THE

ARCHITECTURAL RECORD

VOL. 76. NUMBER 1 JULY 1934

THE NEW HOME MORTGAGE MARKET

by

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The National Housing Act, apart from Administrative provisions, is in the main identical with the bill originated by the National Emergency Council and submitted to the Congress with a message from the President. The principal features of the bill as summarized by Frank C. Walker, Executive Director of the Council, were published in the June issue of this magazine. The National Housing Act completes a program for reorganization of the home mortgage market, for relief of home owners in default on mortgages and of lending institutions embarrassed by frozen home mortgages, and for stimulation of employment through modernization of homes.

The program was inaugurated by the Federal Home Loan Bank Act of July 22, 1932, followed by the Home Owners' Loan Act of June 13, 1933, both of which have been variously amended and supplemented to permit extensions in scope of the program of reorganization, relief and stimulation.

THE OWNED HOME IN FINANCE AND IN CONSTRUCTION

How important to the architectural profession and to the building industry is a program limited in direct benefits to owned homes not exceeding $20,000 in value? Perhaps the best approach to an answer is the evidence presented at the hearings before the Senate Committee on Banking and Currency. The following table, compiled from "The Internal Debts of the United States," a survey financed by the Twentieth Century Fund and published by the Macmillan Co. in 1933, was repeatedly cited wholly or in part.

THE NATIONAL DEBT STRUCTURE

Mortgage debt:	
Home mortgages	$21,000,000,000
Other urban mortgages	$14,000,000,000
Farm mortgages	8,000,000,000
Total	$43,000,000,000
Federal debt	26,000,000,000
State and local debt	19,000,000,000
Industrial debt	10,000,000,000
Public utility debt	10,000,000,000
Railroad debt	14,000,000,000

There were in 1930, according to the Bureau of the Census, 10,503,386 owned non-farm homes in the United States (continental area), of which 354,337 were valued at $20,000 or more. The average value of all owned non-farm homes was $4,778.

The next table is reproduced because it explains why accepted methods and principles of the mutual building and loan association play so prominent a part in the reorganization of the home mortgage market. It is understood that the tables are estimates from different sources, which accounts for the difference in the figures given for the total home mortgage debt ($21,000,000,000 in the first table and $21,500,000,000 in the second).

HOME MORTGAGE HOLDINGS

Building and loan associations	$6,500,000,000
Individuals	4,000,000,000
Mutual savings banks	3,500,000,000
Mortgage companies	3,000,000,000
Banks	2,500,000,000
Insurance companies	2,000,000,000

As to the relative importance of the owned home in construction, no clear picture is obtainable from the committee hearings. In the 1930 Census one-family dwellings constituted 84.3 per cent of all non-farm dwellings. If, in order to employ construction statistics conveniently available, one- and two-family dwellings are taken as representing dwelling construction (as opposed to apartment construction), no important statistical error is likely to result, although the new mortgage legislation includes three-family dwellings as homes and, in some instances, also four-family dwellings. In 1925, a year in which presumably a normal relationship of activity prevailed between the main classes of construction, one-family and two-family houses constituted 26 per cent in dollar value of the total volume of building construction. The contracts let for these houses totaled $1,300,000,000 in the Dodge Reports territory, to which should be added an estimated $200,000,000 for the States outside that territory, making $1,500,000,000 for the continental area of the United States. However, no factual information is available for estimating the proportion of these houses that were built for owner occupancy.

THE HOME MORTGAGE MARKET AS REORGANIZED

The reorganization is based upon the following principles: 1. discount facilities, 2. amortized (self-liquidating) mortgages, 3. mortgage insurance, 4. insurance of individual savings accounts up to $5,000 (represented by shares and certificates) in building and loan associations, 5. Federal savings and loan associations, 6. national mortgage associations, 7. the sale of bonds secured by mortgages to attract new capital and 8. Federal control or supervision, mainly through the Federal Home Loan Bank Board, of institutions authorized to function within the market.

THE FEDERAL HOME LOAN BANK SYSTEM

This is similar in purpose and operation to the Federal Reserve System, except that it is confined to home mortgage finance. It has twelve regional home loan banks, each of which serves, with some exceptions, only member institutions. Eligible for membership are building and loan associations, savings and loan associations, cooperative banks, homestead associations, insurance companies and savings banks which meet the requirements stated in the Federal Home Loan Bank Act. The Act throws the weight of its influence towards promoting the use of amortized mortgages by permitting a regional bank to lend more money on such mortgages than on straight mortgages when a member institution applies for a loan. The system on May 31, 1934, had 2,501 member institutions, comprising 2,292 building and loan associations, 3 life insurance companies, 55 cooperative banks, 126 Federal savings and loan associations, and 16 homestead associations. Their home mortgage assets are estimated at some $3,000,000,000. They hold 197,426 shares of stock in the regional banks, which entitles them to a line of credit of $231,859,642, of which they have borrowed about one-half.

Each regional bank (or the twelve regional banks as a group) may issue bonds and debentures secured by mortgages valued at 190 per cent of the issue.

FEDERAL SAVINGS AND LOAN ASSOCIATIONS

About one-half of the counties in the United States have no local home financing agency of any kind. Of 10,997 building and loan associations, 2,292 have so far met the requirements for membership in the Federal Home Loan Bank System. A Federal savings and loan association is a local, mutual savings institution similar to the general type of building and loan association except that it operates under a Federal charter and under supervision and regulation of the Federal Home Loan Bank Board. It is a private institution, although the Federal Government invests in its shares. The Federal Savings and Loan Division of the Federal Home Loan Bank Board has appointed some thirty trained home financing specialists to cooperate with the regional home loan banks both in organizing Federal savings and loan associations and in converting thrift institutions now under State charter into Federal savings and loan associations, which automatically become members of the Home Loan Bank System. Establishment of Federal savings and loan associations was authorized by the Home Owners' Loan Act of June 13, 1933. According to the latest press release at hand, 314 such associations have been organized in 34 States with $38,079,129 in private share subscriptions. Recently the original restriction of investment by the United States Treasury to $100,000 in the shares of any one association has been amended to permit an investment of 75 per cent of the total capital paid in by the Government and other shareholders, so as to facilitate conversion of the larger State chartered thrift associations.

At the committee hearings it was pointed out that, while the State chartered associations were not yet in a position, generally speaking, to lend money for new home construction, Federal savings and loan associations are making loans for that purpose.

NATIONAL MORTGAGE ASSOCIATIONS

Among the functions of these privately owned and operated corporations, authorized by the National Housing Act, subject to supervision by the Federal Housing Administrator, are (1) to deal in insured home mortgages and (2) to manage properties acquired or turned over to them as the result of foreclosure proceedings. They may sell bonds or debentures secured by insured mortgages, thus enabling them to attract funds from financial centers where there is a surplus of capital for investment to areas in which the local cost of home financing is unduly high.

FEDERAL MUTUAL MORTGAGE INSURANCE CORPORATION

Created by the National Housing Act as an instrumentality of the United States supervised by the Federal Housing Administrator, the Corporation is to have a capital stock of $10,000,000, subscribed for by the Secretary of the Treasury, out of which to pay initial expenses. The insurance fund is contributed by the mortgagees on an actuarial basis. The Administrator is authorized to insure amortized home mortgages up to $16,000 or up to 80 per cent of the appraised value. He may prescribe terms as to maturities, interest rates, the application of periodic payments to the amortization of principal, insurance, repairs, alterations, payment of taxes, default reserves, delinquency charges, foreclosure proceedings, anticipation of maturity, additional and secondary liens and the like. The interest rate on mortgages is not to exceed 5 per cent on the principal obligation outstanding at any time unless the Administrator finds that in certain areas or under special circumstances the mortgage market demands a higher rate, not to exceed 6 per cent.

The premium charge for insurance of mortgages is not to be less than ½ of 1 per cent nor more than 1 per cent of the original face value, and is to be payable annually in advance by the mortgagee.

Provision is made for the classification of mortgages and the establishment of separate groups to which mortgages having substantially similar risk characteristics and maturity dates are to be assigned.

It also is provided that the Administrator may insure first mortgages covering property held by Federal or State instrumentalities, private limited-dividend corporations and municipal corporate instrumentalities of one or more States formed for the purpose of providing housing (up to $10,000,000 in individual projects) for persons of low income, which are regulated or restricted by law or by the Administrator as to rents, charges, capital structure, rate of return or methods of operation. Such mortgages need not conform to the eligibility requirements of other mortgages.

FEDERAL SAVINGS AND LOAN INSURANCE CORPORATION

The committee hearings stressed the fact that even sound building and loan associations had no money to lend for new home construction because depositors were cashing shares and certificates in order to transfer their savings to insured banks. To check the flow of savings away from long-term investment institutions, the National Housing Act provides for insuring accounts of members of the regional home loan banks, except savings banks. Each eligible institution is entitled to insurance up to 80 per cent of the withdrawable or repurchasable value of its accounts, but no depositor of the institution shall be insured in excess of $5,000.

The Savings and Loan Insurance Corporation is under direction of the Home Loan Bank Board.

ARCHITECTS UNDER THE REORGANIZATION

One of the major features of the plan for reorganizing the home finance market is the preference accorded to the amortized mortgage over the traditional short-term mortgage payable in full on maturity. The Federal Home Loan Banks permit larger advances to member institutions on amortized mortgages than on straight mortgages; the Federal savings and loan associations make loans exclusively on amortized mortgages; the Federal Mutual Mortgage Insurance Corporation insures none but amortized mortgages; and the national mortgage associations are permitted to deal only in insured (and consequently amortized) mortgages.

The amortized mortgage preferred or required by these Federal institutions bears a low rate of interest, from 5 to 6 per cent, and may cover up to 80 per cent of the value of the property, a coverage designed to eliminate the customary junior mortgages and building loans. If this form of mortgage, being insured and in other ways protected by the Government, attracts the bulk of private investment capital going into future home construction, it is evident that more houses will be built by intending occupiers, which will it would seem increase the number of prospects for architectural services.

RELIEF MEASURES

These have taken two forms, namely (1) RFC loans to mortgage lending institutions and (2) refinancing of defaulted home mortgages by the Home Owners' Loan Corporation.

It is perhaps an indication of the merits of the amortized mortgage that RFC loans to building and loan associations, which use this mortgage generally, are smaller, both absolutely and relatively, than those to mortgage companies. On December 31, 1933, RFC loans to building and loan associations totaled $66,237,000, having substantially decreased during the year, while the loans to mortgage companies amounted to $177,845,000, having greatly increased during the year.

The National Housing Act authorizes an increase in the borrowing power of the Home Owners' Loan Corporation through sale of bonds so as to provide $2,700,000,000 for refinancing mortgages and $300,000,000 for repairs and modernization of homes covered by refinanced mortgages, all of which are of the amortized type.

MODERNIZATION

The reasoning in support of the credit arrangement for modernization presented at the committee hearings was something like this: According to the National Industrial Conference Board, the number of unemployed in March, 1934, was 8,021,000, as against 13,203,000 in March, 1933. There were about 400,000 workers in the consumer goods industries unemployed, about 1,500,000 in the durable goods industries, about 2,000,000 in the building trades, and the rest—about 4,100,000—in trade, transportation, service, agriculture and so on. Reemployment in the miscellaneous group and in the durable goods industries group depends mainly upon recovery of the building industry.

The purpose of the credit plan for modernization is to promote a considerable immediate reemployment in the building trades, in the expectation that the reorganized home mortgage market will provide enough credit next year to take care of such new construction of dwellings for owner occupancy—mainly one- and two-family houses—as may be warranted by supply and demand.

The credit plan incorporated in the National Housing Act contemplates a private expenditure of $1,000,000,000 under contract before January 1, 1936. The credit is secured mainly by installment notes payable in one to five years. The individual loan may not exceed $2,000, but may be obtained for any kind of property, provided it is to be used for alterations, repairs and improvements. As the Government insures accredited institutions which hold such notes to the extent of 20 per cent of their holdings, the insurance fund amounting to $200,000,000, it is understood that committees of architects, engineers and others will be appointed in each community to pass on the contracts for the Government, although the Act does not make this procedure obligatory.

The fund is to be administered by the Housing Administrator who may establish such agencies, accept and utilize such voluntary and uncompensated services, utilize such Federal officers and employees and such state and local officers and employees as he may find necessary and may prescribe their functions.

The Administrator is authorized upon such terms and conditions as he may prescribe to insure banks, trust companies, personal finance companies, mortgage companies, building and loan associations, installment lending companies and other such financial institutions against losses which they may sustain as a result of loans and advances of credit made by them subsequent to the date of enactment of the Act and prior to January, 1936, or such earlier date as the President may fix by proclamation, for the purpose of financing alterations, repairs and improvements upon real property.

The committee hearings explain why such comprehensive discretionary power was conferred upon the Administrator. Each of the many different kinds of lending institutions which it is hoped will support the plan is governed by specialized Federal or State legislation, so that a particular procedure will have to be worked out for each type of institution.

Until the Administrator has interpreted the Act in its bearing on administrative detail it is impossible to know whether architects will be allowed to organize jobs without assuming the responsibility of general contractors on the notes.

CONCLUSION

Without attempting to forecast results for the program of reorganization, relief and stimulation which has been briefly outlined, it may be suggested (1) that it applies to the section of the building industry which led in the decline, the peak in new construction of one- and two-family houses having been touched as far back as 1928, (2) that house repairs have been neglected for a number of years, as may be inferred from the real property inventory of 64 cities conducted under the auspices of the Bureau of Foreign and Domestic Commerce, and (3) that the reorganization of the home mortgage market is of a kind calculated by its designers to restore the confidence of investors in bonds of that market. The fundamental principles of the reorganization—amortized home mortgages securing loans by mutual thrift associations with power under prescribed conditions to issue bonds against such mortgages—have been approved by experience, partly in America but more generally abroad. According to John H. Fahey, Chairman of the Federal Home Loan Bank Board, about 20 per cent of all funds invested in England pass into the shares of building societies, with the result that scarcity of home mortgage money has not been a serious problem there even during the depths of depression since the war.

PORTFOLIO

SPECIAL BUILDING TYPES

NEW WORK

Rainbow Angling Club, Azusa, California. Gordon B. Kaufmann, Architect.

A Tuberculosis Sanatorium, Paimoni, Finland. Alvar Aalto, Architect.

The Medical School Clinics, the University of California, San Francisco, California. William C. Hays, Architect.

A Tuberculosis Sanatorium. Ernest Weissmann, Architect.

A Rural Health Station. Howard T. Fisher, Architect.

Sabinas Brewing Company, San Antonio, Texas. Charles T. Aubin, Architect.

Two Houses of Concrete Construction, Moderate in Cost.

Apartment House Development, Arlington County, Virginia. Andrew J. Thomas, Architect.

El Karubah Club House, Cross Lake, Louisiana. Jones, Roessle, Olschner and Wiener, Architects.

Lutz Funeral Home, Reading, Pennsylvania. Elmer H. Adams, Architect.

Planning the Funeral Home. By Elmer H. Adams of Weidner and Adams, Architects.

Automobile Shopping Centers. By B. Sumner Gruzen, Architect.

Lighting Large Shopping Centers. By H. W. Desaix, Watson Flagg Engineering Company.

Y. W. C. A. Building, Williamsport, Pennsylvania. Lawrie and Green, Architects.

Headquarters Hut for Admiral Byrd in the Antarctic. Victor H. Czegka, Designer.

A Self-Service Ice Vendor Near Los Angeles.

Roadside Diners for Motorists. Designed by Stanley Nelson and Charles Porter, Under the Direction of Kem Weber, Art Center School, Los Angeles.

MODERNIZATION

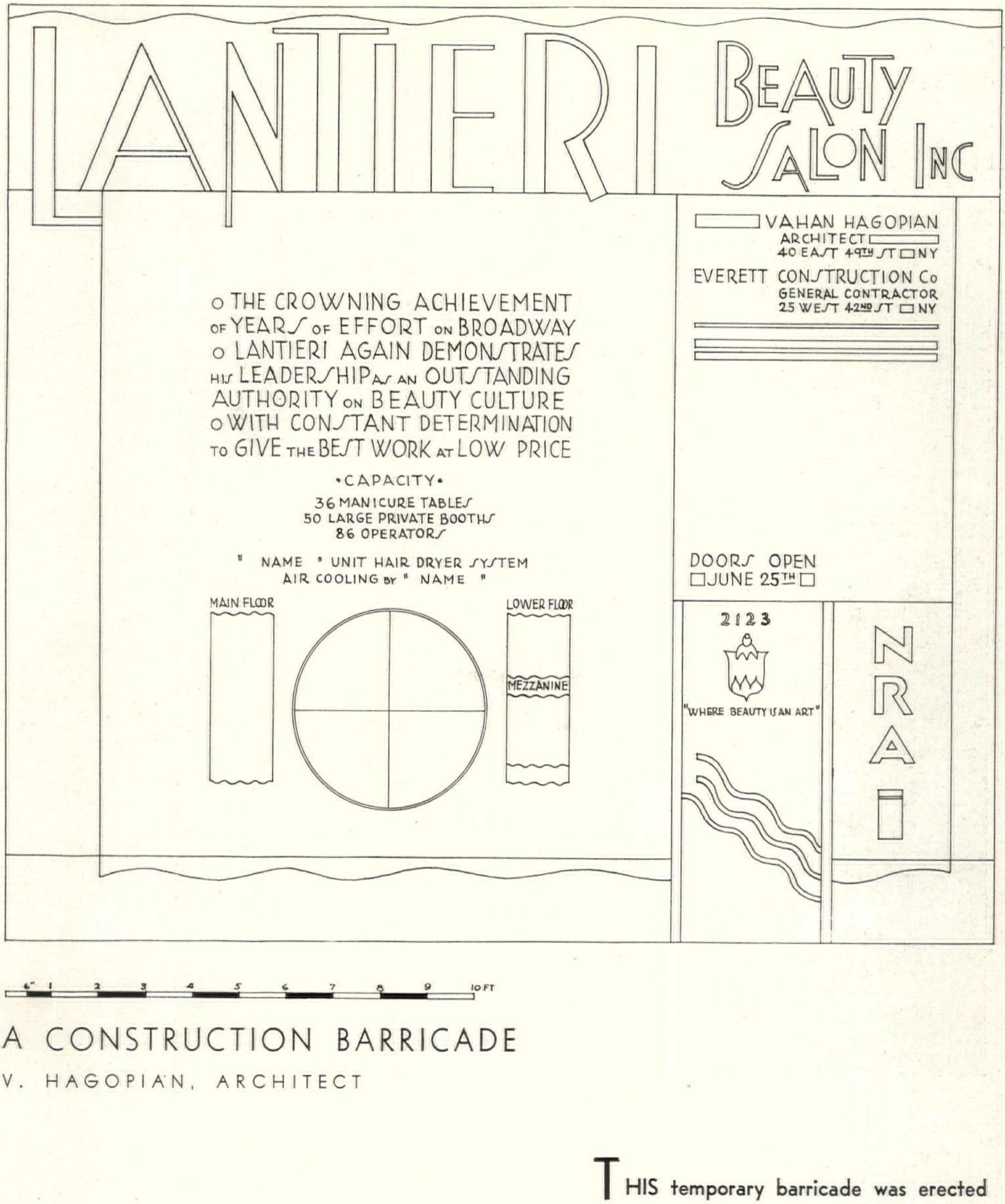
A Construction Barricade — Lantieri Beauty Salon, Inc. — Vahan Hagopian, Architect.

A Hotel Bar, Buenos Aires. Rocha y Martinez Castro, Architects.

Private Office of Gordon Reed, Hanley Company, New York City. V. Hagopian, Architect.

Tru-Food Restaurant, New York City. H. V. St. George, Architect.

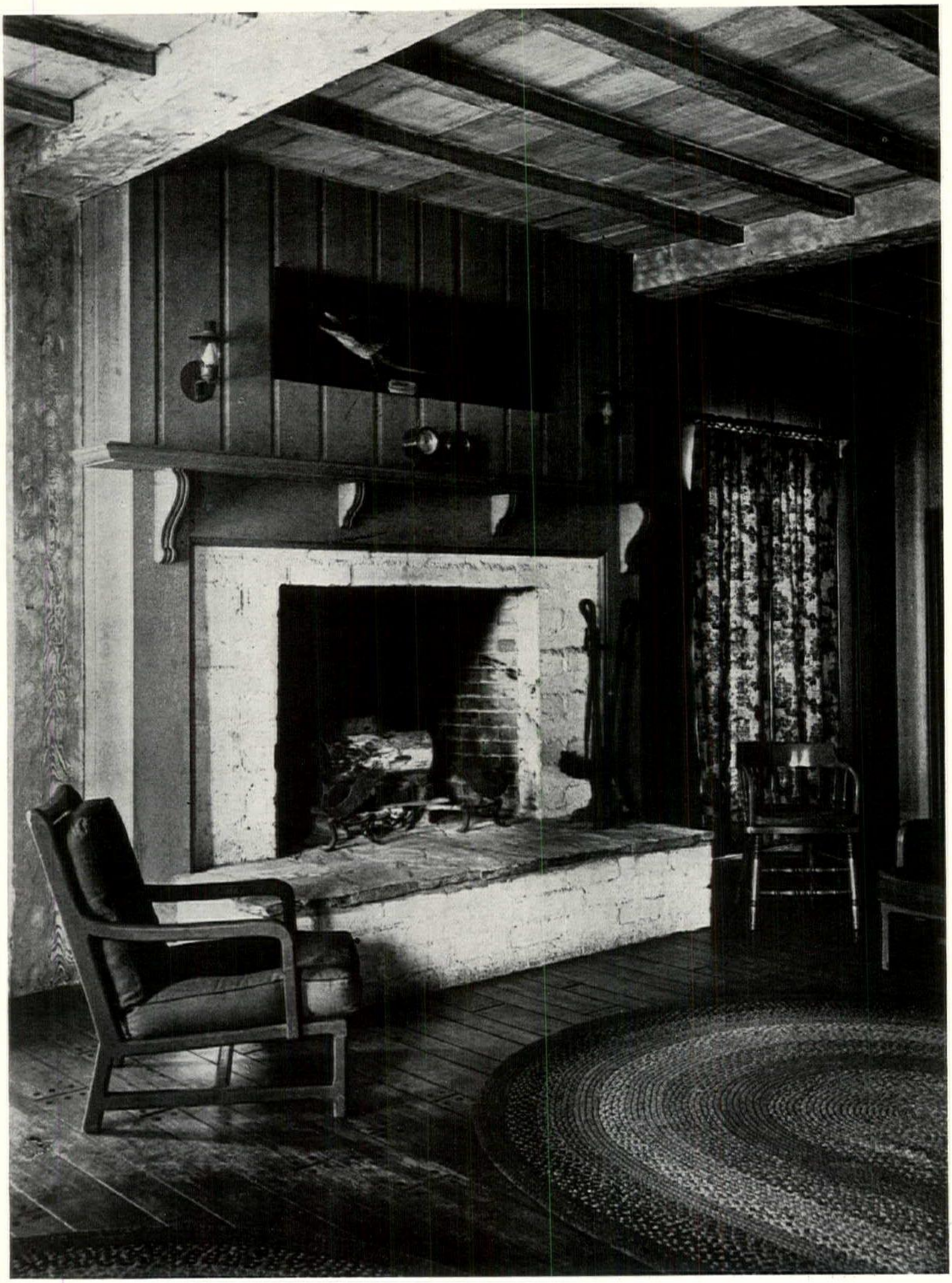
A CONSTRUCTION BARRICADE



A CONSTRUCTION BARRICADE

V. HAGOPIAN, ARCHITECT

THIS temporary barricade was erected as a screen during the reconstruction of a store building. A circular show window served for display during the alteration.



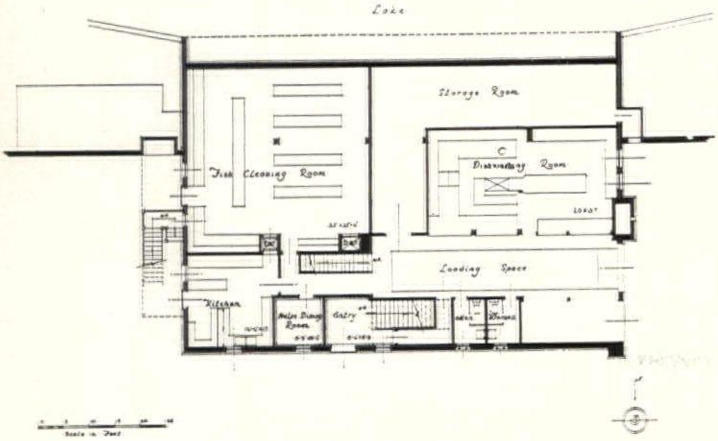
INTERIOR OF CLUB ROOM

RAINBOW ANGLING CLUB, AZUSA, CALIFORNIA

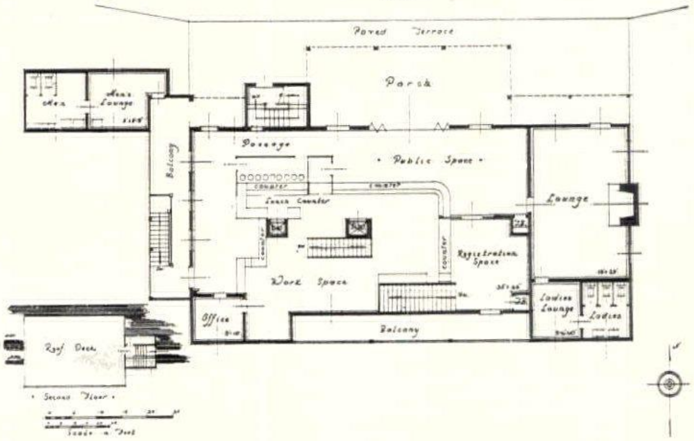
GORDON B. KAUFMANN, ARCHITECT

GENERAL VIEW

GROUND FLOOR PLAN



FIRST FLOOR PLAN



Photos by Wm. A. Clarke

TERRACE ON LAKE

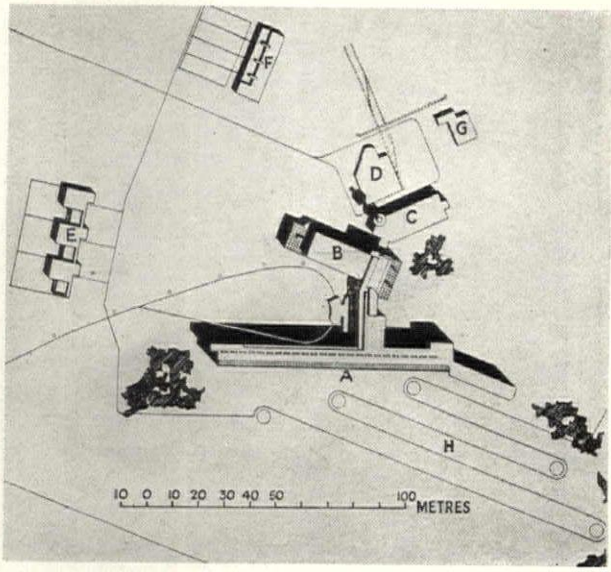
RAINBOW ANGLING CLUB, AZUSA, CALIFORNIA

GORDON B. KAUFMANN, ARCHITECT

ELEVATION TOWARD GARDEN

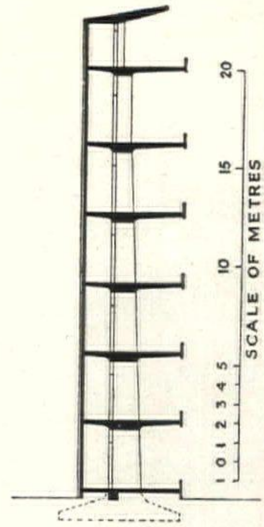
A TUBERCULOSIS SANATORIUM, PAIMONI, FINLAND

ALVAR AALTO, ARCHITECT



PLOT PLAN

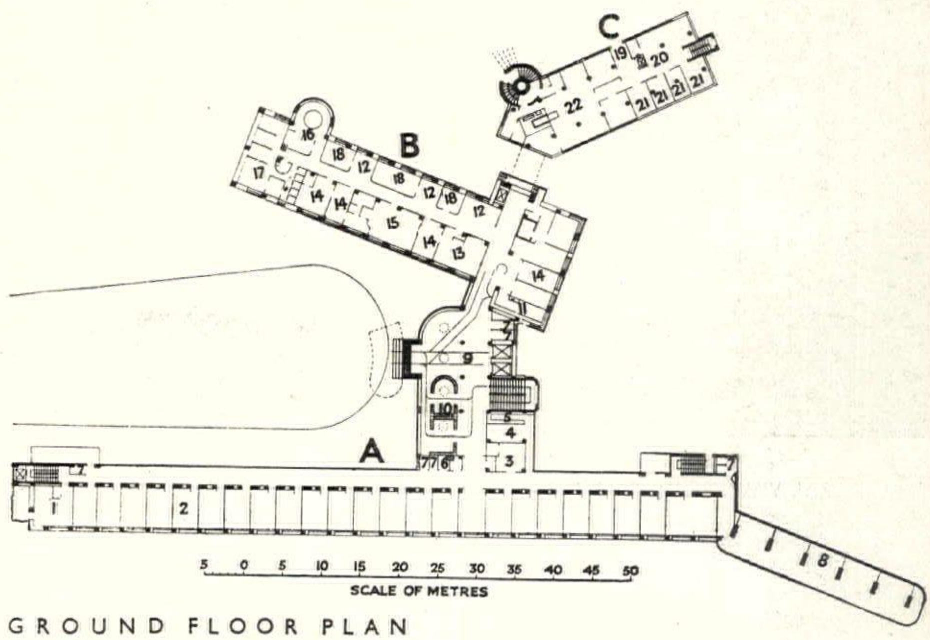
KEY TO PLOT PLAN AT LEFT:
(**A, B, C** shown on plan below); **D,** power house block; **E,** houses for doctors; **F,** houses for employees; **G,** garage; **H,** gardens for use of patients; **Wing A** contains patients' rooms with S. S. E. aspect.



A SECTION THROUGH ONE OF THE WINGS SHOWING A CENTRAL COLUMN WITH SPREAD FOOTING.

GROUND FLOOR.—Wing A. 1: Nurses' quarters. **2:** Patients' rooms. **3:** Divisional day rooms with glass walls. **4:** Washing room, utensils, general cleaning and disinfection. **5:** Laundry. **6:** Sputum analysis room in two divisions, with double lift to sterilizing room on the first floor. **7:** W.C.'s, urinals, bidets, footbaths, etc. **8:** "Lying halls" for the more serious cases. **9:** The entrance hall. **10:** Shoe changing room. **Wing B. 11:** Porter, post office, wireless, telephone exchange, etc. **12:** Waiting niches for patients in corridors. **13:** Administration rooms and doctors' consulting rooms. **14:** Doctors' room. **15:** X-ray. **16:** Operation theater. **17:** Therapy. **18:** Laboratories, dentists' and apothecaries' rooms. **Wing C. 19:** Entrance for provisions and for kitchen and bakery. **20:** Sorting room for provisions. **21:** Cold storage. **22:** Bakery. **Wing D. 23:** Power House. **24:** Boilers. **25:** Tunnel for coal trucks. **26:** Shower.

THE DRAWINGS AND PLANS THAT ILLUSTRATE THIS SANATORIUM WERE PREPARED BY THE ARCHITECTS' JOURNAL, LONDON, AND REPRODUCED WITH PERMISSION OF THAT JOURNAL.



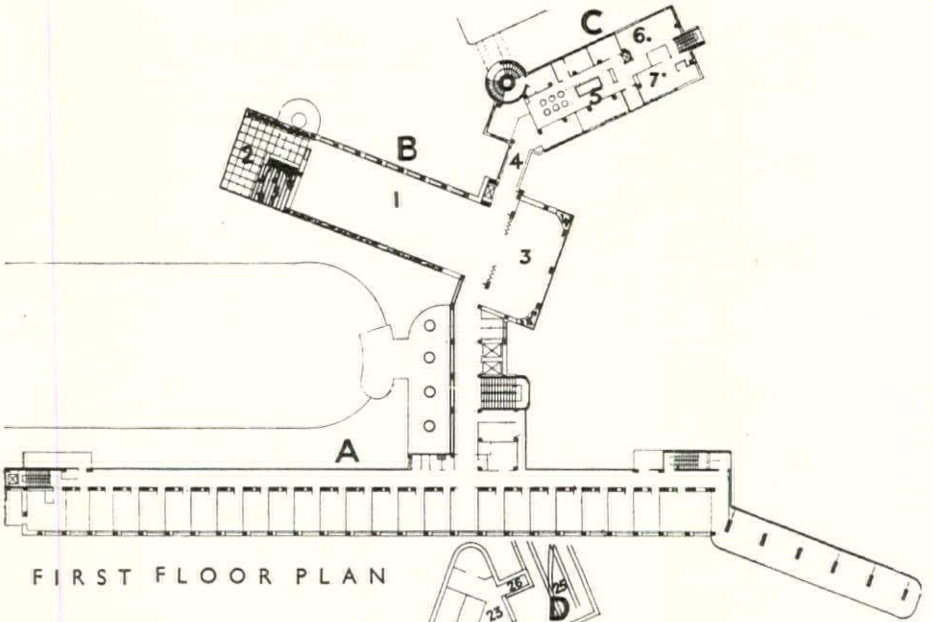
GROUND FLOOR PLAN

This hospital in southwest Finland is in an isolated location and so was planned as a self-contained community.

The Sanatorium building was built with regard to orientation to the sun and an openness of wall so as to permit the entrance of ample light and air. The building is of concrete framework. The use of cantilever construction made possible the adoption of superficial wall faces without obstructing columns. Balconies also are cantilevered and project out and into the sun. A part of the building group is supported on central columns with spread footings which serve as a stem from which the floors project.

Because of the self-contained character of the Sanatorium, provision is made for housing doctors, nurses and other employees on the grounds. There is a wooded park and gardens for the use of patients.

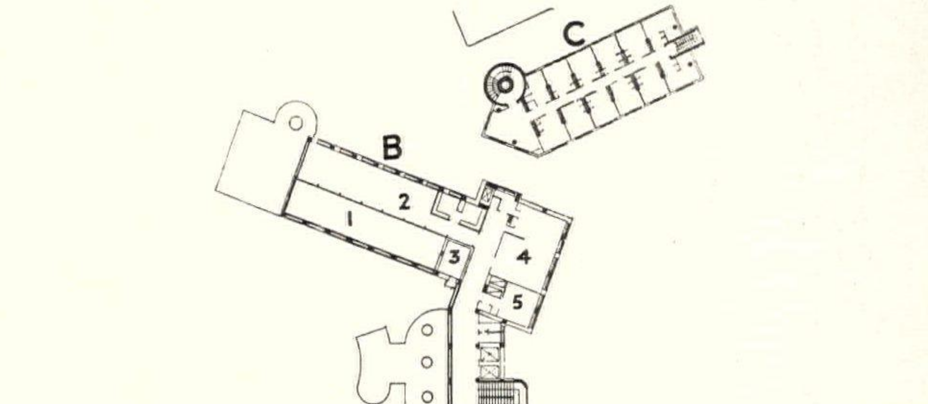
GENERAL VIEW OF WING A AND UNIT CONNECTING IT WITH WING B



FIRST FLOOR PLAN

FIRST FLOOR.—Wing A. As on the ground floor. **Wing B. 1:** Dining hall. **2:** Summer terrace with pergola, etc. **3:** Recreation room. **4:** Service room. **Wing C. 5:** Kitchen with refrigerators, cloakrooms, etc., housekeeper's storage room for flour, sugar, cold and warm foods, and scullery. **6:** Staff dining room. **7:** Housekeeper's quarters.

STAIRWAY IN UNIT CONNECTING WINGS A AND B



SECOND FLOOR PLAN

SECOND FLOOR.—Wing A. As on the ground floor. **Wing B.** 1: Upper part of dining room. 2: Reading room and library. 3: Cinema projector room. 4: Dining and recreation rooms for nurses. 5: Guest rooms. **Wing C.** "Hotel" for staff with assembly room in the angle.

