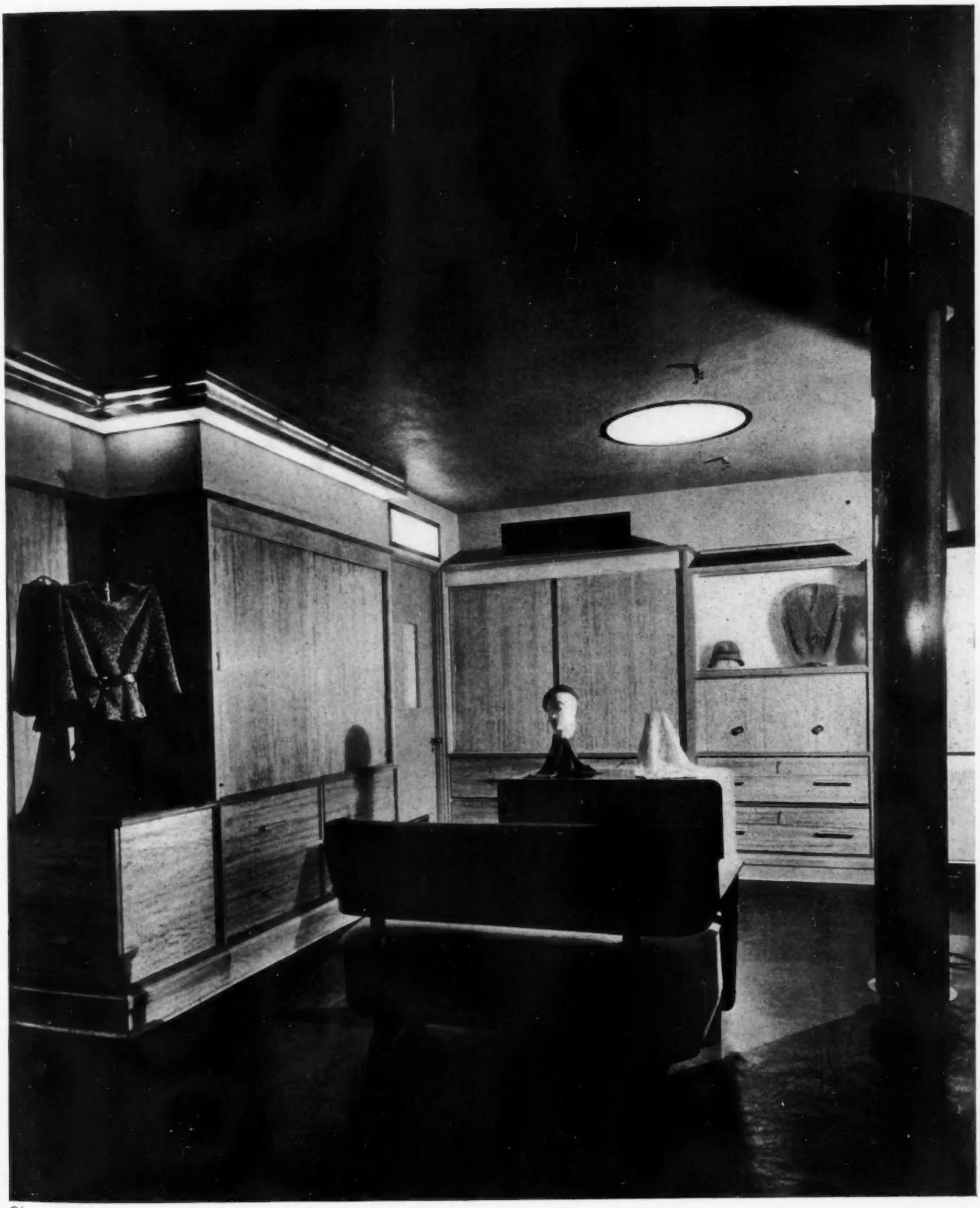
Gillies

Reception room.

Zenitherm floor with cork wainscot. Furred ceiling with built-in light trough.

Color scheme of floor: Light and dark gray, cream, red; blue base with black border. Yellow wall surfaces above cork wainscot. White textured paint surface around corner. Dark gray column and ceiling. Yellow leather upholstery.

PALM BEACH CLOTHES DIVISION
GOODALL CO., INC., NEW YORK
ELEANOR LeMAIRE, INTERIOR ARCHITECT



Glasgow

Sportswear and furs. Rubber tile floor: light and dark gray and red. Structural column for future 6-story building enclosed with brushed nickel finish casing. Satinwood fixtures. Sand-finished red ceiling.

MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT

Glasgow

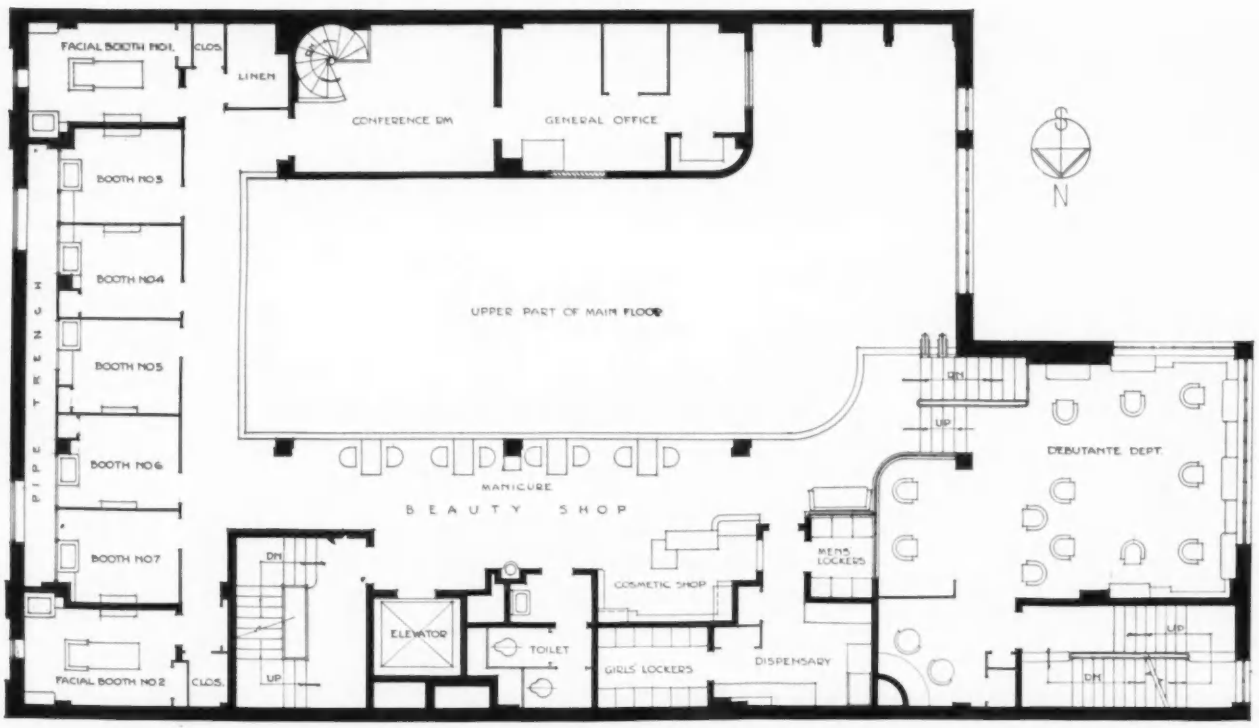
MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT

Foyer. Zenitherm floor: cream, red, brown, light gray and stone gray. Sgraffito walls. Sand-finished blue ceiling. Decorative wood columns in Chinese red lacquer. Gun-metal grilles and door frame.

Glasgow

Millinery. Rubber tile floor. Woodwork in light green lacquer with brushed nickel trim. Basket shaped light fixture of 3/8" glass rods with etched glass cylinder inside, executed by Maurice Heaton.

MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT



• MEZZANINE FLOOR PLAN •

• MAIN FLOOR PLAN •

• SCALE OF FEET •

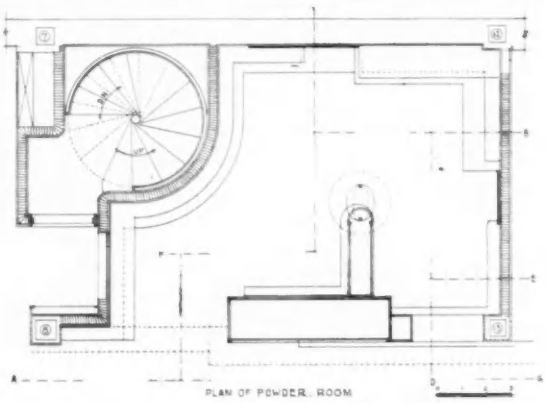
MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT

Glasgow

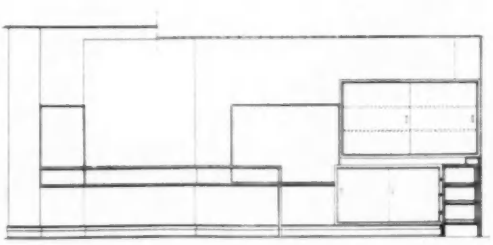
Shoe salon. Henna brown carpet. Maple furniture. Cork pinning board in back of display cases.

MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT

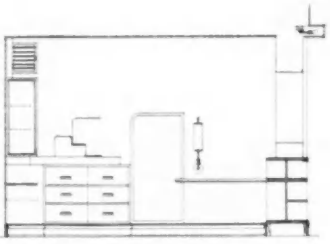
DETAIL DRAWINGS



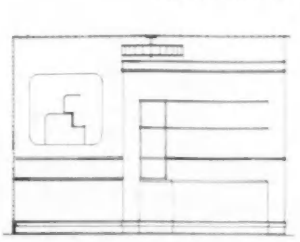
PLAN OF POWDER ROOM



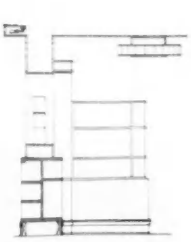
SOUTH ELEVATION A-B



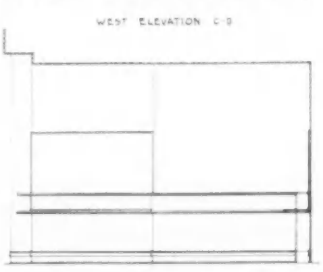
WEST ELEVATION C-D



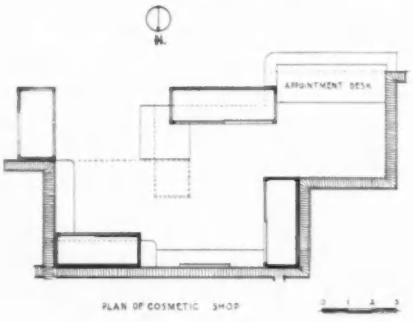
NORTH ELEVATION E-F



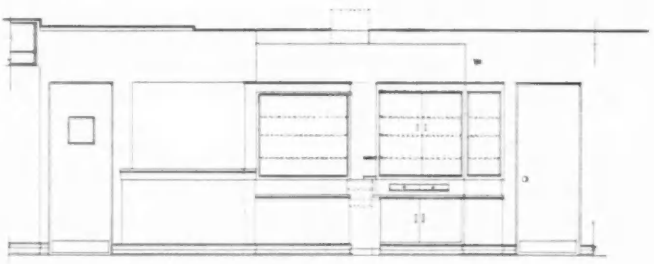
EAST ELEVATION D-C



EAST ELEVATION A-E



PLAN OF COSMETIC SHOP

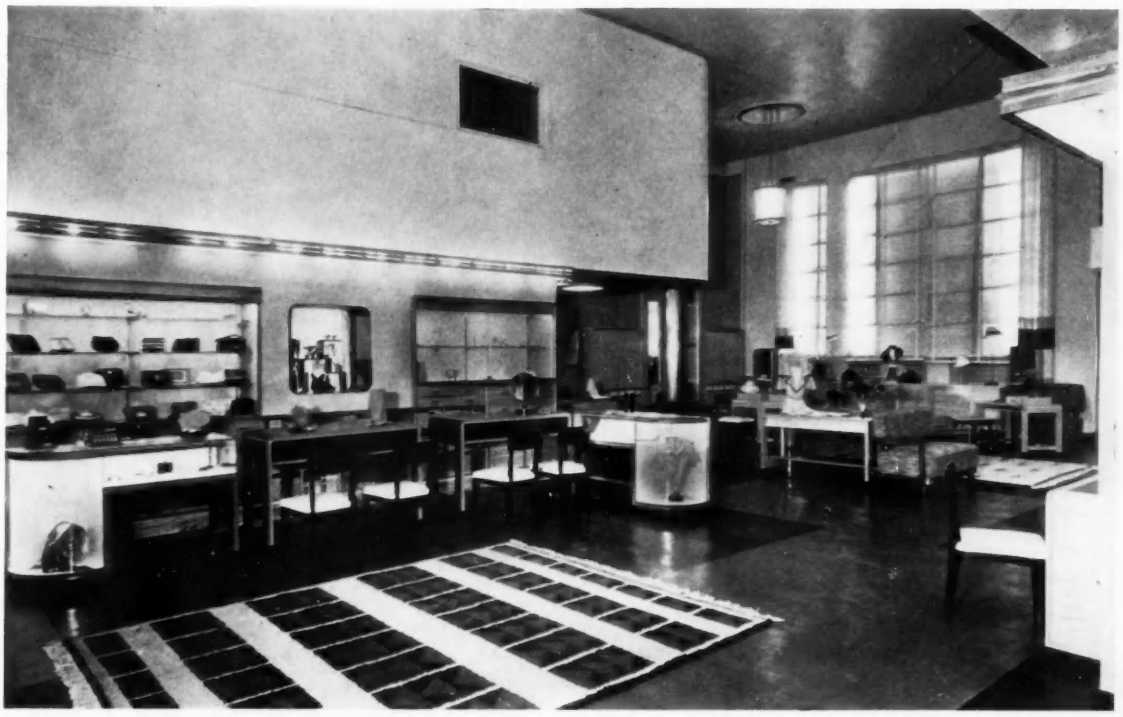


NORTH ELEVATION COSMETIC SHOP

WEST ELEVATION COSMETIC SHOP

NORTH ELEVATION COSMETIC SHOP (INSIDE)

MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT



Main store looking toward millinery department.

Glasgow

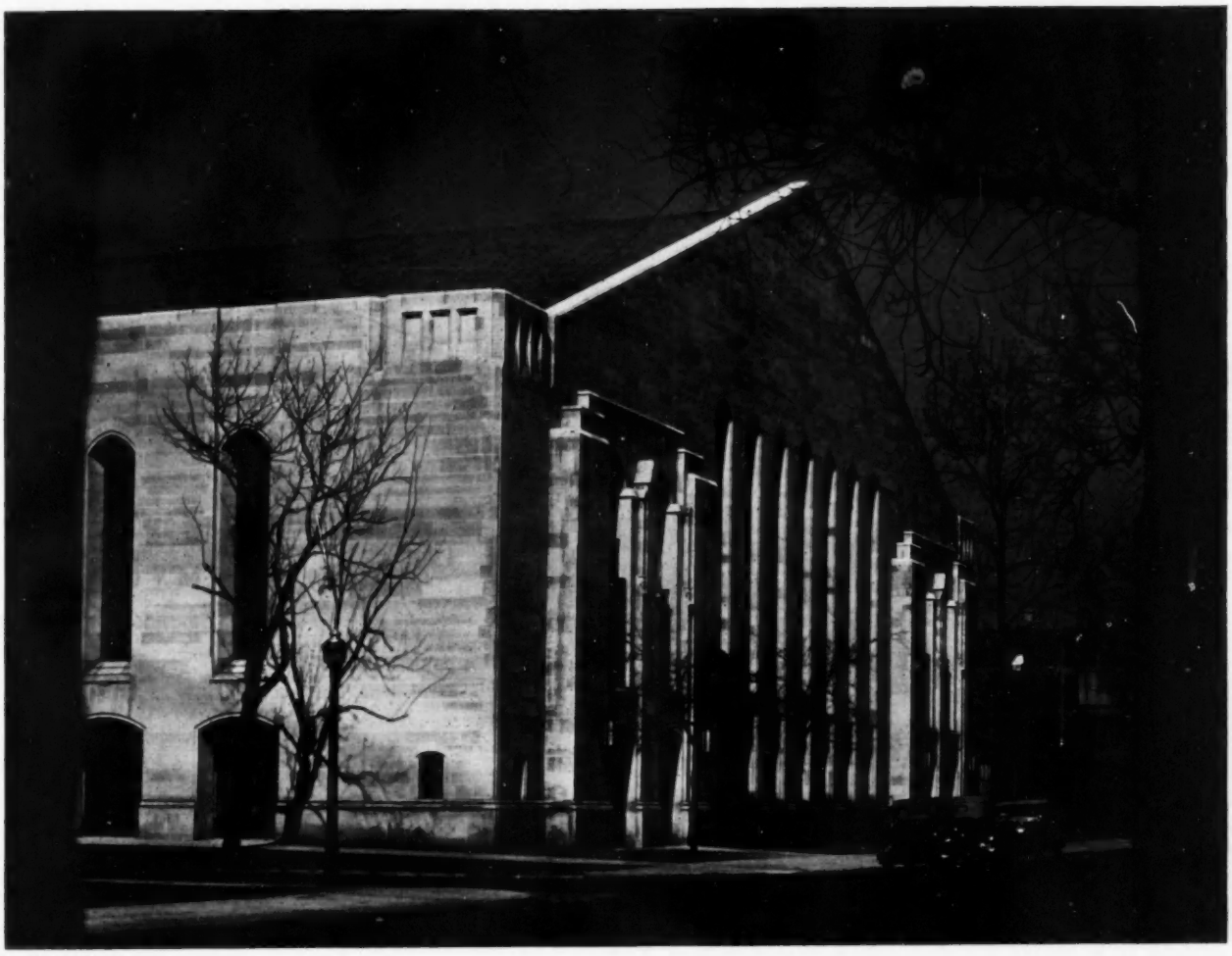
Main store looking toward foyer. Ceiling height of 20 feet. Light trough at 8-foot height insures good light over display counters.

MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT

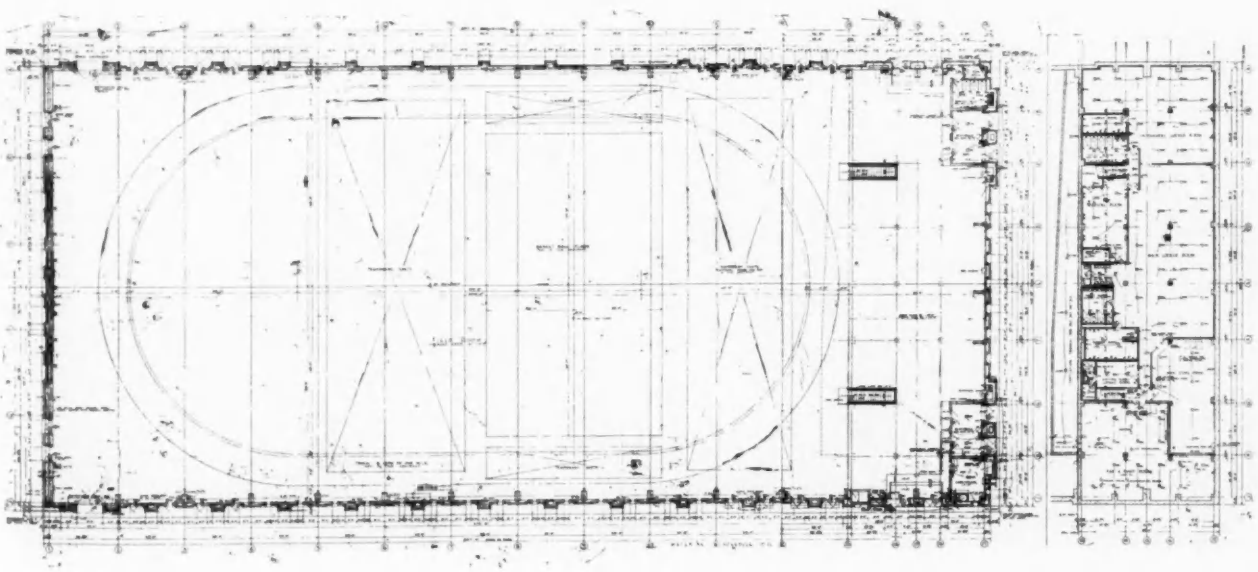
Glasgow

Shoe salon at half-level between main floor and mezzanine.