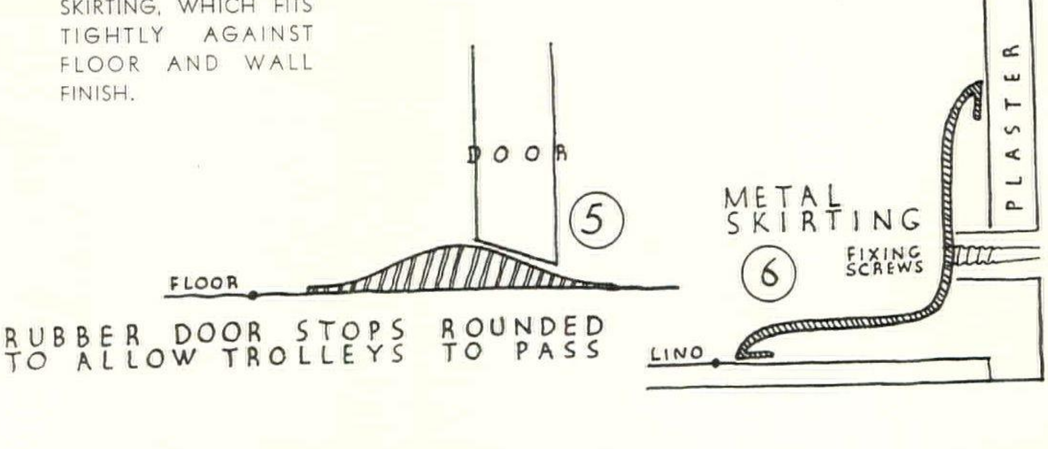
VESTIBULE OFF MAIN COURT

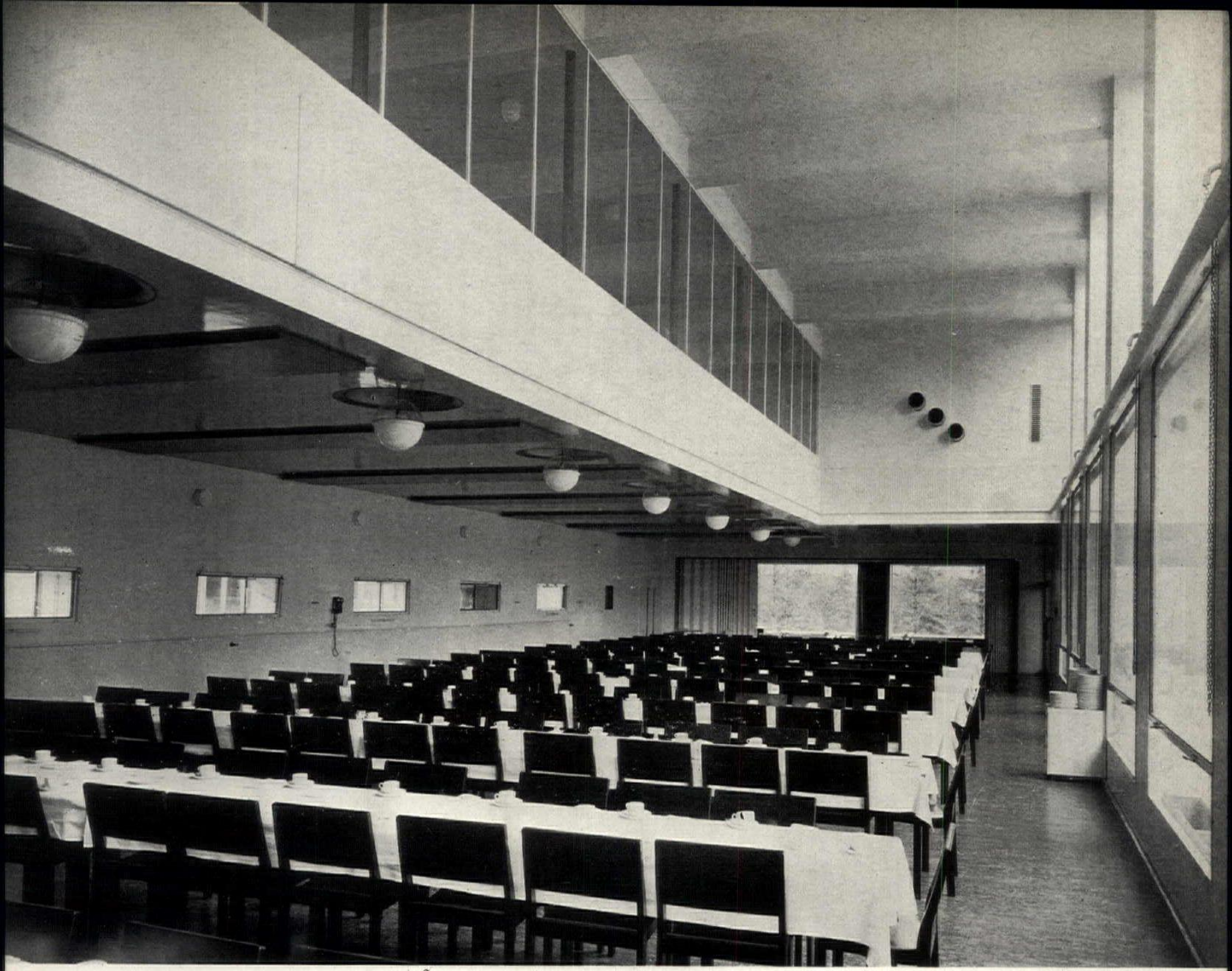
A TUBERCULOSIS SANATORIUM, FINLAND

ALVAR AALTO, ARCHITECT

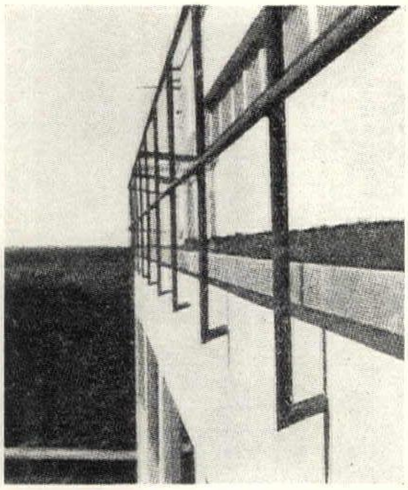
5: A RUBBER THRESHOLD FOR DOORS, ALLOWING CLOSE SHUTTING AND AT THE SAME TIME ENABLING TROLLEYS TO BE RUN OVER IT.

6: THE STANDARD ZINC SKIRTING, WHICH FITS TIGHTLY AGAINST FLOOR AND WALL FINISH.



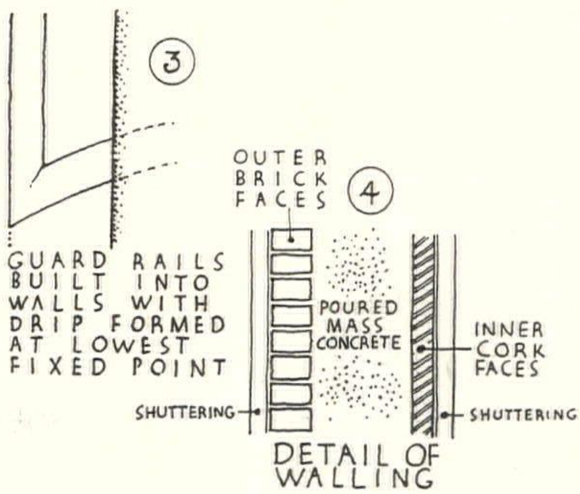


PATIENTS' DINING ROOM



3: GUARD RAILS DESIGNED TO THROW OFF THE RAIN WATER, AND PREVENT STAINING OF THE WALL SURFACE.

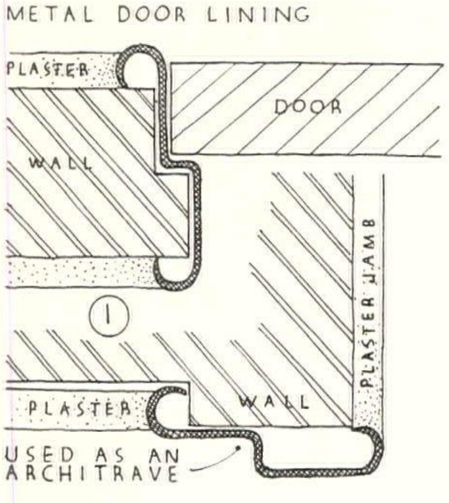
4: THE STANDARD WALL CONSTRUCTION.



PATIENTS' READING ROOM ON SECOND FLOOR

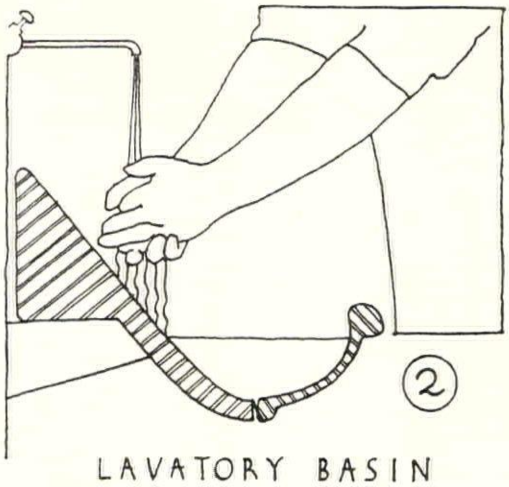
A TUBERCULOSIS SANATORIUM, FINLAND

ALVAR AALTO, ARCHITECT



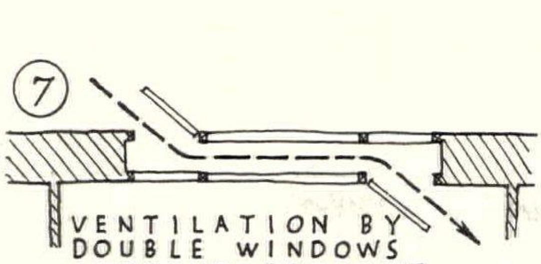
1: THE STANDARD ZINC SECTION, USED BOTH AS DOOR LINING AND ARCHITRAVE.

2: THE WASH-BASIN SPECIALLY DESIGNED TO PREVENT SPLASHING AND NOISE.



LAVATORY BASIN

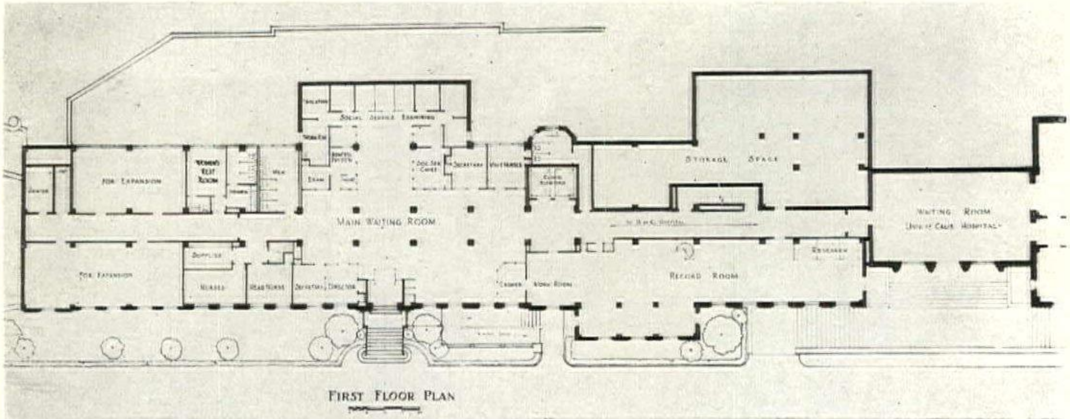
INTERIOR STAIRWAY DETAIL



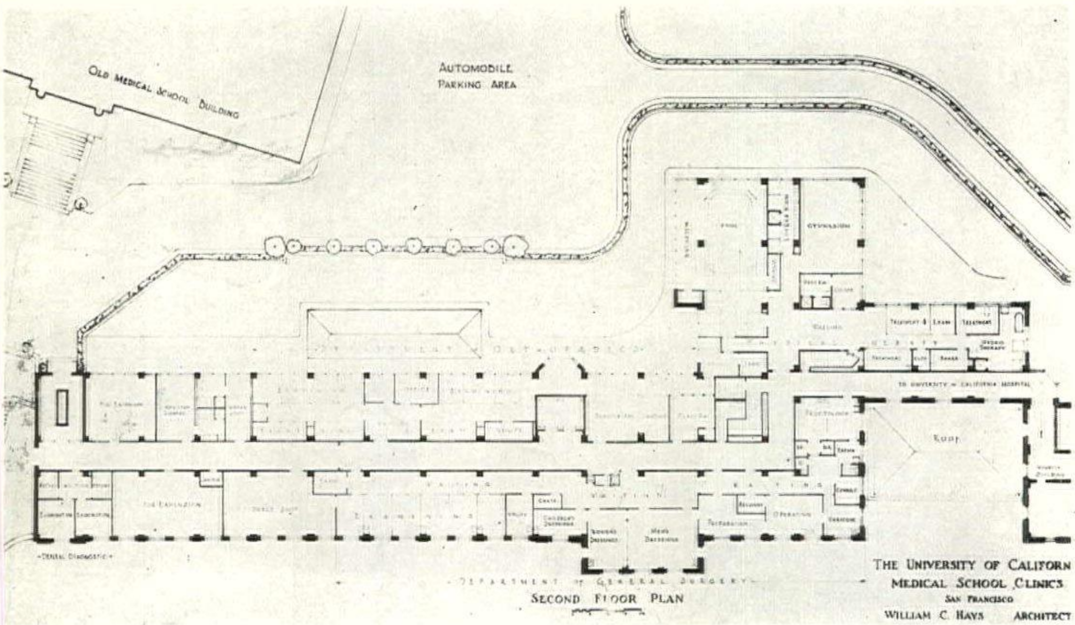
7: DOUBLE WINDOW WITH DRAUGHTLESS VENTILATION, USED IN THE BEDROOMS.

THE MEDICAL SCHOOL CLINICS, THE UNIVERSITY OF CALIFORNIA SAN FRANCISCO, CALIFORNIA

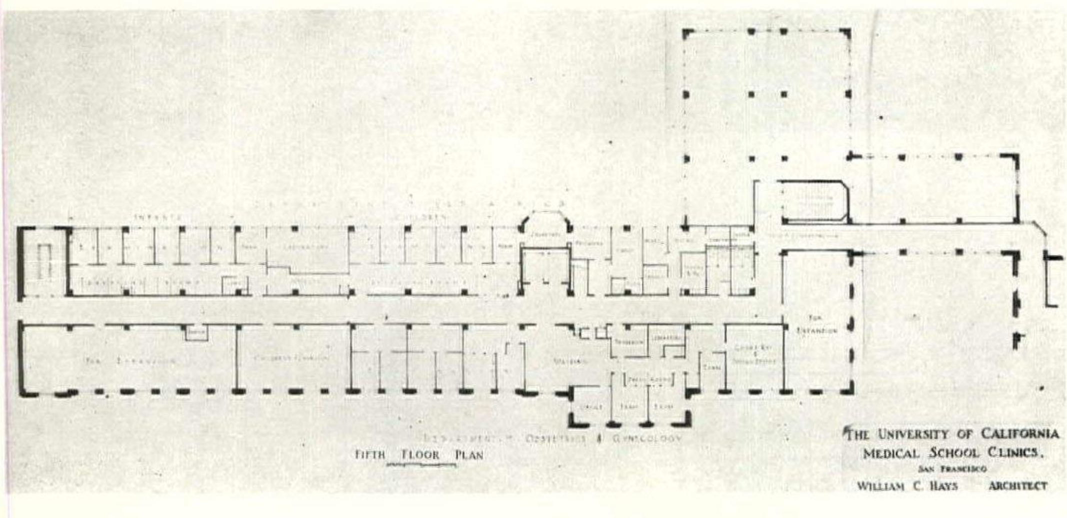
WILLIAM C. HAYS, ARCHITECT



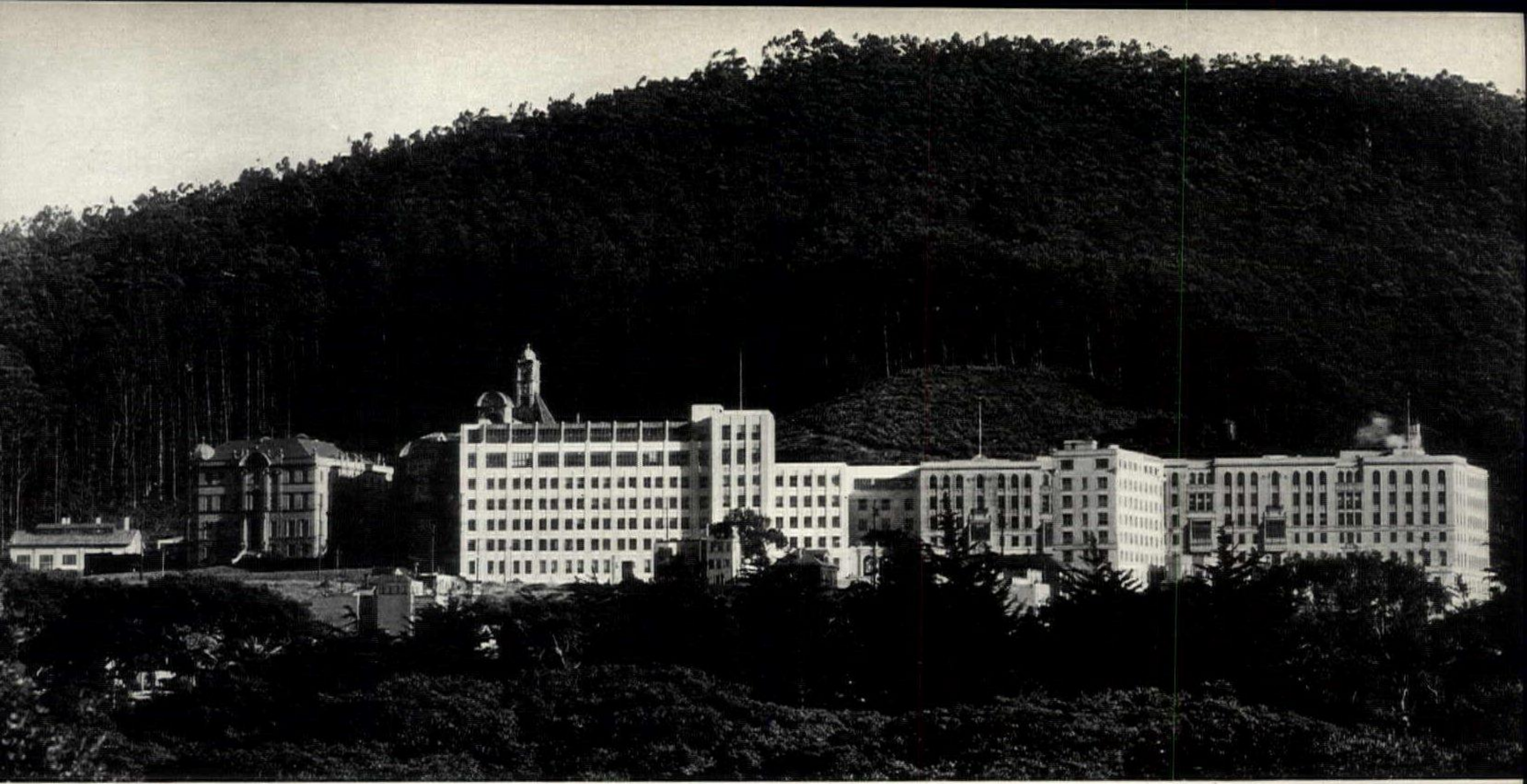
FIRST FLOOR PLAN



SECOND FLOOR PLAN



FIFTH FLOOR PLAN



NERAL VIEW OVER TREES OF GOLDEN GATE PARK—SUTRO FOREST IN THE REAR

THE eight floors of the building combine the medical and dental clinics with approximately 200,000 and 50,000 yearly out-patient visits, respectively. Each floor of the clinics corresponds, in so far as possible, to the same floor of the hospital wards in the connecting building (the University of California Hospital) devoted to similar branches of medicine or surgery.

The structure complete encompasses about 100,000 square feet of superficial floor area. The ground floor houses the record room with its 240,000 case reports, pharmaceutical dispensary, alcohol and drug storage vaults, laboratory and machinery rooms. Contiguous to the main waiting room (2,200 sq. ft. in area) on the first floor are examination rooms for admissions and the social service headquarters. A separate record room for the University Hospital is also maintained on this floor. The second floor provides space for the surgical and some of the surgical-specialty clinics. The Physical Therapy Department is also on this floor, a feature of which is a large therapeutic pool and a solarium for patients suffering from muscular defects. The third floor is devoted to the eye, ear, nose and throat clinics, the dermatological and lues clinics, and the urological clinics. General medicine, psychiatry and neurology clinics are concentrated on the fourth floor, and women's clinics and children's clinics are placed on the fifth floor. The sixth and seventh floors hold the dental clinics with more than ninety (90) chairs in the two main operatories, plus individual examining rooms, laboratories, offices for the staff, etc. These two upper floors have a fourteen-foot height with windows on the north extending to the full height and cut only by structural columns. All services to the dental units are run in waterproofed concrete trenches under the floor, which finish flush with steel plates for access.

Structural Data: The building has a 293-ft. frontage with a depth varying from 46 to 99 feet and contains 800 tons of structural steel. The building adjoins the

MEDICAL SCHOOL CLINICS,
UNIVERSITY OF CALIFORNIA
SAN FRANCISCO, CALIFORNIA

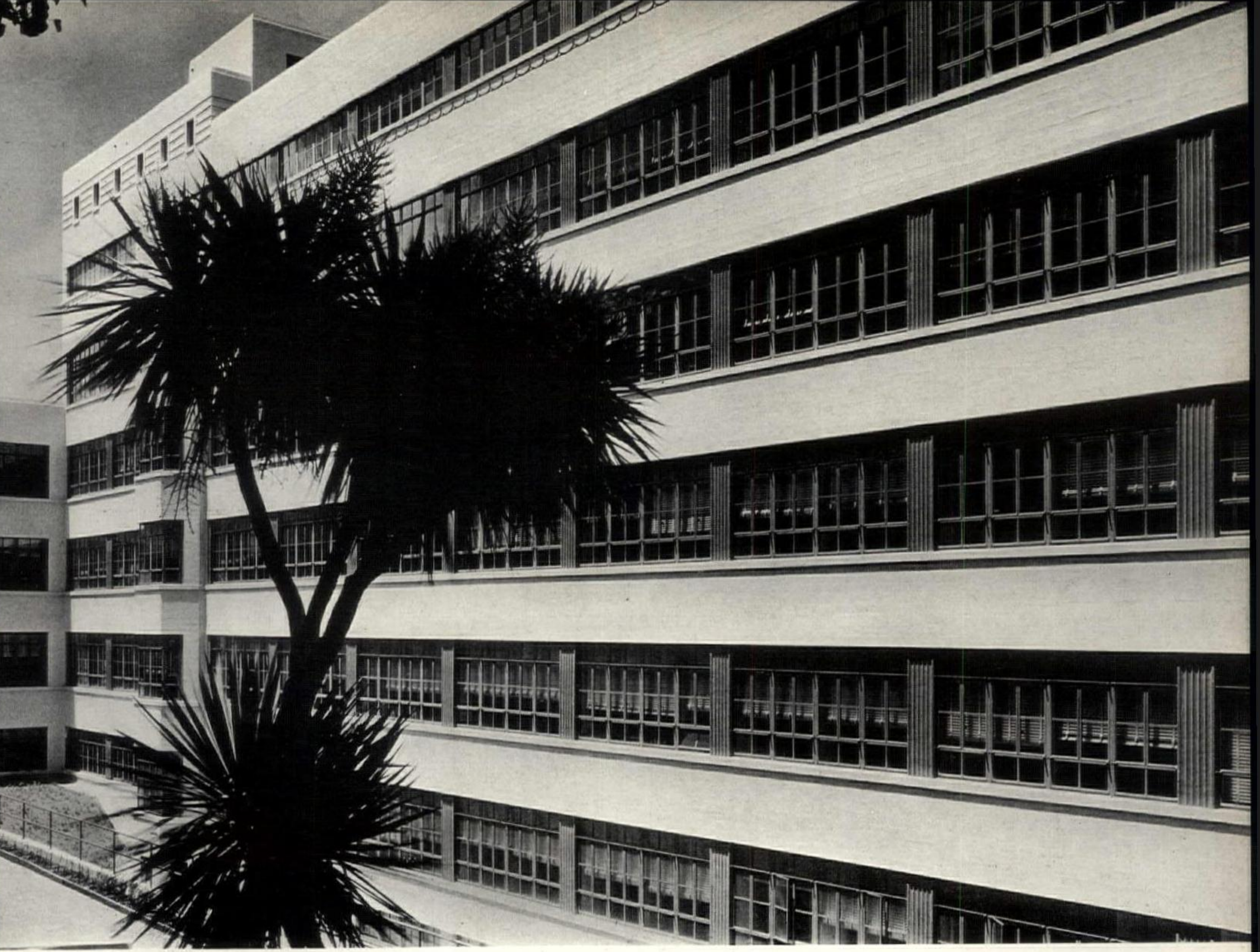
WILLIAM C. HAYS, ARCHITECT

VIEW INTO SOUTHEAST ANGLE SHOWING OLD AND NEW MEDICAL SCHOOLS

NORTH SIDE

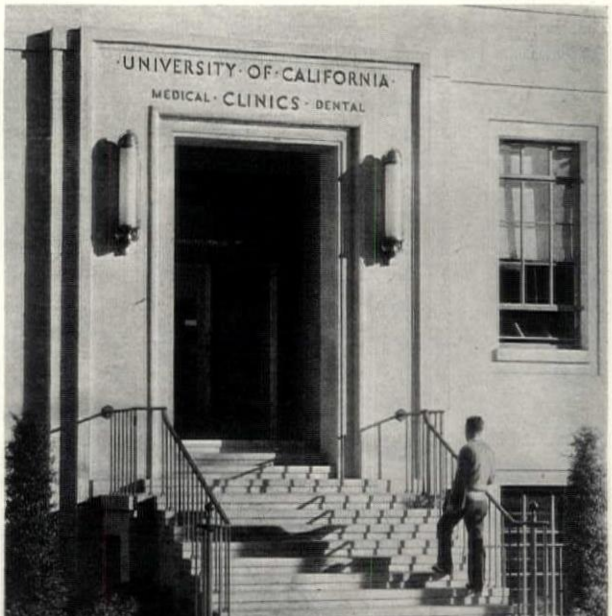
occupied University of California Hospital, making the reduction of construction noises an important feature in design and erection. To meet this condition the architect and the engineer, Walter L. Huber, turned to electric welding in the field work. Connections for all lateral loads, including seismic forces, were arc welded, and direct loads were carried on shop-riveted connections. The design provides for the resistance of a seismic force as well as a permanent lateral earth pressure resulting from the topography of the site which slopes three stories in the thickness of the building.

All columns were connected by steel girders spanning from 16 to 18 feet and panels between columns were subdivided by reinforced concrete beams giving concrete floor slabs of moderate span. All welds were 3/8 fillet welds and 150,000 linear inches were required, including 5,000 inches of shop welds.



THE SOUTH ELEVATION OF NEW MEDICAL SCHOOL CLINICS

MAIN ENTRANCE



All permanent field bolts were ⅞ inch, and were machined to afford practically a driving fit.

General Architectural Data: The building is incomplete as designed, in its present status, due to a last minute slash of 40 per cent in the appropriation amount. The easterly tower and wing to contain administrative offices and classrooms, with the entrance proper in its façade, was arbitrarily vignetted and provisions made for a structural "hook-up" at such time as further moneys are made available.

Exterior Finish: Waterproof cement paint on concrete.

Sash: Heavy section steel—combined casements and vented sections.

Entrance: Travertine steps and walls with stainless steel storm vestibule.

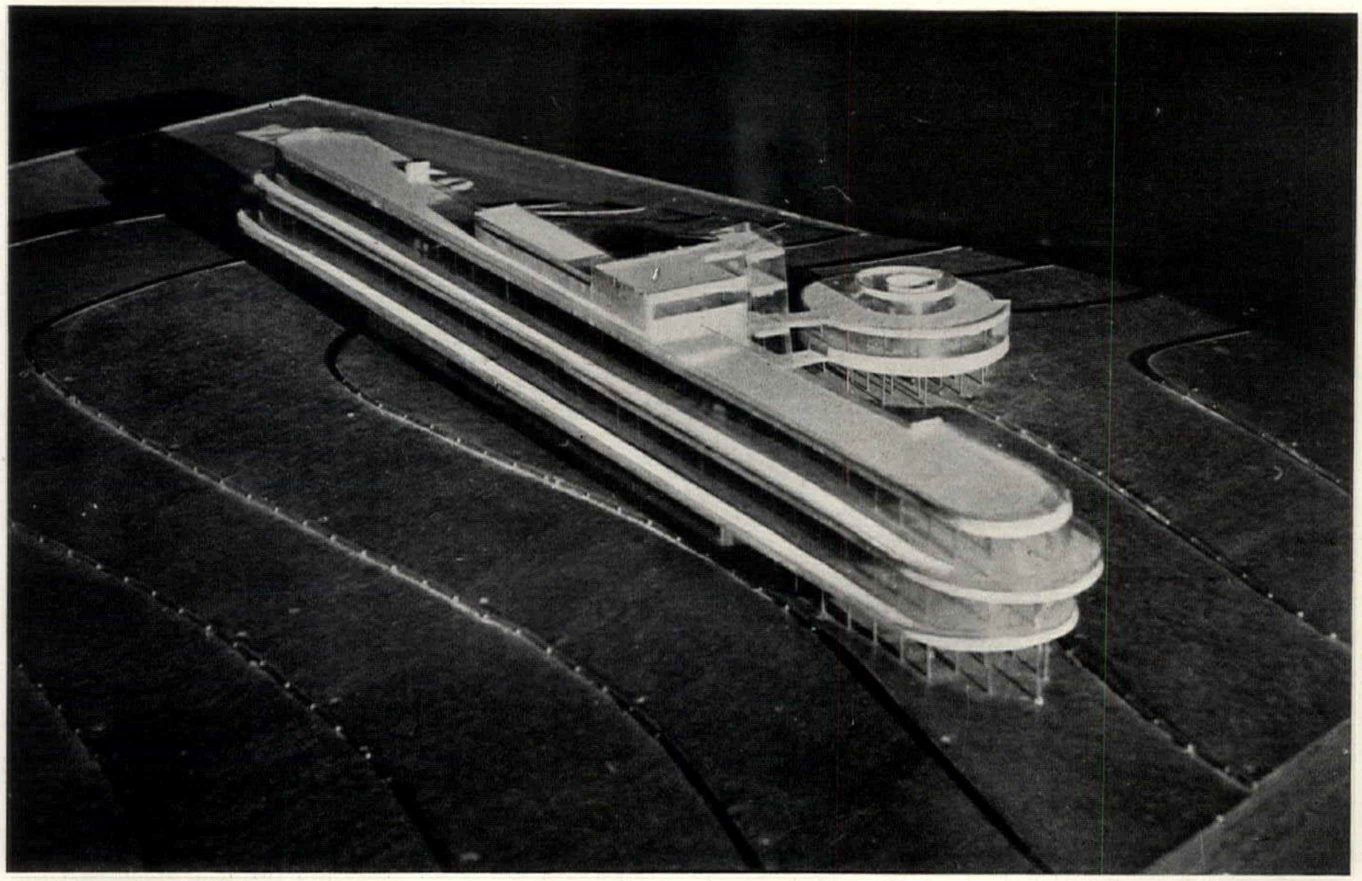
Rear Fenestration: Sash extends vertically from sill

MEDICAL SCHOOL CLINICS,
UNIVERSITY OF CALIFORNIA
SAN FRANCISCO, CALIFORNIA

WILLIAM C. HAYS, ARCHITECT

LEFT: DETAIL OF DENTAL OPERATION ROOM AT SEVENTH FLOOR.
BOTTOM: DETAIL AT SEVENTH FLOOR—NORTH SIDE.

height to soffit of overhead beam and horizontally from structural column to structural column with special mullions designed to take a $2\frac{1}{4}$-inch partition, thereby giving extreme flexibility to room planning.
Interior Finish: All partitions are plaster on metal lath and steel studs. Finish is enamel on hardwall plaster and/or Keene's Acoustic plaster on ceilings and walls of all areas where sound absorption was deemed desirable. Rubber tile floor in main waiting areas and operating room. Glazed, sandblasted tile floors in all areas where water might be present. Marble toilet partitions. Glazed tile wainscots in special purpose rooms and throughout Physiotherapy Department. Hollow metal base throughout, except in corridors and large areas where linoleum is turned up 5 inches on a $1\frac{1}{2}$-inch radius cove and capped with hollow metal.
Doors: Eastern white oak—stained and lacquered.
Floors: $\frac{1}{4}$ inch battleship linoleum.
Radiation: Concealed (generally).
Building completed in July, 1933.
Cost: Approximately $450,000 (exclusive of furniture, linoleum and shades).



MODEL OF SANATORIUM

A TUBERCULOSIS SANATORIUM

ERNEST WEISSMANN, ARCHITECT

This sanatorium was designed for the care and cure of tubercular patients, particularly patients suffering from tuberculosis of the joints and bones. This project was developed with the closest cooperation of Dr. Miroslav Delic, a tuberculosis specialist.

LOCATION On the Mediterranean where light and atmospheric conditions were found to be most satisfactory for this type of sanatorium.

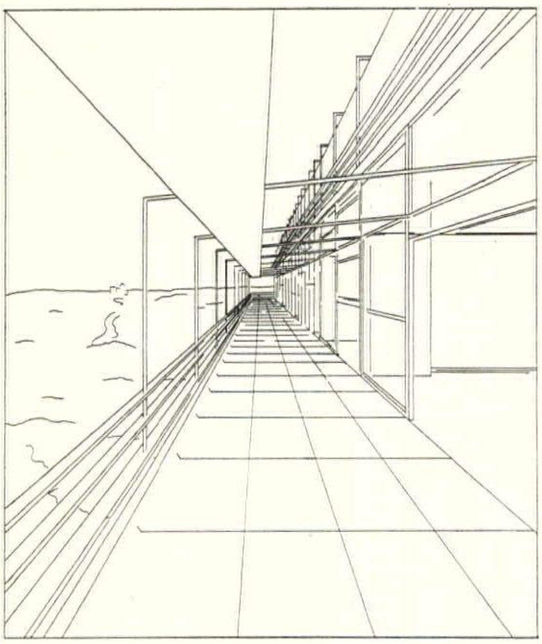
ORIENTATION The architect made a study of the seasonal position of the sun. This determined the terrace arrangement and the direction of the wings where patients are exposed to the sun.

A system of room sizes was followed:

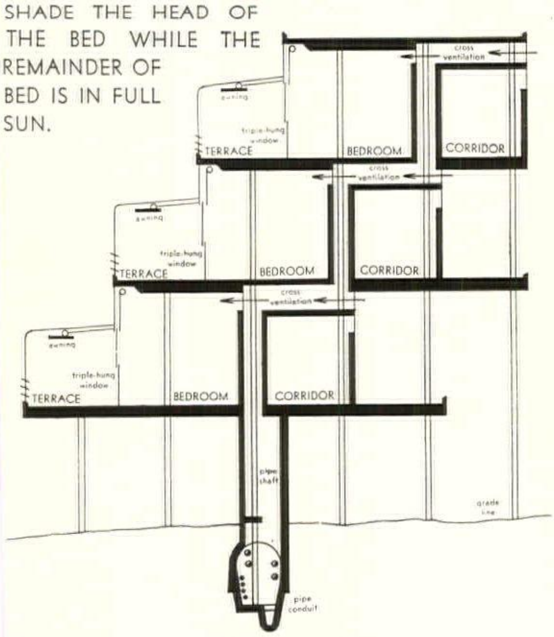
A one-bed room requires a width of 12'-0"	A ten-bed ward requires a width of 65'-0"
A two-bed room requires a width of 18'-0"	Depth of rooms is uniformly . . . 15'-0"
A four-bed room requires a width of 30'-0"	Ceiling heights are . . . . . 10'-6"

A TUBERCULOSIS SANATORIUM

ERNEST WEISSMANN, ARCHITECT



VIEW OF SUN TERRACE IN FRONT OF SLEEPING ALCOVES. THE AWNING IS SO PLACED AS TO SHADE THE HEAD OF THE BED WHILE THE REMAINDER OF BED IS IN FULL SUN.



SECTION OF TUBERCULOSIS SANATORIUM SHOWING TERRACES AND VENTILATION ACROSS BUILDING.

FEATURES IN THIS DESIGN:

(1) Standardization of all constructive elements. Simplicity of erection and economy of materials.

(2) Elasticity of interior organization for easy adaptation to medical progress.

(3) Equipment is prefabricated, readily installed without disturbing structural parts.

(4) Materials are lightweight with better insulating and acoustical properties than ordinary heavy construction.

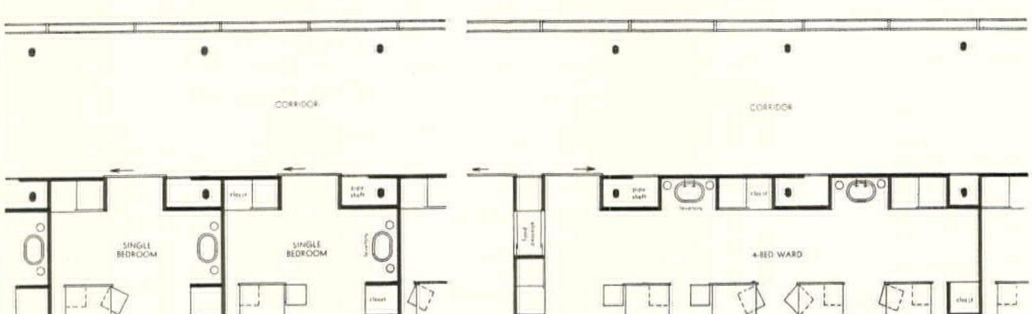
(5) Floor slabs on stilts permit the maximum use of existing ground area.
Simplicity of foundation footings (piers).

(6) The façade to the south is entirely of glass (two sheets with an air space), which has a thermic insulation equal to one foot of brick wall.

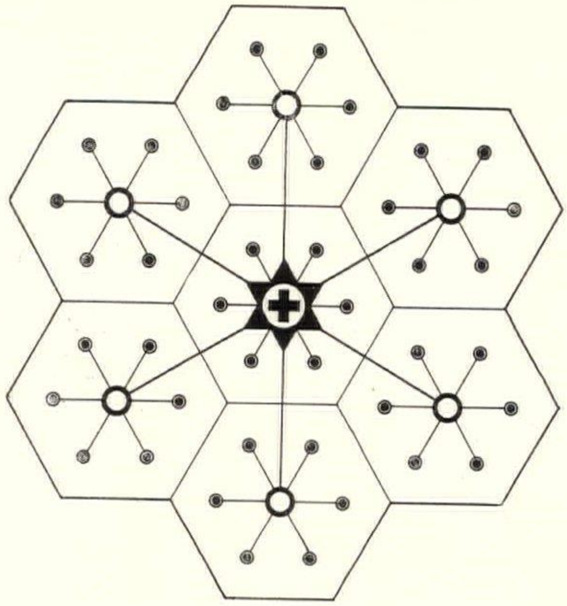
(7) Stairs are replaced by ramps. Easier for patients and makes possible the use of bed wagons.

(8) All proposed materials have previously proved successful.

(9) All proposed constructions have been found economical and efficient.



PLAN SHOWING SINGLE BEDROOMS AND WARD. THE WALL TOWARD SUN TERRACE IS EQUIPPED WITH TRIPLE-HUNG WINDOWS.



DIAGRAMATIC PLAN SHOWING GEOGRAPHICAL AND FUNCTIONAL RELATIONSHIPS OF THE RURAL HEALTH STATION UNITS.

CENTRAL HOSPITAL UNIT

INTERMEDIATE UNIT

BASIC UNIT

A RURAL HEALTH STATION

HOWARD T. FISHER, ARCHITECT*

* Developed by General Houses, Inc.

THE IDEA Hospital and clinic facilities adequate to the needs of the rural sections of this country do not now exist. A coordinated group of such units, properly located and related to one another, would provide a given community with minimum adequate medical facilities.

As the basis for a group of Rural Health Stations, three sized units are proposed:

THE THREE UNITS EMPLOYED

1. THE BASIC UNIT—to provide living quarters for a visiting nurse and facilities for consultation, examination, and the treatment of emergency cases, a group of such units to be so located that one physician will be able to visit each periodically, maintaining in each regular office hours for consultation.

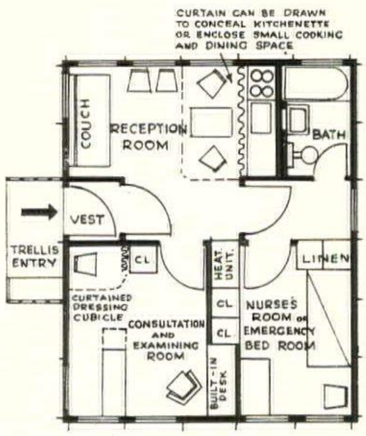
2. THE INTERMEDIATE UNIT—to provide, in addition to the facilities of the Basic Unit, beds for the hospital care and observation of three to five patients, this unit to be centrally located so as to be within easy motoring distance of each of the Basic Units above. The Intermediate Unit serves as a headquarters for the physician. From it his activities radiate.

3. THE CENTRAL HOSPITAL UNIT—to provide all the facilities of a small hospital with accommodations for up to nine or ten patients. To this largest unit will be sent all patients for whose treatment the equipment of the smaller units is not adequate.

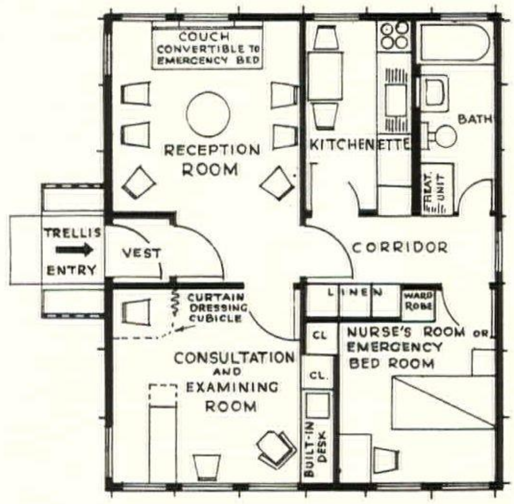
Each unit is so designed and constructed that it may grow or be more easily moved as the growth of population or other changing conditions may demand.

THE BASIC UNIT The plan for the Basic Unit has been designed to provide:

1. Facilities for consultation, examination, and the treatment of emergency cases.



THE BASIC UNIT



ALTERNATE BASIC UNIT

THE BASIC UNIT (Continued)

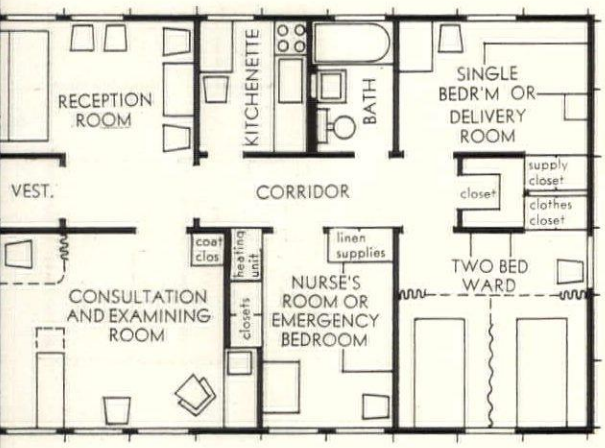
2. Living accommodations for a visiting or obstetrical nurse.
3. Waiting space for patients.

The plan shows:

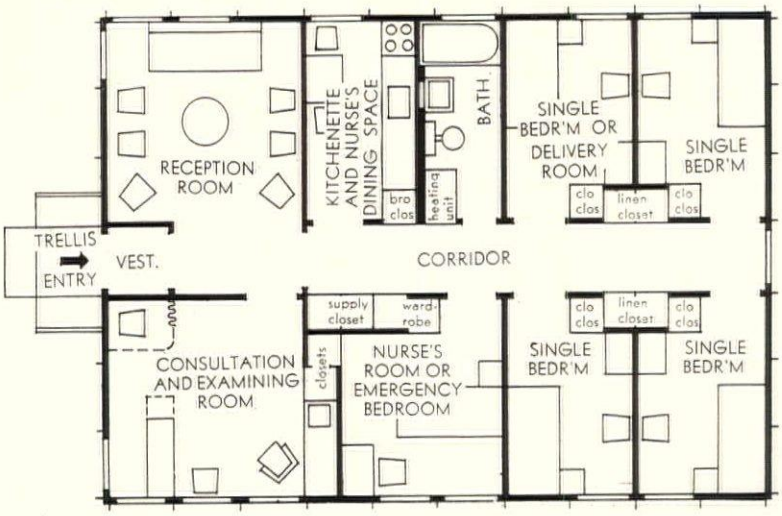
1. Vestibule—may be omitted in a warm climate.
2. Reception Room—serves both as living room for the nurse and as a waiting room for patients during consultation hours. A couch may be included in the furnishings, so designed as to be convertible into an emergency bed.
3. Kitchenette—large enough to provide dining space for the nurse when the Reception Room is not available.
4. Bath—complete with tub, shower, basin, water closet and cabinet.
5. Nurse's Bedroom—an ample room with built-in wardrobe and clothes closet. In an emergency this room is used for the patient and the nurse sleeps on the convertible couch in the Reception Room.
6. Consultation and Examining Room—large room with dressing cubicle inclosed with curtain hung from ceiling track, adjustable examining table, coat closet, and built-in combination laboratory (with basin) and desk (with provision for letter files and storage of medical instruments and supplies).
7. Linen and Supply Cases off corridor.
8. No basement—a small, compact, automatic built-in heating unit, which supplies both hot water and conditioned air, is located off the corridor. (In communities where neither gas nor oil is economically available, a somewhat modified plan will be required.)
9. A one-car garage would accompany this unit, either attached or built separately. In communities where transportation must be by horseback, a small stable containing stall and saddle and feed room would be provided.

THE ALTERNATE BASIC UNIT

The Alternate Basic Unit is offered as an example of minimum planning where



INTERMEDIATE UNIT



ALTERNATE INTERMEDIATE UNIT

utmost economy is required. Very nearly the same facilities are provided with a 28 per cent reduction in floor area.

THE INTERMEDIATE UNIT

The Intermediate Unit provides, in addition to the facilities of the Basic Unit, accommodation for three to five patients.

Starting with the original Basic Unit, the Intermediate Unit is arrived at by simply continuing the corridor and adding rooms at the rear of the building. This can be done either at the time the building is built or later if required.

Bedrooms are so arranged that one can be used as a delivery room. When two nurses are required, as would be the case if one were a visiting nurse, one of the rooms here indicated for a patient could be used for the second nurse or the original plan may be expanded to include an additional room.

THE ALTERNATE INTERMEDIATE UNIT

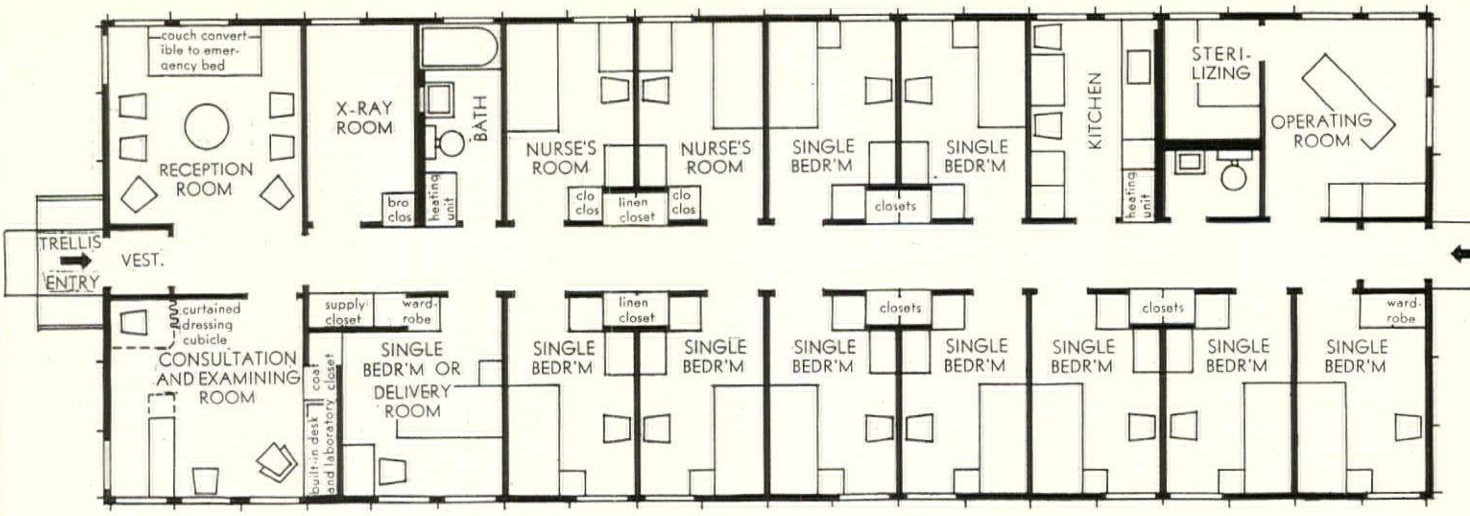
This Alternate Unit is offered as an enlargement, by alteration and addition, of the Alternate Basic Unit. It proposes the addition of two bedrooms (one large enough for two beds) and the alteration of the reception room to permit a separate kitchenette.

THE CENTRAL HOSPITAL UNIT

The Central Hospital Unit provides, in addition to the facilities of the Intermediate Unit:

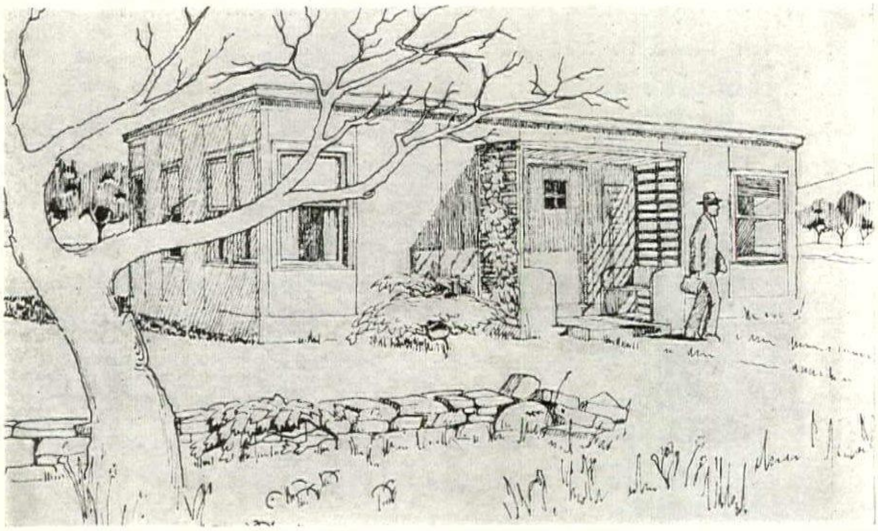
1. Accommodation for additional patients up to nine or ten.
2. X-Ray Room.
3. Operating Room with adjacent sterilizing room.
4. Additional lavatory.
5. Enlarged kitchen.
6. Accommodation for a second nurse.
7. Service Entrance.

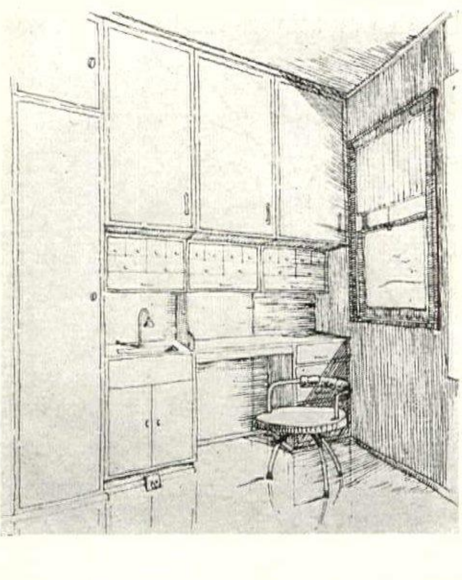
This building can be either constructed of this size originally or produced by enlarging one of the smaller units. For example, the Intermediate Unit becomes the Central Hospital Unit by adding rooms and making such a simple alteration as converting the kitchenette into an X-ray room.



CENTRAL HOSPITAL UNIT

THIS IS A FULLY-EQUIPPED HOSPITAL FOR A TOWN OF SMALL SIZE. IT IS SUITED TO ENLARGEMENT BY ADDING ROOM UNITS.





ABOVE:

SUGGESTED APPEARANCE OF BASIC UNIT TO SERVE AS A SMALL-SIZE RURAL HEALTH CENTER

LEFT:

SKETCH OF BUILT-IN COMBINATION DESK AND LABORATORY, A DEMONSTRATION OF SPACE ECONOMY ACHIEVED BY CAREFUL STUDY OF REQUIRED EQUIPMENT.

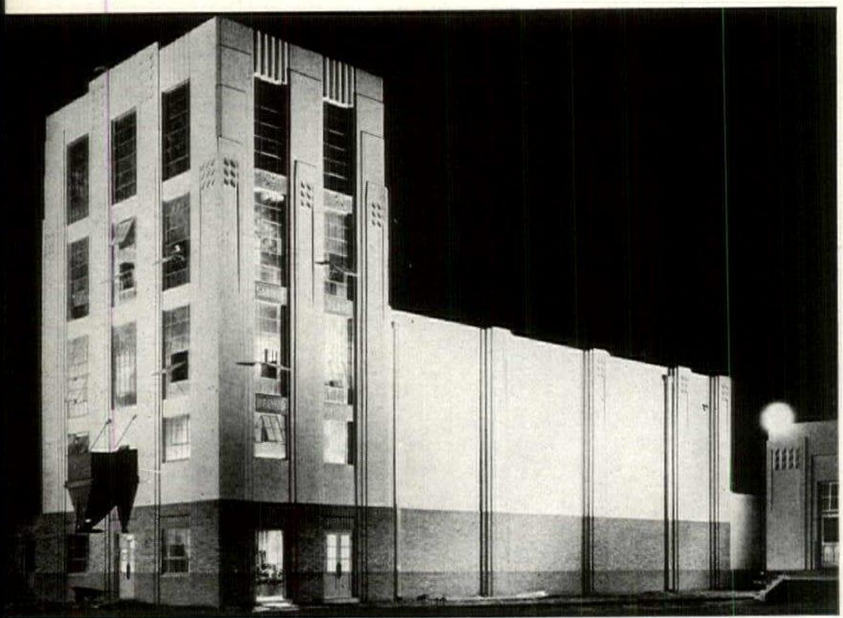
A HOTEL BAR, BUENOS AIRES

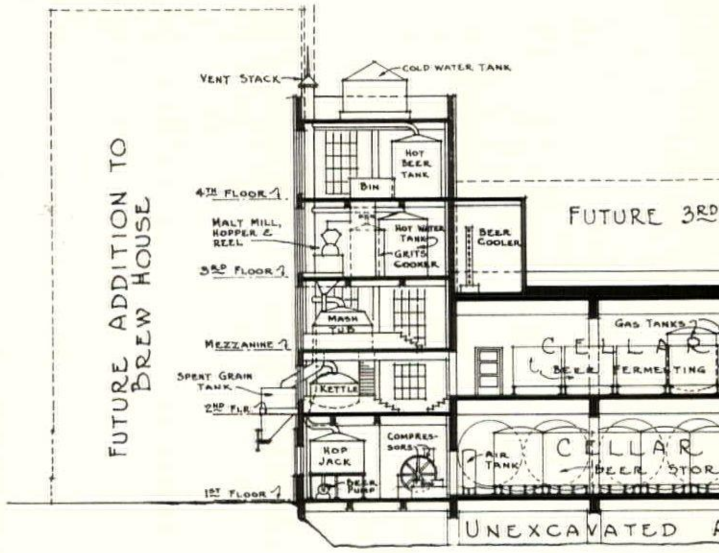
ROCHA Y MARTINEZ CASTRO, ARCHITECTS

This bar was installed in the modernized Plaza Hotel in Buenos Aires, South America. The walls are of gray oak as are also the tables and furniture. The upholstery of chairs is in bright green leather. The chairs at bar are of polished chromium tubing. Chromium is also used as a trim to the bar. The carpet is of gray with a green band.

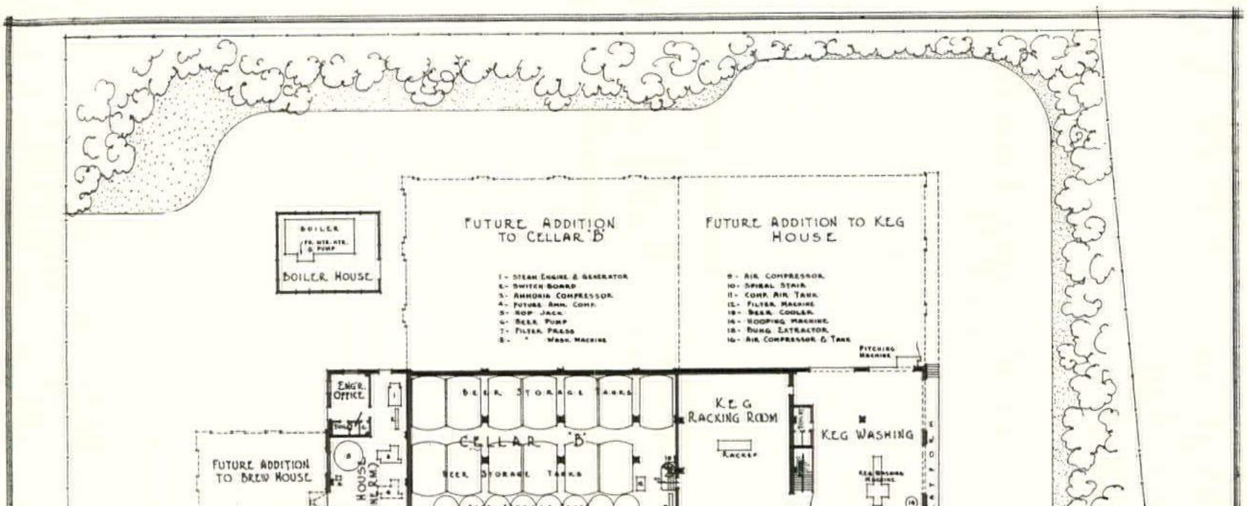
SABINAS BREWING COMPANY, SAN ANTONIO, TEXAS

NIGHT VIEW OF EXTERIOR OF BREWERY



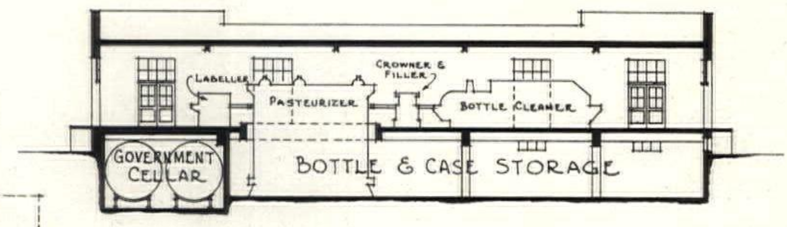


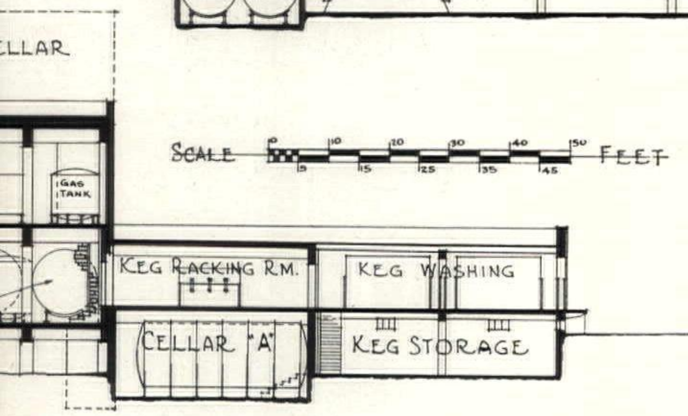
LONGITUDINAL SECTION THROUGH BR



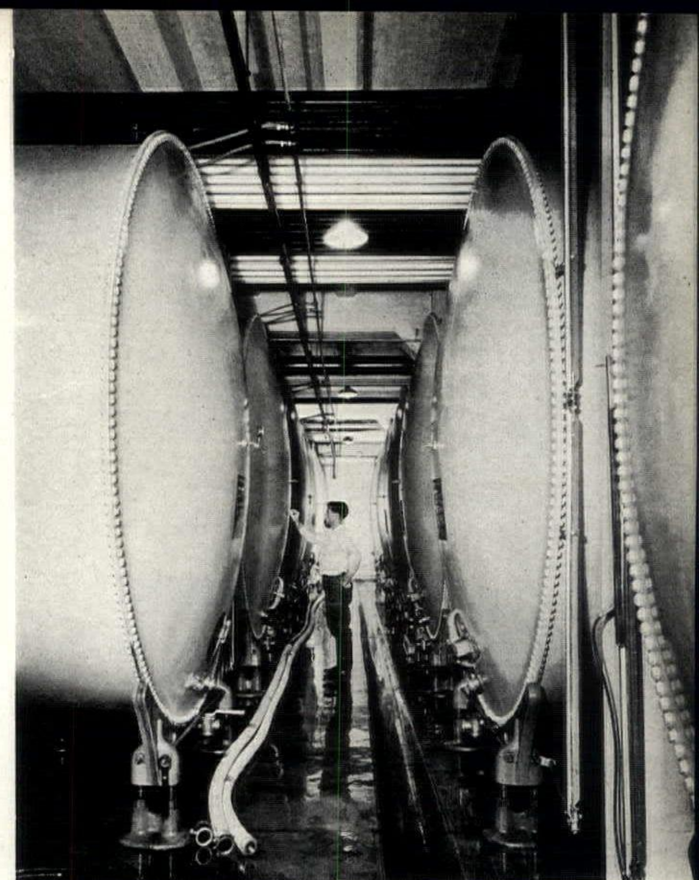
CHARLES T. AUBIN, ARCHITECT

LONGITUDINAL SECTION THROUGH BOTTLING HOUSE

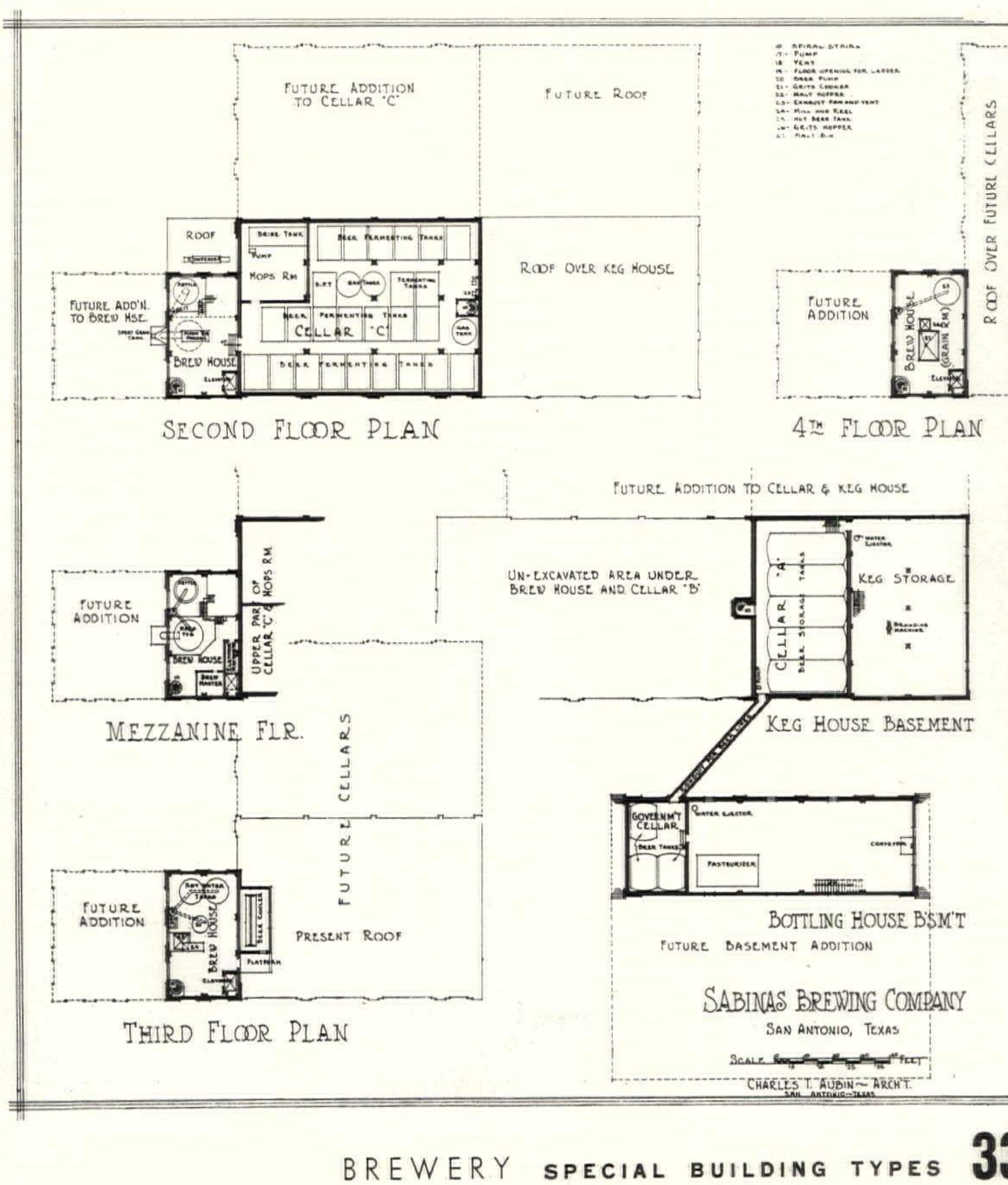


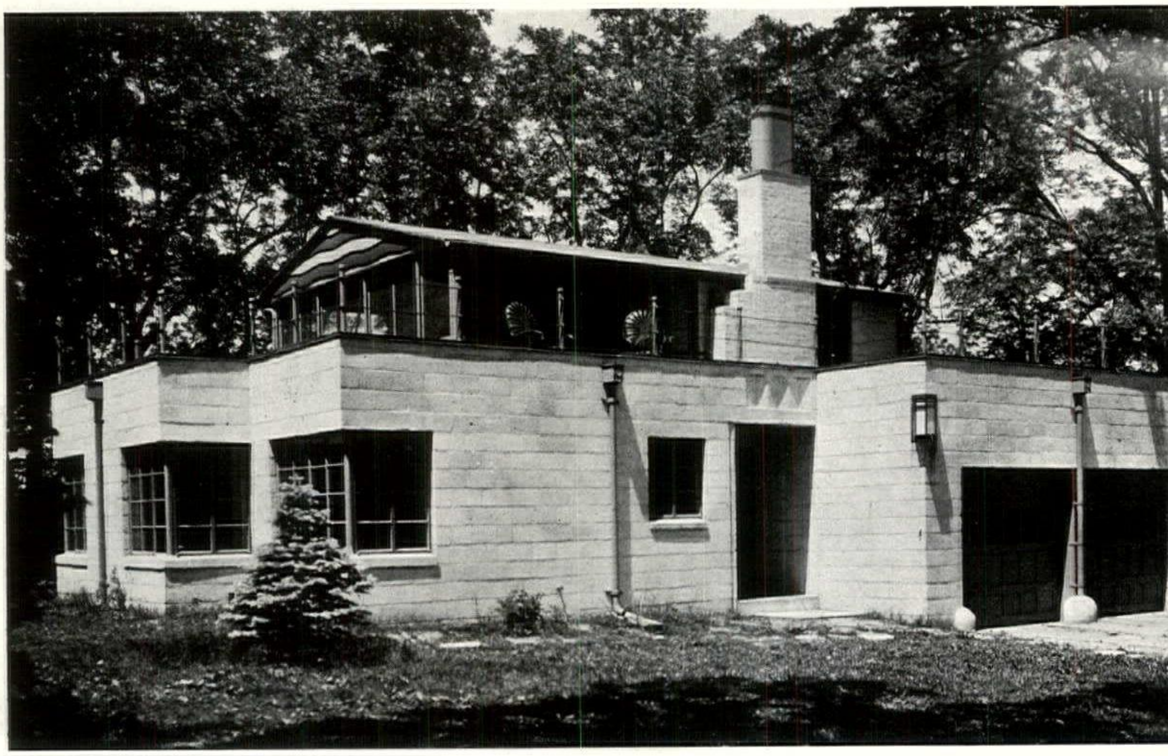


USE, STOCK HOUSE AND KEG HOUSE



Harvey Patteson

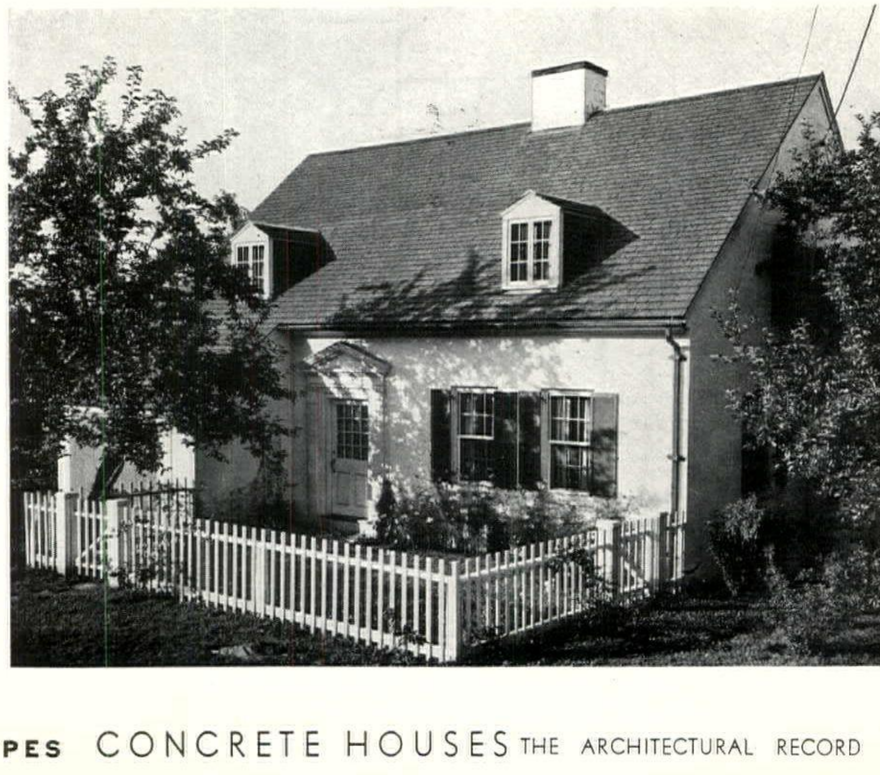




HOUSE NEAR DES MOINES, IOWA
AMOS B. EMERY, ARCHITECT

TWO HOUSES OF CONCRETE CONSTRUCTION MODERATE IN COST

CAPE COD HOUSE
CHARLES M. WILLIS, ARCHITECT



APARTMENT HOUSE DEVELOPMENT, ARLINGTON COUNTY, VIRGINIA

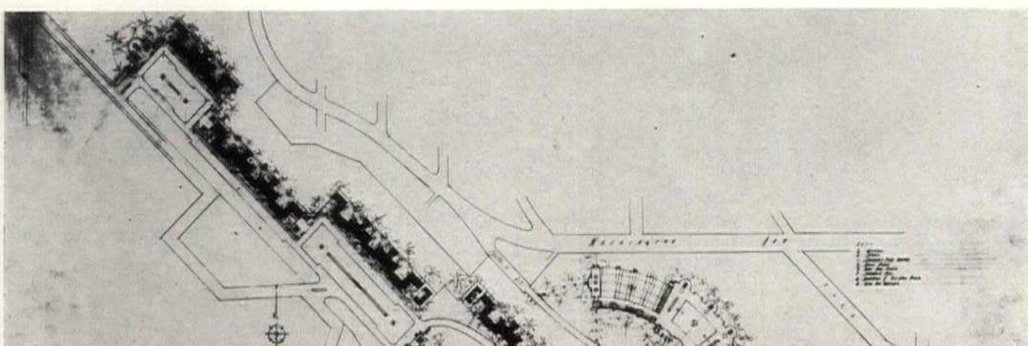
ANDREW J. THOMAS, ARCHITECT

W. F. Roberts Company

Briefly, it is the idea to locate a group of five or six thoroughly up-to-date, fireproof apartment buildings of three to six stories in height near the south end of Arlington Ridge where ideal transportation and sanitary facilities already exist and within fifteen minutes of the center of business and the new Government buildings in Washington.