MARY SACHS STORE
HARRISBURG, PENNSYLVANIA
ELEANOR LeMAIRE, INTERIOR ARCHITECT

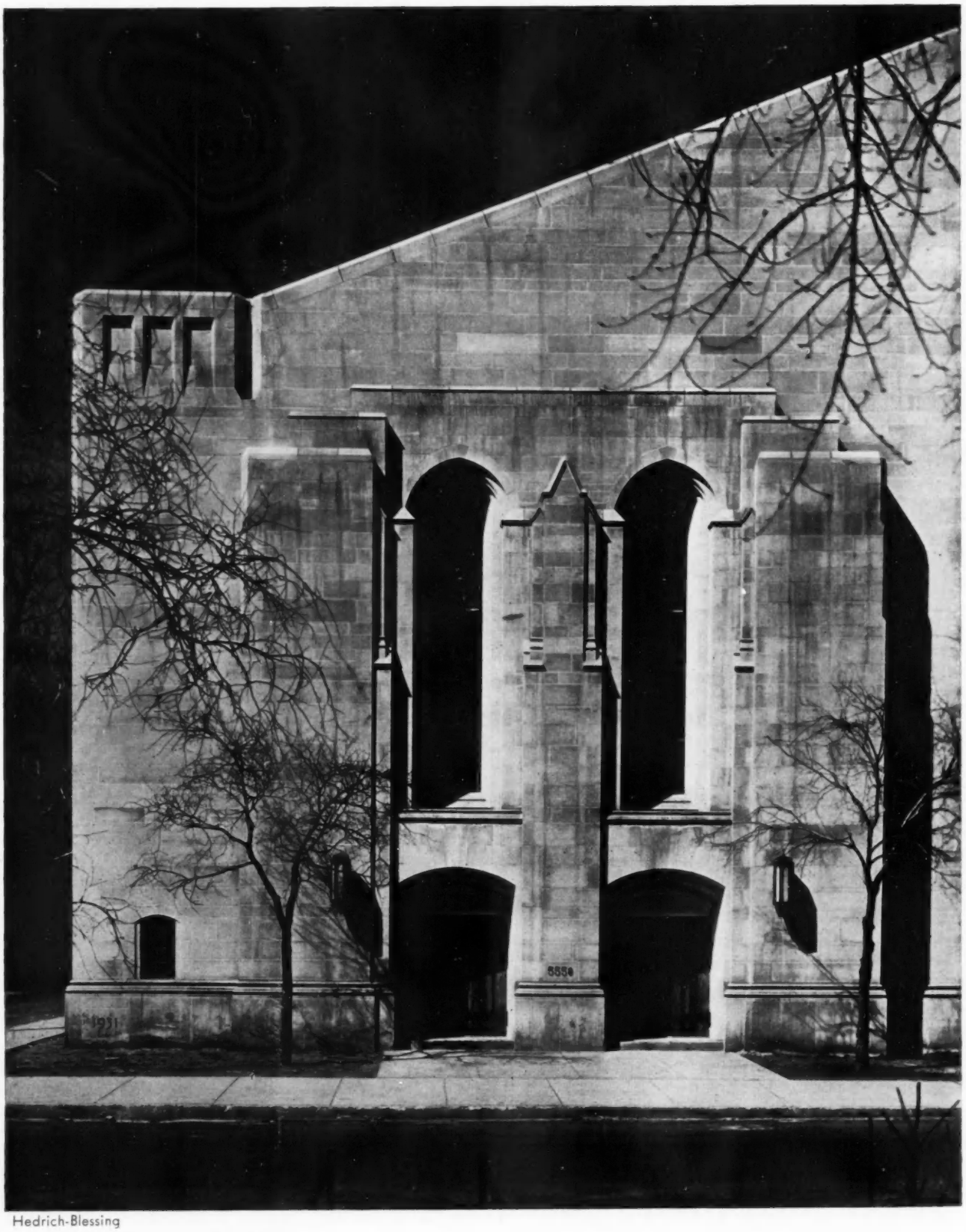


Hedrich-Blessing



The building is equipped to take care of these athletic activities: indoor baseball, outdoor baseball and football practice, basketball, tennis, indoor track and field meets, convocations in inclement weather.

FIELD HOUSE
UNIVERSITY OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS



Hedrich-Blessing

FIELD HOUSE
UNIVERSITY OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

Hedrich-Blessing

FIELD HOUSE
UNIVERSITY OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

Hedrich-Blessing

The structural steel arches are the first of this particular type ever designed. The south column bases were fixed in position by anchor bolts, while the north column bases were rested on greased milled plates so that as the load was put upon the structure the required stresses were induced into the ties. These members were designed as two-hinged arches, consideration being given to possible unbalanced wind and snow loads and to future balconies along the sides of the building, the outer edges of which will be suspended from the arches.

Arches were detailed and reamed with the peak of the arch 4" higher than its required level and with the vertical portions drawn in at the building eaves, these dimensions being determined by deformation calculations, so that with full loads the peak of the arch would lower to its required position and the vertical portions would become exactly vertical.

The roof construction of the building is insulated with ½" thick insulating fiber to protect the interior from excessive heat in the summer and loss of heat in the winter, as well as to prevent condensation under the surface of the roof.

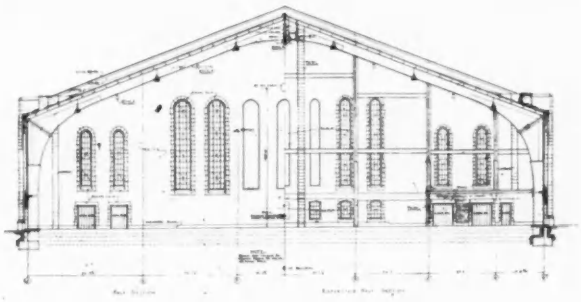
The entire area or field area within the structure containing some 2,800,000 cubic feet of space is automatically maintained during the heating season at a constant temperature. The equipment installed to accomplish this was designed also to provide for four complete changes of fresh air supply under crowded conditions of the floor. Heating and ventilating units, duct and pipe connections are partly concealed by the column and roof truss framing in such a way that none of the parts extends into the open, thus leaving a clear space from floor to roof trusses of 65', with a width of 155' between side columns.

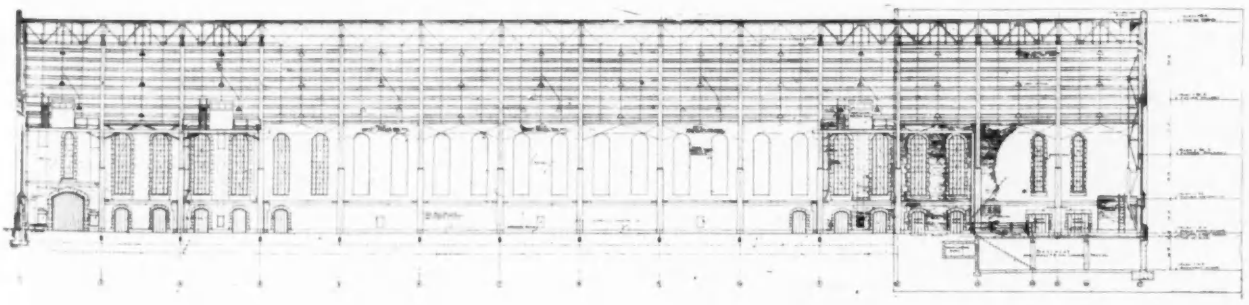
The floor consists of a clay and sand fill about 18" deep over the slab portion and about 1' deep over the balance of the area. It is kept in condition by occasional watering and re-rolling. Whenever any wood floors are required for certain athletic events, they are installed in sections and otherwise stored away.

FIELD HOUSE
UNIVERSITY OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

Hedrich-Blessing

Actually with the full roof dead loads and without balconies, the peak of the roof is slightly over 1" higher than indicated on the drawings and the vertical legs still lean in slightly, but when the balconies are added the arches will probably have the exact dimensions originally expected and the vertical portions will be actually vertical.





FIELD HOUSE
UNIVERSITY OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

GERTNER'S RESTAURANT
NEW YORK CITY
LEBHAR AND PIERPOINT, ARCHITECTS

SHORT LEASE ALTERATION

Changes in the operating policy demanded an immediate improvement of the physical appearance of this restaurant which had been built many years before. Since only a short lease remained, it was necessary to dispense with elaborate alterations so that the cost could be rapidly amortized. An entirely new front was designed with neon sign and concealed awning. A yellow shatter-proof glass was used as facing over the existing terra cotta. Part of the plate glass window was painted a deep opaque blue. A narrow strip of bright red glass in the window reveal and soffit carries the eye to the entrance doors, which are mandarin red with silver, black and copper trimming.

In the main dining room a suspended ceiling of wallboard was built to conceal existing steam piping. Recessed ceiling lights of a specially designed ventilating type are used. This ceiling also provides a ventilating system.

SPECIFICATIONS PROTECT QUALITY AND SERVICE DESPITE PRICE CHAOS

The problem of how to obtain the quality of materials and workmanship contemplated by his design has become more complex for the architect as the pressure of the competition between contractors has increased. The customary methods of control evolved for a market in which normal business motives prevail are admittedly less effective at the present time.

THE RECORD has asked a number of representative architects what means they employ to insure the integrity of their designs. The replies, including the article on *Firm Specifications* by Daniel Higgins, of the Office of John Russell Pope, in the June issue, the contribution entitled *Specify for Quality* by C. E. Krahmer, of Guilbert and Betelle, in the August issue, and the selection of letters published herewith, give a cross section of the current procedure of the profession.

A feature of the communications is their invariable fairness and complete understanding of business conditions. It is recognized that sharp practices are unavoidable unless the architect exercises the necessary preventive vigilance.

In private work, to the extent that the owner is willing to follow the architect, it has been found possible to insure fair price competition on the basis of quality and service by methods of control in use before the depression set in; what is needed are tighter specifications, closer supervision and more attention to detail.

It is mainly in public work, where the architect has been uncertain about the authority which the courts will permit him to exercise, that unbridled price competition exists. Perhaps the most important fact brought out by the present discussion is contained in Mr. Krahmer's article in the August issue, to the effect that the courts will sustain the professional standing and authority of the architect as freely in public work as in private work, provided the specifications conform to certain legal principles. These principles are applicable both to private and to public work, and Mr. Krahmer's article, which is too full of meat to be summarized here, is recommended for special study.

It is clear from this survey by THE RECORD that the profession aims to uphold quality and service, that it is doing so effectively in private work, and that recent legal interpretations point out how specifications can be formulated to insure quality and service in public work also.

Doubt has been expressed concerning the permanence of architecture as an independent profession. To resolve any misgiving on this point one has only to note how unreservedly in a time of general distrust every element of the building industry—owners, contractors, manufacturers—turns to the architect for disinterested advice and fair dealing.

The following selection of letters and of excerpts from letters by architects presents a constructive analysis of conditions which support the belief that the architectural profession can be depended upon to maintain the tradition of sound construction.

W. POPE BARNEY, Architect

I do not hold with the theory that the architect, by reason of his relation to the building industry, should take a hand in stabilizing prices by any means other than intelligent appreciation of what is and what is not good workmanship and material. These he should specify and insist upon getting. The price must be allowed to take care of itself.

There has been entirely too much loose thinking and talking on economic questions on the part of many of us. Stabilization of costs is undoubtedly the sound basis for returning prosperity, but I do not believe that the stabilization can be artificially accomplished or even encouraged, and nothing would be more detrimental to the buyer's psychology than a suspicion that the much talked of stabilization has been achieved in any way other than by the balancing of supply and demand.

If most manufacturers feel that they are faced with the alternative of closing up or of cutting costs beyond any reasonable hope of maintaining quality, remember that they have always felt that way. Who ever heard of a manufacturer's telling the public that he was charging too much or even enough? And yet, in a declining market there are those who find that the lesser of two evils is to cut costs, and having so decided, move heaven and earth to find some way of maintaining quality; which, in the end, means everybody working much harder than they have heretofore—a thing which I do not believe is to be altogether condemned in the light of the use which America in general has made of its leisure time.

The wide fluctuation in prices represents a wide fluctuation in ways of doing business, and the architect ordinarily is so engrossed with his own concerns that he does not take the time and trouble to investigate the full import of these variations. To make up a list of truly competitive bidders today takes infinitely more work than it did some years ago. To review their estimates and consider their subcontractors, etc., so that you may put competitive bidding on a fair basis, requires much attention which must be given by the principals of the office, and can hardly be delegated very far

down the ladder. But if given, it is possible even with present conditions to arrive at fair competition, provided that one's specifications have received the same extra amount of study.

The whole idea can be summed up in a few words. There is no panacea and no solution except frankly facing the fact that it requires more work to be thoroughly competent today than it did a few years ago.

As to concrete practice, here in the office we write a rather tight specification which definitely enumerates the range of choice in materials without an "or equal" clause, the "or equal" being covered in the general conditions by stating any departures from the specifications must be definitely made a part of the contract and no substitutions will be allowed thereafter. We avoid almost entirely the outright specifications of a single individual make or subcontractor, covering this rather by a specific allowance of money in the general conditions. This procedure we have found to present less opportunity of being taken unfair advantage of, since the price is public information; the amount of work which it covers can be reasonably ascertained and the chance of exposure of an unfair price is so great that the temptation to bid up on the part of the material man or subcontractor is reduced to a minimum.

HARVEY A. SCHWAB,
Schwab and Palmgreen, Architects

In the attempt to solve the problem of stabilizing building costs the procedure of this office, based upon more or less bitter experience, has developed several critical points:

1. Satisfactory bidding can only be obtained from a carefully selected and controlled list of bidders, chosen jointly by the architect and the owner from a list prequalified on the basis of financial responsibility, technical skill and experience, performance record, and reputation for business integrity.

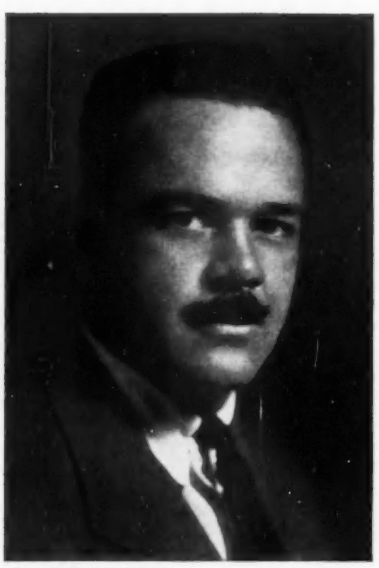
2. The elimination of "peddling" sub-bids by requiring the incorporation in the contractor's proposal of a complete list of sub-bidders (one only for each branch of the work) upon whose bids the contractor's proposal is based. In case it becomes advisable to request a change of sub-bidders, the contractor is required to submit a breakdown of his proposal, and the difference in cost between the sub-bidder finally chosen and the one used in the proposal either becomes an addition to or a deduction from the contract price. The final list of sub-bidders is incorporated in the contract and no change therefrom can be made without the consent in writing of both the architect and the owner.

3. The elimination of "or equal" from the specifications by (a) specifying materials and equipment, where fair competition exists, by means of a "performance and engineering" specification wherein no trade name or manufacturer's name appears; (b) where no real competition exists, or where craftsmanship becomes a major factor, materials or equipment are covered with a money allowance. Materials and equipment covered by such a money allowance are either purchased direct by the owner or by the contractor under the owner's direction. Any difference in cost between the stated allowance and the actual cost becomes an addition to or a deduction from the contract price.

4. Where a bidding list can be kept down to two or three equally prequalified bidders, we have found it very satisfactory to propose to the bidders a cost plus fixed fee contract with cost limit, generally equal to the fixed contract proposal. Savings, if any, are divided between the owner and the contractor.

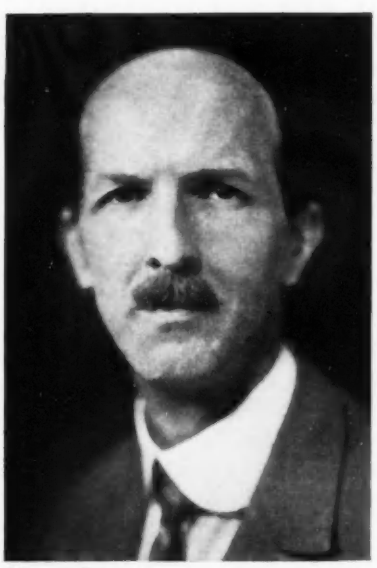
Underwood & Underwood

J. C. BOLLENBACHER



Campbell Studio

G. FREDERIC PELHAM, JR.



Abrams, Inc.

FREDERICK O. LEWIS

Under all conditions complete and accurate documents (drawings, specifications, bidder's proposal forms, etc.) are an absolute necessity in effecting fairness and safety for both parties to the contract. We have no recommendation to make, however, as to any method by the architect for reducing his own costs, necessarily increased by the preparation of such contract documents as well as by intensive investigation of building materials and their proper use.

G. FREDERIC PELHAM, JR., George Fred Pelham, Architects

As Mr. Daniel Higgins pointed out in the June issue, uncontrolled price competition is apparent in nearly every phase of the building industry. Estimates from reliable manufacturers for supplying a similar article often vary by as much as sixty per cent. In these times of precious dollars it is more than ever the architect's duty to see that his client's money goes as far as possible. Yet, on account of this variance, many architects hesitate to accept the lower, or even the middle figures, for fear of receiving poorer quality or inferior substitutions.

But just how much danger is there of such a lowering of quality by manufacturers of nationally known products? With prices where they are today, the estimates of new, or lesser manufacturers, need not be considered. Any architect who solicits or accepts them, deserves the penalty he will, in all probability, be forced to pay. If he wishes to remain in business he will not, in these times, accept the fictitious prices submitted by ill-equipped and inexperienced organizations. But what of the wide difference in figures submitted by the best of manufacturers for nationally known products of the same type? Perhaps a glance at the reasons for their variance will provide a solution and allay our fears. . . .

[The reasons given by Mr. Pelham may be summarized by saying that in the present market the wide difference in prices of comparable products represents difference in degree and time of pressure to liquidate inventories.—Editors.]

As matters stand, the architect of today has less to worry about, in regard to quality, than he had during the palmy days when, under the stress of urgent demand, workmanship and inspections were not always what they should have been. Only the most reputable and well-established companies have been able to survive. Only the estimates of these need be solicited or considered. The present low prices and small demand afford no incentive for the manufacturer of cheap substitutes or inferior articles. Those of the finest quality are available at the lowest prices in years.

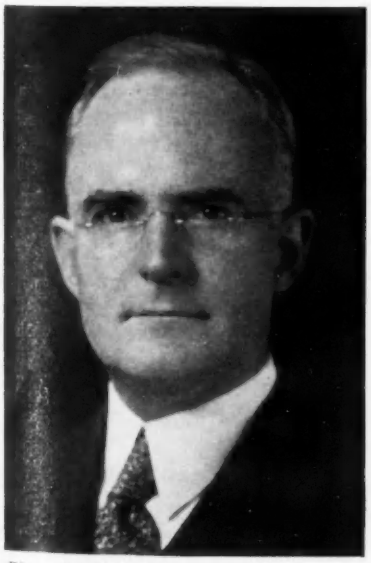
With the drastic cuts in basic materials and the wages of competent labor, the manufacturers, when they do start up again, will, in all probability, produce an article superior, rather than inferior, to that produced before.

Although it is difficult to get accustomed to the fact, the lowest estimates received today on a given product from reliable manufacturers, are, in all probability, closer to the present and future values of that product than are the higher ones. In accepting the lower figures the buyer gets the benefit of the manufacturer's loss, while in accepting the higher ones he undertakes to share it.

I speak, of course, only of nationally known products, manufactured by well-established firms. All the architect need do is assure himself that the bid he accepts is from one of these.

CHARLES B. MEYERS, Architect

I have for some time seen unmistakable evidence of price-cutting in proposals for building construction that would seem clearly to indicate by the marked difference in the amounts of the proposals either that there was a lack of proper understand-



Blank & Stoller, Inc.

J. P. H. PERRY

Moffett

JOHN W. HARRIS

Blank & Stoller, Inc.

L. R. CRANDALL

ing by the bidders of the grade of materials and character of the work that would be required and exacted under the terms of the contract or that there was the anticipation that the precise and exacting terms of the contract would not be enforced. The marked difference in proposals, in my opinion, goes far beyond the reasonable difference that does and likely will always exist even during a stable market price of materials and labor.

Unfortunately, in the past in most cases, awards have been made on the basis of estimated costs in which comparisons of equality of the kind of materials and the character and grade of the work of the competitors are not adequately considered, it being likely held that all of the bidders intend fully to meet the requirements of the contract as expressed by the drawings and specifications.

To make for honest and proper competition in bidding, it would seem to me at the present time more than at any other time that it is the obligation of the architect to so express by drawings and specifications what is desired to be bid upon and contracted for that there can be no reasonable difference in opinion of the bidders of what is wanted. That makes necessary that bidders have furnished to them complete working drawings, substantially all scale details and precise and exacting specifications covering in full detail all materials and the grade and standard of work that will be exacted.

The reputations enjoyed by manufacturers that were sufficient in the past to assure that there would be furnished suitable and proper materials for a given or definite purpose, will manifestly not suffice if the cutting of costs beyond reason is the alternative of such manufacturers to continue in business. Precise specifications of such materials is a safeguard; selected samples on display during the period of bidding, as referred to in the specifications, is another. The latter has been the general practice of this office on so-called specialties.

FREDERICK O. LEWIS,
Lewis and Leonard, Architects and Engineers

Mr. Daniel Higgins sounds a timely warning to architects of their duty to make the selection themselves of products that can be governed by no general specifications without eliminating proper competition, such as many fabricated products. Mechanical items, as elevators, electric panelboards, oil burners, also marbles and like materials, might be thus included.

"Allowances," as described in the A.I.A. General Conditions, in our practice have admirably taken care of such situations. (They can not be used in Government specifications.) We specify the basic conditions of what is wanted, and thereby cooperate with other trades, without specifying any details that vary between the makes competing. For the contractor's guidance we may name one or more makes that are approved. The general contractor is then required to state the amount he includes for such item as an "allowance," naming the make and submitting specific description. Thus the architect, with his technical ability, has the control in keeping out work lacking in quality and uneconomical although appearing cheap in price.

JOHN C. BOLLENBACHER,
Granger and Bollenbacher, Architects

Mr. Daniel Higgins' article on "Firm Specifications" is tremendously interesting and appropriate in these times. The duty of the architect on all projects should be to insure to the manufacturers and subcontractors fair terms of competition and to the client any savings which the architect may decide to accept due to changes in specifications or any differences between original bids of sub-contractors and amounts actually paid to them.

This office has used and has found practicable the following specification in this connection, which is extremely fair to owner, contractor and subcontractor:

"Before the awarding of the contract, each general bidder shall submit, when so requested by the architect, a complete list of the subcontractors to whom he proposes to award the subcontracts for the several branches in the event he is the successful bidder. This list shall show the amount of each subcontractor's bid which was included in the general bid, and the contract price shall be adjusted to take care of any corrections approved by the architect before the contract is signed. The list of subcontractors may be further corrected after the contract is signed, providing the architect approves and the owner accepts further adjustments in contract price. The successful contractor shall award the several branches to the finally approved subcontractors.

"The architect's approval shall not relieve the general contractor of his responsibility, as defined in the contract, to his subcontractors nor to the owner for his subcontractors."