Located on ground 150 feet above the river and in a grove of trees giving ample shade; with carefully protected and supervised playgrounds for small children, tennis courts, a swimming pool and ball field for the older ones, and all the light and air that less than twenty per cent ground coverage assures.

It is figured that large, airy rooms can be rented at about nine dollars per month with the usual apartment-house services, and that garage and such necessary additional facilities can be provided at very low rates.



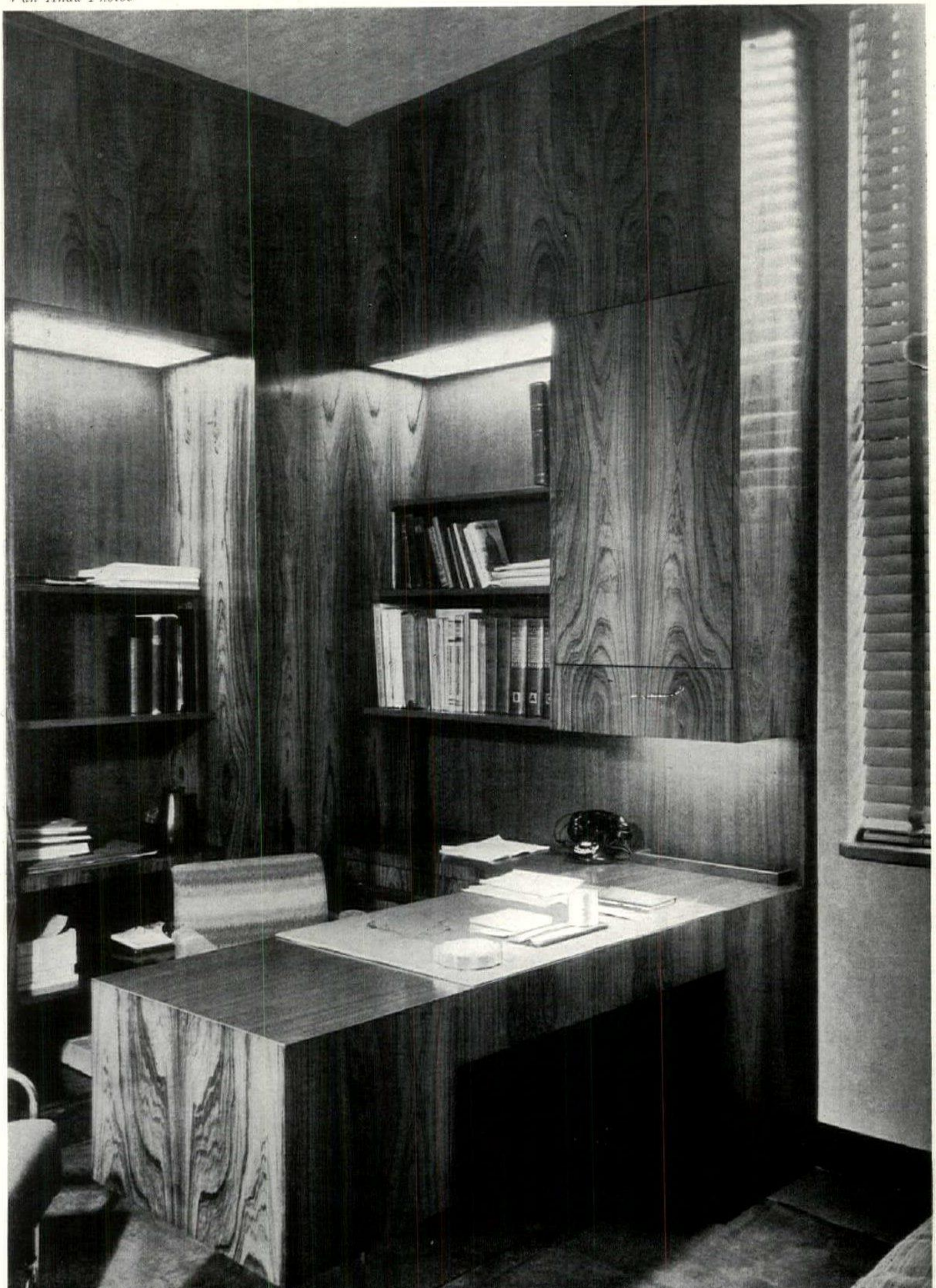
THIS HOUSING PROJECT NEAR ALEXANDRIA, VIRGINIA, IS PROPOSED BY ANDREW J. THOMAS, ARCHITECT, AS HAVING ADVANTAGES TO FEDERAL EMPLOYEES.

PRIVATE OFFICE OF GORDON REED, HANLEY COMPANY, NEW YORK CITY

V. HAGOPIAN, ARCHITECT

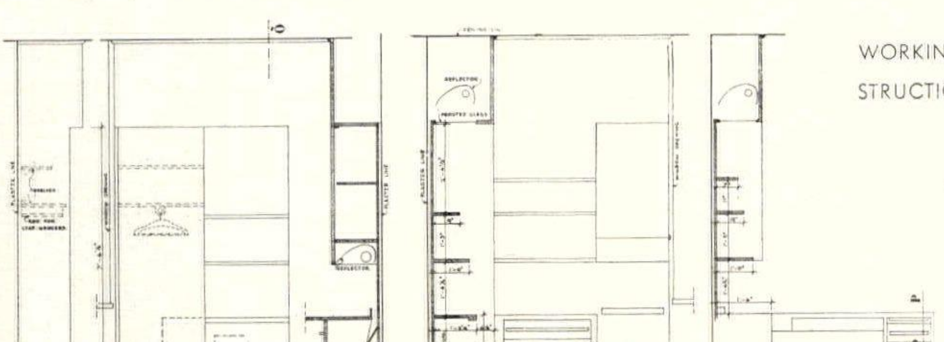
This private office is used for interviews and for directing the city office staff of a manufacturing company. The arrangement was determined by available daylighting and by factors of convenience in seating visitors and in location of library and files.

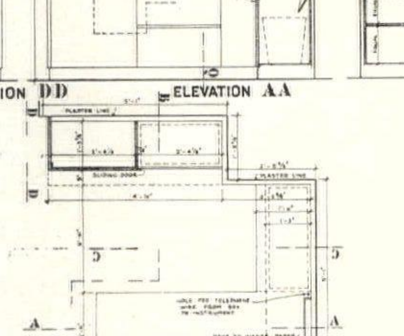
Van Anda Photos

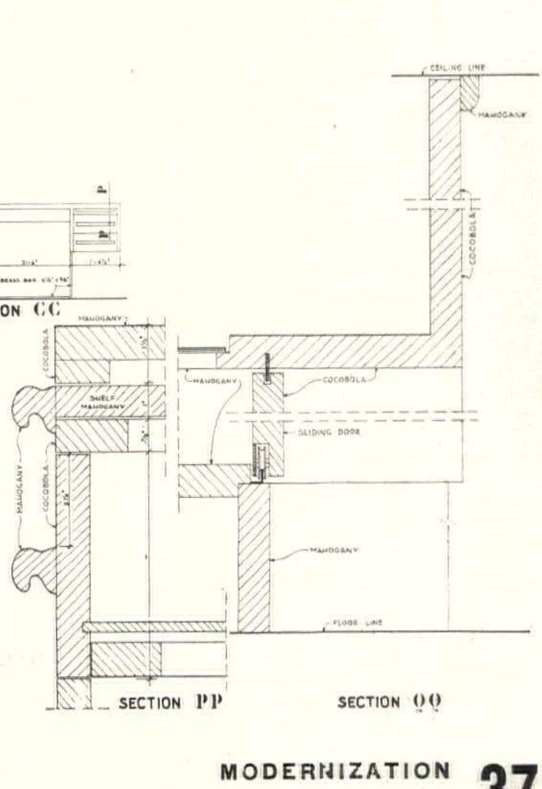


GENERAL VIEW OF INTERIOR

WORKING DETAILS OF WALL CONSTRUCTION. PLAN AT LEFT, BELOW.



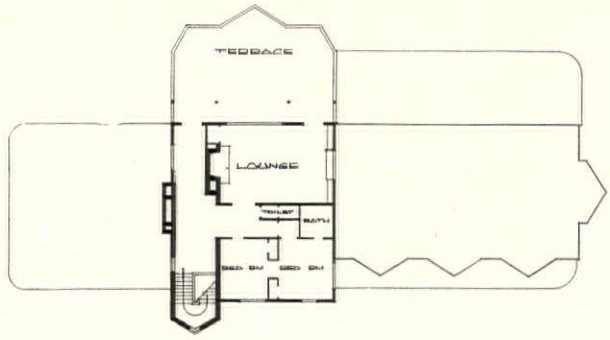




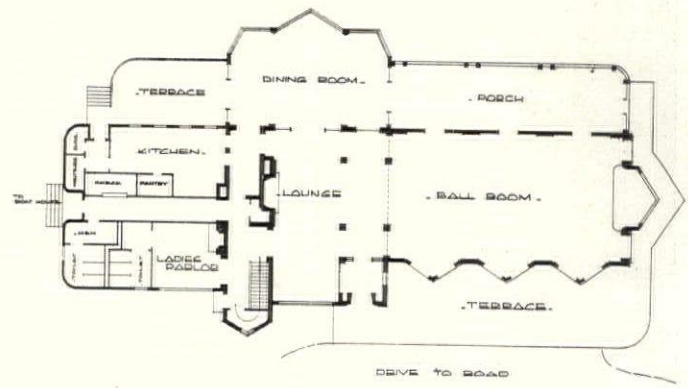
DINING ROOM AND TERRACE FROM LAKE SHORE

EL KARUBAH CLUB HOUSE, CROSS LAKE, LOUISIANA

JONES, ROESSLE, OLSCHNER AND WIENER, ARCHITECTS



SECOND FLOOR PLAN



FIRST FLOOR PLAN

PORCH AND BALLROOM WING FROM LAKE FRONT

LUTZ FUNERAL HOME
READING, PENNSYLVANIA

PLANNING THE FUNERAL HOME

BY ELMER H. ADAMS OF WEIDNER & ADAMS, ARCHITECTS

The average attendance at a funeral is too large for the ordinary living room and too small for a church. The dignity of the ritual is marred in the one case by the discomfort of overcrowding and in the other by the incongruity of a meager gathering in a great hall. A funeral home combines the devotional atmosphere of a small chapel with the conveniences of a private residence and, being admirably suited to a purpose not otherwise adequately served, is coming into general use.
The following check list is intended to cover the complex requirements of this specialized type of design.

GENERAL REQUIREMENTS:

A. Site:
1. In a quiet neighborhood providing parking facilities, and accessible to public transportation systems.

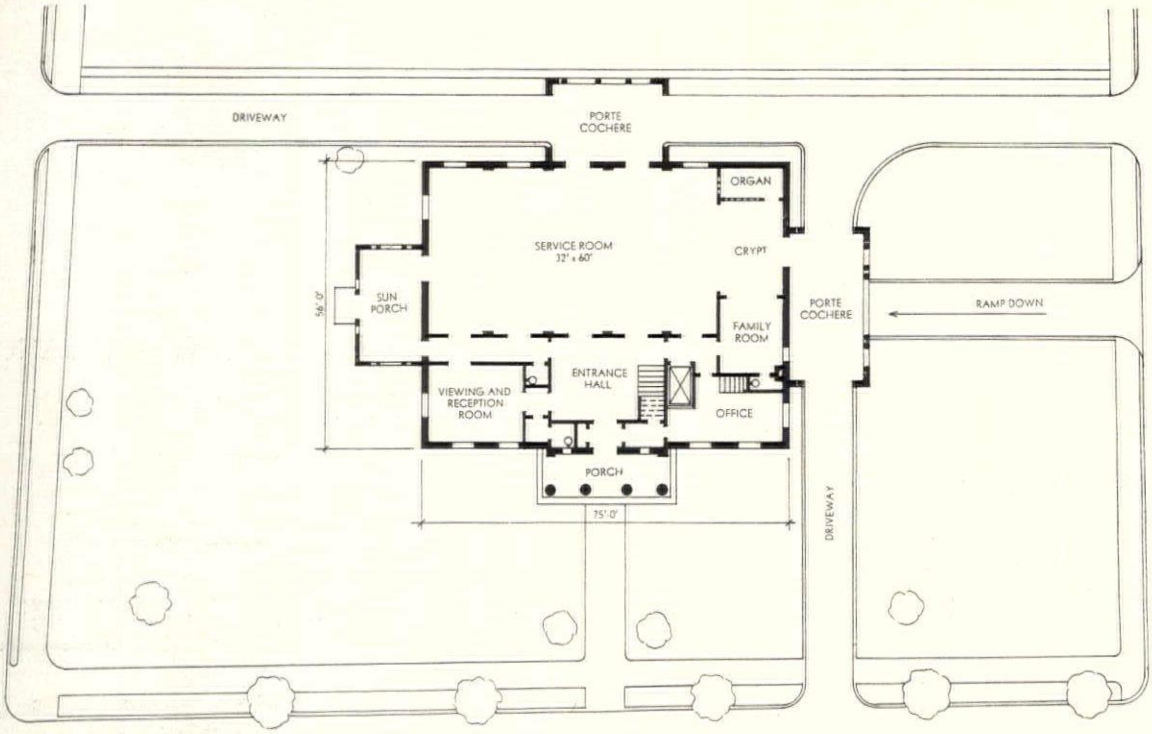
B. Style:
1. Domestic character to be followed throughout.
2. Dependent upon usage and custom, a combination domestic building with ecclesiastical chapel and details may be desired.

C. Plan: Generally one of two types may be followed:
1. First floor used primarily for conducting services. Second floor used for display and working purposes.
2. First floor containing service room and working areas. Second floor containing casket area and apartments or dormitories for attendants and visitors.

D. General:
1. Keep from public sight, as much as possible, bringing in and handling of bodies and supplies.
2. Provide easy approaches to sheltered entrances and exits.
3. Provide sufficient convenience receptacles throughout building for floor and table lamps, etc.

SPECIFIC REQUIREMENTS:

A. First floor: (Rooms arranged according to type I plan.)
1. Service Room: 32′ x 60′ to seat comfortably 350 people. Decorated and furnished informally as a very large living room. Folding or rigid chairs add to normal seating capacity. Acoustical treatment of walls and ceilings and quiet floor coverings desired throughout. Access to a porte-cochère over driveway for public use. Lectern and chairs for ministers in front of room. Lighting, soft and diffused.
   (a) Patrons and custom may demand instead a "chapel" with stained glass windows, high ceilings, pews, etc., to convey a church atmosphere.
2. Alcove or Apse: 12′ x 18′ opening full length on main axis of service room and possible to be curtained off when desirable. Natural daylight unnecessary; use soft, diffused, indirect lighting. Concealed spotlights for lighting floral pieces. Direct exit to porte-cochère for loading casket and flowers in hearse. Adjacent closet space, 2′ x 7′, for wire flower racks, prayer rail and catafalque.
3. Family Room: 12′ x 20′. A small living room in size and furnishings, adjacent to service room and alcove so that the family may see the casket and ministers in privacy. Private entrance and exit to this room from interior and exterior. Exit to a porte-cochère for loading cars. Adjoining toilet rooms and coat closet.
4. Reception Room: 16′ x 20′. Ordinarily a reception room and lounge. May be used also for viewings.
5. General Office: 12′ x 18′. Adjacent to entrance, providing accessibility and supervision. Cashier or bookkeeper's desk and filing cabinets; coat closet adjacent.



PLAN OF MAIN FLOOR

LUTZ FUNERAL HOME, READING, PENNSYLVANIA

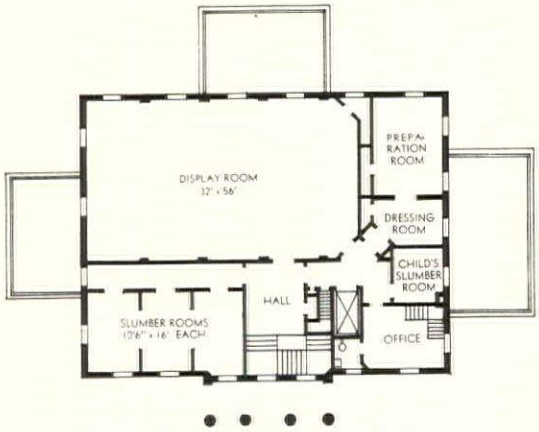
ELMER H. ADAMS, ARCHITECT, NOW OF THE FIRM OF WEIDNER & ADAMS, ARCHITECTS

SPECIFIC REQUIREMENTS: (Continued)

6. Organ Chamber: 10′ x 12′ x 13′ height, minimum size for average mortuary organ. Adjacent to alcove and service room. Hard, smooth plaster finish; no exterior openings necessary.
7. Choir Alçove: 8′ x 10′. Adjacent to front of service room. Separate entrance for organist and choir. Organ console 4′-6″ x 5′-3″ may be placed directly in service room, dependent upon usage, thus eliminating the need of an alcove. A self-player attachment 2′ x 4′-6″ should be placed in a separate room or in the office.
8. Vestry Room: 8′ x 10′. For visiting ministers to don vestments. Used for last minute conferences with family. May be in connection with office.
9. Retiring Space for Pallbearers: Desirable, but not necessary. To provide an assembling space for pallbearers, in corridor near casket alcove.
10. Flower Room: 8′ x 10′. Containing 24-in. work bench and a refrigerator for flower storage. Adjacent to casket alcove.
11. Control Room: 5′ x 9′ space may be provided for housing electric sound transmitting and reproduction of public address apparatus, and panels for lighting first floor and floodlights. Loud-speakers may be concealed at strategic points throughout the building to reproduce music or services.
12. Toilet and Rest Rooms: One for each sex. Dressing room for ladies. Easily accessible to public. Use sound deadening materials in walls and silent flow fixtures. Place a drinking fountain in public corridor or hall.
13. Elevator: 4′ x 8′-6″ car size practical. Combination passenger and freight. Install near alcove and main entrance.
14. Entrance Halls and Corridors: So arranged that they may be utilized for accommodating large crowds. Generous openings should be provided between the service room and these areas to permit such use.

B. Second floor:

1. Display Room: Similar in area to service room. A room 32′ x 56′ comfortably displays 35 caskets without placing one above the other on racks. Average casket, 2′-4″ x 6′-10″, weighs 200 lb. This area may be divided up into smaller rooms, each 12′ x 15′, for displaying the caskets according to price range. Separate room for children's caskets.
2. Dry Goods Display Room: 9′ x 11′. For display of gowns, suits, etc. Sliding glass front display cases recommended. Adjacent to casket display room.
3. Preparation Room: 14′ x 20′. Should be finished and lighted as an operating room with tile floors and wainscot. This size room accommodates two operating tables size 2′-4″ x 6′-6″ and weighing about 680 lb. each. At the foot or drainage end of each table, place a 20″ x 20″ x 20″ slop sink 7′ on centers with spray attachment, spigot, and flush valve; this should be toward the daylight, north exposure preferable. Instrument cabinet 12″ x 28″ x 5′ may be recessed into wall. Positive exhaust ventilation to outside necessary. Floor drain. 5-in. shelf, 4′-6″ above floor along wall between slop sinks desirable to hold supplies, cosmetics, etc., during embalming. Convenience outlets in wall at each table for electric hair dryers, etc. Adjacent closet space 15 square feet, with shelves on two sides for storage of supplies, cleaning equipment, etc. Scrub-up sink desirable here.



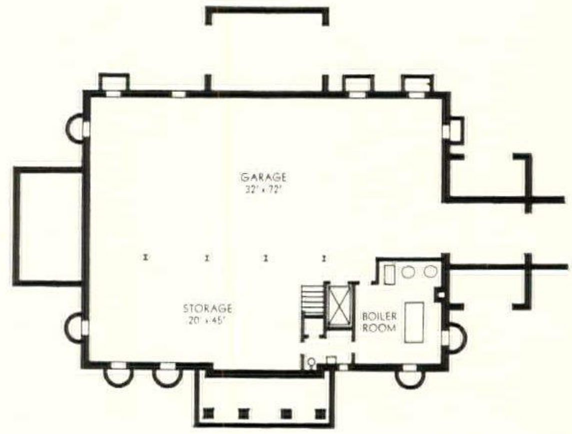
SECOND FLOOR PLAN

LEFT:
DISPLAY, SLUMBER AND PREPARATION ROOMS ON SECOND FLOOR ARE ACCESSIBLE FROM CENTRAL STAIRWAY.

LUTZ FUNERAL HOME, READING, PENNSYLVANIA

ELMER H. ADAMS, ARCHITECT, NOW OF THE FIRM OF WEIDNER & ADAMS, ARCHITECTS

RIGHT:
THE BASEMENT PLAN IS GIVEN OVER TO GARAGE ACCOMMODATION, STORAGE AND MECHANICAL EQUIPMENT.



BASEMENT FLOOR PLAN

SPECIFIC REQUIREMENTS: (Continued)

4. Slumber or State Rooms: Furnished as private bedrooms where families may view the deceased in privacy. The rooms vary in size from 8' x 11' to 14' x 16'. The number of rooms provided depends upon individual practice—four is an average. Separate room furnished as child's bedroom. Each room opens privately from a corridor. Soft, diffused lighting. Keep well ventilated. Provide linen closet for storage of bed linens, etc.
5. Private Office: 12' x 18'. Comfortable furnished room for consultation purposes, where funeral arrangements may be made. Toilet room adjacent.
6. Elevator: Located to provide ease of circulation to display room, preparation room, and slumber rooms.

C. Basement floor:
1. Mechanical Equipment Area: Boiler and fuel storage. Air conditioning equipment which may include heating, humidifying, and cooling. Carefully guard against duct-work transmitting mechanical noises to upper floors. Domestic hot-water heater, 24-gallon capacity sufficient for home without apartments. Incinerator, 1-bushel capacity sufficient. Organ blower, 2'-6" x 6'-3", 1 hp. motor. Run a 3" and a 10" round galvanized air duct from blower to organ chamber. Meter room, 8' x 12'. Panel and meter board for power and light circuits along long wall. Switch box 2' x 3' x 5' high for intercommunicating house 'phone. Telephones in basement, offices, display room, preparation room, etc.
2. Stock Room: 20' x 25'. Storage space for caskets in outside cases 2'-6" x 2'-0" x 7'-3", stood on end, and burial vaults. Space depends on number of caskets stocked. If funeral director covers and trims caskets, double this space to include a trimming room with cupboards along one wall for linings, hardware, etc.
3. Storage Room: 15' x 20'. For chairs, supplies, grave decorations and lowering devices. Adjacent to elevator. Folding chairs stored 6 to a bag. Ten bags on truck measure 1'-6" x 4'-6" x 6' high. Fifty Windsor armchairs, two high, occupy space 6' x 14'.
4. Shower and toilet facilities and lockers for attendants.
5. Garage: If possible, for storage, repairs and washing. Arrange so that caskets may be unloaded directly into elevator.
6. Auxiliary Requirements: Dependent upon the practice of the funeral director.

(a) Crematory.
1. Crematory Unit: 6'-4" x 12'-7". Height above lounge floor level 6'-9". Workroom floor level in rear 2'-6" lower. Oil or gas firing preferable, two burners to one unit. Outside walls of salt glaze brick or tile. Flue under floor to 20" x 20" stack. Storage space for fuel.
2. Lounge: 12' x 15'. Charging door of cremating unit concealed behind door in paneling or screen along one wall.
3. Workroom: 5' x 9'. Work area at rear and side of unit for firing, removal of ashes, etc.

(b) Cryptorium.
18' x 24'. Contains vaults for temporary or permanent entombments, and niches for ashes in urns. Average number of vaults, four. Clear space required in each vault, 2'-8" x 7'-4" x 2'-2" high. Vault construction: slabs of marble, stone or slate fitted for metal fronts held in place by clasps, thumbscrews and lock. Niches, average size 12" x 12" x 15" high in tiers along wall, similarly constructed. Hinged doors of pierced metal and glass, locked with master key.

NIGHT VIEW, BIG BEAR SHOPPING CENTER, JERSEY CITY, N. J.

AUTOMOBILE SHOPPING CENTERS

BY B. SUMNER GRUZEN, ARCHITECT

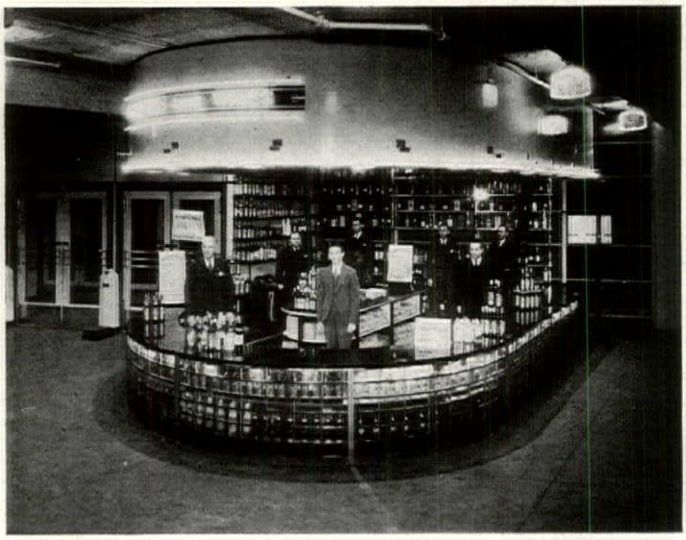
The Big Bear Shopping Centers, one in Paterson, N. J., and the other in Jersey City, illustrated herewith, belong to a chain of department stores designed for automobilists. The chain is of recent origin and its first store in the East, at Elizabeth, N. J., was opened about a year and a half ago. The chain has made a rapid growth and is represented in many of the larger cities.

The Center draws its patronage principally from the motorized public. That, plus the large space required, determines its position on a main highway near the outskirts of the city or at any rate beyond the regulation shopping area. The Center provides free parking space for 500 to 1,000 cars.

As was natural in a new enterprise of this sort, the department store and the public markets were the two sources of experience on which to build. The Big Bear Shopping Centers illustrated here are the culmination of years of experience of one of the East's largest grocery wholesale and retail merchants. The grocery units of the Centers are unique and contain a strong merchandising appeal, although they are self-service and contain not one salesman. Around the grocery unit we build our Center. It is the largest household necessity. With modern methods of advertising, grocery brands have become passwords. The grocer's salesmanship efforts in regard to them are superfluous. It then becomes the duty of the grocery department supervisor and the architect to devise the best means of display, including in some cases silent salesmen, such as rotary pyramids, etc. David Louis Zwerling, the grocery department supervisor of Big Bear, placed at the disposal of the architect years of experience with the American Grocery Company, the parent of Big Bear.

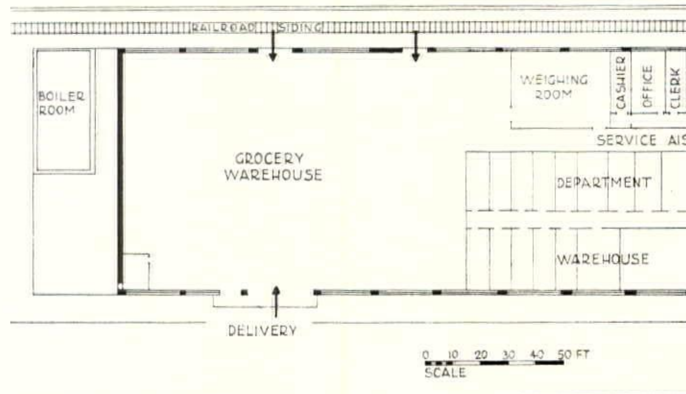
The next problem was to select and correlate the other departments in such a way as to justify the Big Bear slogan "Buy all under one roof." The architect's special concern is to maintain the personality of the store in its planning. He creates a background against which the merchant displays his goods and disposes of them. This personality must be an effect obtained upon entering and must be subtle enough to be displayed quickly by the merchant. The architect's duty is to keep all simple, uniform and effective without defeating the merchant's desire for the spectacular.

LEFT, WINE AND LIQUOR DEPARTMENT
AT THE BIG BEAR SHOPPING CENTER,
JERSEY CITY, N. J.



Davis Studios

PLAN OF BIG BEAR SHOPPI



In the Paterson Center strong horizontal lines and forms were used in the fixtures, in an attempt to stabilize the various effects and jagged lines of the merchandise and with the further intent to concentrate all lines including aisles on the grocery department.

It is too early in the experience of this method of shopping to say how large the Center should be. One fact has been determined and that is that everything must be on one floor. That is yet to be proved incorrect. In Europe, while I was not surprised to find all markets and large municipal shopping centers arranged on one floor, I was impressed with the fact that department stores throughout almost all of Europe feel that visibility of the entire store from a single station is necessary. Even in the new Bijenkorf store at Rotterdam, by William Dudok, the European plan of balconies around a central well prevails.

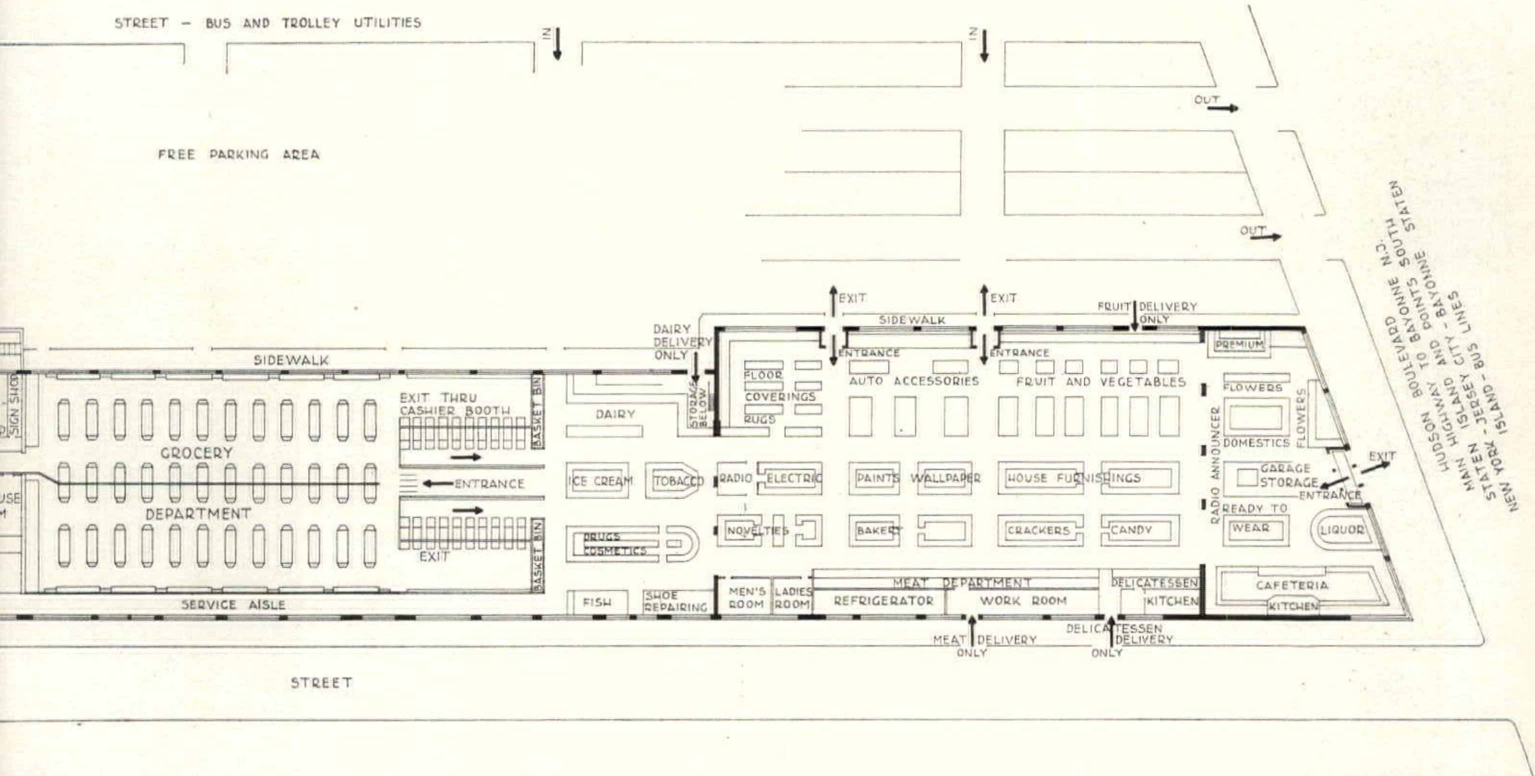
With a Shopping Center which contains mostly foods with rather restricted dry goods and other soft line departments, it is felt that one floor with comfortable aisles and effective displays to stimulate impulse buying is desirable. The Jersey City Center has a shopping area of 45,000 sq. ft.; the Paterson Center, 30,000. In Elizabeth 29,000 ft. has proven very satisfactory.

A mean area must be determined for each department because the system does not permit expansion or contraction of the departments with the season. This would eliminate many departments desirable in the set-up but which must be sacrificed to the success of the whole. To lose the personal touch altogether would not tend towards success.

Since a grocery store needs a few artificial means to attract its consumers a new method was tried in Jersey City and proved successful. Where in the other Centers the grocery department is placed in the center and the other departments about it, in the new Big Bear the grocery department is placed in the rear and all customers are forced to pass the other departments on their way to it. The grocery department method of pay control is another factor in this new arrangement. Two, three or more dollars in groceries make a rather large parcel so that it is desirable to have the consumer do her small purchasing before she reaches that department. We are dealing here with a non-delivery method of selling. All is cash and carry.

In the new Paterson Center theoretical practices were adopted. After one passes from the dry lines in the front section into

ENTER, JERSEY CITY, N. J.   B. SUMNER GRUZEN, ARCHITECT



the food section, one finds the butcher and the dairy in the main right aisle on the way to the grocery, and the fruit, vegetables, fish and delicatessen on the left on the way out. The accessory departments, such as bakery, crackers, candy, etc., are placed on the left and right, respectively, with the tobaccos, house furnishings, ice cream, etc., in the center aisle. Consumers do not buy quite as theoretically as all this, but with ample aisles and effective display we find good circulation around each department. A maximum height of 52 inches for interior departments permits ample visability in all directions.

The cafeteria functions profitably in almost any not too obscure location and might well be located to serve as a resting point in those Centers that exceed 20,000 square feet. A restaurant on a mezzanine overlooking the entire Center would be a silent salesman and reminder of great value. In all departments, except the grocery, a simple system of pay as served is adopted. In the grocery department the customer is given a basket on entering. He or she leisurely selects the articles desired from counters or wall shelves and on the way out passes through a checking counter at which is stationed a cashier and wrapper; as the cashier takes each item from the basket he punches an adding machine while the packer places it in the bag. When all the items are recorded, the machine shows the total owed, and the package is also ready.