CARL W. CLARK, Architect

For many years this office has used a system which, in its opinion, protects the interest of all of those having to do with building operations under its supervision. Inclosed herewith is a copy of a discussion presented before the Builders' Exchange and Factory Plant Engineers at Niagara Falls some weeks ago. From this discussion you will get an idea of the plan on which this office has operated in the past and no doubt will continue to operate under in the future:

Some years ago it became evident to us that the practice of shopping or "chiseling" was becoming more and more prevalent. . . . As we analyzed the situation we came to the conclusion that . . . unethical contractors, subcontractors or material men

(Continued on page 28, advertising section)

Courtesy Henry Klein & Co., Inc.

OFFICE IN IRVING TRUST CO. BUILDING
VOORHEES, GMELIN AND WALKER, ARCHITECTS

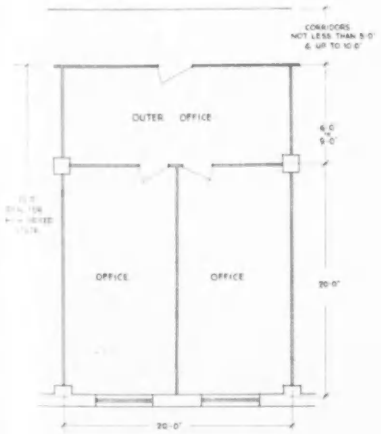
DESIGN AND DRAFTING PROBLEMS

PLANNING OFFICES FOR ECONOMY

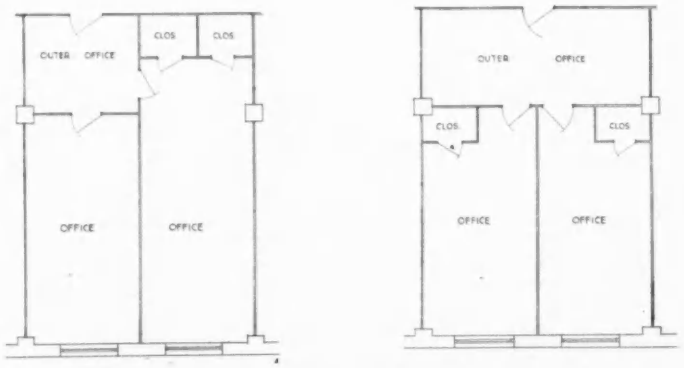
By A. LAWRENCE KOCHER
and ALBERT FREY

Office sizes are determined by a combination of factors recognized by the architect in laying out space in an office building. Engineers have indicated the economy and the desirability of attaining a spacing of steel columns that approximates 20 feet by 20 feet. The *depth of office* space that is adjusted to this span should not exceed 26 feet. This is because effective light does not penetrate beyond this distance from windows. Building managers have urged the acceptance of a 26-foot depth as a desirable maximum since an increase in depth does not result in any increase in rental for average usage.

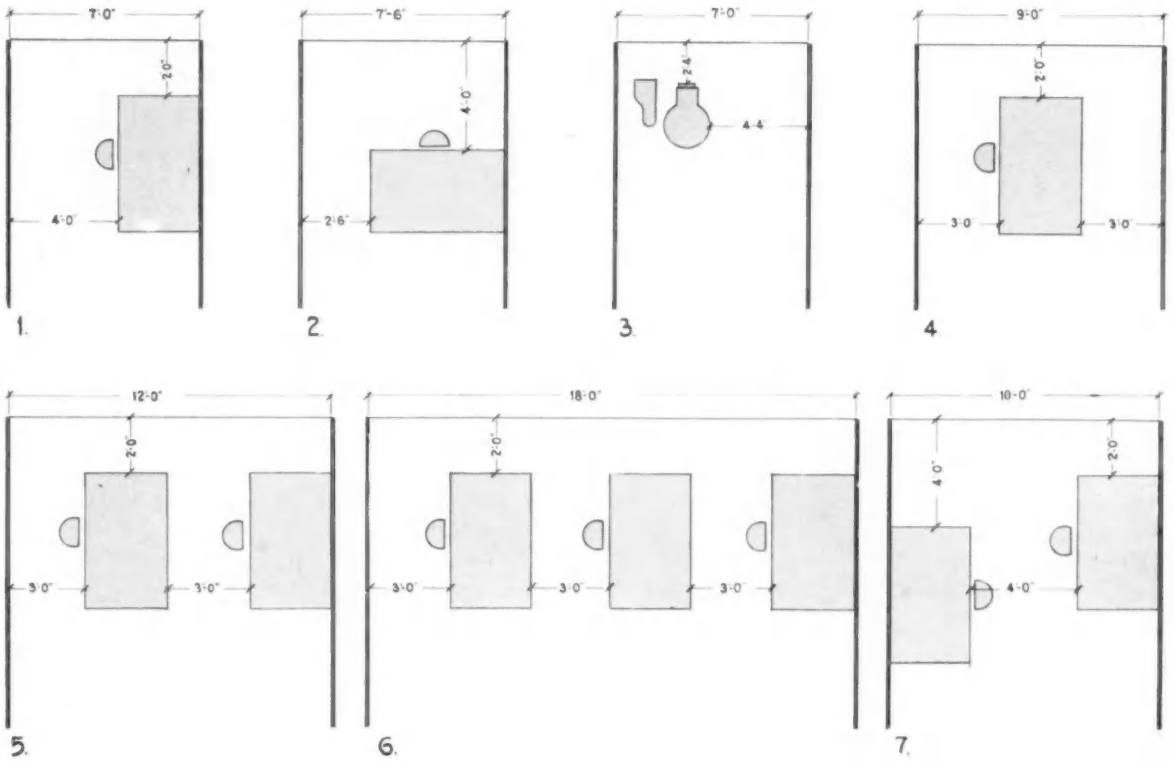
The second factor that determines a desirable and economical width for offices is furniture sizes. The working area that surrounds equipment should be convenient without excess distance between desks or desk and wall. Office widths suited to use and the correct location of furniture are necessary to attain maximum economy in the use of floor space. See table of minimum dimensions of office areas adjacent to equipment on page 198.



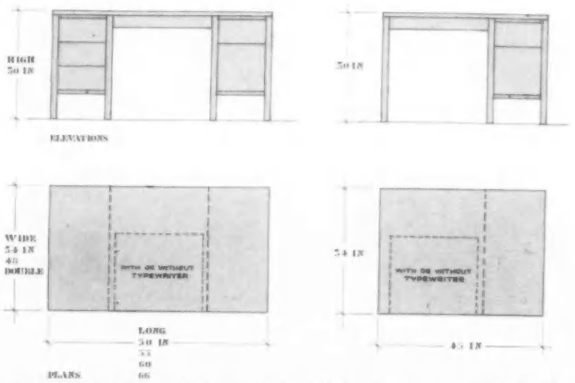
THE MOST ECONOMICAL BAY for office building layout is 20′ by 20′. In actual practice the dimensions of bays can be varied down to 18′ by 18′ and up to 22′ by 22′.



EXAMPLES OF OFFICE LAYOUT with a 20′ by 20′ spacing of columns. Windows in the usual office building are 5′-0″ to 5′-6″ wide. Their height varies from 5′-0″ to 6′-6″. Windows as wide as the office are preferred for satisfactory illumination.



MINIMUM DIMENSIONS OF OFFICE AREAS ADJACENT TO EQUIPMENT. (1) Desk with light from left side. (2) Desk, facing entrance, with light from rear. More suitable to conference than example (1). (3) Minimum width for office of dentist. (4) Light from left side with conference space in front of desk. (5) Two desks with light from left. (6) Width of office required for three desks with light from left. (7) Two desks that face opposite walls—more economical than example (5).



DESK SIZES IN COMMON USE. Almost one-half of all office desks sold are 34" wide by 60" in length.

OFFICE DESK SIZES

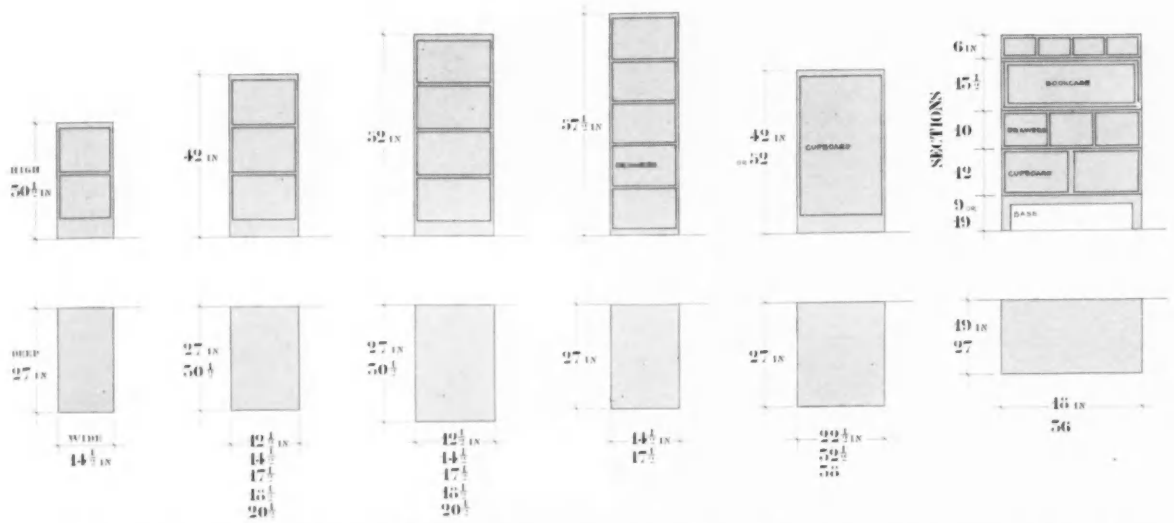
A survey by the National Association of Building Owners and Managers indicates the most common desk size to be 34" x 60". The second popular size is 34" x 54".*

The desk was chosen for measurement since it is the principal and almost universal piece of office equipment. "The results of the survey," says this report, "provide a basis upon which to judge the space requirements of small offices." The analysis follows:

TABLE 3. TABULATION OF DESK AND TABLE SIZES, BASED ON SKETCHES OF 100 ROOMS IN JACKSONVILLE, FLA.

Single Desks	Outer Office			Private Office			Total		
84 x 42	0			1			1		
73 x 38	0			1			1		
66 x 38	1	1	1%	2	6	15.7%	3	7	5.5%
66 x 34	0			4			4		
62 x 32	0			1			1		
60 x 38	0			1			1		
60 x 36	1			2			3		
60 x 34	29	41	45%	6	19	50%	35	60	46.5%
60 x 32	10			10			20		
60 x 30	1			0			1		
54 x 36	0			1			1		
54 x 34	5			2			8		
54 x 32	10	25	27.5%	3	7	18.4%	12	32	23.5%
54 x 30	10			1			11		
52 x 32	1			0			1		
50 x 32	3	7	7.7%	0	2	5.2%	6	9	7%
50 x 30	4			2			3		
48 x 30	1			1			2		
44 x 32	2			0			2		
42 x 34	1	9	9.9%	0			1	9	7%
42 x 32	4			0			4		
42 x 30	4			0			4		
40 x 30	1			0			1		
37 x 30	1			0			1		
36 x 24	1			0			1		
30 x 31	1			0			1		
	91			38			129		

Economic Use of Office Space. Published by The National Association of Building Owners and Managers, Chicago. 1926.



TYPICAL FILING CABINET SIZES. Compartments for filing have become standard for width and depth. It is possible to combine in minimum space the requirements for filing cases, lockers, bookcases, cupboards, vaults. Office sizes should be determined in part by required cabinet sizes.

Double Desks	Outer Office	Private Office	Total
66 x 54	0	2	2
60 x 48	10	4	14
Tables			
72 x 38	0	1	1
72 x 36	2	3	5
72 x 34	1	1	2
66 x 38	0	1	1
66 x 36	0	1	1
60 x 36	1	1	2
60 x 34	3	3	6
60 x 36	1	1	2
60 x 30	2	0	2
	7 32%	5 36%	12 33%

	Outer Office	Private Office	Total
54 x 32	1	0	1
50 x 32	1	1	2
48 x 32	2	0	2
43 x 31	1	0	1
42 x 30	1	0	1
42 x 28	2	1	3
42 x 26	3	0	3
40 x 24	1	0	1
	19	7	36

The 60″ desks comprise 46.5% of the total number listed and vary from 30″ to 38″ in width, the 37″ width predominating.

ARCHITECT'S DRAFTING ROOM,
PLANEIX HOUSE, PARIS
LE CORBUSIER AND
P. JEANNERET, ARCHITECTS

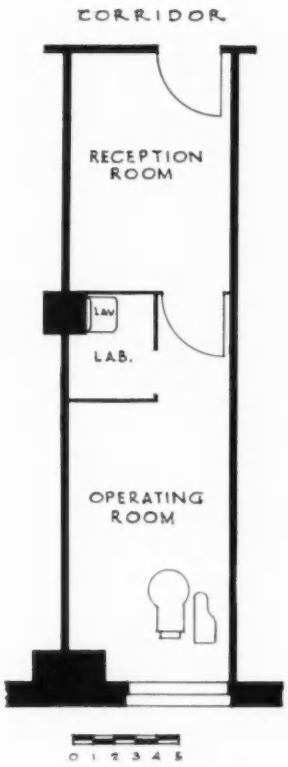
OFFICE OF ALBERT KAHN, INC.
DETROIT, ALBERT KAHN, ARCHITECT

OFFICE OF ALBERT KAHN, INC.
DETROIT, ALBERT KAHN, ARCHITECT

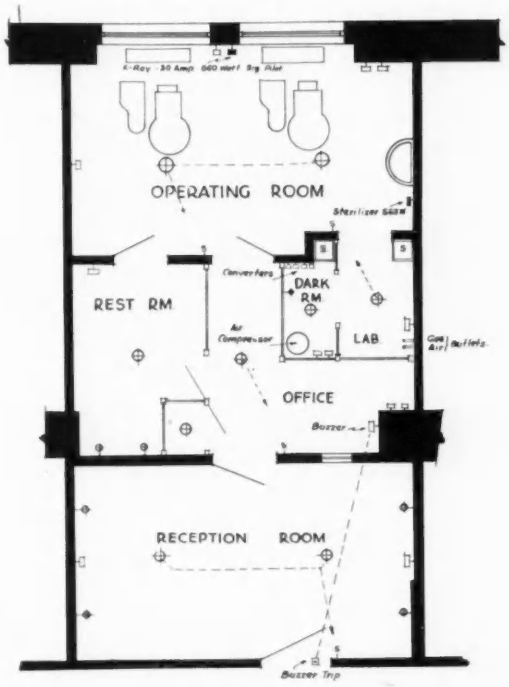
Courtesy E. F. Hauserman Co.

OFFICE IN PHILADELPHIA
SAVING FUND SOCIETY BUILDING,
PHILADELPHIA
HOWE AND LESCAZE, ARCHITECTS
OFFICES ON THIS PAGE SUBDIVIDED
WITH FLUSH METAL PARTITIONS

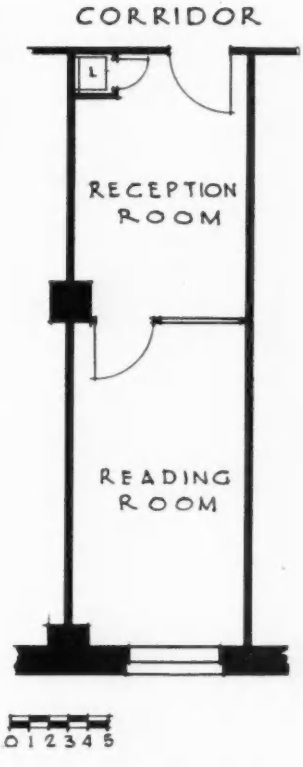
TYPICAL OFFICE PLANS



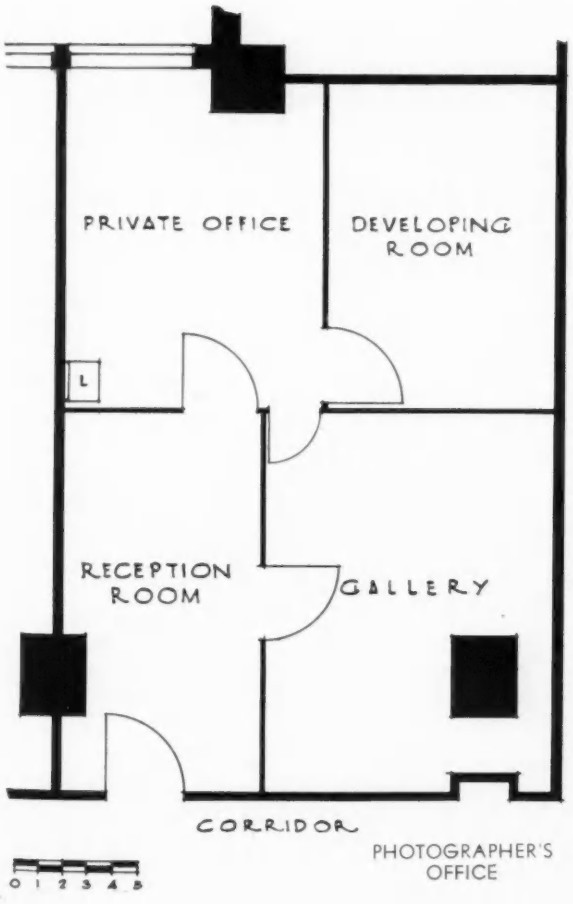
OFFICE OF DENTIST WITH ONE CHAIR



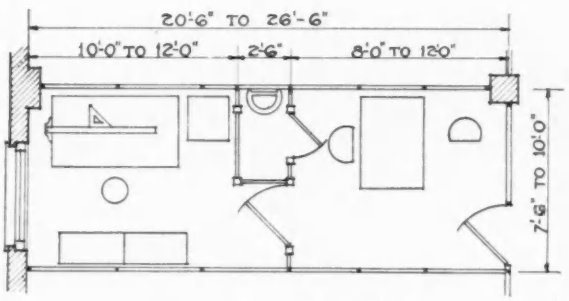
OFFICE OF DENTIST WITH TWO CHAIRS



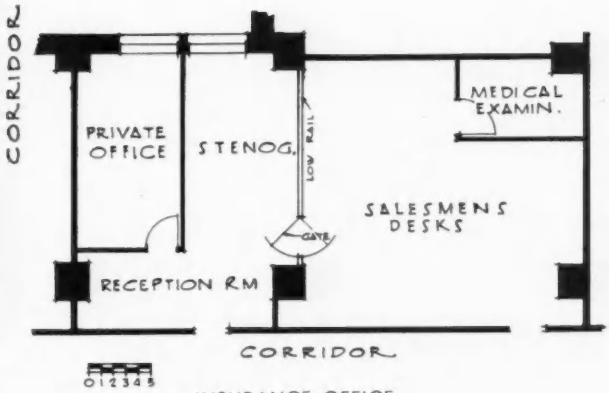
CHRISTIAN SCIENCE READING ROOM



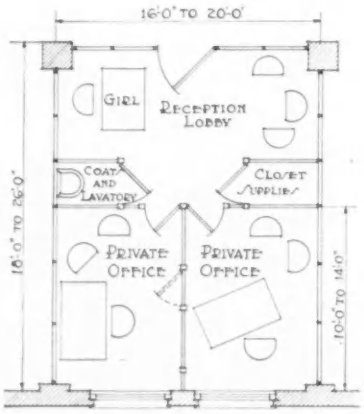
PHOTOGRAPHER'S OFFICE



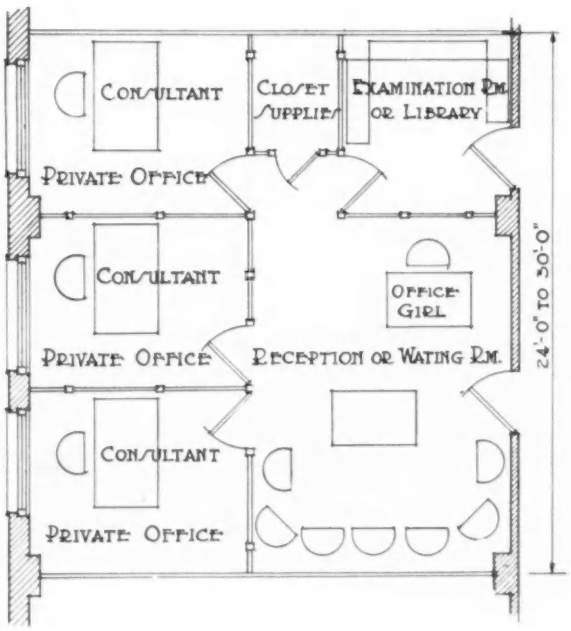
CIVIL ENGINEER'S OFFICE



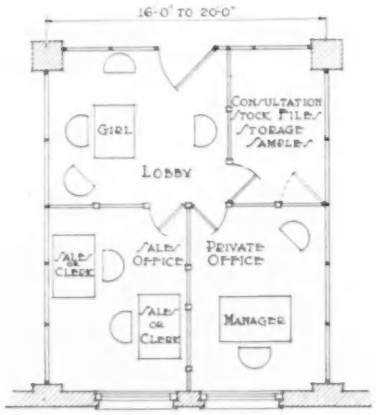
INSURANCE OFFICE



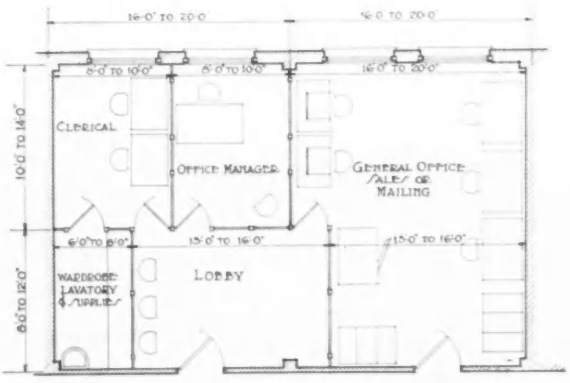
"T" OFFICE WITH CLOSETS



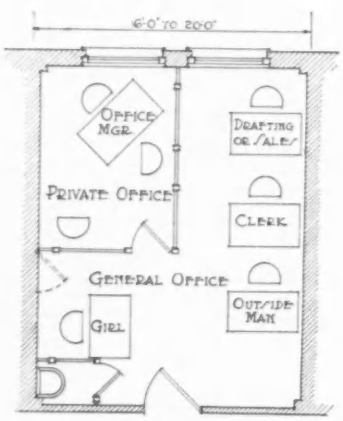
ATTORNEY'S OFFICE



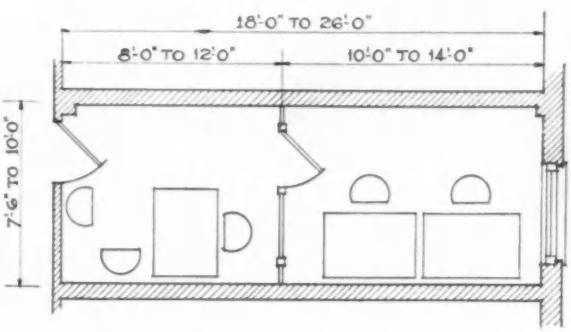
CROSS OFFICE



DEPARTMENTAL OFFICE



"L" OFFICE
ONE BAY WIDTH



SALESMEN—ONE-HALF BAY WIDTH

FROM OFFICE PLANNING STUDIES BY E. F. HAUSERMAN CO.

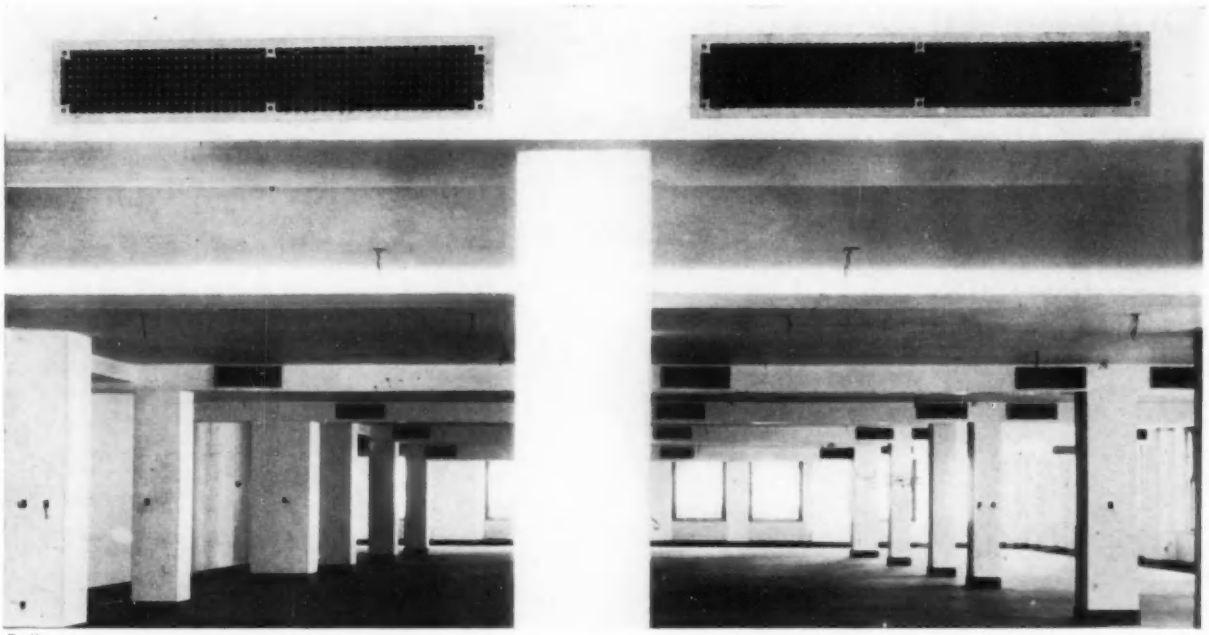
TECHNICAL NEWS AND RESEARCH

Galloway

Chicago's West Side with its smoky factories . . . a farm in Wisconsin.

AIR CONDITIONING

Dust and smoke are often conspicuously present in city atmospheres. The overlying blanket of soot is receiving recognition as a health problem, for measurements have shown that the beneficial ultraviolet rays of the sun are 50 per cent greater in the country than in the city. Air purity is an important factor in air conditioning, together with proper control of temperature, humidity, and air motion and distribution.



Galloway

Screened overhead outlets provide conditioned air in this office space in the Empire State Building in New York City (Shreve, Lamb and Harmon, architects). Air conditioning as a system of atmospheric control means primarily heating and humidification in winter, and cooling and/or dehumidification in summer, with proper air purity and circulation at all seasons.

AIR CONDITIONING

By C. THEODORE LARSON

As a new science and industry, air conditioning is contributing much to the health, comfort, enjoyment and longevity of humanity. Because it bears so directly on human life and activity, and because its essential factors are so intangible, it is deserving of the finest research and co-ordination of scientific knowledge. Sponsored by organizations like the American Society of Heating and Ventilating Engineers, the American Society of Refrigerating Engineers, the American Gas Association, the American Institute of Architects, the U. S. Public Health Service, the U. S. Bureau of Mines, numerous university laboratories as well as several pioneering manufacturers, such research is now under way in the fields of physics and physiology.

The practical value of this work is seen in the intensive development of air conditioning equipment. Many new devices and systems of apparatus have appeared within recent months; many more are anticipated in light of new findings. A large market awaits the manufacturers of such equipment, for air conditioning has an almost universal application—in houses, apartments, hotels, offices, restaurants, theaters, department stores, hospitals, factories, even trains and airplanes.

This large potential demand has equal significance for the architectural profession. The use of "manufactured atmosphere" is certain to bring about many changes and innovations in building design and construction. Windows, for example, are at present a source of trouble to the air conditioning engineers, chiefly because they must be securely closed for proper working of a regulated system. Moisture condensation is apt to occur on the window glass, or heat rays from the sun may be transmitted to upset the balance of temperature and relative humidity inside the room. Another problem is the infiltration of outside air through crack leakage and walls of varying porosity. Research studies now in progress point to the possibility of buildings which will be "streamlined" so as to give better air distribution within rooms as well as greater economy of the mechanical operation. The future development of conditioning systems may thus in turn be influenced by new planning considerations and by new materials which will give greater airtightness and heat insulation to the building structure.

With this interrelationship of the architect, the industrialist and the laboratory investigator in mind, this *Technical News and Research* article attempts to explain what air conditioning is, how it is controlled, and how it affects health and comfort. A second part, appearing in the October issue, will discuss equipment now available, and the various problems of building construction and design resulting from the introduction of conditioned air.

WHAT IS AIR CONDITIONING?

Air conditioning, as defined by the American Society of Heating and Ventilating Engineers, is *"the simultaneous control of the temperature, humidity, air motion and air distribution within an inclosure. Where human comfort and health are involved, a reasonable air purity with regard to dust, bacteria and odors is also included."* (Another factor, about which little definite information is yet available but which offers a fruitful field for research, is *ionization* or the electrical quality of air.)

The phrase "simultaneous control" is very important in this definition. Because of the physical structure of air, a control of the moisture content depends on a definite control of temperature and other factors. Ordinary humidification or dehumdification without proper control of the other factors does not necessarily produce conditioned air, although there are instances where control of the moisture content or a single other factor alone is desired.

Many kinds of equipment are on the market, ranging from large made-to-order air conditioning systems and ready-made unit-conditioners for typical residence installations to various combinations of heaters, coolers, humidifiers, dehumidifiers and air filters and purifiers. Even separate elements are in demand as accessories to existing heating installations which are deficient in such control. Each has its effect on atmospheric conditions.

Because of the multiplicity of apparatus now being sold it has been suggested by several authorities that a factor basis be established for proper classification of air conditioning machinery. Nine such factors are set forth by Mont H. Smith, Jr., in *Heating and Ventilating* (November, 1931):

1. Measured and complete air distribution.
2. Provision for control of temperature for winter.
3. Cleaning of air (filtration or washing).
4. Automatic supply or control of humidity for winter.
5. Cooling effect by air circulation for summer.
6. Provision for summer cooling (mechanical refrigeration or other source of refrigeration).
7. Dehumidification or control of relative humidity for summer.
8. Ionization, deionization and deodorization.
9. Treatment of CO_2 factor.

Under this method of classification an air conditioning unit may be designated as a two- or three-factor unit, if it fulfills the functions of the first two or three factors. Since factors (8) and (9) are not important in household installations, a seven-factor air conditioning unit or system is of practical completeness for a residence. Qualitatively, all such equipment must be judged as to relative efficiency in maintaining the atmosphere according to specified standards.

In final analysis, then, air conditioning is a *system* of atmospheric control and the apparatus the *means* for producing air of desired quality and quantity. In winter air conditioning means primarily heating and humidification; in summer, proper cooling and/or dehumidification. At all seasons air purity is desired.

From the viewpoint of the architect specifying air conditioning equipment, the first question to be answered is, what kind of air is needed?

Physical Properties of Air

Since the discovery many years ago that the ill effects of air in a poorly ventilated room are not caused by poisons or odors given off by the human body but are the results of physical changes in the air itself, much progress has been made in the science of atmospheric control.

Unlike water, which is a *compound*, being made up of hydrogen and oxygen in chemical union, air is only a *mixture*. This mixture comprises a number of gases, chiefly oxygen and carbon dioxide, plus water vapor. The percentage of atmospheric gases is relatively constant and usually given little consideration by the air conditioning engineer. The percentage of moisture, however, varies in relation to temperature.

The atmosphere will, at varying temperatures, hold a certain amount of water up to what is known as the *saturation point*, or 100 percent humidity. This capacity of the air for moisture increases with rising temperatures and decreases with falling temperatures. For instance, the saturation point of a cubic foot of air at 70° F is 7.98 grains of moisture, at 32° F, 2.113 grains, and at 0° F only 0.564 grains (1 lb. of water = 7,000 grains).

Relative humidity is the ratio of the weight of water vapor existing in a given space as compared to the weight which the same space is capable of containing when fully saturated at the same temperature. For example, if the cubic foot of air at 70° F contains only 3.99 grains, the relative humidity is 50 percent.

Condensation of water vapor occurs when the saturation point has been reached. Any change in temperature affects this saturation point since the amount of vapor a given space will hold is independent of the presence of atmospheric gases but varies directly with the temperature. (The vapor *pressure* of water likewise depends upon its temperature.)

Air is usually deficient in water vapor, chiefly because warm air has a greater capacity for moisture than cold air. This is apparent in the fact that air at a temperature of 70° F has a moisture capacity sixteen times greater than that of air at 0° F. If an unsaturated mixture of air and moisture vapor is cooled without the removal

of any moisture pressure, it will ultimately become saturated. The temperature at which saturation occurs for a given weight of water vapor is called the *dew-point temperature*. Additional cooling below this temperature will result in condensation of moisture.

These facts relate directly to the conditioning of air for buildings where the outside atmosphere is the only source of air supply. If cold winter air with its usual low moisture content is taken into a building and heated, its relative humidity is decreased and at the same time its capacity for moisture is increased manifoldly. For example, if outdoor air with a temperature of 30° and a relative humidity of 70 percent is heated to a temperature of 70°, the relative humidity falls to 17 percent. If outdoor air with a temperature of 20° and a relative humidity of 70 percent is heated to 70°, the relative humidity falls to 10 percent.

Sometimes a relative humidity of only 10 percent is found in the typical home. Such low relative humidities tend to absorb moisture from substances within the room, e.g., walls, furniture, fabrics, as well as the mucous membranes of the human body. For physical comfort the relative humidity indoors in the winter time should be increased to at least 40-60 percent. To do so, it is necessary to add water to the air each day, the exact quantity depending on the size of the house and the type of construction.

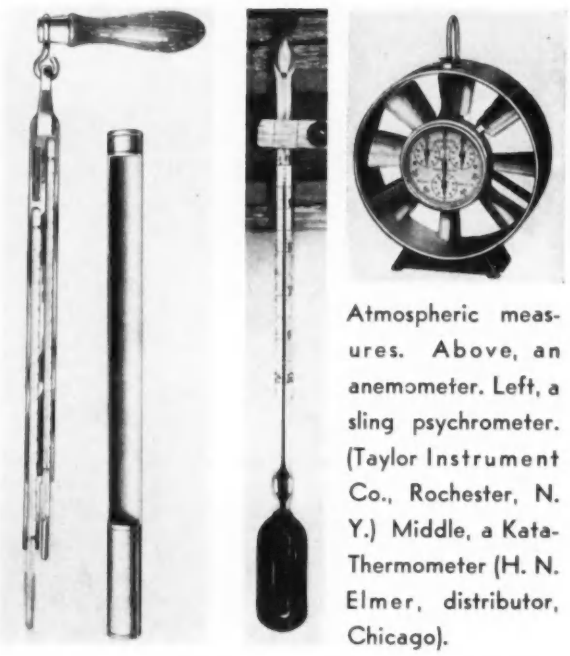
Measuring the Atmosphere

Many devices are available for the measurement of temperature, relative humidity and air movement but so far as known all attempts to design a single instrument which will measure the combined effect of these three atmospheric factors have been unsuccessful.

The *dry bulb* temperature of the air as a measure of the intensity of heat is easily obtained by checking a graduated mercurial thermometer.

The sling psychrometer is a standard instrument for determining humidities. The bulb of an ordinary thermometer is covered with wicking moistened in distilled water; by fanning and whirling the thermometer, the moisture is rapidly evaporated. Since the water vaporizes into the air without loss of heat to the remaining water, the *latent heat* of evaporation (required for change of state) must come from the *sensible heat* of the air itself. The temperature of the air is thus reduced. The process continues until the air is saturated. When the mercury has reached its lowest level, the *wet bulb* temperature reading is made; this is the *temperature of evaporation*, the final temperature at which adiabatic saturation takes place in any body of air of known temperature and moisture content.

The wet bulb temperature is essentially the temperature at which evaporation ceases, and is thus indirectly a true measure of the total heat value of the air and an indication of its humidity.



Atmospheric measures. Above, an anemometer. Left, a sling psychrometer. (Taylor Instrument Co., Rochester, N. Y.) Middle, a Kata-Thermometer (H. N. Elmer, distributor, Chicago).

Since the coolness resulting from evaporation and convection depends largely on the velocity of the air, it is obvious that a stationary wet bulb thermometer is impracticable. Consequently the sling psychrometers are usually mounted on a handle or chain for whirling.

After the dry bulb and wet bulb temperatures are obtained, the relative humidity can be determined by reference to special tables or charts which will give the percentage for the specific condition. Such tables have been prepared by the United States Weather Bureau and may be obtained for ten cents from the Government Printing Office in Washington, D. C. In the A.S.H.V.E. comfort charts (see pages 208 and 209) the direct reading of the wet bulb temperature without translation into humidity percentages is used.

The quantity, velocity and pressure of air may be determined by various methods. Pitot tubes, Kata-thermometer and anemometer readings are in common use.

The Kata-thermometer, invented by Dr. Leonard Hill of England, is particularly useful in detecting drafts, low velocities and areas of stagnant air. It is a specially constructed alcohol thermometer with a cylindrical bulb and a stem graduated to tenths of a degree. In taking a reading, the bulb is immersed in hot water until the alcohol expands and rises to a top reservoir. The bulb is then dried and suspended in the location to be tested. The time taken by the liquid to fall from 100° to 95° is recorded by stop-watch. This time is a measure of the rate of cooling and depends entirely on the surrounding atmosphere. Since the heat loss from the surface of the Kata in dropping from 100° to 95° is a known factor, the *rate* of heat loss is found by dividing the Kata factor by the time of cooling. Once this rate is determined, the air motion is easily calculated from a table.

WHY DO WE NEED CONDITIONED AIR?

The physical properties of air — temperature, moisture content, rate of movement, and purity— directly determine the degree of comfort or discomfort felt by the human body. This relationship occurs because man maintains a constant body temperature (98.6° F at its normal level) which is the resultant of two factors: (1) heat production and (2) heat loss. In the balancing of this equation the body adapts itself automatically by its own heat-regulating mechanism to a wide range of atmospheric changes, but beyond certain limits man rapidly loses his ability to make the physiological compensations. Before those limits are reached, if discomfort is to be avoided, mechanical means must be devised to control the environment.

Food, water and air consumed by man are transformed into energy by a process of slow combustion within the body tissues. This energy finally becomes heat and serves to keep the body temperature well above that of the surrounding air. If the outside temperature is very low, the body reacts partly by shivering and partly by a reflex upon the heat-producing organs, a contraction of the surface blood vessels and a curtailing of the blood supply normally going to the skin, all in order to conserve the body heat. For comfort under such conditions, the body must be insulated with additional clothing or some provision made for adjusting the external temperature.

For the upward range of temperatures similar environmental corrections must be made. The human body must be free to give off its excess of internal heat. If the outside temperature is abnormally high, then the body heat cannot be eliminated as rapidly as it is produced. The part retained in the body causes a rise in skin and deep tissue temperatures, an increase in the heat rate and accelerated respiration. Heat production can be controlled by means of diet only to a limited extent: the minimum consistent with health varies according to the intensity of physical effort. Consequently the excess of body heat must be given off to the environment by means of *radiation, convection* and *evaporation.* (It has been found that the heat loss from a person in normal health is 46 percent by radiation, 30 percent by convection and 24 percent by evaporation.) The proportion of heat loss by each of these means of thermal transmission is determined by the temperature, the moisture content and movement of the surrounding air.

In unusually hot summer weather and in some industries the radiant heat from hot objects makes impossible any heat loss from the body by radiation (the diffusion of heat rays in all directions through the air) or by convection (heat transmission by currents of air). Since the only elimination of heat from the body surface is by evaporation (heat transfer in the form of moisture vapor) under such conditions, any physical activity is accompanied by much perspiration. Heat loss by evaporation is dependent on the relative humidity of the air. If the air is saturated, or if the humidity is very high, then evaporation is curtailed. "Stuffiness" in an inclosed room results when the overheated air will no longer properly absorb the waste heat from the body. With increased air changes, evaporation will go on with lessened discomfort. But beyond certain temperature limits man loses his physiological efficiency and the body mechanism becomes affected by overheating.

What Are the Most Comfortable Air Conditions?

Many experiments have been carried on to determine the environmental standards which are most satisfactory for the physiologic responses of the body. The general conclusion is that comfort standards are not absolute, but greatly affected by such factors as season and climate, physical condition, age, sex, amount of clothing worn and physical activity. It is doubtful whether a *single* optimum acceptable to a large number of individuals can be found. Any single individual is likely to have his own optimum which may vary from day to day. The desirable environment apparently is one which most nearly meets the requirements of the largest number of individuals. By personal adjustments others can accommodate themselves to the selected conditions.

The combinations of temperature, humidity and air motion which give equal sensations of warmth or cold have been determined from extensive in-

Courtesy BETTER THEATRES

This sidewalk window allows the air conditioning equipment in the Studio Theater, Los Angeles, to serve as an advertising medium.

vestigations conducted by the Research Laboratory of the American Society of Heating and Ventilating Engineers, in cooperation with the U. S. Public Health Service at the U. S. Bureau of Mines experiment station in Pittsburgh, and also in cooperation with the Harvard School of Public Health in Boston.* This index of equivalent atmospheric combinations according to the degree of warmth or cold is generally called *effective temperature*. (The term, although in general use, is somewhat confusing, for "effective temperature" is not a temperature at all, but a composite index combining the readings of temperature, humidity and air motion into a single value. It is so called because it measures the physiologic *effects* produced by heat or cold.)

If the dry bulb and wet bulb temperatures and the velocity of air motion are known, the effective temperature may be determined from the *thermometric chart* (see Fig. 1) or from psychrometric charts which have effective temperature lines for various air velocities superimposed. The thermometric chart applies only to rooms heated by the usual convection methods; it does not apply to rooms heated by radiant methods such as the British panel system or open fires.

Although moist air at a low temperature and dry air at a high temperature may both feel as warm as air of intermediate temperature and humidity (i.e., all with the same effective temperature), the *comfort* experienced in the three air conditions would be quite different. Under extreme humidity conditions there is a difference between sensations of absolute comfort and proper degree of warmth. According to comfort experiments conducted by the A.S.H.V.E. Laboratory and the Harvard School of Public Health, the effective temperature is a fair index only within a humidity range of approximately 30-60 percent.

The range of effective temperatures over which a majority of people feel comfortable is known as the *comfort zone*, and the particular effective temperature at which a maximum number feel most comfortable as the *comfort line*.

The comfort zones and lines vary from winter to summer. This is due partly to adaptation to seasonal weather and partly to differences in the amount of clothing worn. It is interesting to note that men wear approximately three to six times as much clothing by weight as do women, a fact which bears on the amount of sensible heat and latent heat of evaporation which the body is enabled to give off. When more skin surface is exposed there is a faster rate of heat loss. Another bit of statistical information affecting the comfort zone is the fact that winters are warmer in the city than in the country because of the prevailing smoke blanket. Sunday mornings are usually coldest owing to the industrial shutdown.

Other factors also come into consideration. For instance, in the accompanying charts of comfort zones, the tests were made in rooms with wall surface temperatures approximately the same as the dry bulb temperature of the room. Where walls have unusually low surface temperatures a higher range of effective temperatures is required in order to compensate for the increased loss of body heat by radiation. Inasmuch as there are many variations, any comfort chart must be used with discretion.

*Prof. C. P. Yaglou of the Harvard School of Public Health has summarized the results of this investigation in his article, "Physical and Physiological Aspects of Air Conditioning," in the A.S.H.V.E. Journal Section of *Heating, Piping and Air Conditioning*, January, 1932.