The storage section must be quite large. Generally speaking, an area equal to 50 per cent of the shopping area should be reserved for storage. This will depend somewhat upon the distance of the Center from the central warehouse. In designing the store counters it is desirable to have as great an understocking as is possible. The standard used here is 30" high and 30" wide. In the case of the grocery and produce departments it is almost impossible to service one for an entire day and servicing must go on all day. To work out carefully the relation of the warehouse to counter servicing is of paramount importance. In the case of the butcher, dairy, fish and delicatessen as large a refrigerator on the floor as possible is worked into the display with an abundance of refrigerator display cases. The distance from the cutting room to the refrigerator and display case must be as concentrated as possible. Many of the commodities must remain in the refrigerator until called for by the customer. Refrigeration in the warehouse is not of great importance except to the dairy department, which requires space for egg candling, etc. Ample space must be allotted for vegetable and fruit storage. The mechanical equipment of the Center, while intricate be-

INTERIORS OF BIG BEAR SHOPPING CENTER, JERSEY CITY, N. J.

cause of the special needs of departments, is not unusual and does not require explanation here. With refrigeration and cutting rooms occupying the sides of the building, it is obvious that windows on the side lower than 11 feet would be of no value.

In preliminary studies it was thought to gain an abundance of light from the sides to illuminate the 100-foot wide building, but here the careful study of two of Europe's new stores proved of assistance—that of the new Bijenkorf store by Dudok in Rotterdam and the Shocken Store by Mendelsohn in Stuttgart. Mendelsohn kept his windows 6 to 7 feet from the floor to permit shelves, etc.; his windows start there and go to the ceiling. In Rotterdam the windows consumed almost all the wall space and the management of the store was forced to build shelves and displays against the windows, destroying the aesthetic values intended and creating an awkward appearance on the exterior.

If the building is to have a flat roof with columns, then windows should start 1 ft. from the floor and go to the ceiling. A 20 to 25-feet height may be regarded as ample, with clear spans if possible. Vaulted or trussed roofs are preferable. Unless air conditioning is contemplated, low ceiling heights should not be used. It is advisable to introduce air conditioning in any case, as the combination of food odors and crowds produces serious air conditions.

Skylights if used at all must be indirect, as the sun rays should not be permitted to concentrate on the merchandise. Only ventilated skylights should be used.

Heating the Center is probably the most difficult task of all. Fresh foods of a perishable nature suffer from heat. People will not on the other hand shop in a cold place, nor can salespeople in the soft lines be expected to dress as warmly as the men handling produce. To heat the building sufficiently without damaging perishable food is the problem and must be accomplished with radiators or blowers carefully directed so that those departments desiring low temperatures can have them yet giving the entire store a comfortable shopping temperature. Low temperature departments occupy the outer walls, so that heat concentrated at the center of the building diffuses sufficiently to the side to permit comfortable shopping. The warehouse requires only enough heat to prevent pipes, etc., from freezing.

DRY GOODS DEPARTMENT, BIG BEAR SHOPPING CENTER, JERSEY CITY, N. J.

FRUIT DEPARTMENT, BIG BEAR SHOPPING CENTER, JERSEY CITY, N. J.

LIGHTING LARGE SHOPPING CENTERS

BY H. W. DESAIX, WATSON FLAGG ENGINEERING COMPANY, ELECTRICAL ENGINEERS FOR BIG BEAR, INC., PATERSON, N. J.

The lighting of shopping centers must be not only sufficient but of the right character. There is risk of neighborhood antagonism from attempts to attract the public by a cheap carnival appearance. Prospective customers are inclined to confidence in the management where this has been avoided.

DISPLAY SIGN

It is important that the automobile traveling public be able to see the location from the greatest distance. As large a sign as is practicable should be placed on the roof or at a proper height on the front of the building. The sign may show the emblem and name outlined with colored luminous tubes. The colors should be the same as those adopted for other display purposes of the emblem.

FLOODLIGHTING

In order to present a well-lighted outside appearance and to convey the impression of activity and patronage it is advisable to floodlight the exterior. This should not be accomplished, however, by promiscuously throwing light on the building. Most people possess some aesthetic sense, and react favorably to artistic treatment. It is essential that sufficient light be directed on the building and on the street but it is just as important that it be done in a dignified manner and not just "splashed on." This can be accomplished by installing along the curbs combination street lighting standards each equipped with a floodlight projector inclosed with the street lamp in one globe. The pole and combination luminaire can be of a design to suit the architectural surroundings. Reflectors should be adjustable and the canopy should be hinged for easy maintenance.

LIGHTING PARKING AREA

In the auto parking area, one aspect of the lighting problem is to provide illumination of an intensity to drive cars in and out safely and to discourage prowlers. Another phase is to design the system to illuminate vertical objects, instead of building up the intensity on a horizontal plane. In accomplish-

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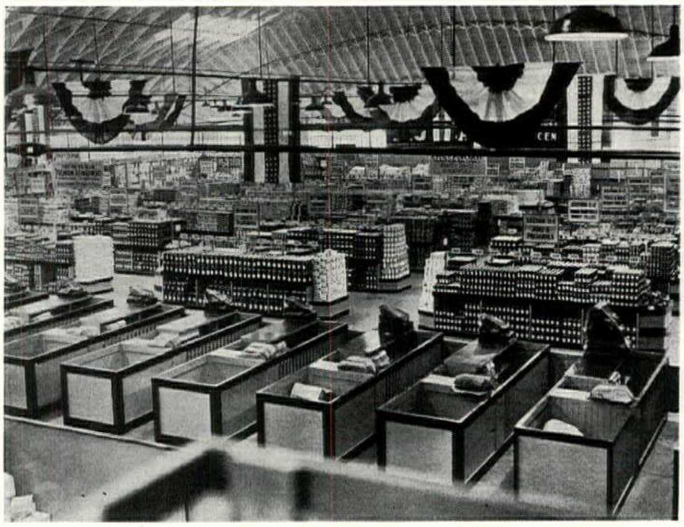
INTERIOR VIEW OF BIG BEAR SHOPPING CENTER, PATERSON, N. J.



ABOVE: BIG BEAR SHOPPING CENTER, PATERSON, N. J. G. SUMNER GRUZEN, ARCHITECT

ing this, however, all objectionable glare must be eliminated. An inexpensive way is to provide the proper number and size of symmetric and asymmetric refractors supported on tubular steel poles, at not less than twenty-foot mounting height, nor spaced over six times the mounting. Calculations should be based on an average of ten times full moonlight on the horizontal or .25 foot-candles. The lamp position should be adjusted for 75-degree angle of maximum candle power.

INTERIOR ILLUMINATION

Upon entering the sales area, the patron must be greeted with a high uniform intensity of illumination designed to average 20 foot-candles, be free from glare, and show up all merchandise on display. Where the building permits it the best arrangement is to mount luminaires not less than 25 feet above the floor, using prismatic glass reflectors, having an angle of maximum candle power of between 35 and 40 degrees. The reflectors should be mounted on an adjustable supporting device, in order to assure setting the lamp in the correct focal position. Spacing should not exceed one and one-half times mounting height. The use of this unit results in a glareless uniform intensity on the horizontal plane, but is particularly desirable for its value in maximum illumination of vertical surfaces, essential for display racks and package goods set up in stacks or pyramids.

When structural conditions do not permit high-boy units, an alternative arrangement that will produce as good results but requiring a greater number of units of smaller capacity to secure the same intensity can be had by using units of the same general construction and design but adapted for smaller-sized lamps.

Well-designed high intensity systems of illumination attract patrons, assist in the display of goods, increase sales, promote cleanliness and create a feeling of security on the part of both public and management.

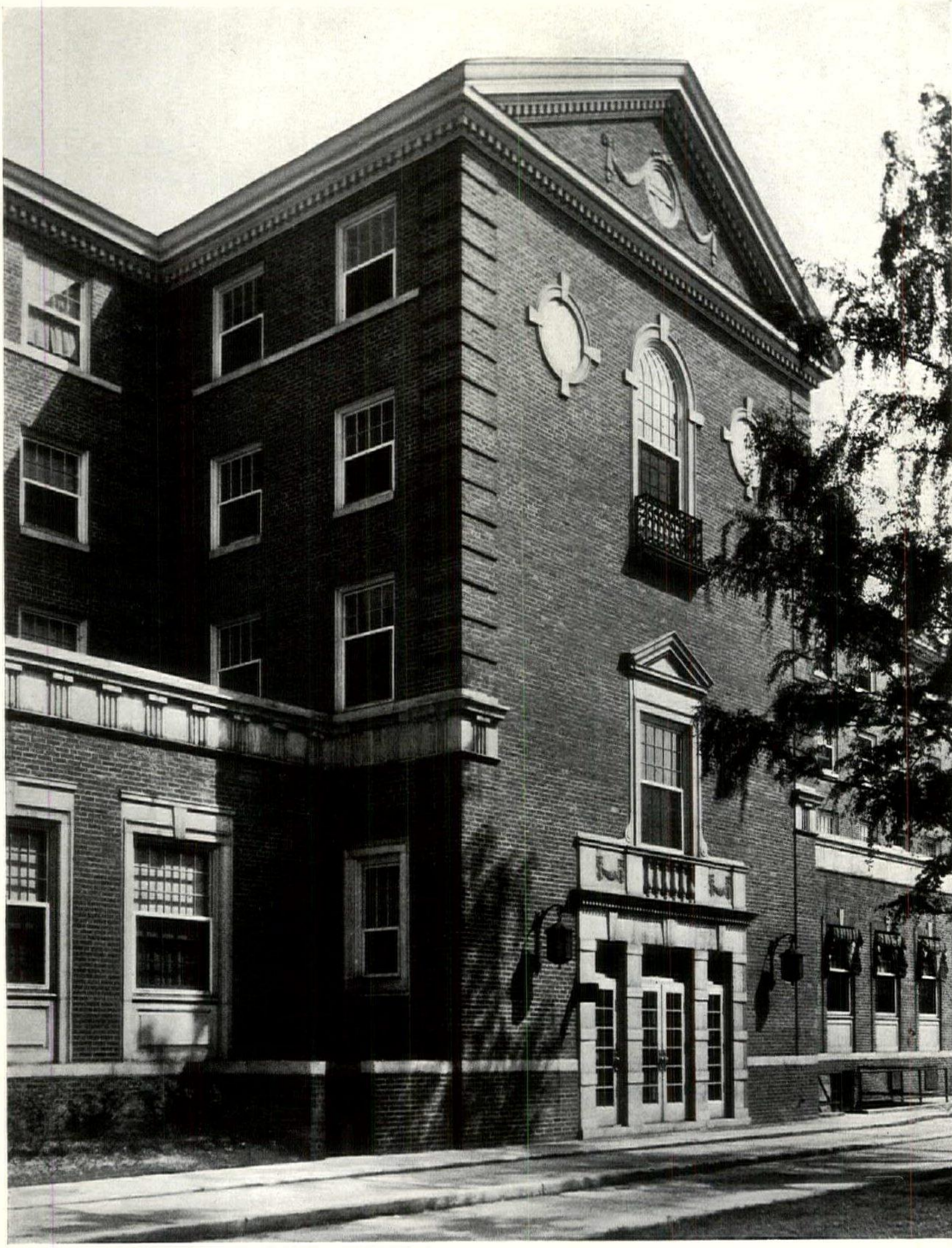
The general area lighting should be supplemented with some local lighting where necessary, especially for goods displayed in show cases, meats and dairy products in refrigerating display cases. Each department should be designated with a neat luminous tube sign of uniform design for all departments. Direction signs of a suitable type should be generously used, in order to assist the patron to the various conveniences and sections.

F. S. Lincoln

TRU-FOOD RESTAURANT, 158 WEST 44TH ST., NEW YORK CITY

H. V. ST. GEORGE, ARCHITECT

WALL FACED WITH STRUCTURAL GLASS

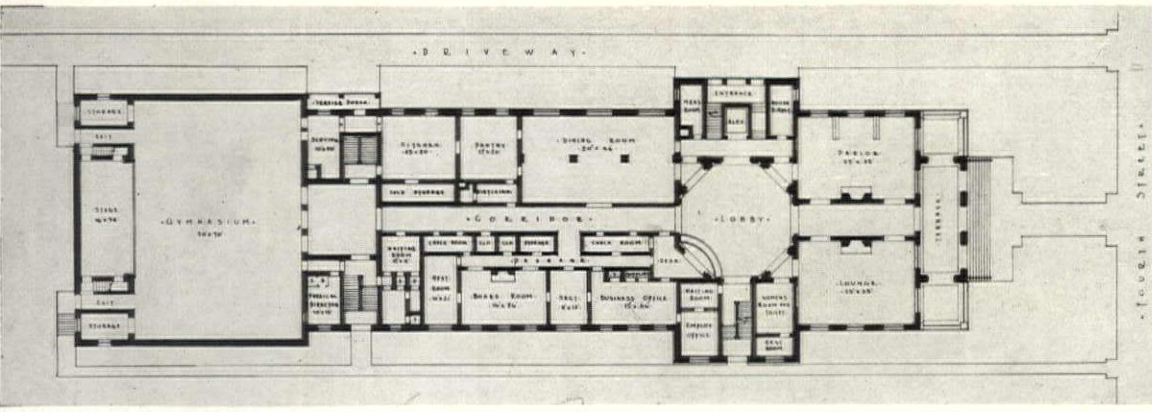


EXTERIOR

YOUNG WOMEN'S CHRISTIAN ASSOCIATION BUILDING WILLIAMSPORT, PENNSYLVANIA

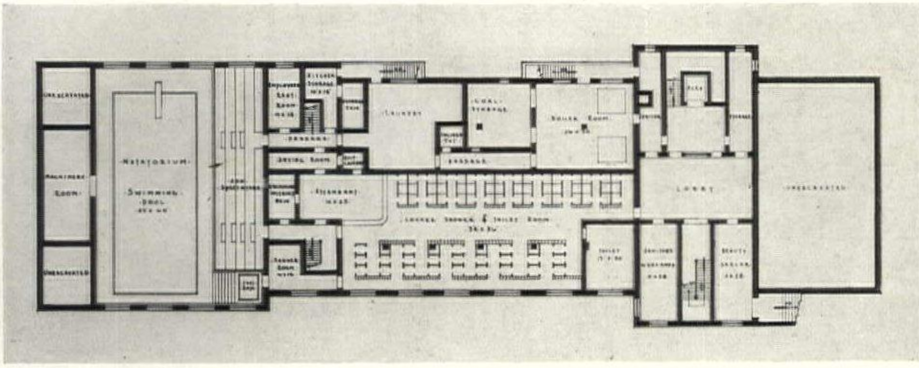
LAWRIE AND GREEN, ARCHITECTS

PLANS

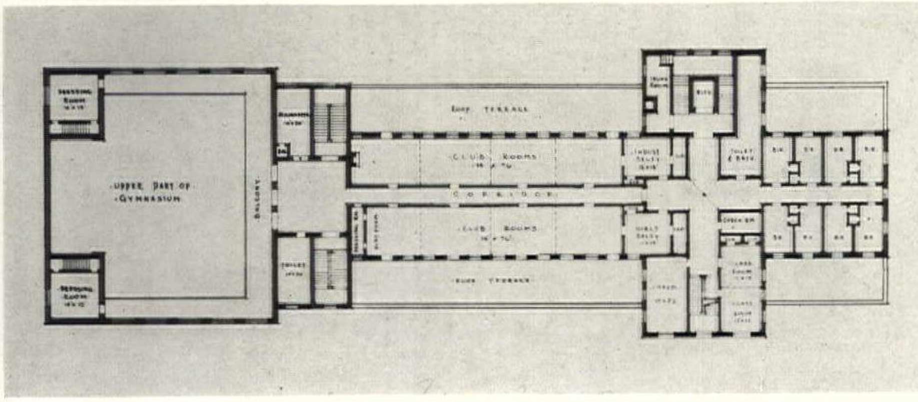


FIRST FLOOR

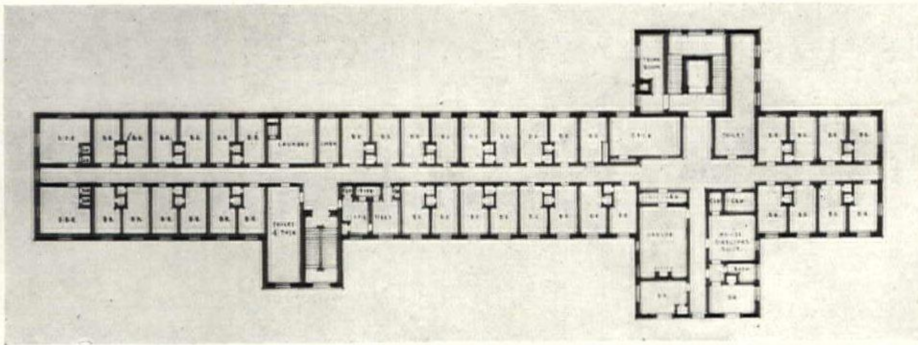
GROUND OR BASEMENT FLOOR



SECOND FLOOR



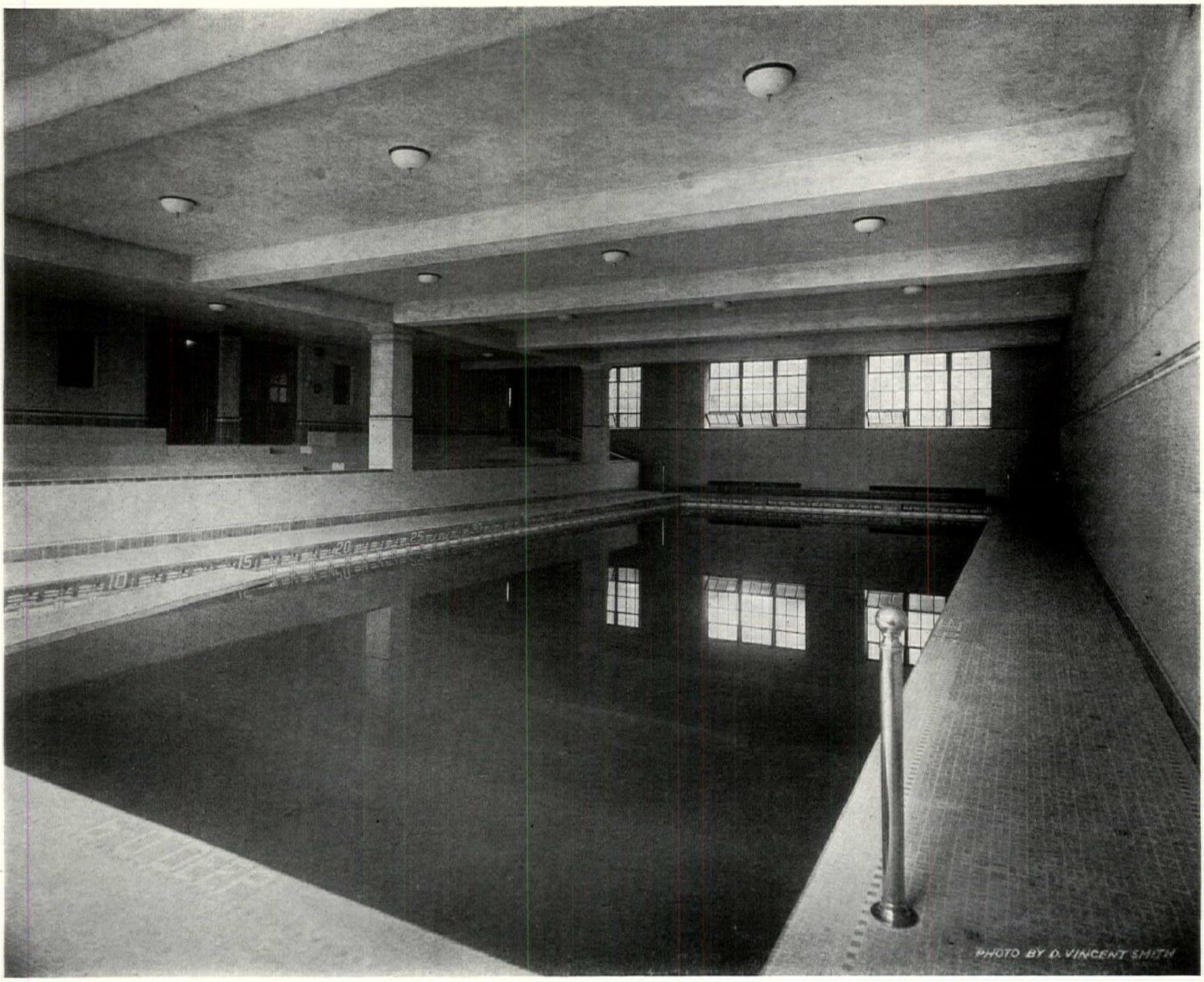
TYPICAL DORMITORY FLOOR



Erected on a level, narrow inside site 100′ x 500′ on one of the principal residential streets of the city. The problem of obtaining easy access to the various comparatively unrelated units on the narrow inside site, was one of the chief problems of plan.

In addition to social and recreational spaces, there are accommodations for 105 residents mostly in single bedrooms.

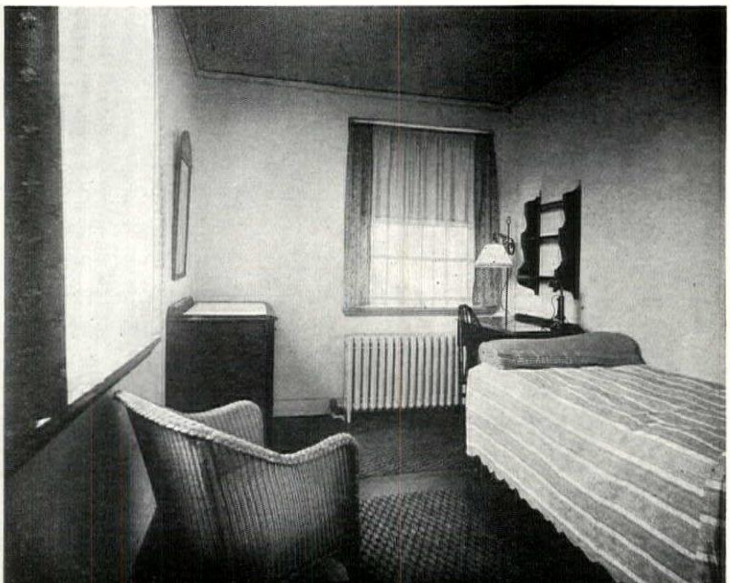
The building contains 1,100,000 cubic feet and was erected at a total cost, including architect's fees, of $401,258.38. The walls of the building are of colonial red brick with limestone trim. A black slate roof with wood cornice was used.



SWIMMING POOL

YOUNG WOMEN'S CHRISTIAN ASSOCIATION BUILDING
WILLIAMSPORT, PENNSYLVANIA LAWRIE AND GREEN, ARCHITECTS

BEDROOM



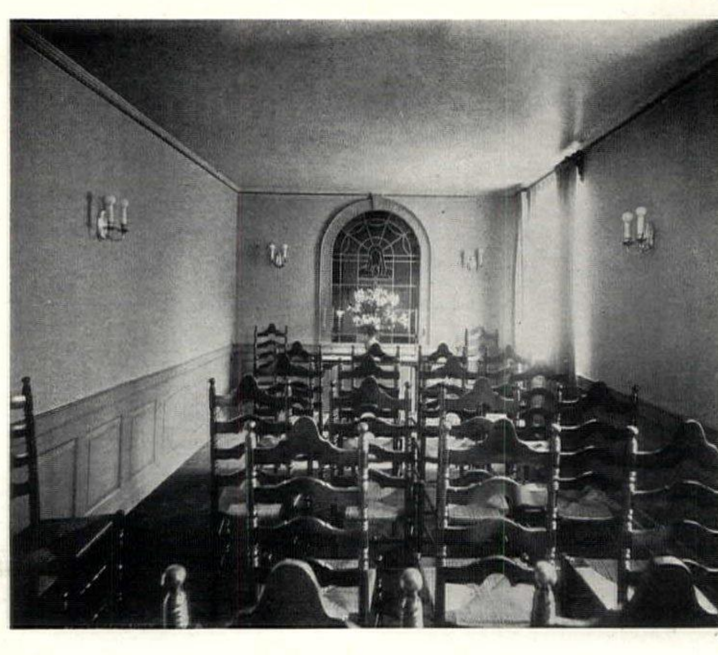
SWIMMING POOL—25' x 60' IN SIZE. WHITE CERAMIC TILE IN POOL WITH BLUE FAIENCE FLOOR AND WAINSCOT. WALLS AND CEILING IN A VERY LIGHT ORANGE TONE.

SINGLE BEDROOM—FLOORS OF DEEP GRAY CONCRETE. CEILING OF CONCRETE WITH BOARD FORM MARKS VISIBLE. WALLS AND CEILING PAINTED IN PASTEL SHADES.

DINING ROOM

LOUNGE

CHAPEL



DINING ROOM—LIGHT BROWN RUBBER TILE FLOORS. GREEN PAINTED WOODWORK. LIGHT GREEN WALLS AND CEILING. ORANGE CRETONNE DRAPERIES.

LOUNGE—WOODWORK PAINTED WARM GREY WITH BLUE AND GREY PAPER ON WALLS. FLOORS OF WOOD WITH RUST COLOR.

CHAPEL—CARPET FLOORS. CREAM COLOR WOODWORK AND WALLS.

HEADQUARTERS HUT FOR ADMIRAL BYRD IN THE ANTARCTIC

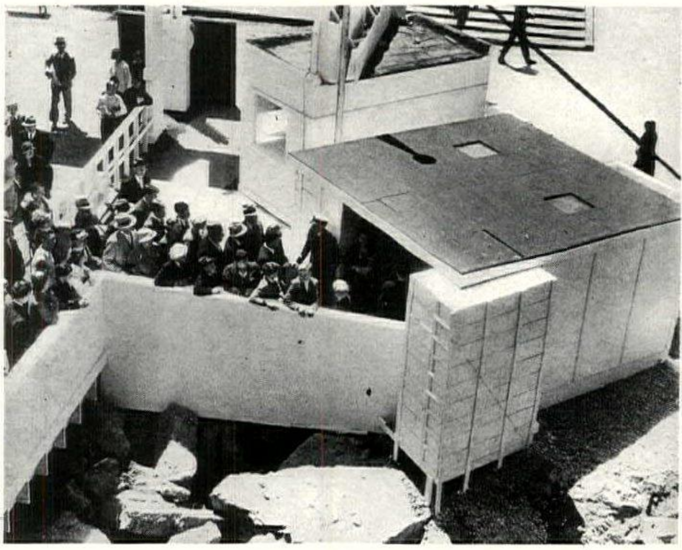
VICTOR H. CZEGKA, DESIGNER

VICTOR H. CZEGKA

Building a house in Boston for use 12,000 miles away in the coldest climate known to man was the problem set to Ivor Tinglof, master carpenter, in providing Admiral Richard E. Byrd with suitable shelter while making scientific observations during the long Antarctic winter. The house is now occupied by Admiral Byrd. (A reproduction of the dwelling is also on exhibition at A Century of Progress Exposition at Chicago.) Instructions to the designer, Victor H. Czegka, supply officer of the Byrd Expedition, called for a house so light it could be carried by airplane, so simple it could be put up at great speed by men working in subzero weather, and finally and most important, so constructed that it would keep its occupant livably warm with a minimum of fuel consumption. Czegka's design fulfills all these specifications. Admiral Byrd uses only four quarts of fuel a day for cooking, light and heating, yet this is enough to keep him warm while the outside temperature ranges from 65 to 100 degrees below zero.

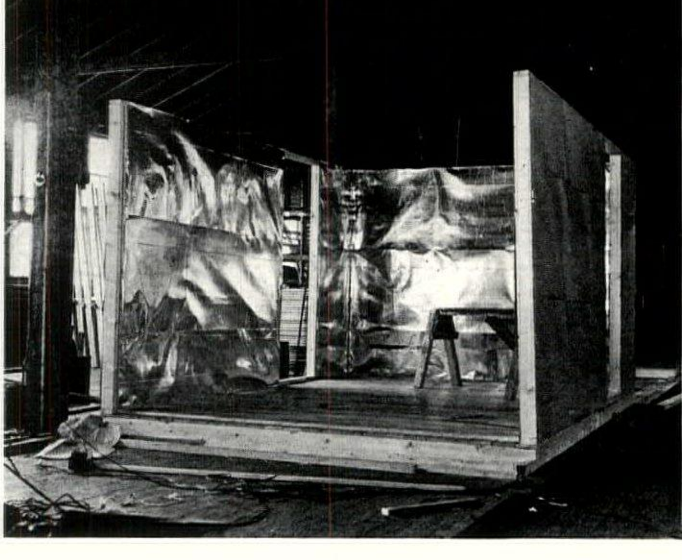
The hut is 9 feet wide, 13 feet 1 inch long, and 7 feet 1 inch high, measured on the inside of the room. In addition there is a porch 4 feet wide running the length of the hut; its roof is supported on three sides by boxes of supplies piled up to the level of the flat roof deck. In this porch roof is a trap door through which Admiral Byrd can make his way to the surface of the snow should any of his tunnels become choked with ice and snow. A door opens from the house to the porch. There are two wire glass windows in the roof of the house itself. One stove pipe for the Primus stove and a heater, a 5-inch hole in the floor, connected to a vent pipe which extends above the snow level, and two 4-inch vents in the ceiling constitute the only other openings.

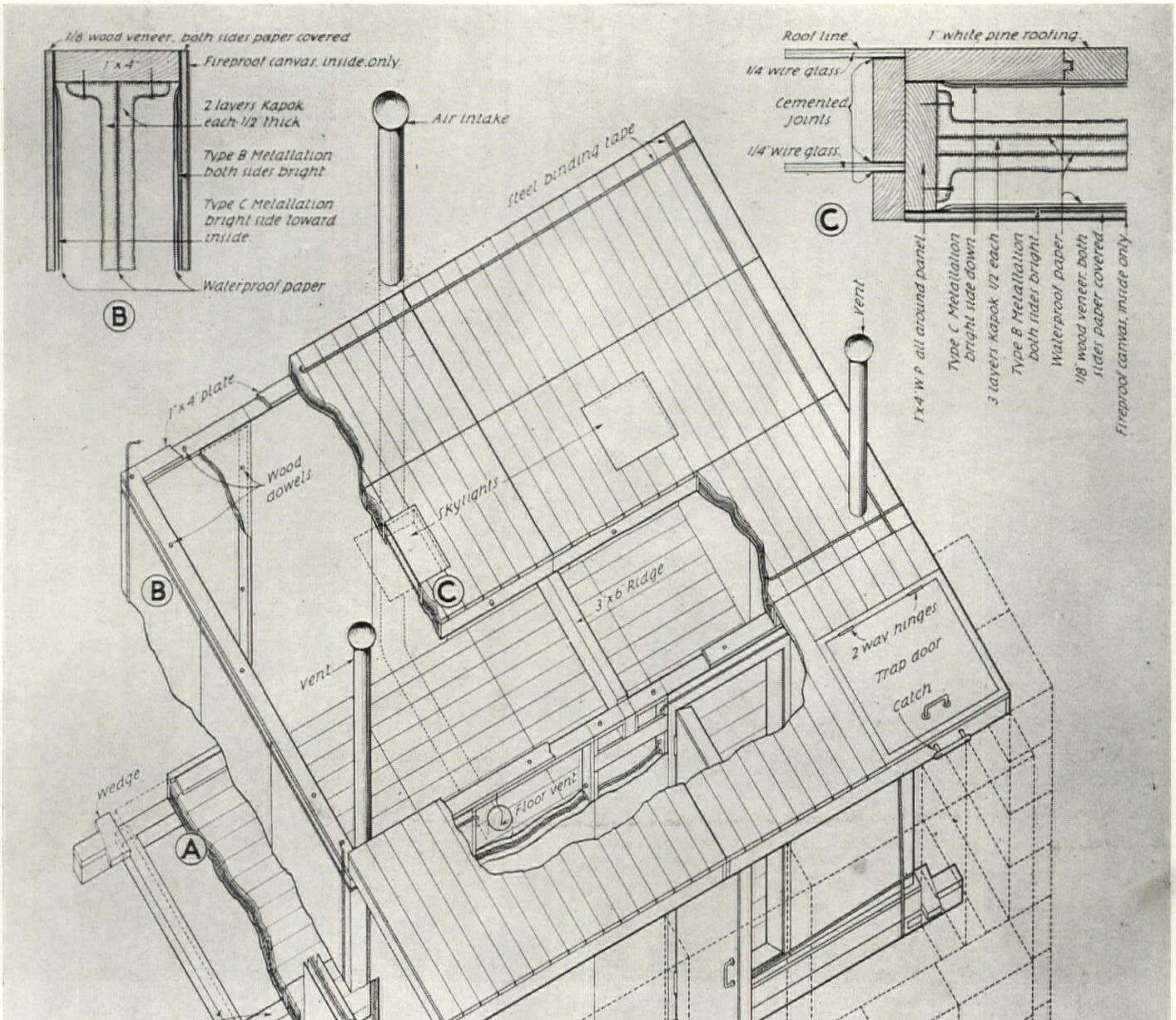
The inner surface of each panel is covered with (1) a fireproof canvas. This is applied directly to (2) the kraft-paper-faced thin wood panel lumber $1/8$ inch thick. Progressing toward the outside of the structure the next layer (3) is Type B Metallation, which is made of heavy kraft paper faced on both sides with polished aluminum foil .0025 in. thick. The Metallation is not glued to the wood panel material but there is a slight air space formed by the natural bulging of the metal insulation. The next layer (4) is a sheet of reinforced waterproof paper somewhat wavy in character which likewise does not make a uniform contact with the Metallation. Then come (5) two layers of kapok blanket each about $1/2$ inch thick, and with no space between the layers except for an intervening sheet of waterproof paper.



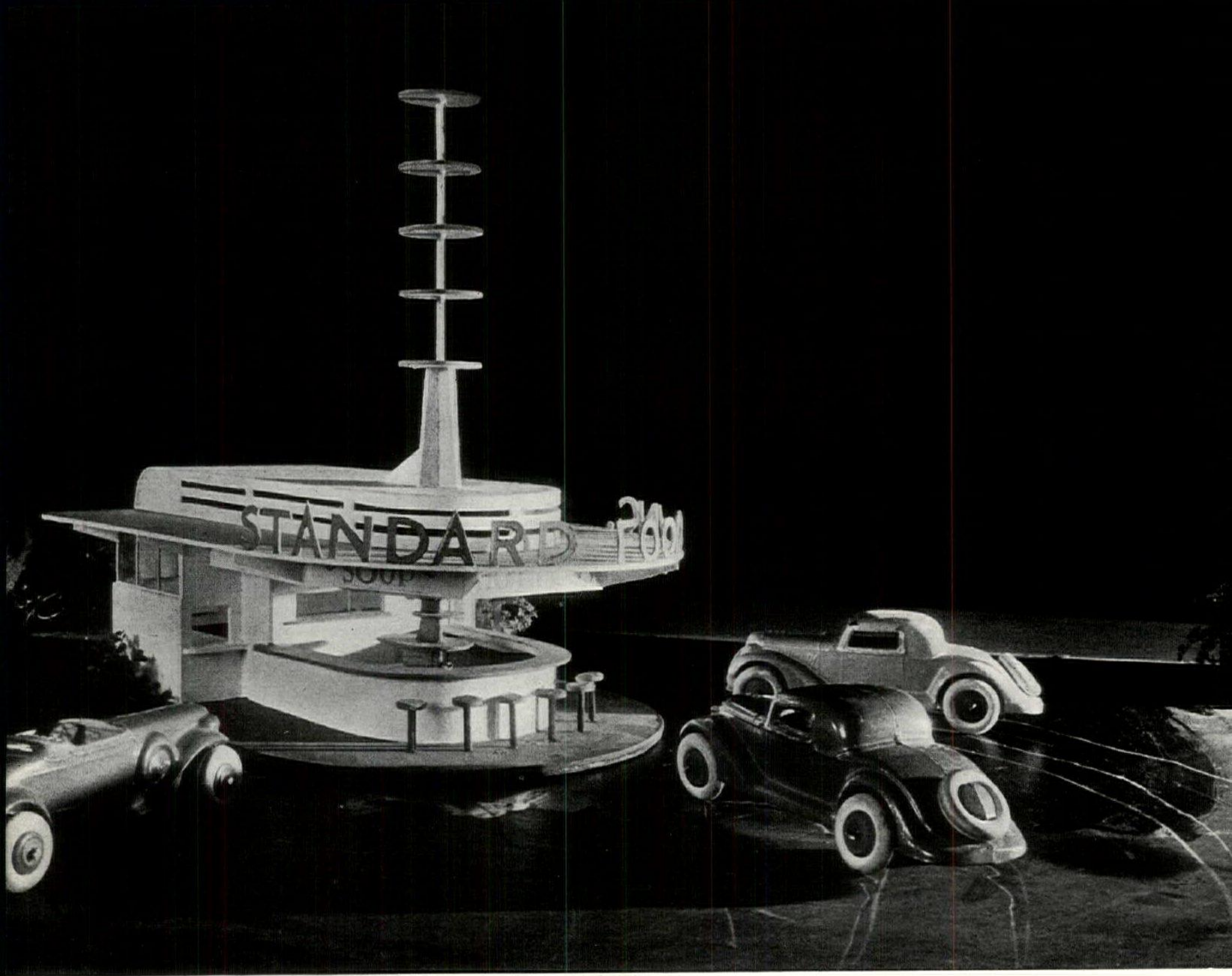
THE EXACT REPLICA OF THE HUT, WHICH IS PART OF THE BYRD ANTARCTIC EXHIBITION, AT THE CENTURY OF PROGRESS IN CHICAGO

THREE WALLS OF THE HUT SHOWING THE ALUMINUM FOIL THERMAL INSULATION



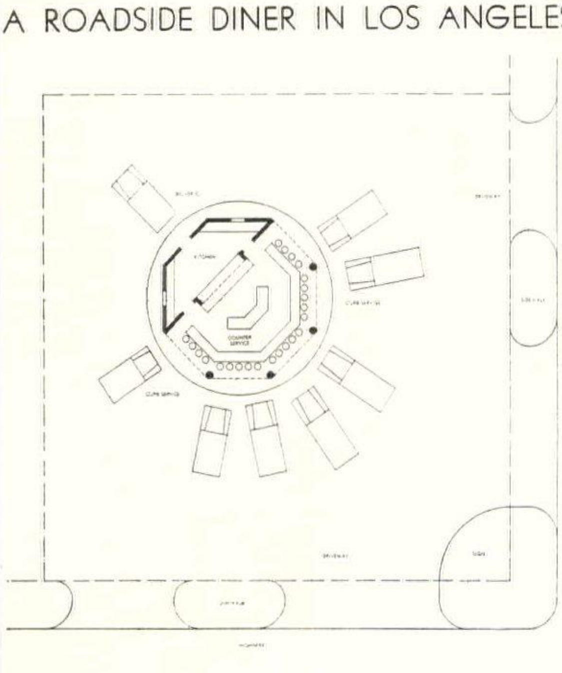


DETAILS SHOWING MATERIALS AND CONSTRUCTION OF THE ANTARCTIC HUT



MODEL FOR ROADSIDE EATING STAND DESIGNED BY STANLEY NELSON UNDER THE DIRECTION OF KEM WEBER, ART CENTER SCHOOL, LOS ANGELES.

A ROADSIDE DINER IN LOS ANGELES

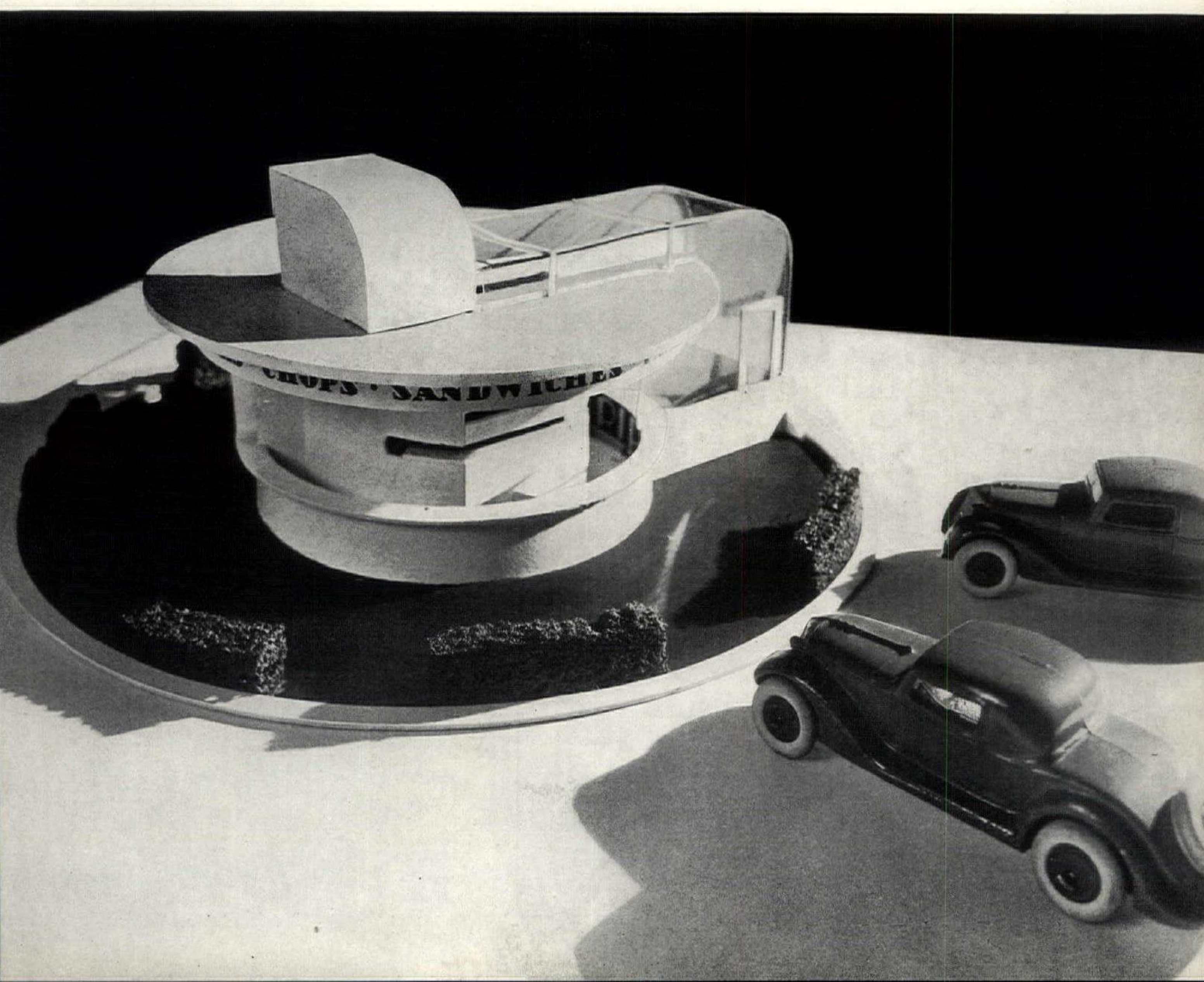


Albert Frey

OADSIDE DINERS FOR MOTORISTS

The roadside restaurant is designed to accommodate motorists who drive to the "stand." Food is brought to the car on a tray, mounted on a rubber-tipped bracket to fit on the side of the car. There is ample counter service for pedestrians.

ODEL FOR ROADSIDE EATING STAND. THIS DESIGN IS PLANNED TO ACCOMMODATE THE MAXIMUM NUMBER OF PARKED AUTOMOBILES. E INCLOSED STRUCTURE IS INTENDED FOR COUNTER SERVICE DURING INCLEMENT WEATHER. DESIGNED BY CHARLES PORTER UNDER THE RECTION OF KEM WEBER, ART CENTER SCHOOL, LOS ANGELES.



A SELF-SERVICE ICE VENDOR NEAR LOS ANGELES

This automatic vendor delivers packaged ice by insertion of a coin in a slot. These devices produce ice on the site and automatically wrap the ice ready for delivery. They are located in the districts near homes. The advantage of such a method for dispensing ice consists of: 24-hour service, low price resulting from self-service, sanitary control of delivered ice.

Albert Frey

THE FEDERATION OF ARCHITECTS, ENGINEERS, CHEMISTS AND TECHNICIANS

A REPORT

BY SIMON BREINES

CHAIRMAN OF THE PROJECTS COMMITTEE, ARCHITECTS SECTION.

THE F. A. E. C. & T. IS A NATIONAL ECONOMIC ORGANIZATION OF TECHNICAL EMPLOYEES. ITS MEMBERSHIP TOTALS ALMOST 10,000.

During the past few months the Federation of Architects, Engineers, Chemists and Technicians has set up a three-point program:

1. Immediate work or cash relief for technical employees.
2. Adequate, comprehensive public works.
3. Unemployment insurance.

Reports from various chapters give conclusive evidence of our success in attaining the first point. With the termination of the CWA on April 1, all emergency jobs were transferred to local administrations on a relief basis. As a result thousands were laid off, wages cut and many projects discontinued. However, the Federation, through organized protest, was able to win a great percentage of reinstatements and to halt numerous lay-offs. The procedure of having grievance committees instead of individuals present all complaints directly to the Administration at stated intervals has been established and the right to organize on the projects assured.

On the second point the Federation states that the only reasonable solution to the problem of employment for technicians is a nation-wide program of public works. Plans for reviving employment in the construction industry have not accomplished much to date. A recent survey by Columbia University estimated that among architects 95% are without work in their field; among engineers 85%, and among chemists 65%. In the building trades over half the workers are unemployed.

In 1932 less than 50,000 residential units were constructed and yet an NRA survey published at the end of that year indicated that the country needs 800,000 new units a year. The building industry, for a number of reasons, has been unable to satisfy this need.

In answer to this situation Administrator Ickes stated, at the inauguration of the PWEHC last October, that:

> "Our experience of the last few months indicates clearly that we may not depend upon private enterprises to initiate comprehensive low-cost housing and slum-clearing projects."

Nevertheless, the failure of the PWEHC to do much to improve the housing situation is due in large part to the requirement of self-liquidation established for its projects: that no houses were to be built unless they could pay for themselves. This factor of self-liquidation has meant that rentals would be beyond the incomes of precisely that section of the population which the administration stated it wished to aid.

Increasing recognition of this difficulty is evident in the announcement on June 13 of a National Housing Policy by the American Institute of Architects, which urges:

> "It is time that we abandon the idea that housing is a business and accept it frankly as a public utility as we have accepted education, hospitalization, etc. Housing for the lower-income brackets cannot be obtained under private initiative, even with favorable financing."

The Federation had come to this conclusion some time ago. Its provisional formulation of a Statement of Principles on a Program of Public Works, including housing, contains the following:

"The Federation of Architects, Engineers, Chemists and Technicians, a national organization of professional workers, calls upon the government of the United States for the immediate inauguration of a socially useful public works program of research and construction under the following conditions:

1) that the program shall be long-termed, nationwide, comprehensive and organized on a central plan;
2) that the program shall be entirely public, not only as to finances, but also as to the land involved in the projects (except in the case of public works farm housing), and as to the construction and administration;
3) that all administrations connected with the program, such as construction, operation and use, shall include adequate representation of national and local organizations, professional and otherwise, to safeguard their wages, tenure and other rights;
4) that the charges to the public for the use of any of the social utilities created under this program shall be based on ability to pay rather than on the cost of construction, operation and use;
5) that there shall be no charge to unemployed workers for such use during the period of unemployment, unless they are receiving unemployment compensation; and
6) that the costs of this program shall be made a general charge upon industry and government, without contributions by workers or farmers directly or indirectly, and without increased taxes on small home-owners; and that taxation of incomes of corporations and higher incomes of individuals, inheritance and gifts, suggest available sources."

With this Statement of Principles as a basis and guide, the various Federation chapters have begun to develop local programs of public workers calling for comprehensive and integrated research, planning and construction. Cooperation with other interested organizations on this program is hoped for.

The Federation's position in regard to rentals being proportionate to income is not based on any abstract theories of altruism. On the contrary, we are quite selfish. We have observed that as soon as wages fall, the inhabitants of the poorer dwellings begin to double up for economy. On a large scale, as at the present moment, this tendency creates a market surplus, which curtails the production of new housing. This in turn throws architects and other technicians out of work, reduces the demand for building materials and labor, and depresses industry in general. In other words, the simple and direct availability to the general public of such utilities as housing is a necessary and practical factor in the solution of the housing question in general and the problems of the technician in particular.

This logically brings us to the last part of the three-point program: unemployment insurance.

The Federation believes that an adequate system of unemployment insurance would be the best guarantee against a market surplus of housing or any other social utility, and, to put it another way, would be the best guarantee of continuous employment. Today this subject is receiving a great deal of attention, especially in Washington. A number of unemployment insurance measures were before the last Congress and the Federation, after investigation, decided to endorse the Workers' Bill, HR 7598. The reasons for this choice are that it was the only bill that included all occupations: "industrial, agricultural, domestic and professional workers"; and that it provided for benefits to start immediately after the law is passed, and extend for the full time of unemployment.

A word about the code in conclusion. The Federation is pleased to report that it has achieved the inclusion of a provision on all PWA projects establishing a minimum rate for architects, engineers and other professionals. This rate calls for: $36 for the northern zone, $33 for the central zone, $30 for the southern zone. Although the Federation does not feel that these rates are adequate compensation for technical men, nevertheless, a minimum security in the labor provisions of the PWA program which did not exist before is provided.

On May 27 a Committee was sent to Washington by the Federation to militate for the inclusion of a wage provision for technical men in the Construction Industry Code which had not been provided in the Architects and Engineers Supplements submitted by the A.I.A. and the A.S.C.E. Because of opposition the Committee finally proposed to the Labor Adviser an alternative suggestion to our original Code demands. This alternative calls for a provision to be written into the Architects and Engineers Supplements providing wage rates and conditions of labor similar to those now obtaining on PWA projects. This provision removes the objection of the A.I.A. and the A.S.C.E.to wage fixing which does not provide for regional differentials.

Major Campbell, Deputy Administrator of the Construction Industry, has been agreeable to our proposal. He wrote a letter to the Adviser of the Construction Code Committee asking for an opinion on the proposal, and suggested that we be invited to subsequent meetings of the Code Committee and the Administration. All draftsmen are urged to address themselves to Major Campbell supporting our plan for minimum wage provisions. The Federation has in addition received affidavits from about 800 technical professionals, who are not Federation members, empowering us to act in their behalf on this matter.

TECHNICAL NEWS AND RESEARCH

BY HENRY L. LOGAN

ELECTRICITY IN THE HOME—Part 2

ELECTRICITY IN THE HOME

BY HENRY L. LOGAN
CONSULTING ELECTRICAL ENGINEER

PART TWO—LIGHTING

PURPOSE

The fundamental purpose of artificial lighting in the home is to make it as safe, convenient and comfortable by night as by day. The amount of light this requires is shown in the following table:

	INTENSITY IN FOOT-CANDLES*		INTENSITY IN FOOT-CANDLES*
OUTSIDE		**OUTSIDE**	
Paths in grounds	0.5	Main entrance	10.0
Approach to house	0.5	Trades entrance	5.0
Driveway	0.5	Porches	10.0
INSIDE		**INSIDE**	
Vestibule	20.0	Bedroom floor corridor	5.0
Entrance foyer	20.0	Bedrooms	5.0
Stair hall	10.0	Bathrooms	20.0
Living room	20.0	Library	20.0
Sun room	20.0	Nursery	20.0
Dining room	20.0	Laundry	40.0
Kitchen	40.0	Game room	20.0
Butler's pantry	40.0	Storage	5.0
Breakfast room	20.0	Boiler room	10.0
Stairs	5.0	Garage	40.0

** The foot-candle is the standard unit for measuring illumination, just as the degree Fahrenheit is the standard unit of measurement of temperature. It is the degree of illumination on a surface one foot distant from a standard candle.*

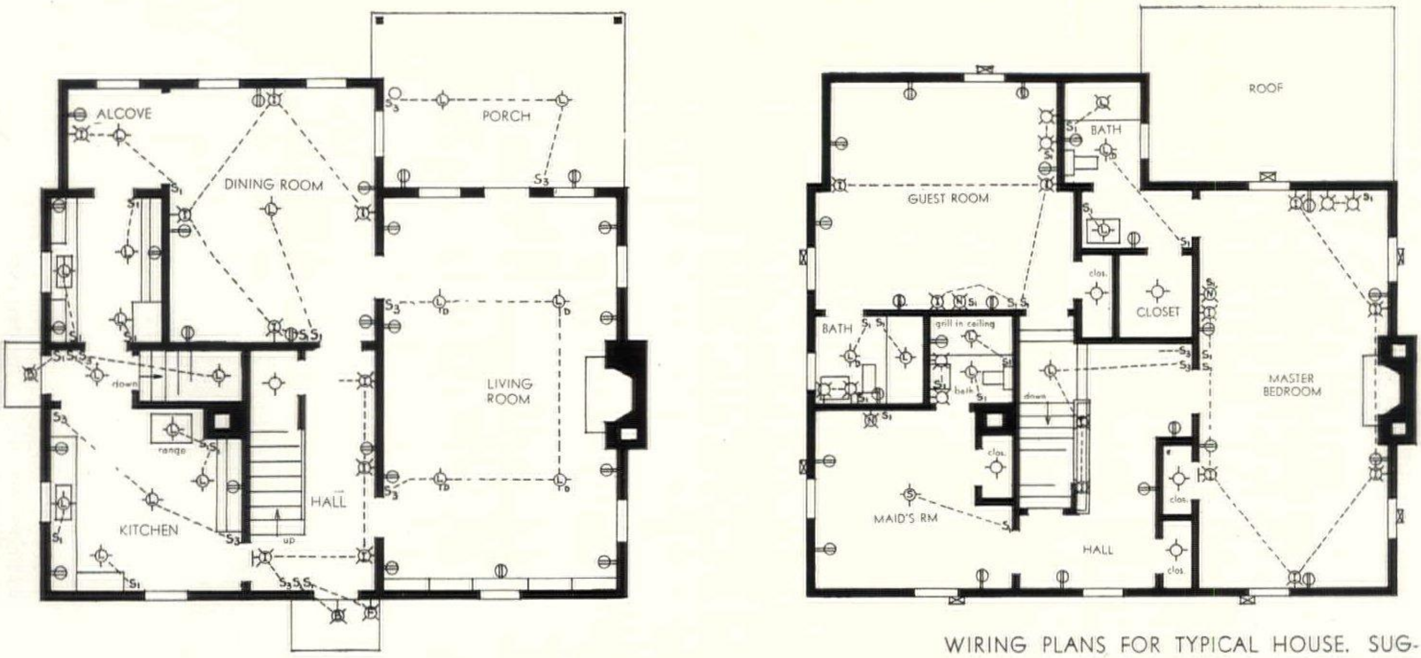
WATTAGE

The wattage per square foot of floor area needed to secure the intensities laid down in this table will vary with the type of fittings adopted, and the finish of the interiors.† This variation is given in the accompanying table.

Intensity in Foot-candles	WATTS PER SQUARE FOOT OF LIGHTED AREA — Outside Lighting: Ornamental Lanterns	Outside Lighting: Refractors	Inside Lighting: Period Fixtures	Direct Lighting: Functional Fixtures	Direct Lighting: Built-in Equipment: Diffusing Glass	Direct Lighting: Built-in Equipment: Lenses	Semi-Indirect Lighting: Functional Fixtures	Semi-Indirect Lighting: Built-in Equipment	Indirect Lighting: Coves	Indirect Lighting: Wall Pockets	Indirect Lighting: Functional Fixtures
0.5	0.3– 0.5	0.1									
5.0	3.0– 5.0	1.0	3.0– 5.0	1.0	1.5– 3	1	1.5	2–?	5	3.0	2.0
10.0	6.0–10.0	2.0	6.0–10.0**	2.0	3.0– 6	2	3.0	4–?	10	6.0	4.0
15.0				3.0	4.5– 9	3	4.5	6–?	15	8.0	5.0
20.0				4.0	6.0–12	4	6.0	8–?	20	10.5	7.0
25.0				5.0	7.5–15	5	7.5	10–?	25	13.0	8.5
30.0				6.0	9.0–18	6	8.5	12–?	30	16.0	10.0
35.0				7.0	10.5–21	7	9.5	14–?	35	18.5	12.0
40.0				8.0	12–24	8	10.5	16–?	40	21.0	14.0

† These figures are based on light wall and ceiling finishes, and the use of the more efficient, higher wattage lamps in all cases when possible.

*** Period fixtures are impractical where satisfactory lighting intensities are desired because they cannot be made to accommodate sufficient wattage and at the same time retain their distinctive character.*



WIRING PLANS FOR TYPICAL HOUSE. SUGGESTED LOCATION OF LIGHTING OUTLETS FOR ADEQUATE ILLUMINATION.

CEILING OUTLET
FLUSH LUM. WALL PLATE OR CONCEALED LIGHT
FLUSH CEILING UNIT
FLUSH INDIRECT WALL UNIT
FLUSH DUAL PURPOSE UNIT
FLUSH NIGHT LIGHT
OUTSIDE WALL UNIT
LUMINOUS HOUSE NUMBER
FUNCTIONAL SEMI-IND. UNIT
TWIN CONVENIENCE OUTLET
BURGLAR LIGHT
S_1 SINGLE POLE SWITCH
S_3 THREE-WAY SWITCH

Artificial illuminants in the past provided light by burning. They needed ventilation to insure a steady supply of oxygen to support combustion and to carry away the by-products, as well as accessory means to protect surroundings from fire hazards, fumes and smoke.

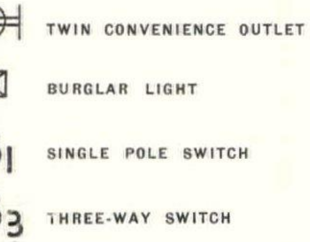
This led to the development of fixtures hanging freely in space or safely bracketed out from the walls. These fixtures, through all their multitudinous forms, have been variations controlled by the defects and limitations of burning illuminants.

Electricity has none of these limitations. It does not need oxygen or ventilation; neither does it produce fumes or smoke. Electric lighting equipment can safely be built into walls and ceilings, as an integral element of the construction, without fire hazard.

The following discussion is based upon the application of the "built-in" principle. The "typical" plans selected to illustrate the discussion show a combination of rooms customary in a six-room house. Additional rooms that occur less frequently in six-room arrangements, or occur often in slightly larger houses, are included for the sake of completeness. However, the text has been made as widely applicable as possible and is not based on the plans. They serve only to show how the textual comments may be applied in an individual example. Space is not sufficient to permit explanation of the electrical arrangement for each room shown on the plans, but reference to the text together with a study of the peculiarities of form, size and location of the door and window openings of each space will lead to an understanding of those arrangements that may not seem clear from casual inspection.

Taking the typical areas and locations in and around the home, one by one, the following comments apply:

It is wise to light steps in the entrance path. This can be done with weatherproof step lights built into the sides of the steps, or into garden ornaments placed nearby; also by the more conventional lantern mounted on a post



A BOWL REFLECTOR TO PROJECT FROM CEILING OR RECESSED IN CEILING.

standard or bracket, or by means of an inclosing refractor similarly mounted.

ENTRANCE

The entrance should be brightly lighted in order to facilitate safe movement, to protect against unwelcome intruders and to invite friends. The house number may be illuminated directly by the same equipment that lights the entrance, or a self-luminous number on a translucent panel (with the lamp inside) may be used; or the figures can be set out a little and appear in silhouette against a background illuminated by lamps placed behind the letters.

The equipment for lighting the entrance, and for illuminating the house number, should be rugged, durable and weatherproof. It should be controlled by switches inside the door or in the hall.

VESTIBULE

Also best when brightly lighted. The guests are aided in the removal and disposal of their wraps, movement is expedited and the friendly atmosphere of the entrance is continued. This location offers an excellent opportunity for built-in lighting. Separate illumination should be provided for the mirror. Wall brackets or a console table light are usually provided but neither is as satisfactory as luminous panels built into the walls on each side of the mirror, of large area and low surface brightness; or as lens equipment in the ceiling over the mirror directing light onto the observer (not onto the mirror). The switches should be conveniently located, possibly with those controlling the entrance and approach lights.

The guest closet can be provided with a 10-watt intermediate base, Mazda lamp in a ceiling fitting, operated by a door switch or a pull chain.

STAIR HALL

This space needs only about half the intensity of the vestibule, except in the absence of a separate vestibule (when suggestions in the preceding paragraph apply). Illumination is best provided from either built-in wall or ceiling equipment. Where the stair well goes through two floors it can be lighted from built-in equipment in the ceiling of the bedroom floor and in the soffit of the upper landing.

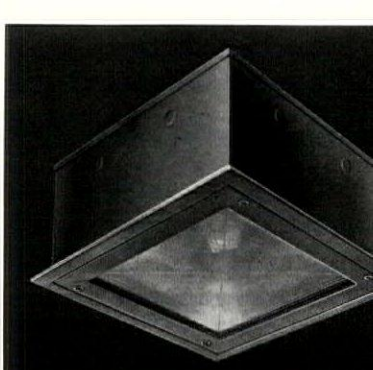
LIVING ROOM

This room serves several purposes in the home and so must contain various forms of lighting. A natural objective of artificial light is to provide the benefits of sunlight. Members of the household spend most time in the living room, so this is the logical place for artificial sunlight equipment providing dual-purpose lighting, except where an all-year sunroom is a feature of the plan.

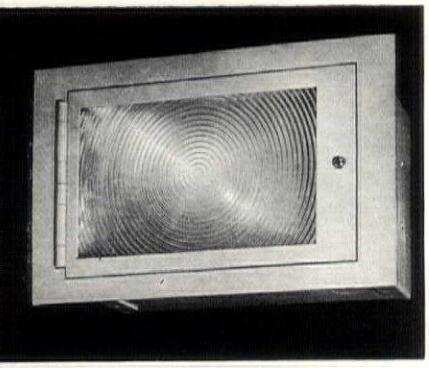
The equipment for dual-purpose lighting can be installed flush in the ceiling to provide general illumination. When single-purpose lighting is used the equipment may be installed in either walls or ceiling.

Ample provision should be made for portable attachments, with one convenience outlet for every five feet of wall space. If a portable is provided for each chair the needs of one person can be met without illuminating the entire room. Provision may also be made for the use of luminous ornaments.

Indirect portable floor lamps will be found useful for bridge parties, when the dual-purpose lighting is not desired.



RECESSED CEILING LIGHT FOR BATHROOM AND KITCHEN.



FLUSH LIGHTING UNIT RECESSED IN EAVES TO SERVE AS BURGLAR ALARM.

RIGHT, INTERIOR WITH INDIRECT LIGHTING AND CONVENIENT LOCATION FOR PORTABLE LAMPS.

Three-way switches should be placed at both entrance and exit to control the general illumination. A mercury switch should be installed at the head of the stairs on the bedroom floor to permit turning on the living room lights from that point before descending, or turning them off after ascending, in those cases where the stairs rise from the living room.

SUNROOM The sunroom should always be provided with dual-purpose lighting equipment, preferably set flush in the ceiling and controlled from a switch near the entrance. Where there is a separate exit from this room, such as into the garden, a three-way switch should be located at both entrance and exit.

DINING ROOM The table is the natural center of activity. When lighted by a suspended fixture the result is apt to be glare if too high or interference with vision across the table if too low. With tables of adjustable size there is no "right" height, all locations for a hanging fixture being unsatisfactory. The best solution is equipment built in the ceiling over the table, with perhaps some indirect or semi-direct illumination from wall pockets, flush wall panels or coves. China and glass display closets and niches should have self-contained lighting equipment. Switches should be located near the entrance, with three-way type for room lights where there is both entrance and exit.

BREAKFAST ROOM The problem and solution is the same as for the dining room, but on a smaller scale.

BUTLER'S PANTRY Built-in ceiling equipment should be provided over the sink and parallel to the closets, with the light directed toward drawers and shelf space.

KITCHEN Same as for Butler's Pantry. In addition, a dual-purpose lighting unit, set flush in the middle of the ceiling, will be appreciated by anyone spending much time in the kitchen.

OUTSIDE SERVICE ENTRANCE A double-quadrant refractor panel should be built in over the door, or a similar device provided, with switch inside the kitchen door, to light the approach.

UPSTAIRS CORRIDOR Built-in wall lights of the semi-indirect type are most satisfactory for this location, with three-way switches in the hall downstairs and at the end of the corridor (for the latter, mercury type).

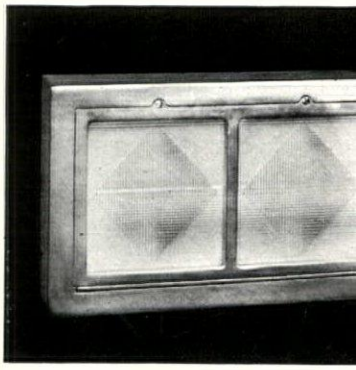
BEDROOMS The most acceptable arrangement is to place a flush light in the wall, near the ceiling, over and behind the bed, to flood the ceiling. This places the source of light behind the person in the bed, at the same time insuring the brightest

AN INDIRECT LIGHTING FIXTURE DESIGNED BY RUHLMAN OF PARIS.

illumination over the head of the bed. Another method is to hang a semi-indirect or indirect luminaire from the center of the ceiling and use a 36-inch 100-watt tubular lamp in a metal trough on the wall over each bed for bed lighting.

The night lights should be flush in the wall, under the head of each bed.

The dressing table should be illuminated, separately, either by one of the methods suggested for the vestibule mirror, or (preferably) by lights on the backs of the mirrors, brightly lighting the wall around the dressing table, and in turn softly but clearly illuminating the person using the mirror.



TYPICAL FLUSH INDIRECT WA LIGHTS FOR USE IN DINING ROO BEDROOMS AND CORRIDOR

Duplex convenience outlets should be placed about 5 feet apart in the walls. The dressing table lights should be controlled locally. Switches for the central ceiling light or the over-the-bed wall lights should be three-way, located at the entrance and at the bed. Switches for the night lights should be of the flexible extension type so they may be placed under the sleeper's pillow.

NURSERY

Indirect illumination from luminous wall plates, wall pockets, luminous indirect ceiling fixture (if out of reach of children), or direct illumination from large luminous ceiling panels are suggested. The baby's crib, if placed in this room, can be protected by a photo-electric alarm arranged so as to ring a bell if any one tries to remove the child or if the child tries to get out of the crib. The windows and doorway of the nursery may also be so protected. A night light should be placed in the wall under the crib. Switches should be of the silent mercury type located in the corridor, outside the nursery door. Convenience outlets should be located as frequently as possible and be protected by lock covers that will defy the children's fingers. All built-in artificial lighting equipment should be protected by shatterproof glass.

LIBRARY

The bookshelves can be lighted by directional flush ceiling units. Paintings can be emphasized in the same manner. Reading light is best secured from a large-wattage indirect portable similar to the type recommended for bridge playing in the living room. General lighting can be secured from one or two luminous wall plates. Switch for general lighting should be near the door; switches for the book lighting units should be handy to each local area.

BATHROOMS General illumination can be obtained from a dual-purpose lighting unit flushed into the ceiling. A luminous ceiling plate should be located over the tub and another over the shower (where separate), to avoid the semi-darkness that follows when the curtains are drawn. The mirror can be flanked with luminous wall plates, or set out from a shallow bowl-shaped depression in the wall extending above and to each side of the mirror about half the mirror width. The lights are placed behind the mirror in this depression which serves as a large indirect reflector. When the mirror is the door of a cabinet there should be sufficient projection on each side of and above the cabinet to conceal the lights, which should then be behind a second protecting louver so that they will not be exposed when the mirror is swung away. Switches should be placed at the door.

LAUNDRY Flush, luminous ceiling plates should be located over tubs, ironer and sorting table. Three-way switches at entrance to, and exit from, laundry.

GAME ROOM Luminous wall plates of the indirect type are desirable in this room because of the usual low ceilings and the need for high diffusion. This lighting can be supplemented with indirect portables for card games. Special lighting for billiards or similar indoor sports should be provided on the basis of the recommendations of the manufacturers of the sports equipment. The switch should be at the entrance.

GARAGE Two lens units should be installed flush in the ceiling over the hood end of each car, and set to flood the motor with light when the hood is raised. Two flush floor lights of the grease-pit type should be located in each car space. Two additional lens units should be set flush in the ceiling alongside each side of the car body to facilitate washing. Where the garage will hold two cars the lights in the aisle between the cars can be arranged to direct light both ways. These lights can also be used for general illumination and should be on three-way switches at both entrance and exit (where both exist).

Flush lens units in the ceiling should be provided over the work bench. The garage lighting should be supplemented by provision for trouble lamps.

A double quadrant refractor panel can be installed over the garage doors to illuminate the driveway. When desired, it can be worked by a sonic switch operated by the sound of the horn, which can also be used to open motor-driven garage doors. Other methods of control, such as photo-electric apparatus and radio, are available for turning on the driveway light and opening the garage doors without leaving the car.

The manual switch for the driveway light should be inside the garage doors.

BOILER ROOM Flush, direct-lighting ceiling equipment is suggested, arranged to emphasize the front of the boiler or heating device, and the various controls. Provide three-way switches at the head of cellar stairs and the exit from the boiler room.

BURGLAR LIGHT SYSTEM

This may consist of a separate wire tie-in of one light in each of the principal rooms of the house (a continuous passage), joined to special lights built into the eaves of the house at front, sides and back (to floodlight the exterior), and also tied in with the outside front and rear entrance lights and the garage door light. The whole system may be controlled by a master switch in the master bedroom.

The night lights in the bedrooms and nursery can also be joined to this burglar light system.

SWITCHES

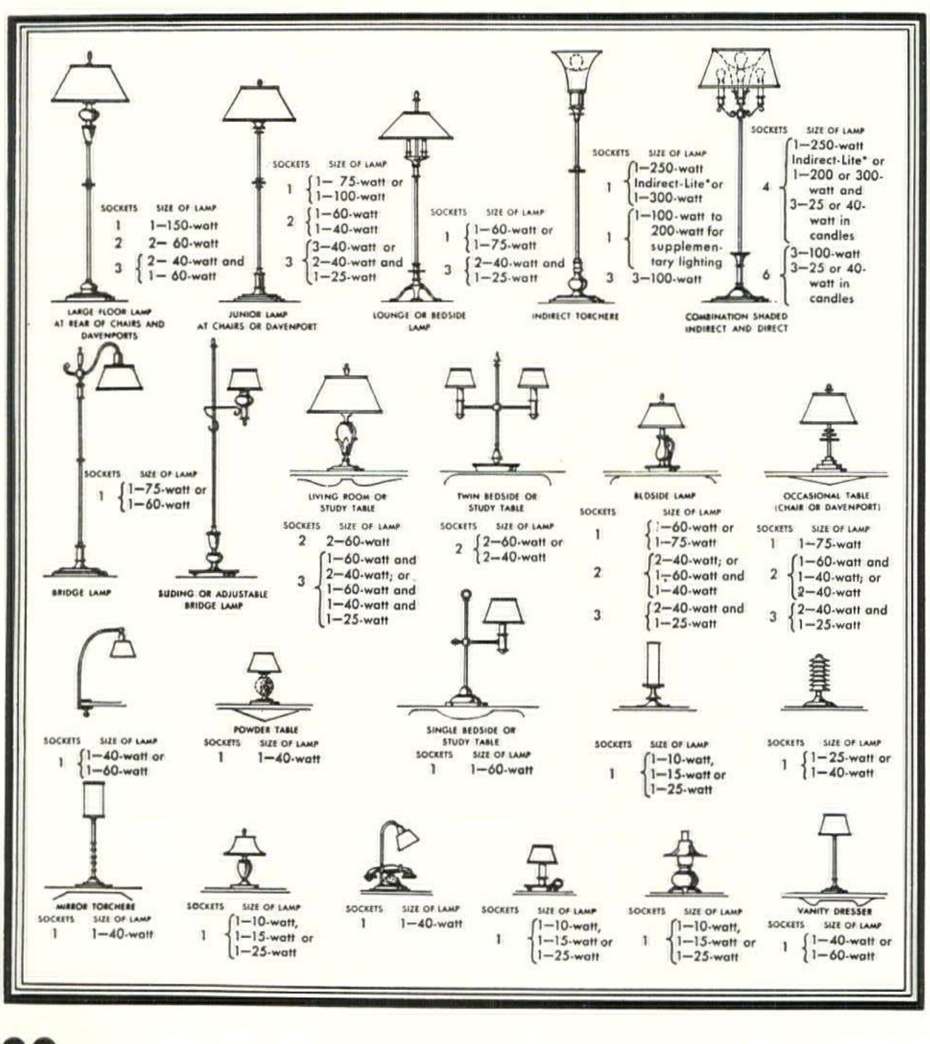
The toggle switch is now commonly used. It should always be placed on the lock side of a door, four feet from the floor. Where closet lights are not operated by door switches a luminous ball on the end of a pull chain will be a convenience. A switch that contains a pilot light used at the head of the basement stairs and at the foot of the attic stairs will tell when the light is left burning. A new 5-watt Mazda lamp is now available for this pilot light service. Mercury switches should be used in all locations requiring silent service.