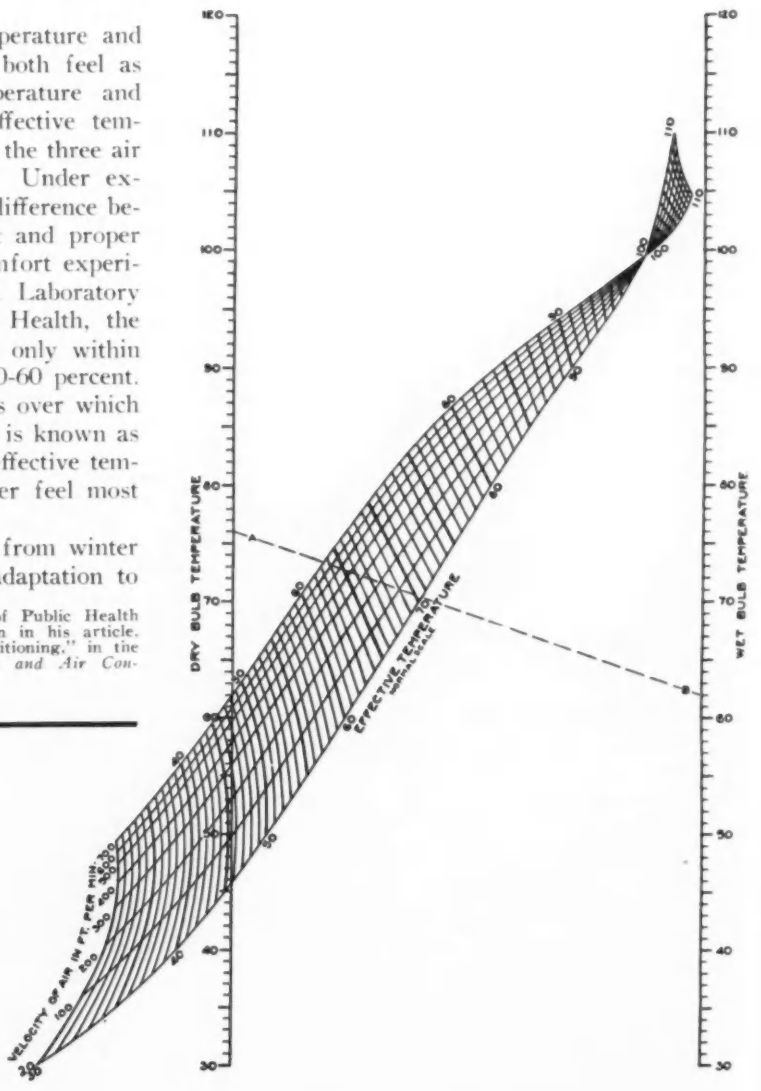
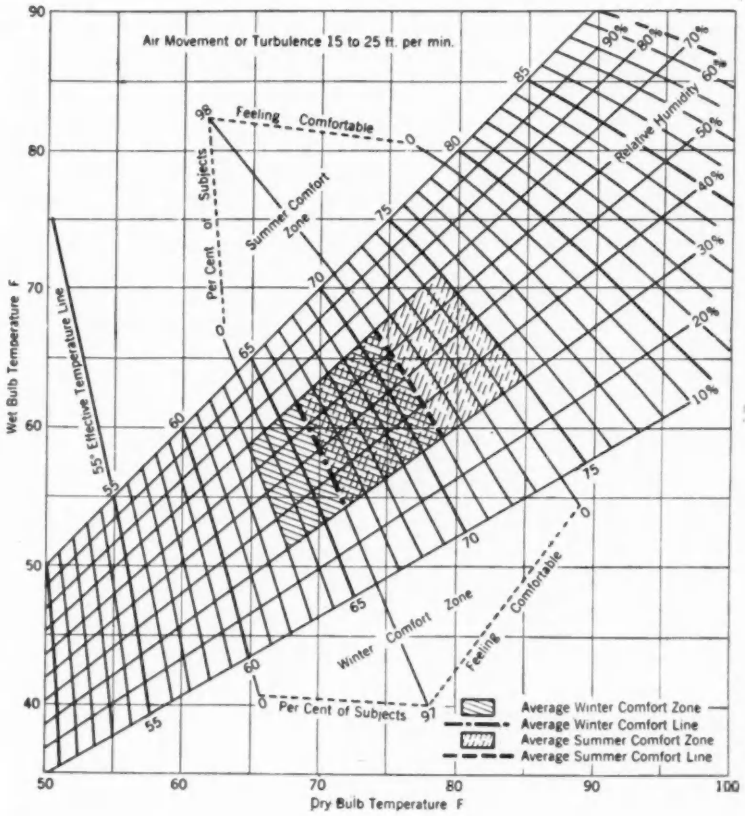


Fig. 1—Thermometric chart showing normal scale of effective temperature applicable to convection heating methods, sedentary or light muscular work and customary indoor clothing.

Fig. 2—Comfort chart with effective temperatures for air velocities of 15 to 25 f.p.m. (still air).

Example illustrating use: Given a dry bulb temperature of 76° and a wet bulb temperature of 62° (a measure of the relative humidity), the effective temperature can be found on Fig. 1 (opposite page) by drawing the line A-B. Where this line intersects the specified air velocity line, the effective temperature reading can be made. Effective temperatures vary as to comfort according to the season, as shown in Fig. 2.

Both charts were prepared by the American Society of Heating and Ventilating Engineers.



RECOMMENDED ATMOSPHERES

The comfort zone chart has many practical applications. In certain industries definite conditions of temperature or humidity, alone or in combination, are desirable for standardized production. These combinations may be uncomfortable to the workers, but conditions can be brought within the comfort zone without affecting the process of manufacture if use is made of air motion. If the process requires only a high temperature the comfort of the workers may be improved by reducing the relative humidity. Where only a high relative humidity is required, greater comfort can be secured by a reduction in temperature.

Minor differences of opinion are evident in the various recommendations made by air conditioning authorities as to the optimum effective temperature. More research is needed in this direction. In general it may be stated that experimental subjects prefer an effective temperature of 63-66 for comfort in winter and 70-71 for comfort in summer. These variations from winter to summer are probably due to acclimatization and the variable factor of clothing. In summer, when the prevailing temperature out of doors is excessively high, it is generally impracticable to reduce the indoor temperature more than 10-15° if the objectionable sensations of intense heat or chill experienced by those leaving or entering a building are to be avoided. This reduction, provided the relative humidity is also reduced, should give nevertheless a sufficiently comfortable condition.

Obviously, in making effective temperature recommendations the character of population in air conditioned buildings must be considered. Some will enter the conditioned area for a short time only; others must stay and work. Visitors of the first class are likely to experience too great a temperature change and care should be taken that shocks at entrances and exits are reduced.

The following revised table* has been prepared by the A.S.H.V.E. Technical Advisory Committee on Restudy of Comfort Charts and Comfort Lines to give desirable indoor air conditions corresponding to outdoor temperatures which are applicable to theaters, department stores, restaurants and other public buildings where the period of occupancy or exposure is less than three hours:

OUTDOOR TEMP. (Deg. Fahr.) Dry-Bulb	INDOOR AIR CONDITIONS WITH DEW-POINT CONSTANT AT 57° F. Dry-Bulb	Wet-Bulb	Effective Temp.
95	80.0	65.0	73
90	78.0	64.5	72
85	76.5	64.0	71
80	75.0	63.5	70
75	73.5	63.0	69
70	72.0	62.5	68

Comfort data concerning active work are meager. According to C. P. Yaglou, satisfactory air conditions are found to vary from 40-70 in effective temperature, depending on the rate of work and

*The original table appears on page 10 of the A.S.H.V.E. Guide, 1932 edition.

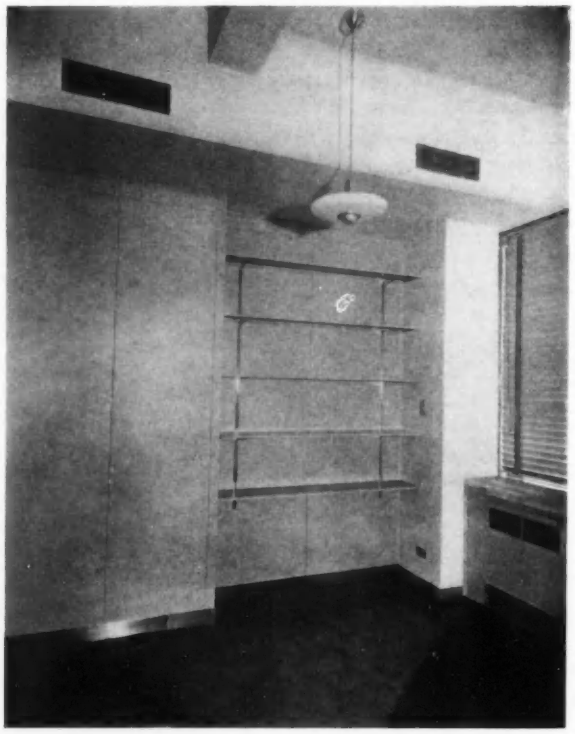
the amount of clothing worn. In hot industries an effective temperature of 80 may be set as the upper limit compatible with efficiency. Wherever possible this should be reduced to 70 or less.

Optimum Humidity

The effect of humidity on comfort and health has not been satisfactorily established, according to various investigators. There is no consistent research to show the response of adults to controlled humidity conditions over a prolonged period of time, but available evidence indicates the desirability of providing a fair percentage of moisture in the air. Extremes in humidity are undesirable. It is contended that air low in moisture content tends to dry up the mucous membranes of the nose, throat and lungs, thus lowering the resistance of these organs to infection. Excessively high humidities likewise are undesirable because they interfere with the normal evaporation of moisture from the skin. The chief objection to high indoor humidities is condensation and frosting on window panes. A range of relative humidities between 40 and 60 percent appears practical and acceptable, although humidities of 30 percent and less may prove satisfactory.

Air Purity

Dust and soot, smoke, fumes, gases and disease producing organisms are often conspicuously present in the atmosphere, so the factor of air purity is very important. The amount and nature of this foreign material determines the degree of atmospheric purity. Most of these substances can be removed by means of filters or by directing the incoming air through an air washer.



Air conditioning grilles for office space in the new Philadelphia Savings Fund Society Building (Howe and Lescaze, architects). Each floor of this bank and office building is controlled separately for the conditioning of air.

In many industries the dusts and vapors resulting from manufacturing processes are injurious to the health of the workers; carbon monoxide is a common form of gas poison. Silicious dust is especially harmful because it affects the tissues of the lungs and results in silicosis. Lead poisoning is another hazard. Prevention of these impurities is largely a problem in localized ventilation.

The exclusion of solar ultra violet light because of the overlying blanket of smoke and soot in many cities is receiving recognition as a health problem. Measurements have shown that ultra violet light is 50 percent greater in the country than in the city. Although these facts are generally recognized there are no data proving that the health of city dwellers is thus impaired by impurities in ordinary air.

The chief popular objection to air suspended particles is the presence of pollen which may cause hay fever. One of the many claims advanced for air conditioning is its removal of this pollen.

Air Motion and Distribution

Air movement in itself is a pleasant sensation, but a combination of too great a temperature difference between the air which is moved and that to which the body is accustomed, plus its velocity, causes the problem of *drafts*. Temperature is more important a factor in this than velocity. The conclusion is that there should be a uniform distribution of both heat and air. In this distribution the room construction and design plays an important part. Formation of strata of hot air or cold air, abrupt drafts and "pockets" of stale air should in all cases be avoided. Air in occupied places should be in a constant motion sufficient to maintain a reasonable uniformity of temperature and humidity, but not so strong as to produce objectionable drafts in any part of the room.

In the design of school classrooms, this factor of ventilation has been emphasized. Many state laws now require 30 cubic feet of free air per minute per pupil, by forced ventilation, a requirement that has been challenged by several authorities. An investigation was made in 1923 by the New York State Committee on Ventilation which reached the conclusion that "the requirement was based on a false theory and in practice is less satisfactory than ordinary window ventilation." Dr. C. E. A. Winslow, a member of this commission, states in his book, "Fresh Air and Ventilation," that the requirement is needlessly expensive to the taxpayers.

Many air conditioning engineers now calculate air motion according to a lineal instead of a cubic measure. On this basis an average air motion of not less than 40 feet nor more than 50 feet per

ATMOSPHERES RECOMMENDED BY A.S.H.V.E. COMMITTEE ON VENTILATION STANDARDS

Presented at the semi-annual meeting of the American Society of Heating and Ventilating Engineers in Milwaukee, June, 1932, and reprinted by special permission.

AIR TEMPERATURE AND HUMIDITY

The relative humidity shall be not less than 30 percent, nor more than 60 percent in any case. The effective temperature shall range between 64 and 69 when heating or humidification is required, and between 69 and 73 when cooling or dehumidification is required. These effective temperatures shall be maintained at a level of 36 inches above the floor.

AIR QUALITY

The air in such occupied spaces shall at all times be free from toxic, unhealthful or disagreeable gases and fumes and shall be relatively free from odors and dust.

In every space coming within the provisions of these requirements and in which the quality of the air is below the standards prescribed by good medical and engineering practices, due to toxic substances, bacteria, dust, excessive temperature, excessive humidity, objectionable odors, or other similar causes, means for ventilating shall be provided so that the quality of the air shall be raised to these standards.

AIR MOTION

The air in such occupied spaces shall at all times be in constant motion sufficient to maintain a reasonable uniformity of temperature and humidity, but not such as to cause objectionable drafts in any occupied portion of such spaces.

The air motion in such occupied spaces, and in which the only source of contamination is the occupant, shall have a velocity of not more than 50 feet per minute, measured at a height of 36 inches above the floor.

AIR DISTRIBUTION

The air in all rooms and inclosed spaces shall, under the provisions of these requirements, be distributed with reasonable uniformity, and the variation in the carbon dioxide content of the air shall be taken as a measure of such distribution.

The air in a space ventilated in accordance with these requirements, and in which the only source of contamination is the occupant, shall be distribtued and circulated so that the variation in the concentration of carbon dioxide, when measured at a height of 36 inches above the floor, shall not exceed one part in 10,000.

AIR QUANTITY

The quantity of air used to ventilate the given space during occupancy shall always be sufficient to maintain the standards of air temperature, air quality, air motion and air distribution as herein required. Not less than 10 cubic feet per minute per occupant of the total air circulated to meet these requirements shall be taken from an outdoor source.

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minute is taken as a reasonable requirement.

Recirculation of conditioned air to the extent of 50 percent or more is found in practice. A considerable saving in both heating and refrigeration costs is effected, but as a general rule recirculation, unless well regulated, impairs the quality of the air by excessive humidity and/or excessive odors.

The popular belief concerning the alleged virtues of ozone and recirculated air, C. P. Yaglou of the Harvard School of Public Health states in the January, 1932, issue of *Heating, Piping and Air Conditioning*, is not well founded. Research has shown that ozone has no effect on air-borne organisms and does not destroy all odors but merely conceals them through olfactory compensation. Since human beings are injuriously affected by ozone in concentrations which do not destroy odors nor kill bacteria, the value of ozone in air conditioning is very doubtful.

Health Standards

Atmospheres are better known for their effects on comfort than on health. The question has been raised whether optimum conditions for comfort are identical with those for health, although it is reasonable to assume for the present that the two do not differ greatly.

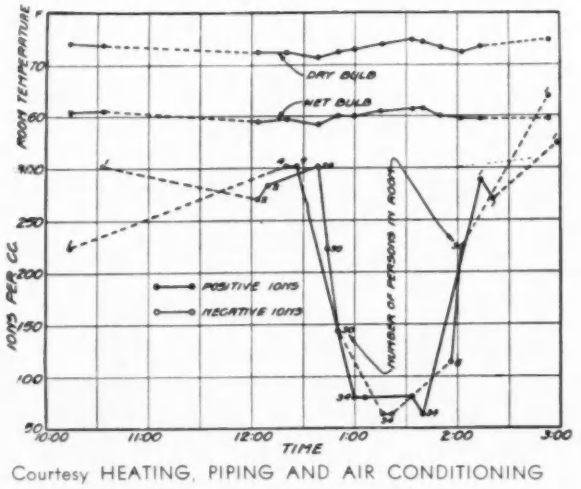
According to Dr. William H. Howell of the School of Hygiene and Public Health, Johns Hopkins University, where research on common colds has been in progress for several years with the support of the Chemical Foundation, so little is known about health correlations of ordinary room atmospheres that no one can state with certainty that a given condition, excepting concentrations of toxic gases, will in the long run be injurious to health. In the absence of such absolute criteria, it is surmised that bodily discomfort does become the basis of bad health.

IONIZATION—THE ELECTRICAL QUALITIES OF AIR

Notwithstanding rapid advances in the science of air conditioning in the last few years the manufacture of air is not yet considered fully satisfactory as a reproduction of open country air under ideal weather conditions. The American Society of Heating and Ventilating Engineers is authority for the statement that open country air has a stimulating quality which is apparently lost when the air is brought indoors and particularly when it is treated chemically. This "stimulating quality" has so far evaded the most exacting chemical and physical tests devised by physicists, chemists and engineers. "According to some unpublished data," Prof. Yaglou writes in reply to an inquiry, "there is an indication that it may be due to either ionization or ozone, when the latter is present in the atmosphere in extremely small concentration beyond the limits of accuracy of present chemical methods of determination. Studies are now in progress to prove or disprove this indication."

Although ultra-violet radiation is an excellent curative agent, particularly for rickets and certain skin diseases, it is not yet known which of the solar rays brings about the cure. Ionization, likewise, is a field in which further information on desirable physiological effects is needed.* Comparatively little is known about the energy or electrical condition of air.

From physical experiments it has been established that the atmosphere or any gas can conduct electricity only through the agency of ions. In a relatively dry air these ions occur more abundantly and persist longer than in a humid atmosphere. A high electrical potential difference exists permanently between the atmosphere and the earth, varying directly with the altitude. In open country it exists in full force but where there are trees or structures of any sort with relatively good electrical conductivity it is shunted off. Inasmuch as the earth has a tremendous negative capacity and the atmosphere is positive, there is a permanent vertical flow of positive electricity from the atmosphere to the earth.



Courtesy HEATING, PIPING AND AIR CONDITIONING

Experiments have demonstrated that the ionic content of a room falls abruptly to a very low level soon after occupants assemble. Both positive and negative ions begin to rise again as soon as the room occupants depart. The biological significance of this atmospheric electricity is still in doubt.

The Theory of Ionization

This phenomenon of an electrical potential has many implications. A Hungarian physicist, Lenard, discovered that a spray blown up by the wind is always charged negatively but that the heavy drops which fall to the bottom are positive. On the basis of his observation Dr. Simpson of the British Meterological office built up the accepted theory of lightning. Raindrops tend to split into smaller drops and as there is a sifting of drops by rising currents of warm air the small drops congregate at the top of a cloud. Between the negative earth and the negative charge of small drops there is a positive charge of the large drops. These charges pile up until they result in a discharge, or lightning flash, which is visible evidence of *ionization.*

For an understanding of this phenomenon it is necessary to explain briefly the hypothetical structure of the atom. Physicists view the atom as a nucleus around which one or more electrons revolve, just as planets whirl around the sun. The nucleus has a positive electrical charge, the electron a negative. These electrons can be discharged from the atomic structure by impact or bombardment by particles such as the alpha and beta particles, other ions migrating at high velocities and by radiations such as x-rays, gamma rays and short-wave ultra-violet rays. Once the electrons are knocked loose from the atom they become ions, or "wanderers." In the case of the lightning flash the air atoms are wrecked and the ions which result glow with agitation in the brief fraction of time which it takes them to capture the equivalent of the electrons they have lost. The explanation for this is that when the electrons are knocked loose a preponderance of positive electricity remains in the wrecked atom, but the system receiving the free electron becomes a definitely negative ion. The positive becomes a definite negative body until it is neutralized. In this way electricity is conducted by atmospheric gases.

The ion intensity near the earth's surface is only a fraction of that existing in the upper stratosphere. It is produced mainly through radiation from radioactive material in the earth's crust with the cosmic rays a large contributing factor. An intensive investigation of extra-terrestial radiation is now going on under the direction of Prof.

*A summary of the first ionization research, conducted by the A.S.H.V.E. and the Harvard School of Public Health, appeared in an article, "Changes in Ionic Content in Occupied Rooms, Ventilated by Natural and Mechanical Methods," by C. P. Yaglou L. C. Benjamin and S. P. Choate in *Heating, Piping and Air Conditioning,* October, 1931.

Arthur H. Compton of the University of Chicago. The second polar year, in which scientists from 22 nations are collaborating, is also in progress and promises much in the investigation of ionization in the upper atmospheres, particularly the Kennelly-Heaviside layer which has already found a practical application in radio transmission

Ionization in Air Conditioning

Recent experiments in ionization and its relationship to air conditioning have revealed many interesting facts. It has been demonstrated that the ionic content of a room falls abruptly to a very low level soon after people assemble and this level is maintained until the occupants leave, when both the positive and negative ions begin to rise again. The ionic content in unoccupied heated rooms differs very little from the outdoors but is higher in cool weather, probably because of the effect of temperature. The minimum supply of outdoor air required to maintain normal ionic content in a crowded room—160 cubic feet per minute per person—is prohibitively high. A supply of 30 c.f.m. per person, according to the collaborative research reports of the A.S.H.V.E., makes the ionic content about the same as with no ventilation.

Artificial ionization, according to the American Society of Heating and Ventilating Engineers, is practical. The ionic content may be controlled up to 10,000 ions per cubic centimeter without producing perceptible ozone but it is doubtful whether a concentration higher than 2,000 ions per cubic centimeter would be needed in ventilating work. The normal ionic content of pure outdoor air in and 500 negative small ions per cubic centimeter summer is approximately 615 positive small ions of air. The maximum natural ionic content recorded in Boston is 700 ions per cubic centimeter in clear summer weather.

Another fact ascertained through experiments is that air passed through a long metal duct undergoes a small loss of ionic content. Air passed over a heating unit gains ions and air passed over a cooling unit loses ions. The use of a water spray for humidification or dehumidification deprives air of all small ions and produces a large number of large negative ions similar to those produced by hard rain, smoke or fumes. Wall surfaces absorb ions.

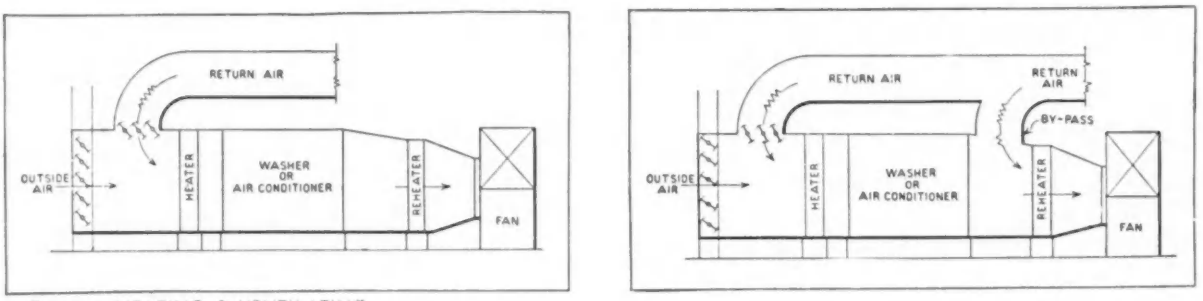
Does Ionization Affect Health?

The biological significance of this atmospheric electricity is still very much in doubt. Perhaps the best research in this direction is the work of Dr. P. Hoppel and Professor Friedrich Dessauer of the Institute for Physical Foundations of Science at the University of Frankfort in Germany. A résumé of this work has been made by Frank E. Hartman, director of the Biological Engineering Laboratory of Chicago, in a series of articles called "Life and Our Atmosphere," appearing in *The Aerologist* (October, 1931, to February, 1932). A detailed account of Dr. Hoppel's methods of measuring ions and his experiments with ionized air on clinical subjects is given.

In the case of hypertonics (patients suffering from "nerves") it was found that a preponderantly positive ionization causes considerable increase in blood presure together with a decided "deterioration" of the general condition of the patient. A preponderantly negative ionization produces a decrease in blood pressure enduring over a long period of time, and the general health of the patient appears to be improved.

Observations were made on both normal subjects and clinical patients to determine the effect of positive and negative ions on the respiratory rate. In a majority of cases the experimental subject breathed more easily under the influence of negative ionization. With positively charged air the breathing rate was increased.

Dining room in the Hotel Gibson in Cincinnati (Gustave H. Drach, Inc., architects). Air conditioning has had a wide application in the hotel and restaurant field, where the physical comfort of patrons is very desirable.



Courtesy HEATING & VENTILATING

Two methods of air recirculation: (left) Complete reconditioning of return air together with air from outside and (right) partial reconditioning with bypassing of remaining return air.

HOW IS CONDITIONED AIR PRODUCED?

Much equipment is now commercially available for controlling, within certain limits, the desired indoor atmosphere. This equipment includes apparatus for providing necessary heat and moisture changes and for supplying air to ventilated rooms, together with automatic devices governing such apparatus in the control of the temperature and humidity.

In general, an air conditioning *system* operates approximately as follows:

Outside air is brought through metal ducts to a preheater by means of suction fans. The warmed air is then delivered to the humidifying apparatus. (In many instances the air is introduced directly to the humidifying unit and later heated to the proper temperature.)

In summer the air supply, instead of being heated and humidified, is cooled and/or dehumidified in the conditioner. The apparatus for controlling humidity changes is of two sorts:

1. Humidifiers which increase the moisture content of the air and produce cooling by evaporation.
2. Dehumidifiers which remove moisture from the air and produce cooling by contact with water or surfaces having a lower temperature than the air itself.

In the process of washing the air the water spray removes from it the coarse dust particles and soluble matter which may have been introduced in the absence of accessory filters. The humidified air then passes through a series of eliminators or baffle plates which trap excess water particles from the water spray.

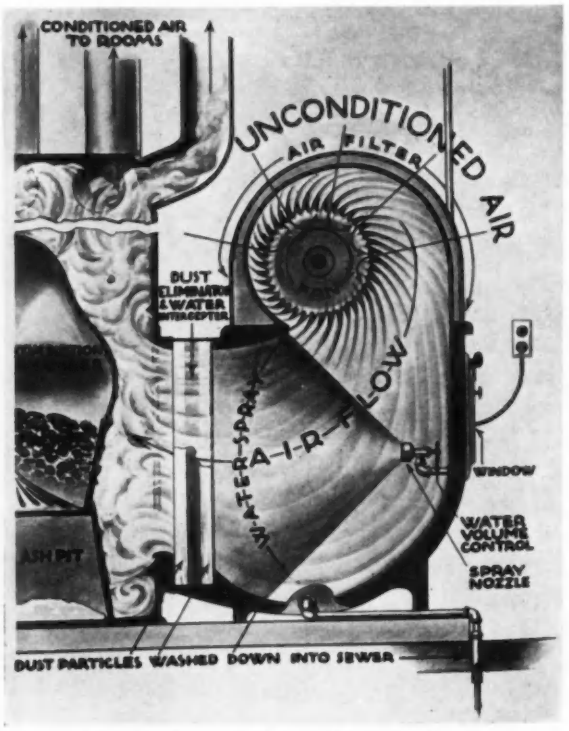
After leaving the humidifying apparatus the air usually is brought into contact with another series of heating coils. This reheater gives a final check on the desired temperature. From this point the conditioned air is delivered through ducts to designated rooms.

Because of the operating economies which the practice offers, many systems make use of *recirculated* air mixed with outside air. As shown by the accompanying diagrams,* there are two general methods of recirculation:

1. The system whereby the return air is reconditioned completely together with air from the outside.
2. The system in which part of the return air is reconditioned with the outside air and the remainder bypassed to the fans.

Each method is considered practicable according to specific problems. The saving in operating costs through recirculation, however, should not be obtained at the expense of air quality. At no time during room occupancy, the A.S.H.V.E. *Guide* states, should less than 10 c.f.m. for each occupant be taken from out of doors.

The method of producing conditioned air as outlined here is purely diagrammatic. There are numerous ways in which heating, cooling, humidifying and dehumidifying as well as cleaning and distribution may be accomplished. These will be discussed in greater detail in the October issue.



Sectional view of a unit conditioner.

*From "Air Quantities and Recirculation," by M. G. Harbula in *Heating and Ventilating*, December, 1931.

WHAT BUILDINGS SHOULD BE AIR CONDITIONED?

To recount the actual applications of air conditioning is essentially to trace the history of its development.

Very little attention had been given to the control of atmospheric moisture and temperature variations in their effects on manufacturing processes and products until 1902 when Willis H. Carrier, a thermal engineer (now head of the engineering companies bearing his name), evolved a spray-type central station humidifier with a thermostatic dew-point control to correct printing difficulties in a lithographing plant.* From his experiments he discovered that a finely atomized spray of water cooled to a predetermined temperature will reduce the moisture content of the air (dehumidifying). These investigations led to a mathematical rationalization of the laws governing atmospheric heat and moisture contact, presented in a paper before the American Society of Mechanical Engineers in 1911.

As a result of these developments, textile mills were enabled, as early as 1905, to maintain atmospheric conditions suitable to the delicate handling of the hygroscopic silk and cotton fibers. The introduction of high speed machinery liberating large quantities of mechanical heat had further complicated the problem of locating mills only in favorably humid climates. The erection of great mills near the cotton fields in the South has been possible only because of air conditioning or controlled humidification.

Other industries numbering nearly two hundred —automobiles, bakeries, breweries, chemicals, clay products, confectioneries, drugs and pharmaceuticals, electrical goods, films, foods, laboratories, lacquers, leather, linoleum, matches, minerals, paper products, lithography and printing, rubber goods and tires, shoes, soaps, textiles, tobacco, et cetera—have since introduced air conditioning into the manufacturing and processing operations.

In recent years increasing attention has been given to air conditioning insofar as it affects the health, comfort and efficiency not only of factory and office workers but also of people in restaurants, shops, theaters, hotels, schools, hospitals, and the like. The newest field is the domestic—the apartment and the house.

In these developments three main purposes can be discerned:

1. *To facilitate the processing of hygroscopic materials.* Temperature and relative humidity have a marked effect on the weight, strength, appearance and general quality of such products as paper, wood, textiles, leather, food stuffs, tobacco, etc., which take up or give out moisture. Ordinarily hygroscopic materials become softer and more pliable as the moisture content increases, and if the room atmosphere is controlled the manufacturing process can be carried on more satisfactorily and with a minimum loss of material. Other products require removal of moisture during various stages; slow drying in an atmosphere that is not conditioned would involve the accumulation of large quantities occupying needed floor areas, hampering efficient operation and increasing overhead costs.

This phenomenon of moisture content and regain of hygroscopic materials is recognized in commercial standards which specify percentages which by test have been found equivalent to a "standard atmosphere." For instance, a relative humidity of 64-66 percent and a temperature of 70-80° have been adopted as the standard atmosphere for textile testing by the American Society for Testing Materials.

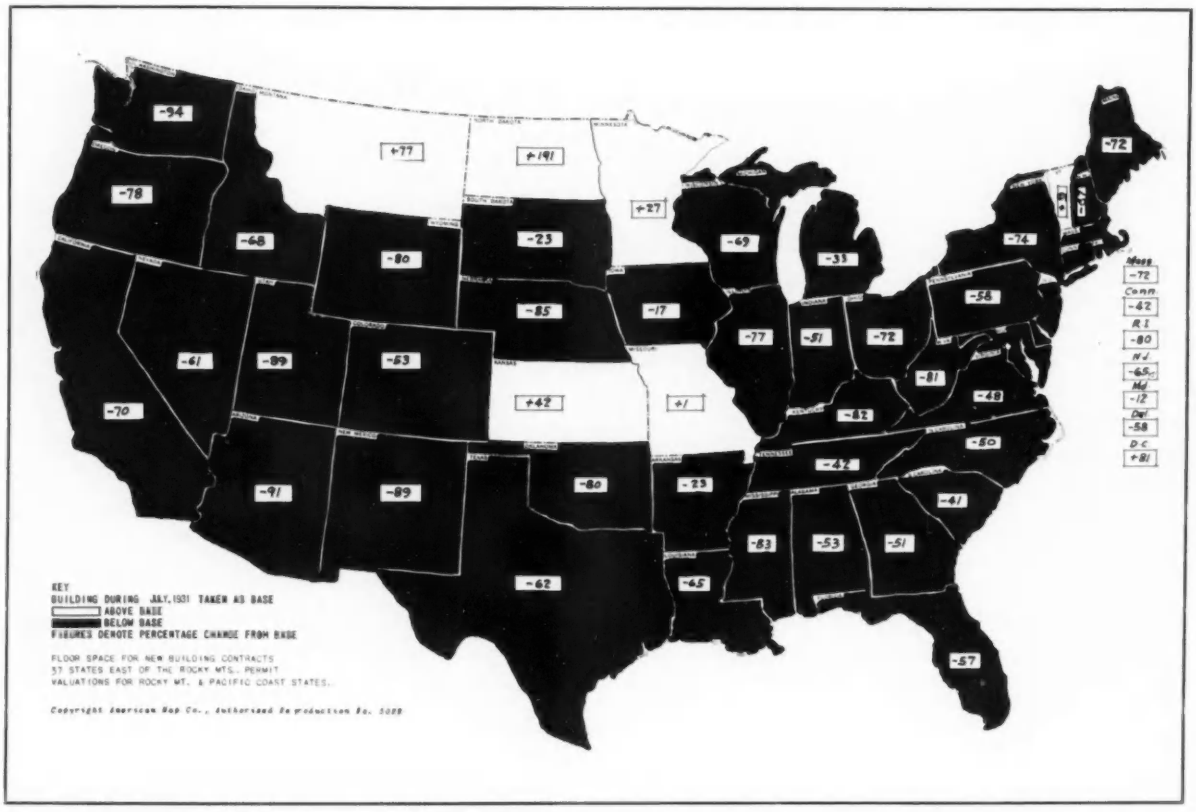
2. *To achieve standardization in manufacture.* When delicate mechanical operations are involved, variable atmospheric conditions often cause trouble. Air cleanliness and moisture control are required in the routine of high speed machinery and in the manufacture of certain products, such as special glasses, where precision is necessary.

3. *To promote human comfort and efficiency.* While much tangible evidence can be brought forth to prove the economic value of air conditioning in manufacturing operations, the human benefits are more intangible. Physical comfort is always a criterion, and in commercial enterprises where competition is keen, the air conditioned establishment is likely to have more cheerful employees and a larger clientele, other things being equal.

*See—"Newspapers and Publishing Plants," a Technical News and Research article in the December, 1930, issue of *The Architectural Record* for a discussion of the difficulties of securing proper register by successive color printings on paper which varies in size according to humidity variations between impressions.

BIBLIOGRAPHY

In the May, 1932, issue of The Architectural Record (pages 58-62, advertising section) appeared a list prepared by the American Society of Heating and Ventilating Engineers, of recent writings on air conditioning. Specialized information is to be found in the following publications: Journals and 1932 Guide of the American Society of Heating and Ventilating Engineers; Journal of Industrial Hygiene, Harvard School of Public Health; the reports of the Metropolitan Life Insurance Company and the U. S. Public Health Service; and such professional magazines as The Aerologist; Heating, Piping and Air Conditioning; and Heating and Ventilating.



BUILDING TRENDS AND OUTLOOK

By L. SETH SCHNITMAN

The July contract total affords some encouragement as to the nearby trend of new construction. Awards aggregating $128,768,700 were 14 percent larger than those recorded in June; normally there is a 12 percent decline between the two months. The advance over the previous month's contract total was produced by larger awards for non-residential building and public works; residential contracts and awards for public utilities showed declines from their respective June totals.

The July contract record rather definitely indicates that the third quarter total should be substantially above the indicated figure of $300,000,000 given in our August issue; the more favorable outlook grows out of a likely expansion in public works under the relief measures recently enacted in Congress.

For the first seven months of the year contracts for all construction totaled $795,848,400; this was 38 percent as large as the contract record shown for the corresponding seven months of 1931. It is becoming apparent that the decline for the full year 1932 from 1931 will not be as drastic as that which has occurred during the first seven months; the full year should show a total between 40 and 45 percent as large as the figure of $3,092,849,500 recorded for the full year, 1931.

MATERIAL PRICE MEASURING ROD*

The prices in this tabulation enable one to visualize at a glance the main trend of the material market.

Their significance does not extend beyond that point, and the explanation under them should be read carefully.

F. W. Dodge Corporation Composite Prices as Indicated in Explanation—

Material	This Month	Month Ago	Year Ago
Portland Cement	$2.00	$2.00	$1.86
Common Brick	11.80	11.85	12.18
Structural Steel	1.60	1.60	1.60
Lumber	15.60	15.67	18.35

Prices given in this comparison are composite and do not in all cases refer to one item. For instance, the price of structural steel is the composite of prices of shapes and plates f.o.b. Pittsburgh; the price of lumber is a composite of five items of Southern pine and five items of Douglas fir f.o.b. mill; the price of cement is a composite of prices in fourteen different cities per barrel, carload lots, to contractors; price of brick is composite in fourteen cities per M, delivered on the job.

*As previously published in *General Building Contractor.*

Its amazing "*slip*"

brings more speed and economy to every flat finish job . . .

A QUICK painting job, of course, saves money. But there's a limit to the speed which a painter can attain. That limit lies largely in the paint itself. How easy is it to apply?

Painters cannot help working faster . . . better . . . when they use the new Barreled Sunlight Flat Wall Finish. It has an ease of flow that can only be defined as an amazing "slip."

This "slip" speeds up the paint job without "hurry". . . frees the painter's brushes from the hindering drag of ordinary flat paints. Result: More rooms finished in a day with distinct savings in time and labor—by far your greatest painting expenses.

Then, too, there's a great saving in paint. Impartial tests prove the new Barreled Sunlight Flat Wall Finish has a spreading power of from *16% to 50% greater than that of any other high-quality flat finish.* You buy from 16% to 50% less paint! . . .

Surfaces painted with the new Barreled Sunlight Flat Wall Finish are distinctly handsome. It dries smooth, flawless, absolutely free from brush marks and laps. Its faint sheen, visible on close inspection, means a dirt- and dust-resistant surface that's easy to wash.

You can effect material initial and maintenance savings for your clients by specifying this new flat wall finish for the interiors of your projects. Write for further details.

U. S. Gutta Percha Paint Company, 221 Dudley Street, Providence, R. I. Branches or distributors in all principal cities. (For Pacific Coast, W. P. Fuller & Co.)

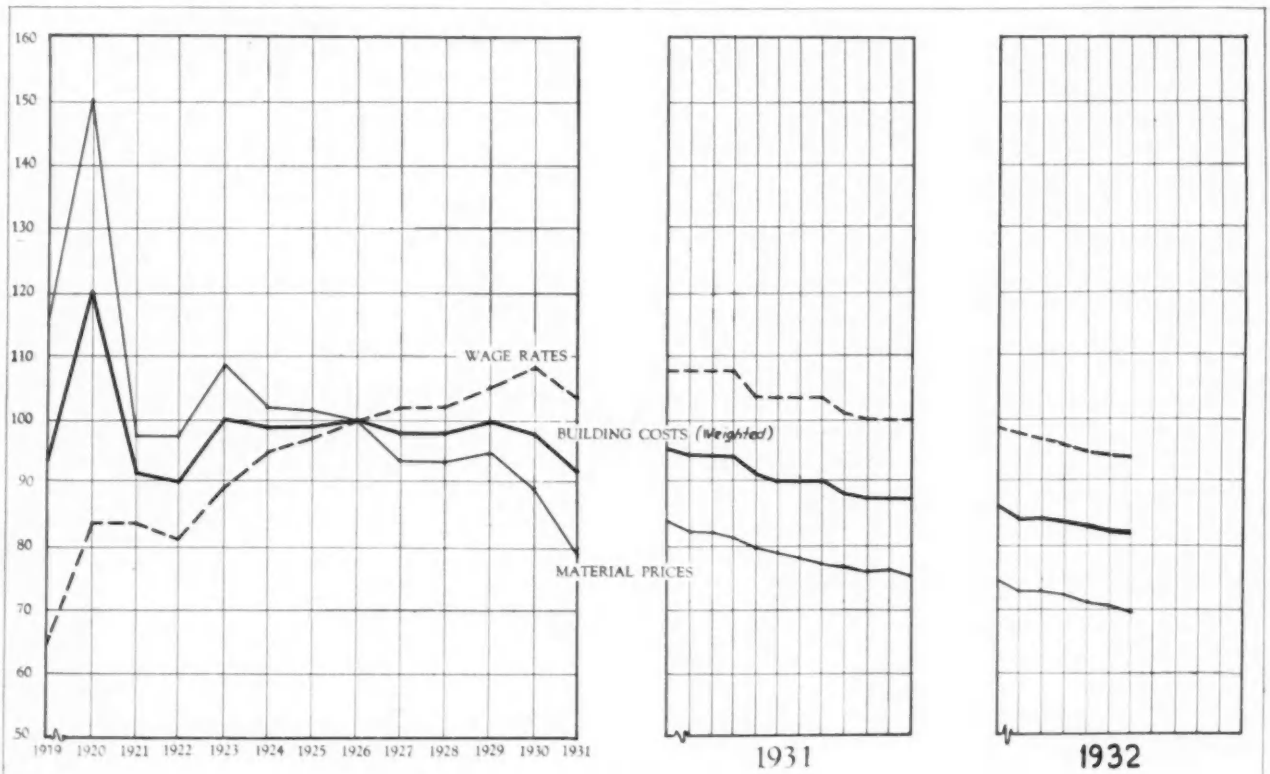
Easy to Tint—for any color scheme

Made in white—the new Barreled Sunlight Flat Wall Finish is easily tinted any shade with pure oil colors. Quantities of 5 gallons or more tinted without extra charge at the factory.

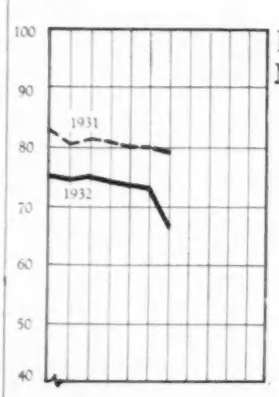
THE NEW Barreled Sunlight
REG. U. S. PAT. OFF.
FLAT WALL FINISH

MATERIAL PRICES, BUILDING WAGE RATES AND BUILDING COSTS COMPARED

1926 Monthly Average — 100

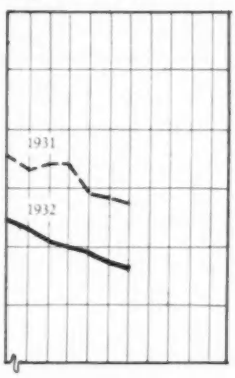


WHOLESALE PRICE INDEXES



PAINT MATERIALS

There is little reason to believe that the downward trend of prices will soon be arrested.

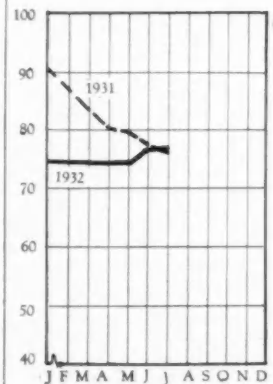


LUMBER

Further price declines loom in the nearby future.

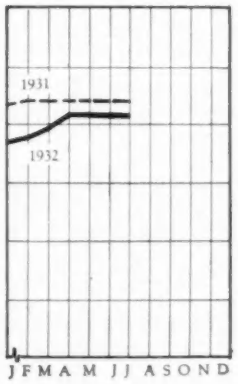
BRICK AND TILE

Present course of residential building seems to price weakness.



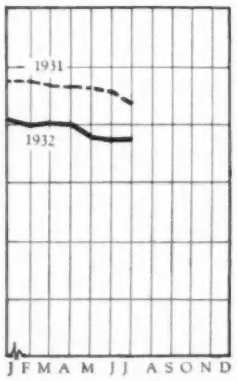
CEMENT

Prices may likely be stabilized at current levels over nearby months. Severe test of present levels looms, however.