LAMPS

The convenience and practicality of the lighting equipment will be increased if as few different types and sizes of lamps as possible are required. Equipment requiring special lamps is unsatisfactory because of the difficulty of replacement. Many different sizes lead to confusion and incorrect relamping.

MAINTENANCE

Practical equipment is accessible, easy to clean and relamp, non-deteriorating in service, not subject to style obsolescence, and made of standard parts.



THIS CHART, PREPARED BY THE GENERAL ELECTRIC COMPANY, IS A FAIRLY COMPREHENSIVE GUIDE TO THE TYPES, USE AND LAMPING OF PORTABLE LAMPS.

HOUSING OBSOLESCENCE

BY THOMAS S. HOLDEN,

VICE-PRESIDENT IN CHARGE OF STATISTICS AND RESEARCH, F. W. DODGE CORPORATION . . . CHAIRMAN OF MAYOR LAGUARDIA'S ADVISORY COMMITTEE ON REAL PROPERTY INVENTORY FOR NEW YORK CITY

SEE TABLE ON NEXT PAGE

Real property inventory reports for 25 small cities give important data on 230,091 residential structures containing 279,689 family units. These cities are well distributed geographically and the list includes slow-growing cities, rapidly-growing cities and cities with stationary population. Therefore the data appear to be adequate for drawing some general conclusions, particularly with respect to housing in American cities of less than 100,000 population.

Of these 230,091 residential buildings, 44.9 per cent were reported as needing minor repairs, 17.1 per cent as needing structural repairs, and 2.7 per cent as being unfit for use. The rather considerable need for minor repairs indicates a potential market for this kind of work; however, variations in the percentages of buildings so rated are not highly significant. The ratings of buildings needing structural repairs and of buildings unfit for use may be taken to include the structures in various stages of physical deterioration, and the combined percentages of buildings listed under these two ratings may be taken as indices of deterioration for the several cities.

In the accompanying Table the 25 cities are listed in the order of physical deterioration reported, and classified in six groups. The 4 cities of Group I have 25 to 40 per cent of their residential buildings either needing structural repairs or unfit for use; the 5 Group II cities, 20 to 25 per cent; the 6 Group III cities, 17 to 20 per cent; the 4 Group IV cities, 15 to 15½ per cent; the 3 Group V cities, 12 to 13½ per cent; the 3 Group VI cities, 10 per cent or less.

AGE AND OBSOLESCENCE

The buildings of the Group VI cities are, generally speaking, the oldest of all and are in the best physical condition. Next best in physical condition are the buildings of Group V, which contains Nashua with the highest median age of all, and Reno and Shreveport with unusually large proportions of relatively new buildings. In Group I, which has the worst physical condition, there are two cities, Paducah and Butte, with large numbers of old buildings; one, Asheville, with many relatively new ones; and one, Casper, with buildings of approximately average age. Butte is a city which has been losing population and now has an indicated housing surplus, which probably explains why many buildings there have been allowed to run down.

Comparison of structural repair needs with median ages of buildings seems to show that, in general, the ages of structures have little to do with their present physical condition.

STRUCTURAL MATERIALS AND OBSOLESCENCE

The Group I cities, whose buildings have deteriorated most, have a much larger percentage of masonry structures (brick, stone and concrete) than any other group, except Group VI. Omitting this last exceptional group, the proportion of masonry structures decreases as we go down the scale of structural repair needs. This does not, of course, prove that masonry construction is less durable than wood construction; it simply shows that the original materials of construction do not necessarily give any indication of the physical soundness of the buildings.

HOME OWNERSHIP AND OBSOLESCENCE

The figures for percentages of owner-occupied homes indicate a tendency toward less need for structural repairs in such buildings as compared with rental units. This tendency is perhaps brought out somewhat more clearly by the following comparisons: In the 9 cities having more than 40 per cent of homes owner-occupied, 17.5 per cent of the buildings either need structural repairs or are rated as unfit for use; in the 11 cities in which owner-occupancy ranges between 30 and 40 per cent of the total units, 20.5 per cent of the buildings are rated low in physical condition; in the 5 cities with less than 30 per cent owner-occupancy, 22.2 per cent of the buildings have low physical-condition ratings. The disparity is not very great, but there is a definite indication that owner-occupied property is generally kept in somewhat better condition than rental property.

RENTAL-SCALES AND OBSOLESCENCE

The valuations of owner-occupied dwelling units and monthly rentals of rental units were reported for all the cities. For purposes of comparison, valuations have been turned into equivalent rentals and combined with the actual rental figures. The median figure used to designate the general rental index for each city is the half-way figure, so taken that exactly half the units rate higher and half rate lower than the index figure. Thus the median figure $19.02 for all 25 cities indicates that a clear majority of the dwelling units would bring less than $20 a month in the rental market.

In Groups I, II and III, which have large numbers of dwellings that are unfit or require structural repairs, only 5 cities out of 15 have median rentals above $19.02. In Groups IV, V and VI, which have proportionately fewer buildings in poor physical condition, 9 out of the 10 cities have median rents above $19.02. The exception is Shreveport, where the low proportion of poor buildings is probably accounted for by its having an unusually large proportion of comparatively new buildings.

The relationship of structural needs to rent-scales is even more strikingly brought out by the following comparison: In the 11 cities having median monthly rentals under $19.02, 22.3 per cent of the buildings need structural repairs or are unfit for use; whereas the 14 cities with median rentals over $19.02 show only 16.3 per cent of their buildings with low physical ratings. In short, the buildings showing greatest structural deterioration are, generally speaking, low-grade buildings.

HOUSING OBSOLESCENCE

(TEXT ON PREVIOUS PAGE)

GENERAL CONCLUSIONS

Physical obsolescence is much less a matter of age or type of structure than of the quality of construction. This should be a matter of common observation requiring no statistical proof, but the figures are interesting and impressive.

It is likely that large numbers of existing structures which have deteriorated physically are not worth the expenditure of very much money other than for minimum repairs.

A nation-wide campaign to stimulate repairs and modernization, aided by the favorable credit conditions created by the National Housing Act, will probably create an important volume of business within the upper and middle levels of owner-occupied homes, and this business is worth stimulating as an emergency measure. It is not, however, comparable with the volume of replacement work that is conceivable under a long-range plan for elevating housing standards generally.

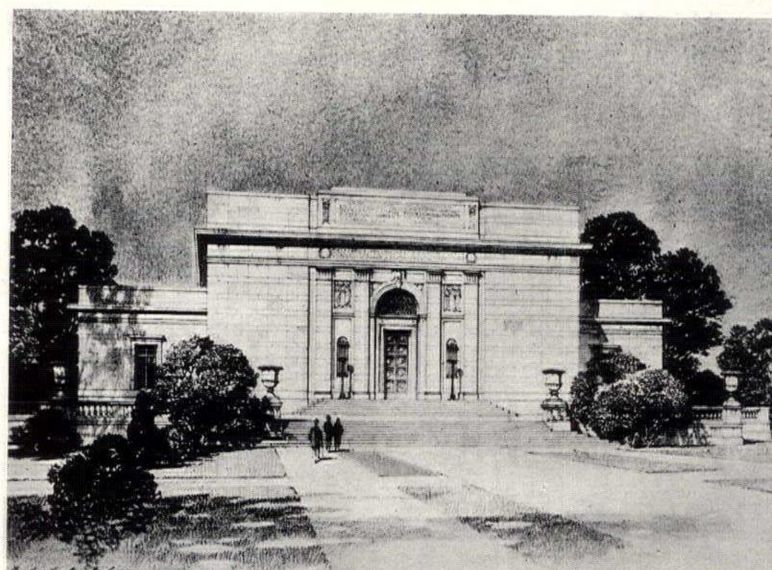
PHYSICAL DETERIORATION OF HOUSING STRUCTURES

CITY	NUMBER OF STRUCTURES	PER CENT NEEDING STRUCTURAL REPAIRS OR UNFIT FOR USE	MEDIAN AGE OF STRUCTURES	PER CENT OF MASONRY CONSTRUCTION	NUMBER OF DWELLING UNITS	PER CENT OF UNITS OWNER-OCCUPIED	MEDIAN MONTHLY RENTAL OR RENTAL EQUIVALENT
I. PADUCAH, KY.	7,765	39.6%	29 years	12.4%	9,029	33.6%	$10.92
BUTTE, MONT.	7,358	28.6	31 "	32.2	10,727	38.1	17.22
ASHEVILLE, N. C.	10,833	26.5	15 "	12.2	12,584	28.1	15.34
CASPER, WYO.	4,227	25.8	19 "	8.4	5,619	36.0	18.22
GROUP I	30,183	30.3%	20.6 "	16.6%	37,959	33.4%	$14.96
II. LITTLE ROCK,* ARK.	25,161	24.8%	18 years	12.1%	27,792	37.0%	$15.40
WICHITA FALLS, TEX.	9,667	22.7	18 "	7.7	10,722	32.0	12.44
PHOENIX, ARIZ.	10,519	21.8	13 "	34.0	14,392	28.4	19.65
COLUMBIA, S. C.	10,009	20.8	23 "	14.9	12,188	29.3	14.44
SPRINGFIELD, MO.	14,801	20.5	22 "	7.8	16,200	45.8	16.07
GROUP II	70,157	22.6%	17.0 "	14.3%	81,294	35.4%	$15.72
III. GREENSBORO, N. C.	11,000	19.7%	18 years	9.8%	12,061	29.4%	$17.25
BATON ROUGE, LA.	6,951	19.6	17 "	1.6	7,692	31.1	20.31
DECATUR, ILL.	14,662	19.1	21 "	9.6	16,407	43.9	20.82
PUEBLO, COLO.	10,882	18.8	28 "	28.6	12,723	46.4	14.32
BOISE, IDAHO	5,167	18.2	25 "	8.7	6,477	44.9	23.74
ALBUQUERQUE, N. M.	6,458	17.4	14 "	19.3	7,820	40.8	23.16
GROUP III	55,120	19.0%	20.3 "	13.4%	63,180	39.8%	$19.23
IV. SANTA FE, N. M.	2,145	15.4%	15 years	9.8%	2,720	45.0%	$24.40
SIOUX FALLS, S. D.	7,555	15.3	18 "	4.0	9,240	43.4	26.86
FARGO, N. D.	5,209	15.3	20 "	3.7	7,467	36.6	33.20
LINCOLN, NEB.	18,780	15.2	22 "	8.5	23,242	45.9	25.92
GROUP IV	33,689	15.3%	20.5 "	6.8%	42,669	43.7%	$27.04
V. RENO, NEV.	4,652	13.5%	16 years	23.5%	6,194	38.7%	$28.91
NASHUA, N. H.	4,646	13.4	40 "	35.5	7,969	36.0	22.87
SHREVEPORT, LA.	19,722	12.2	14 "	3.4	21,872	32.1	15.46
GROUP V	29,020	12.6%	15.6 "	6.6%	36,035	34.1%	$19.74
VI. HAGERSTOWN, MD.	5,035	10.0%	28 years	53.5%	8,149	33.0%	$20.13
FREDERICK, MD.	2,635	9.8	39 "	74.2	3,785	42.5	21.54
BURLINGTON, VT.	4,252	9.7	39 "	13.7	6.618	39.3	28.12
GROUP VI	11.922	9.8%	33.0 "	43.9%	18.552	37.2%	$23.34
TOTAL, 25 CITIES	230.091	19.8%	19.5 "	13.4%	279,689	36.7%	$19.02

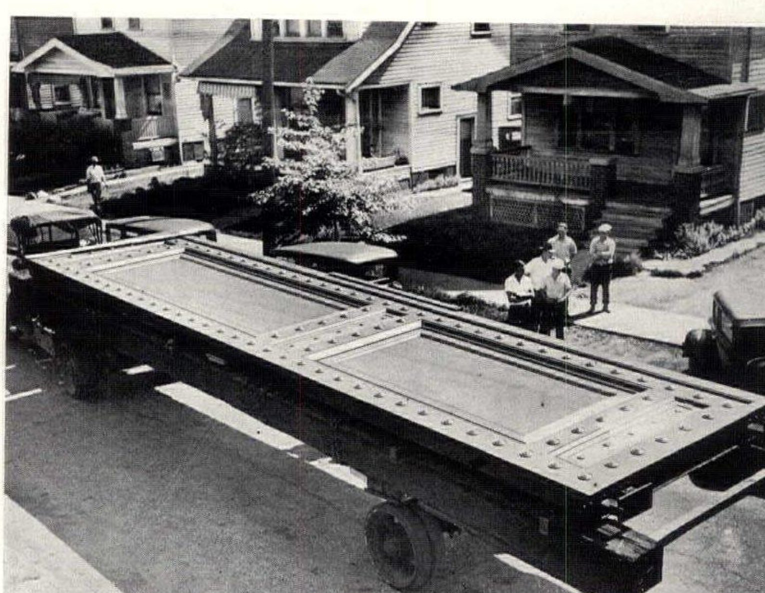
* Figures for metropolitan district.

ILLUSTRATED NEWS

Drawing of Sears' windowless department store being erected on the corner of 63rd and Halsted Streets in Chicago. Nimmons, Carr and Wright are the architects.

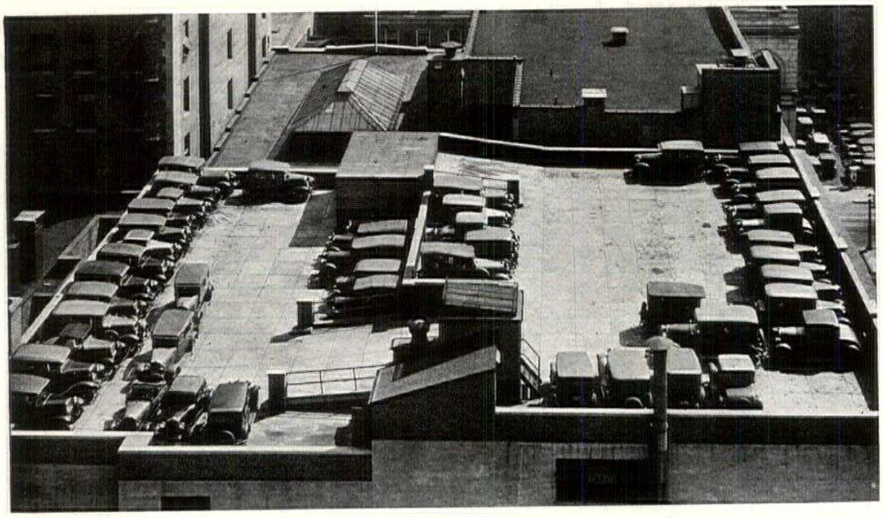


This building of Vermont marble, designed by John Russell Pope, is being erected opposite the Lincoln Memorial in Washington by the American Pharmaceutical Association. The structure is to be known as the National Institute of Pharmacy and will be the headquarters of the profession in the United States.



Wide World Photo

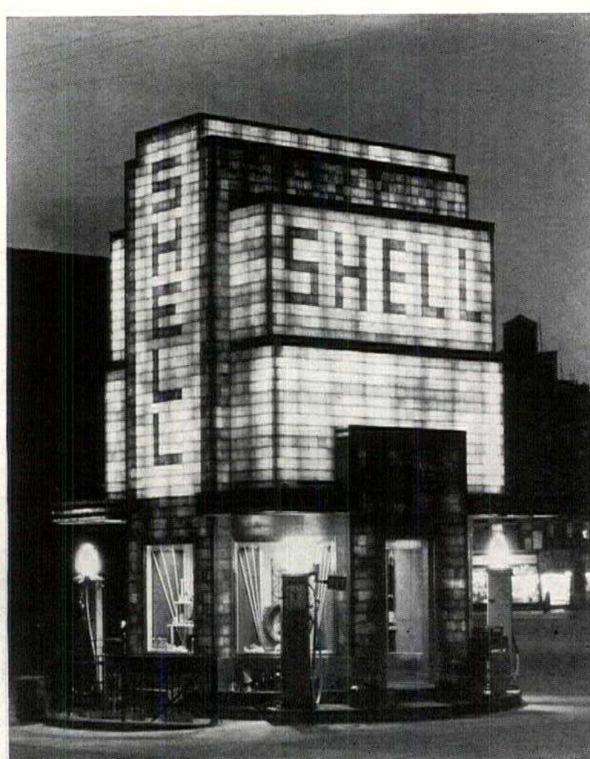
Largest door in the world on its way to Washington. Ten-ton portal, one of two each 35 feet high, 9 feet wide and a foot thick, made for the Government Archives Building, as it started from the factory in Cleveland where it was cast.



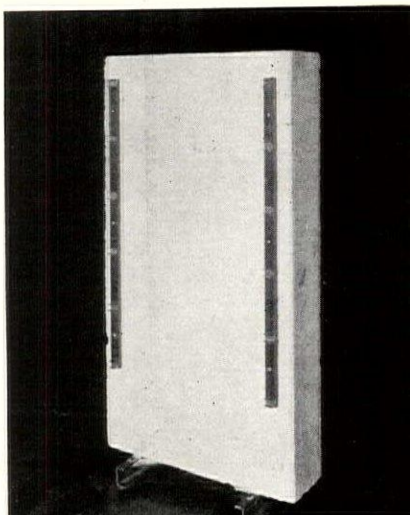
Ewing Galloway

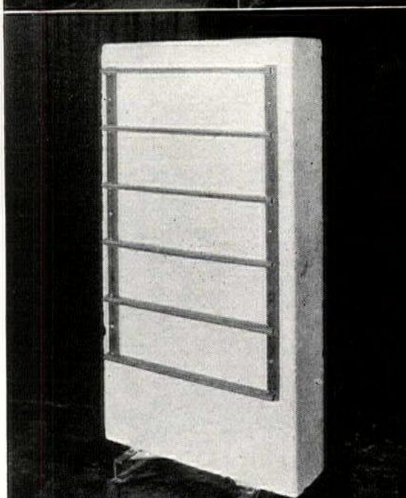
A roof top in Baltimore, Maryland, utilized for auto parking.

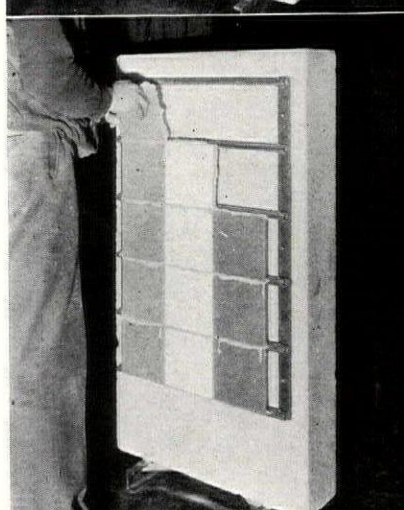
A new glass construction is demonstrated in this service station of Shell Eastern Petroleum Products, Inc., in New York City. The detail photographs show the method of construction developed by Sealed Joint Products Co. Eberson and Kautsky are the architects; Gilbert Miles Ramsey, associate architect.

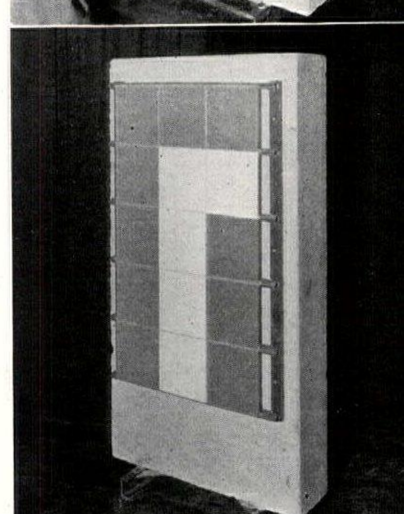


lbert Rothschild

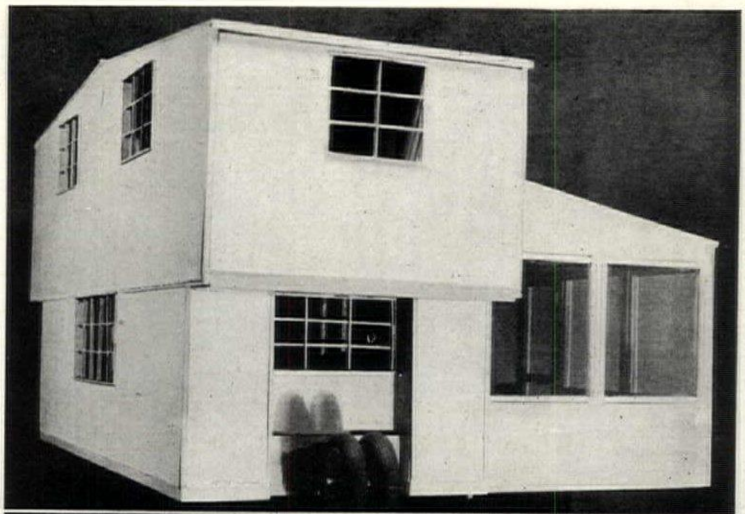


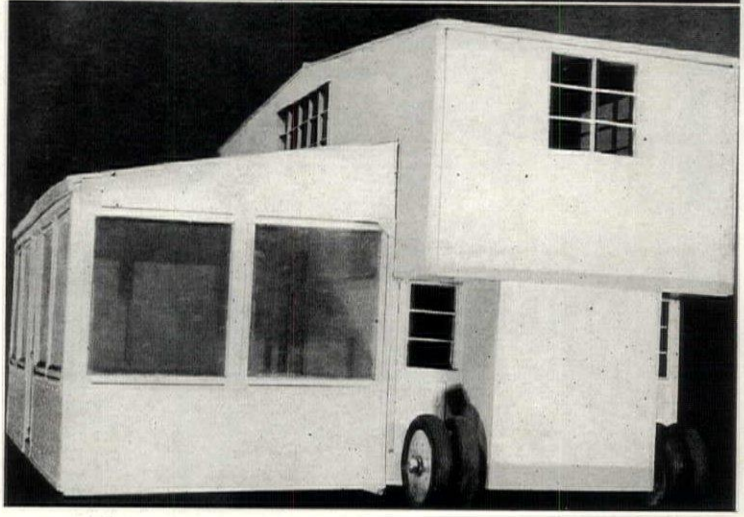






Model of a portable house with "in-built mobility." Designed for mass production by Corwin Willson of Flint, Michigan.





GOVERNMENT CONSTRUCTION

The United States Treasury Department has 193 buildings already under construction as part of the Treasury construction program, according to an announcement on July 4. These buildings, mainly post offices, involve the spending of approximately $52,000,000.

The Treasury Department, in charge of the erection of Federal buildings, has in hand in all approximately 900 building projects. The amount which will have been spent when all are completed is in excess of $167,000,000. More than $110,000,000 of this amount has just recently been allotted and appropriated in order to help relieve unemployment throughout every section of the country.

The building program is now being carried out in four separate divisions, paid for from four separate funds.

200 FORGOTTEN MUSEUMS

Discovery of 200 forgotten museums in the United States, that have somehow escaped attention, was announced recently at the meeting of the American Association of Museums by the director, Laurence Vail Coleman. "These newly discovered museums are all of one kind," said Mr. Coleman. "They are historic house museums—little institutions—concerned solely with the interpretation to the public of the houses they occupy."

More than 400 of these historic houses are maintained as museums in the United States. The United States has 1,700 museums now, Mr. Coleman announced, of which 200 are large museums of first rank.

A very important change in the public's use of museums is taking place, Mr. Coleman said, in connection with little, out-of-town museums. These institutions on sites of historic or scientific fame, used to be visited chiefly by local residents, who stayed an hour or so. Now these museums are addressing themselves to people who motor from a distance. Dozens of the museums serve meals, and some provide facilities for a few visitors to stay over night. Visitors spend more time in the museum, and the museum has a better chance to teach its lessons of history or science.

"DRY ICE" AS BLOW TORCH

Solid carbon dioxide, popularly named "dry ice," may, at a temperature of 112 degrees below zero Fahrenheit, compete with heat in securing "shrink fits" for machine parts. W. H. Swanger of the National Bureau of Standards who has been conducting experiments with solid carbon dioxide reports that machine shop practice may come to accept the new method of applying excessive cold instead of heat in shrinking metals.

When it is necessary to secure a metal band to a shaft, the usual practice is to heat the band. Expansion allows it to be slipped into place, and as it cools it contracts to a tight fit. However, by "refrigerating" the inside part, or shaft, it can be shrunk materially. The band is slipped on and when the shaft warms to room temperature it expands again to normal size, and a tighter fit is secured.

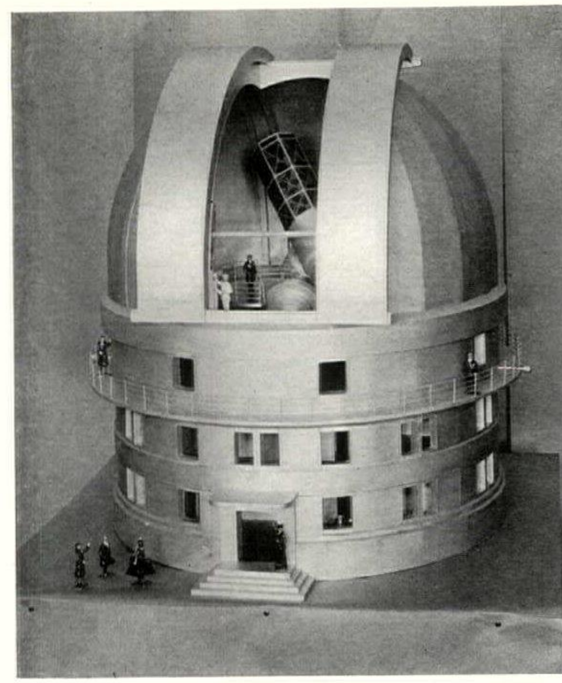
ELECTRICITY BLIGHTS WATER

Fugitive electric current has been identified as one of the surreptitious forces that at intervals blight water supplies, according to a report of researches in northern New Jersey by the Hackensack Water Company.

Coursing along a water pipe which provides a metallic path through the house wiring system from some household electrical device such as a vacuum cleaner, it seems to be a possible cause of certain tastes and odors which mysteriously appear in the water delivered to a consumer, yet absent in water in the street main, the report declares.

MAYANS POOR BUILDERS

It was lack of imagination, according to Science Service, that kept Mayan Indians in the American tropics from looking at their beautifully ornate stone buildings and seeing how the construction could be much improved. The Mayan engineers never discovered the principle of the true arch. They never learned the trick of



(Above) Model of McDonald Observatory fo University of Texas showing great reflecting tele scope with its 80-inch mirror and 62-foot revolvin dome. When erected on Mt. Locke, it will be th second largest in the world. Length of tube—2 feet. Total weight of moving parts of telescope— 45 tons.

(Left) A small portable bar designed by Alfre Roth, architect, of Zurich, Switzerland.

bonding or overlapping their building stones to make a firmer structure.

This is the verdict of Lawrence Roys, noted engineer, who has just completed an appraisal of the engineering knowledge of America's most famous prehistoric builders. Mr. Roys made his study under the auspices of the Carnegie Institution of Washington.

The imagination of the Mayas was poured out on artistic creations. The sculptors never wearied of contriving elaborate patterns and resplendent figures of gods and men. But the engineers and architects who laid the plans and raised the walls achieved no comparable progress in technique.

"It would seem," says Mr. Roys, "that their architects thought in terms of monolithic masses wherever possible, and took comparatively little interest in the manner in which individual stones were laid together."

The Mayas developed only moderate skill in fashioning the dry rubble masonry of roadways, platforms, and pyramids. They do not seem to have tried using wood to supplant stone in their more permanent structures. Their wall building methods set up strains when the foundations settled, and resulted in long vertical cleavages. In handling lime cement or concrete, on the other hand, Mayan builders made better progress, and Mr. Roys is highly complimentary to the real skill they acquired in using this medium. As for their greatest engineering achievement, he considers this to be the vaulted roof.

TOMORROW'S ARCHITECTS

There is much evidence to point to a promising future for architects of a wholly new type, according to Walter B. Pitkin*:

"They will be trained both in design and in engineering. And they will concern themselves especially with small and inexpensive home planning and mass production, as well as with community building.

"There is much evidence, however, to point to a promising future for architects of a wholly new type. They will be trained both in design and in engineering. And they will concern themselves especially with small and inexpensive home planning and mass production, as well as with community building.

"Look for your first chance in small communities where there is a proved demand for cheap and medium priced homes. At first they will not be efficiently produced. Mass production will arise only with a marked improvement in employment and purchasing power. Should the Federal Government step in with a vast housing program, look for a revolution in the industry almost overnight. Otherwise the demand for the next few years is likely to be for progressive architects who can shoulder the responsibilities not only of design, but of construction and financing as well. Home owners have so long been cheated by grafting builders, contractors, and real estate and financial agents that they turn steadily to reliable architects to take full charge of their entire program. To succeed here, architects mu know their communities, the physical a financial requirements of the dwelling as well as the economic status of pro pective owners.

"When pre-fabricated housing develo on a large scale, the old-style archite will yield to competent designer-enginee The latter must have exhaustive knowled of building costs, materials, and the m efficient and inexpensive production met ods. Since the average householder is su picious of radical change in exterior desi and materials, the first revolution will cur in construction. More and more ho owners will accept and soon demand conditioning throughout the home, stan ardized tight windows, rooms sound-proof against both inside and outside distu ances, a more flexible distribution of el trical outlets, and a far more efficient fl plan.

"As to building in general, there h been so little of it during the past fo years that soon a substantial amount new building will be necessary. When used, building space wears out rapidly, a as new industries develop they require n conditions of enclosure. Hence new mands may soon become so enormous th the architectural profession will be put it to rebuild its lost organizations."

The author's comments on architects a architecture were amended and approv by Harvey Wiley Corbett.

*New Careers for Youth. By Walter B. Pitk Simon and Schuster, 386 Fourth Avenue, New Y City. 236 pages. $1.50

General view of concourse in the new railway station at Hamilton, Ontario, in Canada. The wainscot, doors and frames, counter grilles, column coverings and walls are all steel. The walls are finished in baked enamel of a deep terra cotta color. The column coverings are also of steel, finished in bright aluminum enamel.

The huge chimney of the United States Government Assay Office at South Street and Old Slip in New York City—a rival to the Manhattan skyscrapers.

Keystone-Underwood

GUILBERT AND BETELLE, ARCHITECTS

Photograph by George Frenc

VISUAL EDUCATION AT NEWARK, N. J., PUBLIC SCHOOL OF FINE AND INDUSTRIAL ART

THE
ARCHITECTURAL RECORD
VOL. 76, NO. 2 AUGUST, 1934

NEW SCHOOLS ARE NEEDED

By C. THEODORE LARSON

A general survey of educational conditions in this country reveals two major trends:

(1) Because of tax delinquencies and dwindling revenues, school services in general have been seriously restricted and in many communities, particularly those in rural areas, the schools have been closed entirely.

(2) At the same time population growth and industrial code provisions limiting child labor have increased enrolments, especially in the vocational and high schools, to an extent which indicates a widespread demand for new school construction.

This present inadequacy of educational opportunities has resulted in appeals by the distressed localities and States for emergency Federal aid. Several bills were introduced in Congress to provide such funds, and from February 26 to March 1 hearings were held before the Committee on Education, House of Representatives. This committee unanimously reported the Douglass Bill, permitting grade and high schools to draw on a $75 million fund under FERA supervision and on the advice of the U. S. Office of Education; it was emphasized that the measure would be limited to one year and should be considered in no sense the beginning of a permanent policy of Federal aid to the schools. The recommended bill failed to come to a vote before the adjournment of Congress.

REDUCED EXPENDITURES FOR SCHOOLS

Perhaps the most complete summary of existing conditions is to be found in the report of the National Committee for Federal Emergency Aid for Education which was read into the record of the Congressional hearings.* The following facts, based on findings of the U. S. Office of Education and the Research Division of the National Education Association, were quoted:

(1) Many schools, affecting thousands of children, failed to open in September 1933.

(2) Before January 1, 1934, about 2,600 schools were closed, denying 140,000 children the opportunity to attend school.

(3) Except for such Federal aid as has been and may be granted this year, 20,000 schools involving more than a million children will cease to operate by April 1, 1934.

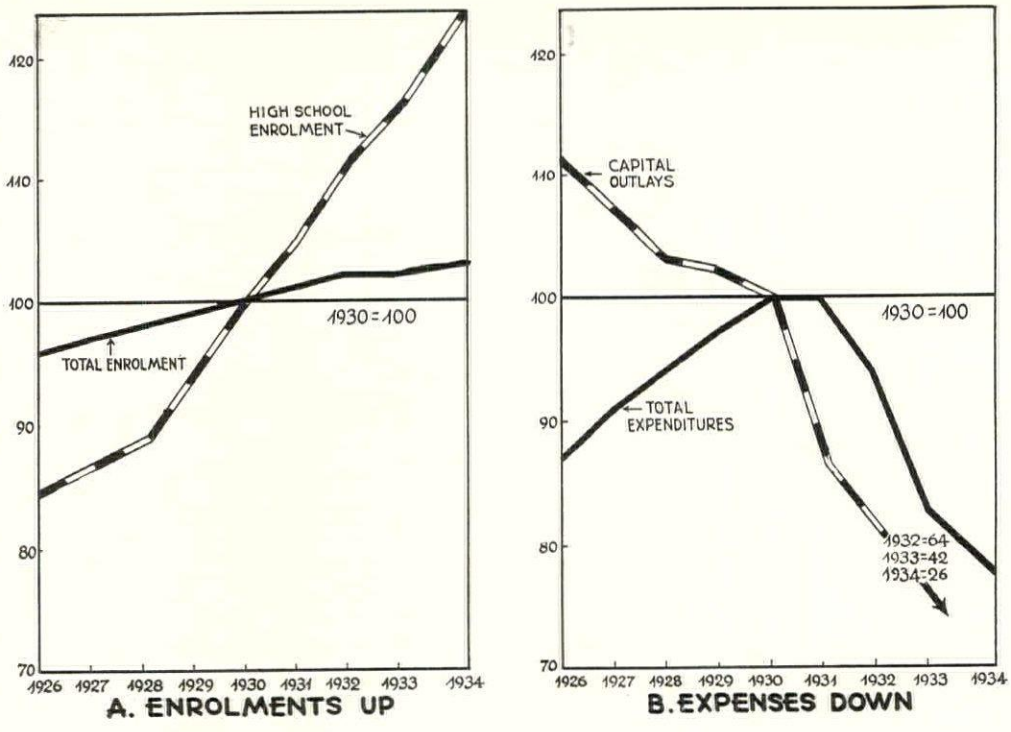
(4) Many public schools are being kept open only by charging tuition.

(5) Important units and services such as kindergartens, health services, and classes for handicapped children have been discontinued.