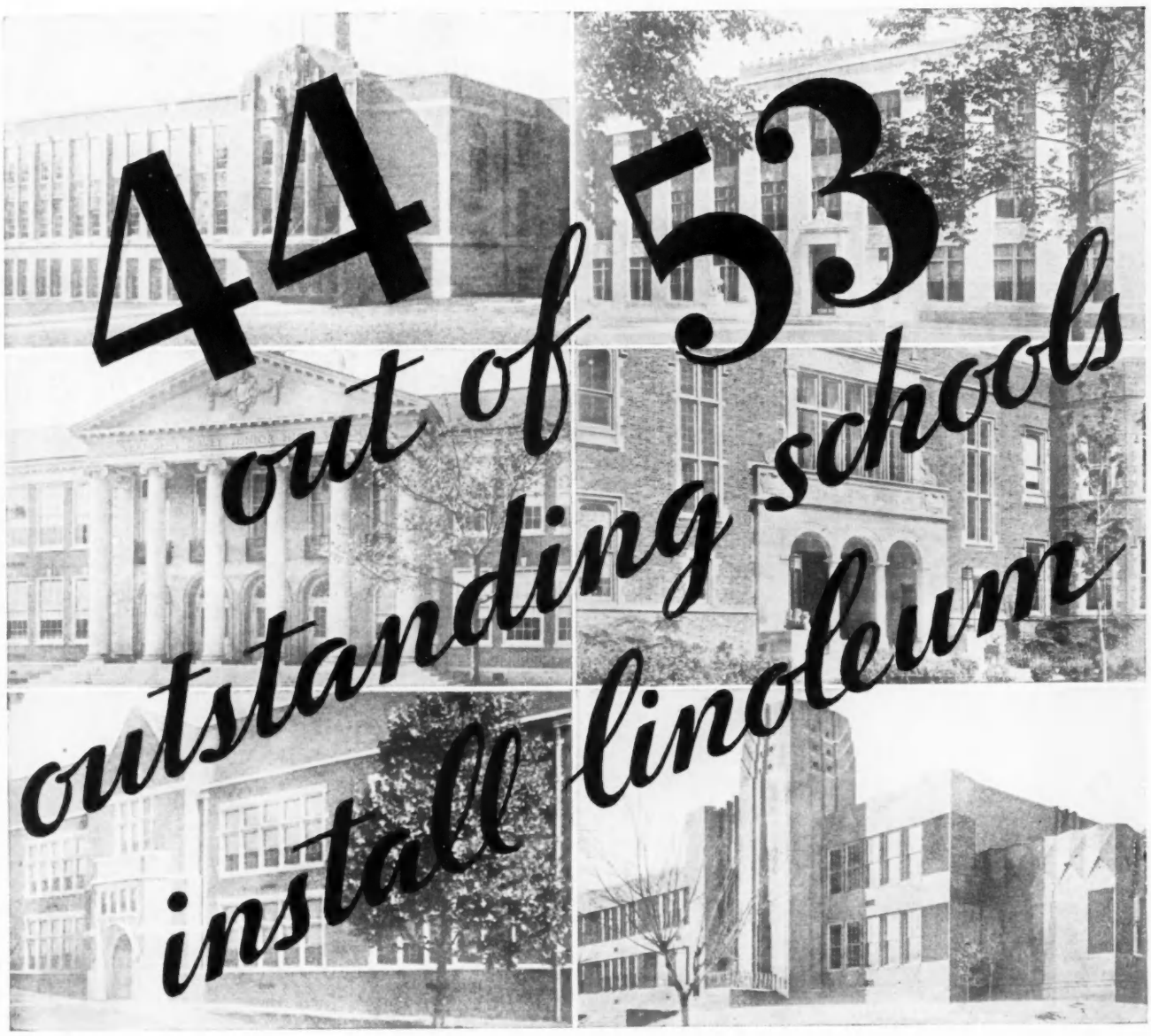
STEEL

Present price level will doubtsignal further less be severely tested in the next few months.



OTHER MATERIALS

Present stability is more apparent than real. Down trend will probably be resumed in nearby future



"THESE are outstanding school buildings," say two leading architectural magazines, in articles which recently appeared in their pages. Fifty-three schools were featured. It is significant that in forty-four of these buildings linoleum floors had been installed!

Resiliency is the reason for this 83% selection of linoleum. Whether the school is primary, grade, high, or university, located in California or Massachusetts, school architects specify floors that are friendly underfoot—cushioning, quiet, warm, and clean.

Small wonder, then, that of the 44 schools using linoleum, all sixteen mentioned in one magazine and nineteen out of twenty-eight in the other, had floors of *Sealex* Linoleum. For these sturdy floors are, first of all, resilient.

If you would like to know some of the many other reasons why leading architects specify Sealex, ask us for complete data. Write our Architectural Service Department and get the facts about Bonded Floors service, backed by our rigid guaranty.

CONGOLEUM-NAIRN INC. . . . . KEARNY, N. J.

SEALEX
REG. U.S. PAT. OFF.
LINOLEUM FLOORS

WAGE SCALES IN THE BUILDING TRADES

Information Furnished by National Association of Builders Exchanges and Compiled by Division of Statistics and Research, F. W. Dodge Corporation, as of August 15, 1932

	Asbestos Workers	Bricklayers	Bricklayers' Tenders	Carpenters	Cement Finishers	Electricians	Hoisting Engineers	Iron Workers—Ornamental	Iron Workers—Structural	Laborers	Lathers	Painters	Plasterers	Plasterers' Tenders	Plumbers	Roofers—Composition	Roofers—Slate & Tile	Sheet Metal Workers	Steamfitters	Stone Masons	Tile Setters	Tile Setters' Helpers
Akron	$1.37½	$1.45	$0.45	$0.95	$0.90	$0.90	$0.70	$1.00	$1.15	$0.45	*$1.37½	$0.90	*$1.62½	$0.80	$1.00	$0.95	$0.95	$0.95	$1.00	*$1.45	*$1.25	*$0.50
Atlanta	1.00	1.25 1.40	‡.30 .45	.70	1.25	.90 1.10	.60 1.00	.35 1.85	1.25	.25 .35	1.00 1.25	.75	1.25	.30 .45	1.25	.80	.80	.90 1.00	1.25	1.00 1.25	1.25	.40
Baltimore	1.12½	*1.25	1.00	*1.00	*1.25	*1.43¾	*1.25	*1.65	*1.65	.35 .40	*1.50	*.90	*1.25	1.00	*1.00	1.00	1.00	*1.37½	*1.25	1.25	1.25	.72
Boston	1.25	*1.30	.70	*1.17½	1.17½	*1.50	1.17½	1.17½	1.17½	.70	*1.25	1.12½	*1.37½	*.95	*1.25	*1.17½	*1.37½	1.17½	*1.25	*1.30	*1.50	*.95
Buffalo	1.50	*1.25		*1.00	1.12½	*1.30	$49.50 to $55.00 wk.	1.25	*1.25	.50 .60	1.37½	*1.00	1.62½		1.25	.85	1.10	1.10	*1.25	*1.25	*1.43¾	
Chicago	1.37½	*1.37½		*1.31¼	1.31¼	1.25 1.50	1.31¼	1.31¼	1.35	.82½	*1.37½	*1.41	*1.37½	.88¾	1.37½	1.37½	1.40	1.37½	1.37½	1.37¼	1.37½	.96¼
Cincinnati*	1.15	1.37½	.70	1.02½ to 1.20	1.02½	1.25	.80-1.10-1.25	1.25	1.25	.45	1.31¼	1.10	1.37½	.70	1.25	.92½	1.07½	1.07½	1.25		1.25	
Cleveland*	1.17½	1.37½	.72	1.12½	1.12½	1.05 1.25	1.12½	1.25	1.25	.72	1.37½	1.12½	1.37½	.72	1.25	1.15	1.37½	1.12½	1.25	1.37½	1.25	.81¼
Columbus	1.25	1.30	.90	1.00	.85 1.25	1.00	.60 1.25	1.25	1.25	.50	1.37½	1.00	1.00	.40 .50	1.00	.70 .80	.80 1.00	1.00	1.00	1.30	1.37½	.45
Dallas††	10.50	10.00	.50	8.00	10.00	*11.00	10.00	10.00	10.00	.35	10.00	*9.00	*10.00	*.50	12.00	8.00	9.00	*10.00	12.00	10.00	*12.00	†*.75
Dayton*	1.25	1.30	.80	1.00	1.15	1.55	1.25	1.35	1.35	.35	1.10	1.00	1.25	.80	1.15½	.85	1.00	1.00	1.15½	1.30	1.50	.60
Denver††	9.00	12.00 *13.00	6.50 7.00	10.00	10.00 11.00	10.00 11.00	10.00	10.00 11.00	10.00 11.00	4.00 5.00	11.00	*10.00	12.00	7.00	11.00	7.00 8.00	7.00 8.00	9.00	9.50	12.00 13.00	10.50	†.62½
Des Moines	1.00	1.25	.65	1.00	1.00	1.00	1.00	1.00	1.00	.55	1.00	1.00	1.25	.75	1.25	1.12½	1.12½	1.12½	1.25	1.50	1.25	.67½
Detroit	1.37½	1.25 max.	.55 .60	.80 1.00	.70 .90	1.25 1.40	.60 1.00	1.00 1.20	1.00 1.25	.50 .55	1.37½	.80 1.00	1.00 1.25	.70 .80	1.00 1.50	.70 .90	.80 1.00	.80 1.00	1.25 1.50	1.25 1.50	1.00 1.25	.80
Duluth	.85	1.10	.35 .45	.75 .85	.75 .85	.90	.80	.80	.90	.35 .45	.85	.80	1.10	.70	.95	.70	.70	.80	.95	.75 1.10	1.25	.80
Erie	.80 .90	1.31¼	.50 .60	.75 1.00	1.00	1.00 *1.15	1.12½	.60 .90	1.10 1.12½	.35	1.12½	.75 .90	1.31¼	.50 .60	1.18¾	.60 .70	1.00	1.00	*1.18¾	1.31¼	1.00	.50 .90
Grand Rapids	.65 .80	1.25	.40	.60	.65	.90	.75	.80	1.00	.35	.80	.60	.80	.40	.90	.50	.70	.70	.90	1.25	1.25	.50
Houston	NO FIGURES AVAILABLE																					
Indianapolis	1.32½	1.62½	.90	1.22½	1.17½	1.50	1.37½	1.45	1.45	.40 .45	1.57½	1.25	1.57½	1.00	1.00	.60 .90	1.27½	1.22½	1.50	1.62½	1.50	.60
Kansas City	1.05	1.32½	.80	1.12½	1.12½	1.50	1.12½	1.12½	1.12½	.70	1.25	1.12½	1.32½	.80	1.25	.92½	.92½	1.12½	1.25	1.12½	1.25	.75
Los Angeles††	10.00	8.00	6.00	7.00	8.00	8.00	8.00	7.00	7.00	4.00	8.00	7.00	9.00	7.00	9.00	7.00	7.00	7.00	9.00	11.00	10.00	†.75
Louisville	1.12½	1.25	.50	.80	1.00	1.00	1.00	1.25	1.25	.25 .35	1.37½	.90	1.62½	.60	1.12½	.30 .50	.85	.85	1.12½	1.25	1.00	.50
Memphis	1.00	1.37½	.50	.50 .87½	.50 .75	1.00	.75	.75	.75	.20	1.00	.75	1.25	.50	1.25	.25 .40	1.12½	1.12½	*1.25	1.37½	1.25	.50
Milwaukee	1.00	1.00	.90	.85	1.00	1.25	1.00	1.05	1.05	.50	.85	.85	1.00	.90	1.00	1.00	1.00	.92½	1.00	1.00	1.00	.82½
Minneapolis	1.06¼	1.10	.55 .65	.75 .85	.75 .85	.90	.80	.90	.90	.45	.75 .85	.80	1.10	.70	.95	.70	.70	.80	.95	1.10	1.25	.65
Nashville	1.00	1.00		.65		.75 .87½					1.00	.80	1.00	.30		.65	.65	.65	1.25	.90	.65	
New Haven*		1.40	.50 .65	.90 1.06¼	1.40	.80 1.00	1.16¾ 1.27½	1.37½	1.37½	.50 .65	1.27½	.80 1.00	1.40	.50 .65	1.06¼	.65	1.50	1.06¼	1.06¼	1.40	1.40	
New Orleans	.65 .80	1.25	.85	.55 .75	1.00	1.25	1.25	1.25	1.25	.35 .50	1.25	.75 .90	1.25	.75	1.00 1.25	.40	.90 1.15	.90	1.05 1.25	1.50	1.25	.35
New York City††	11.20	13.20	8.00	11.20	c11.20	12.20	13.20	11.20	13.20	6.60	11.20	10.00	12.00	8.50	c12.00	10.28	12.62	11.20	11.20	13.20	11.50	8.50
Oakland††	7.00	11.00	7.00	7.20	7.20	8.00	9.00	7.20	9.60	5.00	10.00	7.00	8.80	6.00	8.25	7.00	7.00	7.50	8.25	9.00	8.00	5.00
Oklahoma City††	8.00	8.00	4.00	6.00 8.00	8.00	6.00 8.00	8.00	8.00	8.00	3.50	.80	7.00 8.00	.80	4.00	.80	6.00	6.00	8.00	8.00		11.00	†.62½
Omaha	1.32	1.00	.45	.80	.90	1.00	1.00	.90	.90	.35	1.00	.80	1.00	.45	1.00	.72½	.87½	.87½	1.00	.90	1.00	.50 .60
Philadelphia	1.12½	1.50		1.00	1.05	1.25	$40.00 to $50.00 wk.	1.25	1.00 1.15	.30 .45	1.62½	.80	*1.62½	1.12½	1.04	.80 1.00	1.00	1.25	1.04	.50 1.00	1.25	.75
Pittsburgh	*1.50	*1.50		*1.25		*1.56¼	1.37½ 1.43¾	*1.37½	1.37½			*1.18¾			1.50	*1.25	*1.50	*1.31¼	*1.71⅞	*1.40	1.33¾	.88
Portland, Ore.††	8.00	*12.00	4.80	7.20	*7.20	*8.00	6.40 9.60	8.80	8.80	7.20	*8.80	7.04	*9.60	*7.20	*8.80	7.20	10.00	*8.00	*8.80	*10.00	10.00	6.00
Reading	.70 .80	.90	.75	.75	.85	.75				.35	.75	.70	.85	.75	.90		.80	.80	.90	.75	.90	.50
Richmond	.87½	1.25		.90	1.00	.75 .87½	.80 1.00	1.25	1.25	.25 to .30	1.00	.80	.80	.30	1.00	.80	.80	.85	1.00	1.37½	1.25	
Rochester	1.01¼	1.25		*1.00	*1.12½	*1.15½	1.00	.80-*1.00	.80-1.00	.55	1.00	*1.00	*1.25		*1.17½	*.90	*.90	*1.00	*1.17½	*1.25	*1.25	
Salt Lake††	6.00 7.20	9.00	6.00 8.00	7.20	8.00	8.00	9.00	8.00	8.00	4.00	10.00	7.20	10.00	8.00	9.00	7.20	7.20	8.00	9.00	9.00	9.00	†.50
San Antonio††	6.00 10.00	8.00 12.00	2.00 3.50	3.00 7.00	6.00 10.00	6.00 9.00	4.00 8.00	6.00 8.00	6.00 10.00	2.00 2.75	.7.00	4.00 7.00	6.00 8.00	2.00 3.50	6.00 8.00	5.00 8.00	8.00	6.00 10.00	8.00	5.00 12.00	8.00 12.00	2.50 3.00
San Francisco	8.00	11.00	7.00	9.00	9.00	9.00	9.00		11.00	5.50	8.50 10.00	9.00	11.00	7.50	10.00	8.00	8.00	9.00	10.00		10.00	
Seattle††	8.00	9.60	5.28	7.20	7.20	*8.80	8.00	8.00	8.80	4.75	*8.80	*7.20	*9.60	*6.40	*8.80	7.20	7.20	8.00	*8.80	9.60	8.00	
Sioux City	90	1.50		1.00	.75	1.00		1.00	1.00	.40	.90	.60 .90	1.15		1.00	.60 1.00	.60 1.00	.90		1.25	.60 1.00	
St. Louis	1.25	1.50	1.00	1.25	1.31¼	1.67½		1.47	1.47	.78¾	1.25	1.25	1.25	1.50	1.06¼	1.43¾	1.17½	1.25	1.25	1.43¾	1.25	.76½
St. Paul	1.18	1.10		.75 .85	.75 .85	.90	.80	.90	.90	.45	.75 .85	.80	1.10	.70	.95	.70	.70	.80	.95	1.10	1.25	
Washington, D.C.	*1.50	1.75	.50 .75	*1.37½	1.25	*1.65	*1.37½	*1.65	*1.65	.75	*1.62½	*1.37	*1.75	*.75	*1.50	*1.37½	*1.37½	*1.50	*1.50	*1.25	*1.50	.75
Wichita	.60	.75 1.25	.25 .40	.40 .75	.40 1.00	.50 .87½	.30 .75	.40 1.00	.40 1.00	.20 .40	.50 1.25	.50 .87½	.60 1.25	.25 .50	1.00	.50 1.00	.50 1.00	.50 1.00	.75 1.12½	.75 1.25	.50 1.00	.25 .40
Youngstown††	*1.37½	12.00	6.80	10.00	9.00	11.00	10.00	12.00	12.00		12.00	10.00	12.00	6.80	11.00	10.20		10.00			10.00	.70

NOTE.—Where two figures are shown they are the minimum and maximum. All figures are for hour rates except as indicated. ††8-hour day. †Rate per hour. *On 5-day week ba[illegible] c Correction. Asterisk after city indicates all trades on five-day week basis.

ABOVE DATA ARE WAGE SCALES AND DO NOT NECESSARILY INDICATE ACTUAL WAGE RATES BEING PAID IN THE RESPECTIVE TRADES.

SIXTY WALL TOWER

HIGHEST IN DOWNTOWN NEW YORK, THIRD IN ALL THE WORLD

●

Architects: Clinton & Russell, Holton & George, *Heating & Ventilating Engineers:* Tenney & Ohmes, *General Contractor:* Jas. Stewart & Co., *Plumbing Contractor:* Jas. McCullagh, Inc., *Heating Contractor:* Riggs, Distler Company, Inc. *All of New York City*

NOT only in physical dimensions but in all that goes to make such a building admirable, "60 Wall Tower" stands high. Architects, engineers, and builders have given it dignity and soundness above the ordinary in design, construction, and equipment. In beauty, convenience, and outlook its occupants find much that is inspiring. Among its several advantages—superior transportation facilities and fine unobstructed views from successive set-back levels, etc.—the management directs attention to highly improved heating and ventilating for the health and comfort of the occupants. In the forced hot-water system by which the building is heated, it is worthy of mention that NATIONAL Pipe was used. Thus once again, signal recognition is accorded to NATIONAL—

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH, PA.

NATIONAL PIPE

MANUFACTURERS' ANNOUNCEMENTS

PHOTOELECTRIC CELL

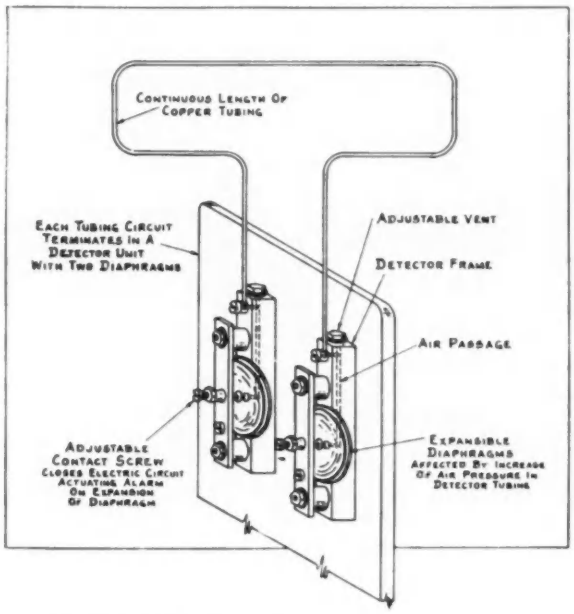
A new, low-cost photoelectric relay, the *Foto-Switch*, is announced by G-M Laboratories, Inc., 1735 Belmont Avenue, Chicago, Illinois. This unit embodies an electro-magnetic switch which is opened or closed by the interruption or variation in the illumination on the photoelectric cell. With the *Foto-Switch*, any sort of electrical device, such as motors, electric signs, signals, or alarms, can be controlled through the medium of the light beam.

The *Foto-Switch* is also suitable for automatically turning on and off artificial lights when the natural daylight drops below or rises above a predetermined level. This application of the light-sensitive switch is said to produce considerable savings in eliminating the unnecessary use of electric light, and yet reliably provides artificial illumination when it is needed.

UNIQUE COMBUSTION PRINCIPLE IN G-E OIL FURNACE

A revolutionary principle of combustion is employed in the new oil furnace which has been announced by the General Electric Company. The announcement of the new product, which will be marketed by the newly created air conditioning department, follows several years of study. The furnace is designed for use primarily in homes.

The furnace comprises a coordinated boiler, burner, and control, designed and manufactured as one unit. It will automatically maintain an even temperature in the home in winter, and will heat water for domestic use the year round, without manual supervision. It is, according to the manufacturers, quiet, clean, and presents a finished appearance which permits the furnace room to be transformed into another living room.



AUTOMATIC FIRE DETECTOR

A sensitive, fire-detecting copper tube less than 1/12" in diameter is placed along or around the ceilings or roof of the premises to be protected. The tubing contains air at ordinary atmospheric pressure. In case of fire, the air becomes heated and expands.

At each end of the tube there is a diaphragm or small metal box with very thin sides capable of being bulged outward by air pressure. The bulging of the diaphragm closes electrical contacts which operate a transmitter, automatically sending the alarm to a Central Station and the fire department.

This is a product of the American District Telegraph Company.

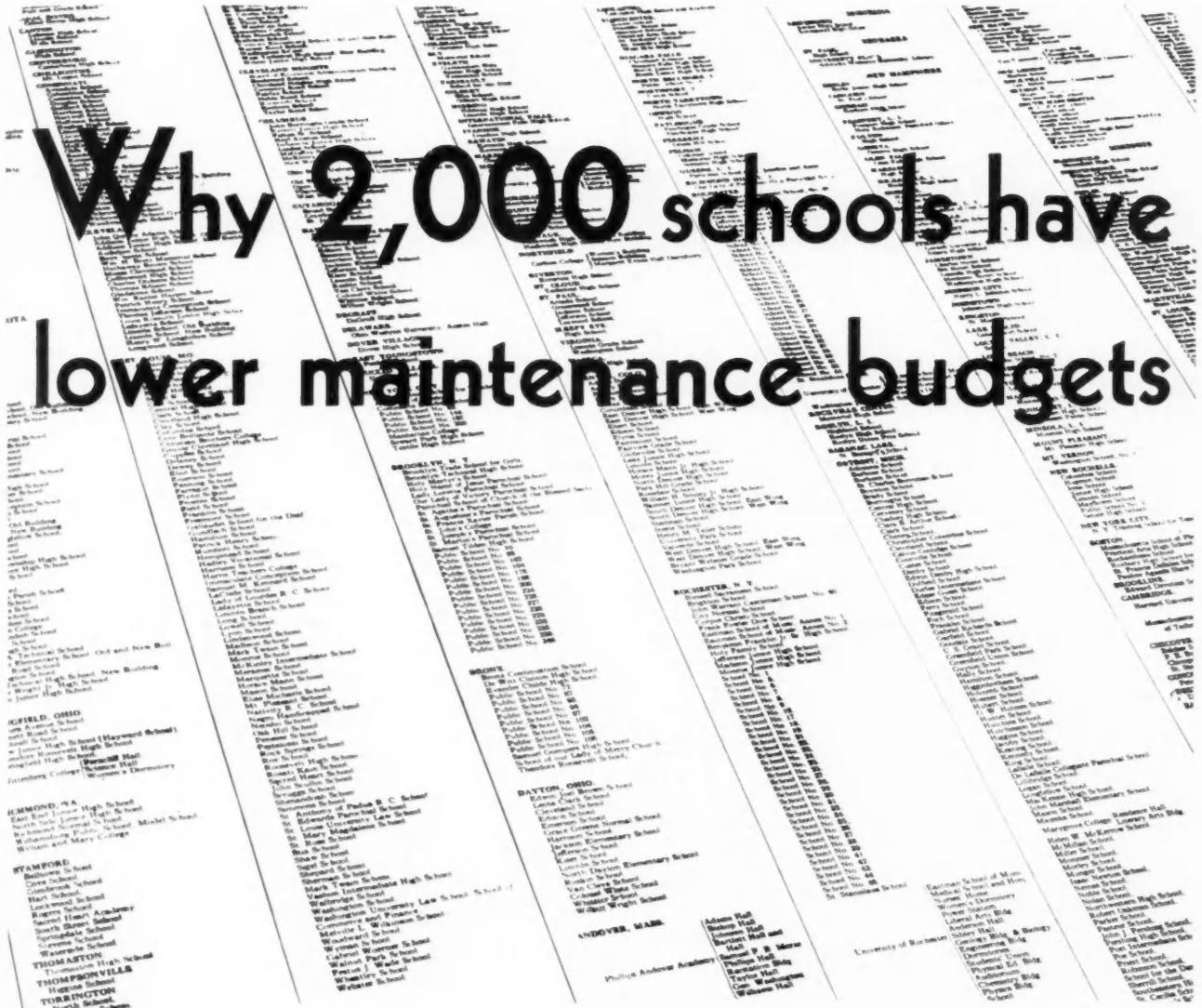
WEATHERPROOF CASEMENT WINDOW

The J. S. Thorn Company of Philadelphia has developed a new steel casement window which effectively excludes air drafts and rain. It incorporates a weatherstripping section to the sash frame which meets a groove in the frame of the window insuring positive weathering. It is also equipped with a geared underscreen operator with a self-locking worm, an automatic cam latch and a double glazing feature.

COTTON FABRIC ROOFING

Cotton fabric is advocated for roofing purposes with a new method developed by the Cotton Textile Industry. The fabric is treated with a special paint and applied over slate, tile, metal, slag or other original roofing and forms a surface which gives an old roof a new lease of life. Occasional painting is the only maintenance required, and when properly set and painted the cotton fabric roofing is good for many years of service.

Records show that a cotton fabric roof has given 34 years of service on one large plant in Pittsburgh, and 24 years service on another Pittsburgh plant.



Why 2,000 schools have lower maintenance budgets

MORE than 2,000 schools . . . . city and rural, old schools and new . . . . have been enabled to lower their budgets because Spencer central vacuum systems are cutting the cost of cleaning, of floor maintenance, of redecorating.

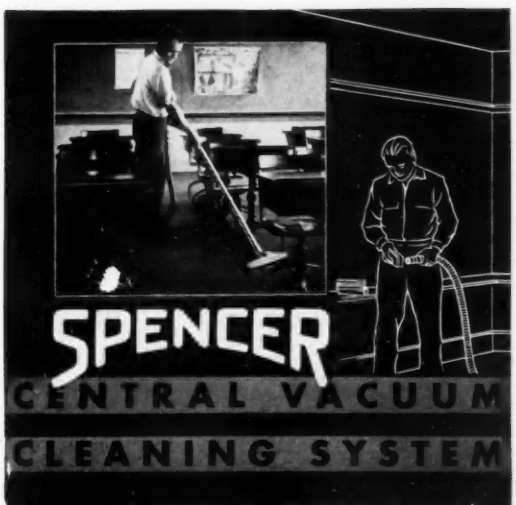
The labor cost is lower because the work is faster . . . and because the strong suction cleans thoroughly and so quickly.

Dust and dirt are removed from every tiny crevice, pit and pore . . . . dust that only suction will remove. The floors don't need such frequent mopping and refinishing.

Since no dust is scattered in the cleaning, walls and ceilings do not become discolored. Redecorating bills shrink sharply wherever the Spencer system is used.

Whether you are planning a new school, or seeking to reduce costs in an old one, you will welcome the information given in "Modern Methods of School Cleaning". We will gladly send it on request, together with a list of Spencer cleaned schools near you.

THE SPENCER TURBINE COMPANY
HARTFORD CONNECTICUT



SPECIFICATIONS PROTECT QUALITY AND SERVICE

(Continued from page 196, editorial section)

were making things very difficult and expensive. We determined that we would see what could be done toward getting each of the group for a given operation on the same basis as we have argued for years should be used in the selection of an architect. In the employment of an architect, we like to have owners consider first, the man; second, his training and experience; third, his experience in the particular type of work to be done; and fourth, the success he has had in pleasing others.

We can see no reason why contractors, subcontractors and material men should not be selected on the same basis, and therefore prepared a form of questionnaire which was sent to each contractor wishing to bid on a particular job. We select contractors on the basis named above, with the addition of the important item of credit standing. Further, at the time bids are received from these contractors, we require them to give the name of the subcontractors and material men whose figures they use in making up their proposal.

It is our theory that subcontractors and material men who help the contractor get the job are entitled to their portion of it without further discussion. At first there was some objection on the part of the general contractors, on the theory that they had no opportunity to buy at a lesser price than they had figured, and the subcontractors' prices were at times out of proportion. This was undoubtedly true in isolated cases. As each case was brought to our attention the firm which had given a price out of line with market conditions was omitted from our list of approved firms. Accordingly there has been built up in the minds of those who are wont to figure our requirements the knowledge that their first price must be their best. Through the time we have followed this practice of selecting contractors, subcontractors, and material men, we have become more and more of the opinion that ultimately it will, with some variations, be universally adopted. . . .

O. H. AMMANN, Chief Engineer,
The Port of New York Authority

I am not entirely familiar with the practice of architects in connection with the construction of buildings in the control of quality and services, or prices, and undoubtedly their practice is somewhat different from the practice in connection with most engineering works, more particularly engineering work connected with public undertakings, such as those of The Port of New York Authority.

In regard to the latter works I have found it impracticable for the owner or his engineer to attempt to control the cost of the major portions of the work, except by competitive bidding, and the contractor must, therefore, take entire responsibility for his prices. If the prices are too low, he must take the loss; if, on the other hand, they are too high, he is fully entitled to what profit he can make after the contract is awarded to him as the low bidder. It would be unfair to reduce the contractor's profit once the contract is let even though this profit may be unreasonably high and brought about by decrease in prices, labor or other conditions after the contract is awarded. These are unavoidable circumstances in times of keen competition and rapidly fluctuating prices and are so intricately involved in the general economic situation that they cannot equitably be controlled by the architect or the engineer. I consider it improper also for the owner to try to control the contractor's price by requiring him to submit prices from subcontractors or material men, except, of course, where his compensation is based upon actual cost plus percentage. Very often the contractor does not commit himself to the placing of orders or enter into subcontracts before he submits a bid and he is entitled afterwards to enter into the best deals he can make.

J. E. SCHWARZ,
C. W. & Geo. L. Rapp, Architects

It is our opinion that the upset guarantee, with a fixed fee to the general contractor, comes more closely to solving this problem than any other form of contract.

We believe that the drawings and specifications should clearly define the requirements of the project and that general contractors should be required to submit with their proposals the names of the subcontractors and manufacturers upon which their bids are based, with the names of other recognized subcontractors and manufacturers for each particular trade, and the resulting addition or deduction from the base figure included in the bid.

We believe that the contract should provide for a percentage of the savings, as determined by the difference between the final cost and the guaranteed upset price, to be paid to the general contractor as an additional fee, the balance to revert to the owner. The contract should also provide for an additional fee to the contractor based on a percentage of the cost of additions to the contract.

With this type of contract the quality of materials, the cost, and the reliability of the different subcontractors and manufacturers can be determined to the entire satisfaction of the owner and the architect at the time the general contract is awarded, but it does not preclude the awarding to other than those mentioned in the base proposal.

This type of contract does not require the general contractor to award subcontracts for the amounts which have been used to make up his proposal, but does eliminate the possibility of controversy and misunderstanding should he desire to award work to other subcontractors. Recommendations should be submitted by the general contractor for approval by the owner and architect before subcontracts are awarded.

(Continued on page 32)

FROM Roof TO Basement

A STEELTUBES JOB

● The increasing use of Steeltubes in such buildings as the Epp Apartments is another reason why it's good business to "keep your eye on Steeltubes". In this building, approximately 20,000 feet of Steeltubes is installed . . . including wiring for elevators and electric refrigeration.

The popularity of this modern electrical conduit is growing rapidly. Over 30,000,000 feet are now installed. Steeltubes leaves more margin for additional outlets . . . a more complete electrical job. Contractors like it because of its easy handling, light weight because there are no threads to cut . . . and because of the quality of the finished work.

Steeltubes is the pioneer threadless thinwall conduit . . . developed expressly for the electrical industry . . . made from high quality, tough open-hearth steel . . . electrically welded. Fully approved for open and concealed work, and buried in concrete (except cinder fill). Approved for use in government work, under Federal Specifications W-W-T-806.

Look up Steeltubes in Sweet's . . . or write for full information, prices and samples.

The Epp Apartments, San Francisco, California. Architect, H. C. Bowman, Electrical Contractor, David Grandi, Steeltubes supplied by the Westinghouse Electric Supply Co.

Electrical Division **STEEL AND TUBES, INC.**, *Cleveland, Ohio*

(A UNIT OF REPUBLIC STEEL CORPORATION)

STEELTUBES

THREADLESS THINWALL CONDUIT

J. W. HARRIS,
Hegeman-Harris Company, Inc., Builders

Specifications, however close and rigid, cannot be enforced without the willing cooperation of the contractors who are building the job and that applies quite as much to the general contractor as to the subcontractor. The architect cannot be expected to have an organization large enough to maintain sufficient supervision to keep account of everything on the job. The contractor, working under a lump-sum contract and facing a probable loss, inevitably will look out for his own interests first. So will the subcontractor. That is only human.

Furthermore, even assuming that the contractors and subcontractors are willing to conform to specifications and quality construction, it does not always happen that they have the ability and experience and organization to do so. In other words, selection of the contractors to carry out the specifications properly is quite as important as the specifications themselves.

L. R. CRANDALL,
George A. Fuller Company, Builders

It is obvious that the combination of a competent architect, a competent contractor and a competent subcontractor will produce good workmanship and satisfactory results regardless of the form of contract entered into. On the other hand, if any link in this chain is weak, the mere verbiage of the contract or the specification will not guarantee satisfactory results.

J. P. H. PERRY, Vice-President
Turner Construction Company

The more money an architect or engineer spends on his plans the closer his competition and the better the results. Specifications should be made as brief as possible. A thing should be said once and not repeated. Every time a man repeats himself he is likely to introduce a new shading of meaning. All different classes of work should be segregated under separate headings or sections. As far as possible specifications should describe results to be obtained and functions to be performed rather than definite articles and methods.

The "or equal" clause should be used sparingly. It always raises the question of what the architect will consider the equivalent of the initially named material. If there are two or three choices, let the architect name each one by its trade name and then close the specification.

There is apparently a rising tendency on the part of architects to require the general contractor to nominate in his bids the subcontractors he proposes to use if awarded the work. Such procedure is in some quarters looked upon as a partial solution of the quality question.

It may be a dangerous device. It would in my judgment be better to require the contractor to name two or three subcontractors on each item than to require him to name one. The naming of only one invites price collusion, allocating of work by subcontractors' associations, etc.

TOMORROW SHOWS ITS HAND

Corrosion's day is waning, the waste and ugliness of rust need no longer be tolerated . . . this is The Stainless Age. Strikingly original in its appearance, advanced in its ideas . . . this new, free Stainless Booklet is a captivating portrayal of Stainless Progress. • It traces the history and predicts the future of steel products . . . Every chapter is an intimate, specialized discussion of a particular field. • Product design, Metal fabrication, Building, Hardware, Sports, Home, Medical, Dental, Food, Automotive, Laundry, Petroleum, Mine, Paper, Chemical, Textile . . . All these markets for "Stainless" are interestingly analyzed and effectively and beautifully illustrated. • This booklet will prove valuable to any one interested in metal products or in the more general subject of corrosion-resistance. • Genuine Stainless Steel is manufactured only under the patents of American Stainless Steel Company, Commonwealth Building, Pittsburgh, Pennsylvania. Write for this informative booklet, today . . . Now.

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○ This coupon is for your convenience . . . Fill it out and mail it today Your copy of "Forward with Stainless" will be sent you without cost or obligation.

Architects' Refusal to Subordinate Quality to Price Is Approved by Business Interests

The following extracts from letters have been grouped together for the sake of the light they throw upon the problems and expectations of contractors, manufacturers and other business men in their relationship to the architectural profession. The majority of the letters were elicited by Mr. Higgins' article.

ROBERT E. GROVE,
Ketchum, MacLeod and Grove, Inc., Advertising

The cure is not simple. It requires the exercise of common sense on the part of all concerned—the owner or builder, the architect, the contractor and the manufacturer.

Of these, the hardest to reach is the owner. Whether he be an individual or a corporation, he will by nature want to get what looks like as much for his dollar as possible. This is true in normal times; it is doubly true now in the face of reduced incomes and proportionately increased operating expenses. The owner's protection must admittedly come from his architect or, if in the industrial field, from his designing engineer.

We agree with Mr. Higgins' feeling of the importance of the architect—but not to the point of placing the entire responsibility on him. Part of that is the manufacturer's; much of it is the contractor's. Architecture is a profession. Its members are trained to study the problem, design the building, specify the best materials available, at the price the owner can afford to pay. Whether or not the architect is a purchasing agent is subject to discussion. At any rate, I think we can agree that one of his primary jobs is the writing of the specifications. The extent to which these specifications influence the final purchase largely rests on the knowledge he has of the products that he recommends to the owner, and his ability to substantiate the reasons for their use.

Parry

ROBERT E. GROVE

That is where the responsibility of the manufacturer comes in, granting that he produces a good product at a fair price. It is necessary that the manufacturer sees that the architect has this information which he so vitally needs.

IT HANGS TOGETHER

Here you see one of the reasons why Brixment mortar cuts bricklaying costs—*the mortar hangs together.* . . It doesn't break off and fall to the ground before the joint is struck. As a result, no mortar is wasted and the bricklayer stoops less often to the mortar board. It doesn't slop down over the face of the wall. So less time is required to clean down the finished job. . . This is due to the fact that the plasticity of Brixment mortar does not depend upon the use of excessive water. . . *The mortar hangs together.*

LOUISVILLE CEMENT COMPANY, *Incorporated*, LOUISVILLE, KY.

District Sales Offices: 1610 Builders Bldg., *Chicago;* 600 Murphy Bldg., *Detroit;* 101 Park Ave., *New York*

Mills: Brixment, N. Y. and Speed, Ind.

BRIXMENT

A Cement for Masonry and Stucco

There is no doubt that the architect can play a most important part in forcing the contractor to adhere to the standard of his original specifications. The action of Mr. Paul Cret in forcing the contractor to credit the owner with the difference between the original quotations and the final payments to the subcontractors, is worthy of note and could well be followed by many others.

RALPH E. HILL,
Southern Oak Flooring Industries

It is helpful to have such a presentation of the real danger that has been developing in the building material field by the constant decline in prices. . . .

SOFI has, in the midst of the depression, adopted the most exacting grading rules that Oak Flooring ever had. At the same time it has enforced strict adherence to those exacting rules by uniform and rigid inspection service. . . .

HOLLIS E. SHIREY,
The Kinnear Manufacturing Company

We believe that architect and specification writers should study fabricated materials, classify these in the order that their judgment may dictate after making comparison of the reliability of the producers, the quality of the product and the facilities for service. Then select one product as a standard of quality and specify it outright by trade name if it has any, giving also the name of the manufacturer; next permit alternate bids with corresponding savings, which, if accepted, will accrue to the owner.

LOUIS K. BERMAN,
Raisler Sprinkler Company, Inc.

I would make one suggestion, if I may, which might help to carry out the thoughts you express: reduce to a minimum the number of alternate estimates for different manufactured articles in the same class. In our trade, a practice recently prevalent seems to be to request alternate estimates on almost every one of the manufactured articles of the same class, so that the choice becomes increasingly more difficult.

ROBERT L. MAUCHEL,
The Master Builders Company

The tighter the exclusive specification, the surer the responsible manufacturer must be to sell his products at as low a price as he would under a competitive specification.

The evil of specifications as I see it, certainly as respects our products, is absolute misunderstanding—or shall I say nonunderstanding—of values.

CLAUDE O. WILLETTE,
The Kernerator Company

The president of our company, Mr. Mackey Wells, thought so well of your article that he procured copies and sent them attached to our monthly company bulletin, *The Kernergram,* to one hundred and fifty offices throughout the world. . . .

Under severe overloads the Breaker Handle clicks to the "TRIP" position (shown here). A mere flip of the handle restores service immediately.

Let a cigar shop pay rent

—IN THE SPACE NOFUZE SWITCHBOARDS SAVE . . .

"DE-ION" BREAKERS
are available in
Load Centers
(for homes)
Panelboards
Switchboards
Motor Circuit Control and Protection
* * *
Eliminate fuses throughout the building

NOFUZE switchboards, equipped with modern "De-ion" Breakers which replace fuses and switches, require only one-half to two-thirds the usual switchboard space in office buildings. You can increase the rentals of buildings you design by specifying Nofuze Switchboards because enough space is saved for a cigar shop . . . or other small establishment.

This decreased switchboard size is made possible by the excellent arc extinguishing characteristics of "De-ion" breakers. Arcs are so quickly and effectively dissipated that even dry cotton wrapped snugly around the unit is not scorched when short circuits are opened. Thus, the breakers can be mounted without the usual allowance for arcing required by switchboards using other types of breakers.

Small size is but one advantage of Nofuze switchboards. They are completely dead-front—only the insulated breaker handles protrude through the board. They are lighter, thereby simplifying and reducing the cost of installation and decreasing floor stresses. They require little maintenance as there are no blown fuse replacements.

Mail the coupon for complete information on Nofuze Switchboards.

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Westinghouse

Quality workmanship guarantees every Westinghouse product

MAIL THE COUPON

Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.
Gentlemen: Please send me a copy of Catalog 2246, giving complete information on Nofuze Switchboards, Panelboards, Load Centers, (for homes) and Industrial Breakers.

Name .....
Company .....
Address .....
City ..... *State* ..... AR 9-32

GEORGE A. KNAPP,
Knapp Brothers Mfg. Company, Inc.

We think one of the greatest evils is the persistent appeal by contractors to both the architect and the owner for permission to substitute after they have been awarded the contract. We think it would correct the situation somewhat to state in the plans and specifications that the contractor must bid with a definite obligation to supply what is specified or, if he knows of an item or product equal or superior, he shall at the time of bidding define it and state whether his bid will be higher or lower and to what extent if the substitute is used.

T. A. WERNER,
Tuttle and Bailey Mfg. Company

There is a great deal of pressure from contractors to get lower figures. Your article is a very timely one. I only wish that every architect, general contractor and subcontractor in the country could read it. It hits the nail absolutely on the head.

A. P. MADDEN

You have embodied real common sense with essential facts and it is my wish every architect will read your writing and appreciate its true value.

H. A. FITCH,
Kansas City Structural Steel Company

It is refreshing to have such a clear analysis of the business situation presented to the construction industry by an architect in your position. It is as if you had held up a looking glass so that we could clearly see ourselves.

Your remark "Granting that a real danger exists to all parties in transactions where some one has got to lose money, what can be done about it?" puts this problem squarely up to those of us who are selling materials. . . . It is up to us to correct the situation.

LEON H. FRANK,
Bull Dog Electric Products Company

I have read your article in THE RECORD of June 1932 and in my opinion it splendidly explains the situation and the cure. More constructive articles such as you have written would be of great benefit to everybody concerned.

PAUL COSTE,
United States Rubber Company

Please congratulate Mr. Daniel Higgins on the splendid article that he has written. I can't express to you how much I enjoyed this sane viewpoint and the encouragement that I personally derived from reading the article.

DAVID SALISBURY TRAITEL

I have just seen your article in THE RECORD dealing with the question of substitution after an architect has specified the article which he has carefully studied and decided that it is to the owner's advantage to use. I want you to know that I admire your stand in this matter.