(6) Building programs have been almost completely discontinued. Although more than 400,000 pupils in city schools and a much larger number in rural districts are improperly housed, expenditures for school buildings are 74 per cent lower than those of 5 years ago and 76 per cent below expenditures in 1926.

*Pages 29-48, *Hearings before the Committee on Education, House of Representatives, Seventy-Third Congress, Second Session, on House Bills Providing for Federal Emergency Relief for Education, February* 26, 27, 28 *and March* 1, 1934: U. S. Government Printing Office. The statements recorded in this document of 249 pages give detailed descriptions of the educational crisis in different communities.

RECENT TRENDS IN PUBLIC SCHOOL STATISTICS



(7) Approximately 40,000 fewer teachers were employed in 1934 than in 1933 and nearly 60,000 fewer than in 1932. In view of advancing enrolments, this means a dangerous increase in class size.

(8) More than 200,000 teachers (one-fourth of them all) are receiving less than $750 per year, the minimum amount paid factory workers under the blanket code of the President's Reemployment Agreement. Approximately 85,000 of these teachers are receiving less than $450 a year.

(9) At the close of the school year 1933 in city school systems alone, unpaid salaries amounting to $29,689,749 were reported. For the nation as a whole, total unpaid salaries exceeded $40,000,000.

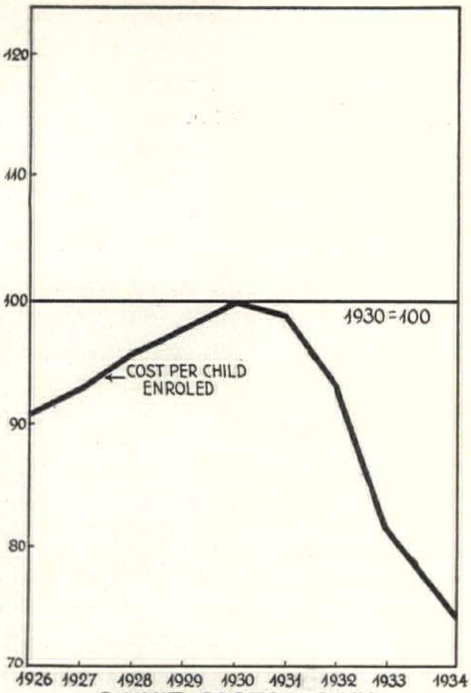
(10) Returns from 29 States about February 15, 1934, showed the sum of $33,-172,000 in outstanding warrants and certificates of indebtedness for teachers' salaries in 14 States. In addition, there were 9 States with unpaid salaries amounting to a total of $11,108,000. In 6 other States warrants were being cashed at discount rates ranging from 5 to 40 per cent, no estimate being available on the amount outstanding. In only 8 of the 29 States were all salaries being paid in cash when due.

(11) To operate schools, even with the rigid economies outlined above, Federal money amounting to more than $5,675,000 will have been used by March 1, 1934, for the salaries of teachers on relief rolls. These expenditures touch only the most serious aspects of the problem in limited areas and are far short of the sums really needed. Nevertheless, Federal funds will be used in increasing amounts during the remainder of the year as local and State school funds are exhausted.

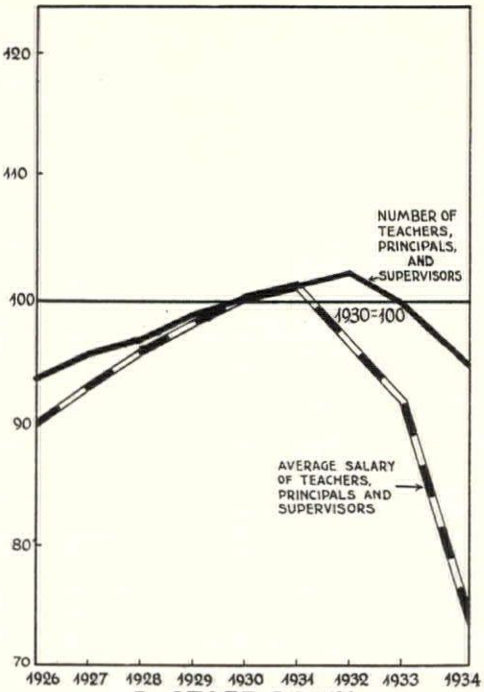
According to the report, incomplete returns from 36 States show that on January 15 of this year more than 5,000 teachers were being kept in regular classrooms by Federal aid. An indication of the growing need for this relief is seen in the statement of disbursements month by month: October, $75,000; November, $316,-902; December, $1,280,791; January, $1,611,-556; February, in excess of $2,500,000.

About 75 per cent of school funds normally are obtained from the general property tax. During the past few years, however, two trends —(1) a decline in the assessed valuation of property and (2) an increase in tax delinquency —have operated to curtail this source of revenue. The possibility of obtaining in 1934-35 additional revenue from State and local sources is lessened by tax-limitation laws existing in many States and by the fact that tax levies in many cases are already at the maximum.

Although State governments can tap sources not available to local school districts, the Federal Emergency Aid Committee report goes on to say, there is no evidence that they will be able to extend enough aid where local resources are depleted to keep the schools functioning during 1934-35. An abnormal growth in the bonded debt for school purposes was registered



C. UNIT COSTS DOWN



D. STAFF DOWN

RESEARCH DIVISION
NATIONAL EDUCATION
ASSOCIATION

in the period 1930-32, and further State and local borrowing for school support is impractical, for—as the report states—if credit facilities were available, school districts would not be indebted to their employees to the sum of more than $40 million.

During February statements were obtained from 44 State departments of public instruction in an effort to determine the school revenue available in 1934-35. In 8 States conditions are so uncertain that the State superintendents could make no prediction, but in 21 States which did report estimates, the expected income for 1934-35 is 30 per cent below expenditures in 1932 and 35 per cent below those in 1930.

INCREASING NEED FOR NEW SCHOOLS

During the depression years expenditures for school construction have dwindled rapidly, dropping from a capital outlay (purchase of buildings, sites and major equipment) of $370,878,000 in 1930 to an estimated $97,600,000 in 1934 (National Education Association figures). The bulk of recent construction is attributable to Federal funds: up to June 15 the Federal Emergency Administration of Public Works reports a total allotment of $74,189,860 for 493 school projects.

In many fields declining construction has followed declining demand as a result of business and industry moving more slowly, but in the school field the demand has steadily *increased*, as shown by enrolments. Each year roughly 200,000 more children have entered the public schools than in the preceding year—an annual gain of slightly less than 1 per cent.*

The number of high school students has increased at a much more rapid rate than the total enrolments—about 2 per cent annually from 1926 to 1928, and about 4 per cent thereafter. It is probable, according to the National Education Association, that all or nearly all of the increase in total enrolments is now occurring in the high school bracket. This conclusion is confirmed by estimates of the U. S. Office of Education which suggest that elementary school enrolments in the nation at large have already begun to decrease. The increase in high school enrolments is also significant financially, because it is in this classification that higher costs are involved.

Since the discontinuance of school building construction cannot be attributed to lessened demand, only two other possibilities remain, as James H. Richmond, chairman of the National Committee for Federal Emergency Aid for Education, points out:† Either (1) school construction was so far ahead of actual housing needs at the beginning of the depression that few additional buildings were required, even with an additional enrolment of a million pupils, or (2) a building program has been halted that should have been carried forward.

No significant rise in school building expenditures occurred after 1922. Beginning with 1926, four years before the first depression year, the

*Research Bulletin of the National Education Association, November, 1933.

†Statement in support of the Gregory Bill, H.R. 8955, specifying that not less than 10 per cent of any funds appropriated for public works by the 73rd Congress should be used to provide proper housing in public schools and public colleges.

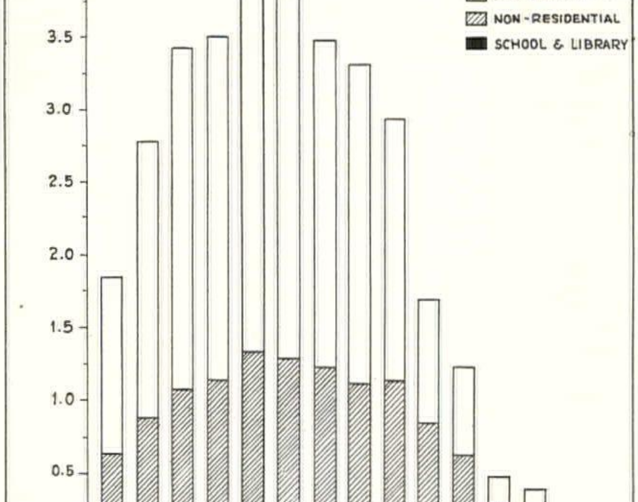
trend turned downward and, since 1930, the drop has been precipitous. Comparing school construction with building construction of other types, Mr. Richmond finds that:

> Between 1921 and 1923 school and library construction forged slightly ahead of all nonresidential construction, and since 1930 it has run ahead of residential construction. But from 1924 through 1929, during the height of prosperity, school building construction lagged behind other types. Never since 1923 has the index for school and library projects equaled that for nonresidential construction in general.

Since the data just presented have not been related directly to school enrolments, broad generalizations with respect to the adequacy of school building programs cannot be drawn from them. In view of the fact, however, that school building construction lagged behind construction of other types during a period of rapid school growth (one in which school enrolments increased approximately 20 per cent as compared with an increase of only 16 per cent in the general population), these data indicate conservatism rather than unjustified expansion.

Although no complete summary of the school building needs of the nation is available, enough facts are at hand to show that a widespread and urgent need exists. On the basis of reports from 1,266 cities, it is estimated that during the school year 1932-33 more than 26,000 children in city school systems attended school on a part-time basis and that about 145,000 were housed in temporary or portable buildings. Thus, leaving out of consideration for the moment the need for better school buildings in rural communities, and disregarding also the increases in enrolment, more than 400,000 school children are improperly housed.

EXPENDITURES FOR BUILDING CONSTRUCTION IN 257 IDENTICAL CITIES SINCE 1921



*Included with the amounts for residential purposes are sums reported for additions, alterations and repairs. Source: U. S. Dept. of Labor, Bureau of Labor Statistics, *Building Operations in Principal Cities in* 1932; page 844.

EMERGENCY EDUCATIONAL PROGRAM

Within recent months Federal agencies have begun aiding the schools. In reply to inquiry, the Educational Division, Federal Emergency Relief Administration, writes that during the fall and winter the Relief Administration maintained an emergency educational program consisting of various phases of adult education and nursery schools. Some funds were authorized for the aid of rural elementary schools in communities under 2,500 population which were financially unable to continue to provide a normal length of school term. This entire emergency program received a total of some 9 million dollars.

On February 2, Harry L. Hopkins, Federal Emergency Relief Administrator, issued a new authorization permitting relief funds to be used in school districts where State and local finances had broken down completely, and where, without extra aid, the public schools would be obliged to close short of a normal term. This authorization was made available not only to elementary schools but also to high schools in communities up to 5,000 population. From February 2 to the end of the current school year, a total of $16,-924,659 was spent in 33 States under this specific authorization.

As part of a student aid program, relief funds totaling about $4,500,000 were extended to 75,-000 men and women students in universities and colleges to complete their courses. This aid averaged $15 a month for each student in return for nonclassroom work. The beneficiaries were attending 1,300 colleges and universities throughout the country and represented approximately 10 per cent of the registration.

No relief funds were made available under any FERA authorization for the maintenance of school buildings and equipment. Under the CWA, the building program primarily restricted renovation and remodeling but not drastic reconstruction; new construction was limited almost entirely to small rural schools. In establishing nursery schools CWA labor was made available for remodeling a few rooms in existing school buildings.

Ewing Galloway

"Good roads and buses now provide easy transportation over large areas and permit consolidation of school districts."

LONG-RANGE IMPLICATIONS

The National Education Association and other professional and civic groups have joined in urging the Federal government to give consideration to the needs of the schools as part of the emergency recovery program. The Congressional hearings, however, make clear that there are two well-defined schools of thought concerning education as a permanent policy—one believes that education is essentially the duty of the State, the other believes that the Federal government should assist the States as a national policy.

In many States educators have made surveys to determine economies which would put the public schools on better financial footing and which could be made without injury to school children or their teachers. The most important of these possibilities is reorganization of the district system to secure larger and more effective administrative division. The old-fashioned school district, which is the unit in most States, is criticized as being awkward and wasteful in a time when children no longer must live within walking distance of their school. Good roads and buses now provide easy transportation over large areas, and permit consolidation of districts.

Experience shows, however, that change in the administrative structure of the schools is usually a slow and difficult process because of local prejudices. As William J. Wallace, secretary of the House Committee on Education, comments in the May issue of *School Life*:

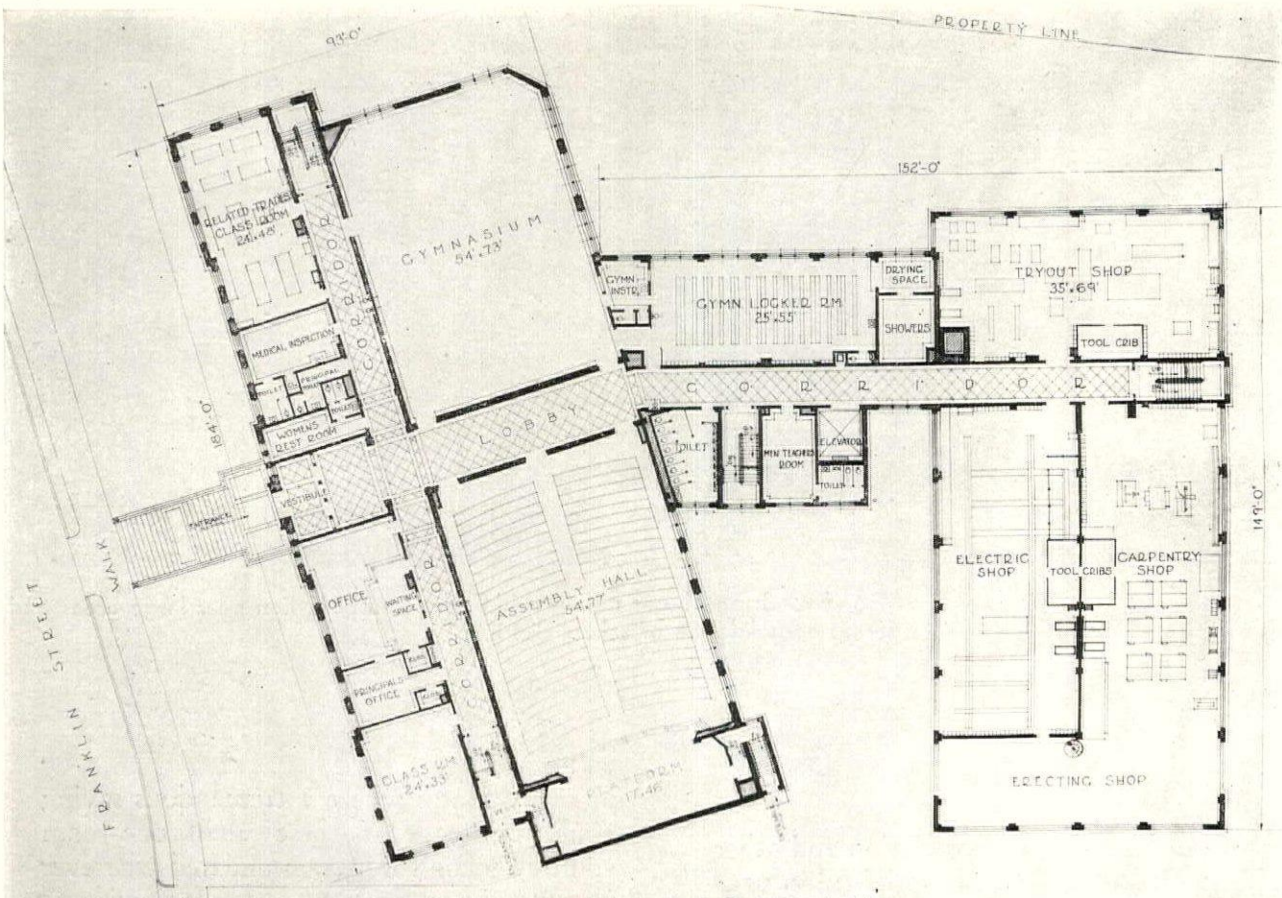
> Perhaps one of the most startling conditions brought to light during the hearings was the almost complete lack of consolidation of rural schools. There were situations in many States where a tremendous saving could be made if these small one-room country schools were consolidated wherever possible. Local pride often tends to prevent consolidation, and it also appears that the only worthwhile consolidation that can be made must be based upon a State-wide survey and not independent county surveys.

Further confirmation of the desirability of such administrative reorganization is expressed in a statement by William G. Carr, director of research division, National Education Association, to The Record:

> Desirable consolidations of rural school districts should be encouraged in the interest of economy and educational efficiency, but such consolidations are blocked in many communities by the inability of rural districts to provide the funds necessary for the required new consolidated buildings. The old one-room schools have become obsolete because of changes in social conditions largely beyond the control of the rural population. The rural population is not able at the present time, and cannot reasonably be expected, to finance the construction of new buildings and to absorb the loss resulting from the abandonment of the old buildings.

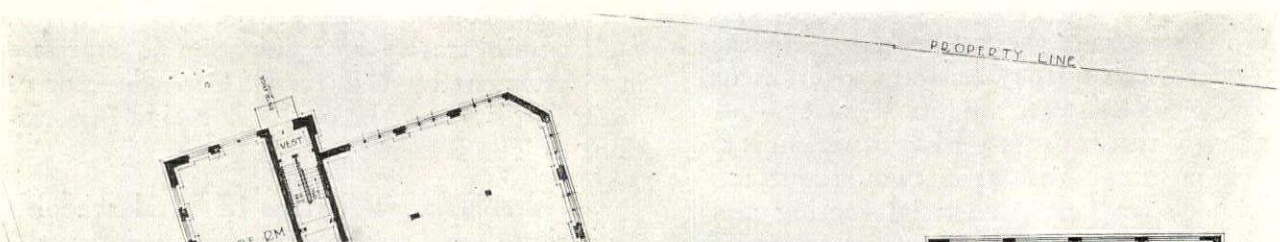
Here, then, is a field* for architectural initiative if State or Federal funds become available.

*Two mimeographed pamphlets may be useful in this direction: *Financial Implications of the Consolidation of Schools and the Transportation of Pupils*, by Timon Covert (Circular No. 117), and *A Selected and Annotated Bibliography on Education During the Depression, Particularly Emphasizing Economies*, by Martha R. McCabe (Circular No. 118), published by the Office of Education, U. S. Department of the Interior, Washington, D. C.



FIRST FLOOR PLAN

ESSEX COUNTY BOYS VOCATIONAL SCHOOL AT BLOOMFIELD, NEW JERSEY



GROUND FLOOR PLAN

VOCATIONAL SCHOOLS

INCREASING ENROLMENTS BECAUSE OF INDUSTRIAL CODES INDICATE A BUILDING NEED

By JAMES O. BETELLE, Architect

THE object of the vocational school is to fit an individual to pursue effectively a recognized profitable employment, thus enabling him to earn a better living and at the same time to raise the general standard of citizenship. It also provides opportunities that will encourage the progress of individuals into more desirable occupations. It is intended for persons over fourteen years of age who are preparing for a trade or industrial pursuit, and for those who have already entered a vocation.

It is not designed to take the place of the general education now given in the regular schools, but in a large measure is intended to keep at school those pupils who would otherwise leave to go to work. The number of pupils seeking employment at an early large is large, and the cause of their leaving school is not always an economic one. With courses of studies such as the vocational schools provide, many of these pupils can be kept at school two or three more years and receive sufficient training in useful occupations to take them out of the unskilled labor class.

Vocational schools are run on several different plans: (1) the all-day vocational school, where the pupil devotes the entire school day to instruction. (2) The part-time or continuation school, where the pupil, having already gone to work, devotes a part of the working time for further education. (3) The evening school, where mature workers attend evening classes, receiving instruction supplementary to their day employment.

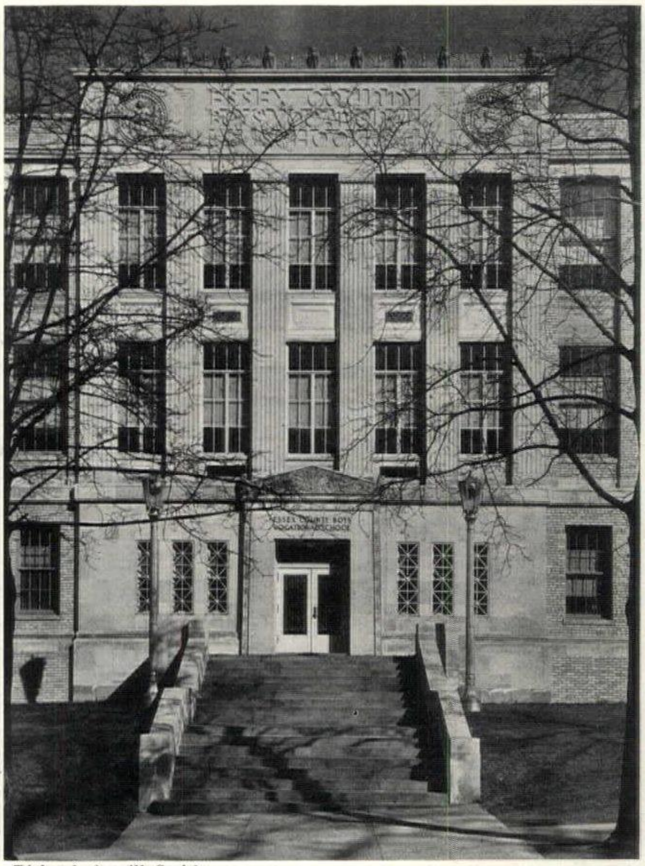
The subjects taught and the instruction given in each course are recommended or approved by an advisory committee consisting of representative men and women actively engaged in those particular fields. Thus is maintained a close contact with those who know what the students should be taught. (The wide range of subjects is indicated by the accompanying illustrations.)

ALTERATION POSSIBILITIES

It is sometimes desired or suggested that an available large factory, possibly vacant or for sale, be altered and used for a vocational school. At first this appears feasible and a good way to obtain large accommodations for very little money, and it has been successfully done in a number of cities. However, it has disadvantages, such as improper location regarding the center of school population, transit facilities and environment. The window lighting area will very likely be far below the recognized standard or law requirements; ventilation and heating will be inadequate, and lighting and toilet facilities bad. On the other hand, it would have the advantage of large areas and closely approach actual shop-working conditions.

Old abandoned school buildings are sometimes suggested in order to get the vocational school started at minimum expense. These have the disadvantage of small rooms difficult to alter, and fail to impress the pupil with the atmosphere of a shop, which is important to secure efficient results. The principal advantage is the saving in first cost. It is unnecessary to state the advantages of a new building, specially designed and properly located for the vocational school. These advantages are, of course, recognized and a new school provided in all cases where funds are available.

ESSEX COUNTY BOYS VOCATIONAL SCHOOL AT BLOOMFIELD, NEW JERSEY
GUILBERT AND BETELLE, ARCHITECTS



Richard Averill Smith

LIBRARY

LOCATION OF SCHOOL

There are many advantages in a school composed of a group of buildings. The separate buildings can be devoted to the various trades and additional buildings can be built as needed. The shops can often be erected one story high and made to approximate very closely actual shop conditions. Naturally, a site of large area is required for such a scheme.

The location of a vocational school is just as important as the location of ordinary schools, but for somewhat different reasons. The center of the school population of the city or district is not so important in this case as a proper location easily accessible to the majority of the pupils. The school should also be convenient to the various manufacturing plants, as part-time courses may be provided wherein the school shops are used for special instruction to apprentices in their respective trades on certain days of the week during specified hours.

While a quiet location is essential for the ordinary school, it is not so important for the vocational school, although desirable. Many of the pupils will come from a distance, and accessibility to trolley lines or other means of transportation is therefore important. As the school is likely to be located in a very busy section of the city, school playground space will be expensive and is not an absolute necessity. The children attending this type of school would get considerable exercise in their school and shop work, and a school gymnasium is generally included.

DESIGN CRITERIA

A vocational school should be given the expression of both a factory and a school. On the whole, the design should provide as ideal conditions as funds will permit, so that the pupils will be used to the best shop conditions, and thereby create a demand on the part of labor for a betterment in shop conditions in the various trades when the pupils begin their working career. The academic departments should be planned in the usual way, as now standard in ordinary schools, and if possible should include an auditorium and gymnasium. The portions devoted to shops should be in large areas, on account of the constant changing in importance of the various industries, which makes a flexible plan desirable. Two similar activities can be conducted side by side in one large space, without a dividing partition, so that if more room is needed in either study this may be readily arranged. In arranging the shops and academic departments, these should be in separate groups with the classrooms centrally located, as all shops will need to use them. In the shops, units of fifteen pupils each can best be handled in one group, while in the academic department the usual high school class of thirty pupils is satisfactory.

SCHOOL EQUIPMENT

There is nothing particularly unusual about the plumbing and electric equipment, except that enough should be provided, arranged and of sufficient capacity so that changes and additions can be made at a minimum of trouble and expense.

It has been pointed out that most vocational schools are either overequipped, or have too much equipment of one kind. It is much better to have a few of a variety of apparatus than many of one kind. It must also be realized that new machinery and methods are constantly being developed and the shop equipment to be most effective must be kept up to date. In private business, competition is so keen that changes and improvements must be made to keep up with the procession. In the school problem, no such situation arises; the tendency is to keep on using old machinery and methods and thus to save expense; needless to say, this is bad economy. A variety of equipment also permits individual instruction, which is so much to be desired over a group or class instruction.

COSTS

A definite statement as to the cost of vocational schools is difficult in these days of varying and rising prices. It is safe to say, however, that a school building of the vocational type will cost at least 10 per cent more than an ordinary school of the same cubature. The reason for this can be readily understood when one considers the heavier construction of floors and walls needed to support heavy moving machinery, and the additional and scattered plumbing necessary in washrooms, toilets, and drains for special equipment. Electric wiring must be much more elaborate to provide service for the different individual motors on the various machines and the increased individual lighting required at each bench and machine, in addition to general illumination. A saving, however, is made in the simple and cheap shop construction as compared with the more costly school classroom construction.

The cost of teaching and of equipment and maintenance is somewhat beyond the scope of this article, but generally this expense is high. It can be cut down within reasonable limits by making the shops serve some purpose beyond that of education. Useful articles can be made and sold, or made for use somewhere else in the school system. By not buying all the needed equipment when the school opens, pupils can have the experience of making certain portions. In many instances odd jobs and minor new work in the school system, such as repairing broken glass, painting outside and interior of the building, are done by the students all to good advantage.

It has been pointed out that vocational education is expensive, but that ignorance is more expensive. It is coming to be more and more recognized that money devoted to education is an investment rather than an expense. In connection with vocational schools a more or less complete department of vocational guidance is maintained. It is here that the young people are advised and counseled as to their future occupation and life work. The object is to avoid the economic loss of misfits in industry, to explain the meaning and advantages of the various trades, and to assist the pupil in making a wise choice of a pursuit for which he is best adapted. While the vocational school is primarily to guide the pupil in his selection of a trade, it is to a certain extent an employment bureau as well. Here employers make application for help, and positions are obtained for the pupils. Record is also kept of the needs of the various industries, to the end that the vocational institution shall fulfill the demands of labor but avoid overproduction in any department.

ESSEX COUNTY BOYS VOCATIONAL SCHOOL AT BLOOMFIELD, NEW JERSEY

GUILBERT AND BETELLE
ARCHITECTS

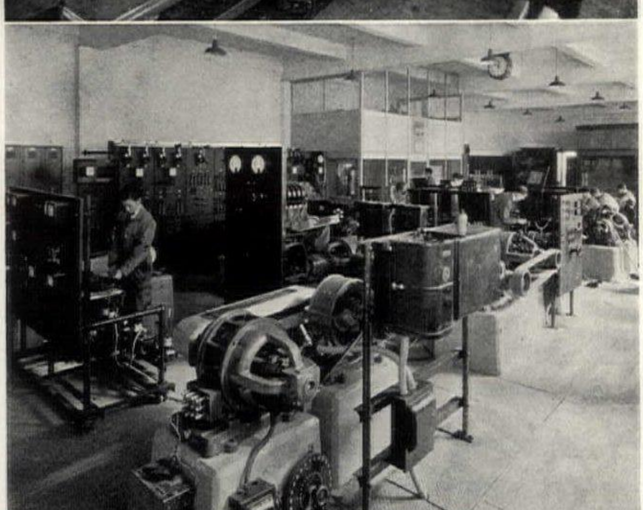
Right:

(1) Aviation shop. (2) Automobile shop. (3) Machine shop. (4) Electrical shop. (5) Drafting room. (6) Cafeteria kitchen. (7) Carpentry shop. (8) Plumbing shop.

1

2

3



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William F. Cone photographs

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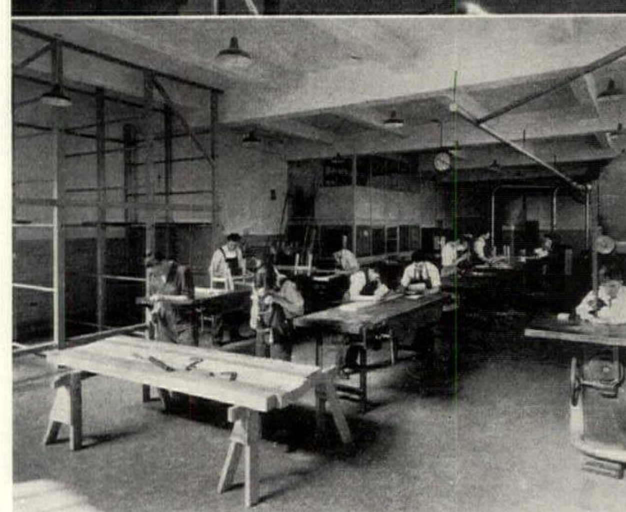

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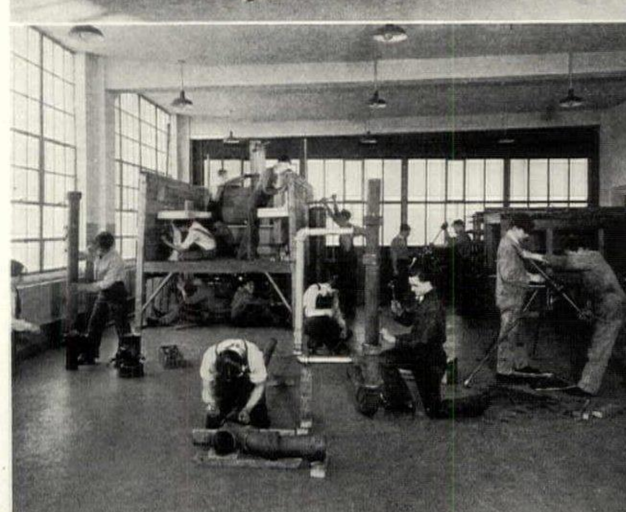

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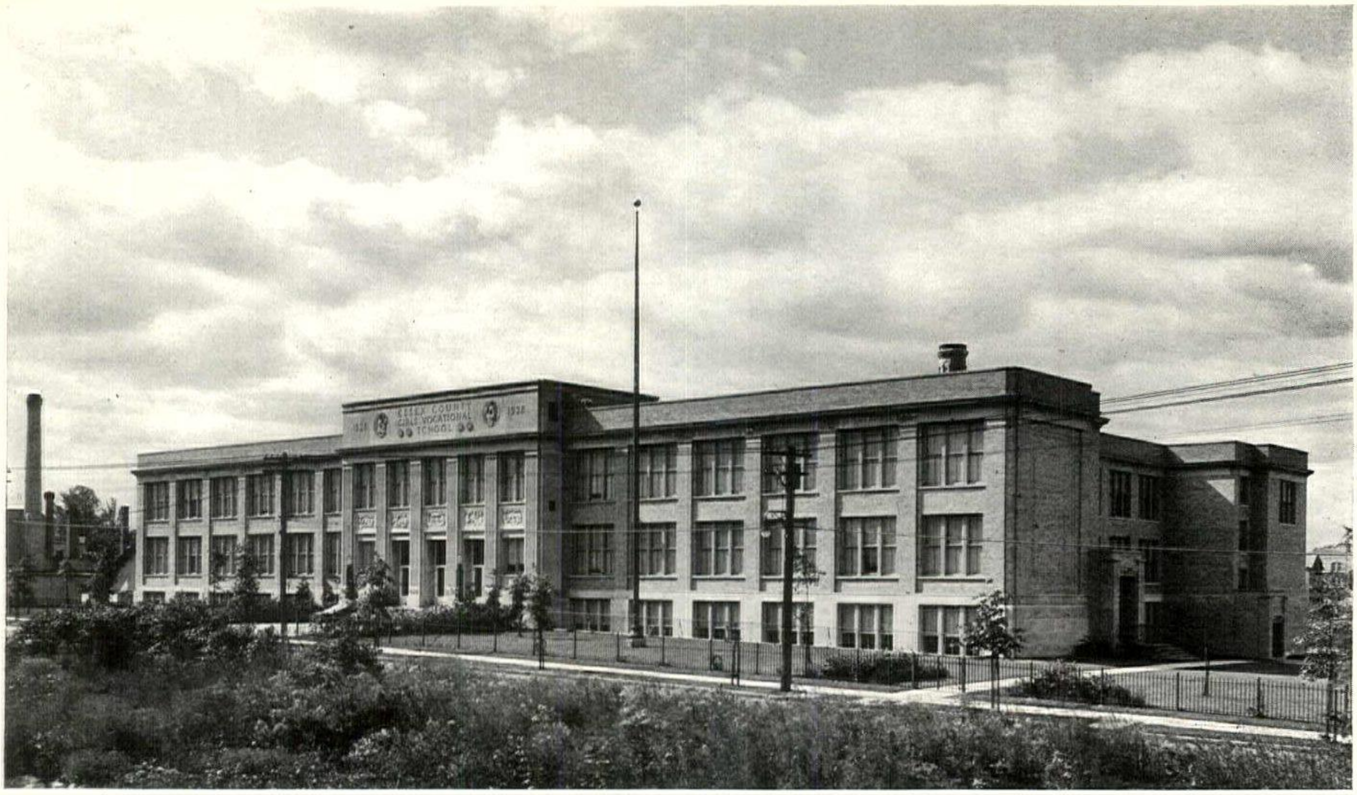


ESSEX COUNTY GIRLS VOCATIONAL SCHOOL AT NEWARK, NEW JERSEY

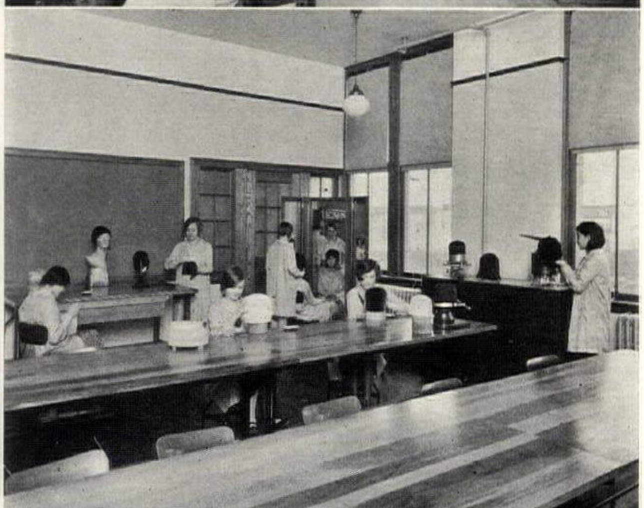
William F. Cone

GUILBERT AND BETELLE
ARCHITECTS

Left:
Main entrance lobby. The show windows are used in training students in window decoration.

Right:
(1) Display shop. (2) Millinery class. (3) Power machine operation. (4) Advanced dressmaking class. (5) Dental assistants class. (6) Art class. (7) Beauty culture class. (8) Manicure class.


1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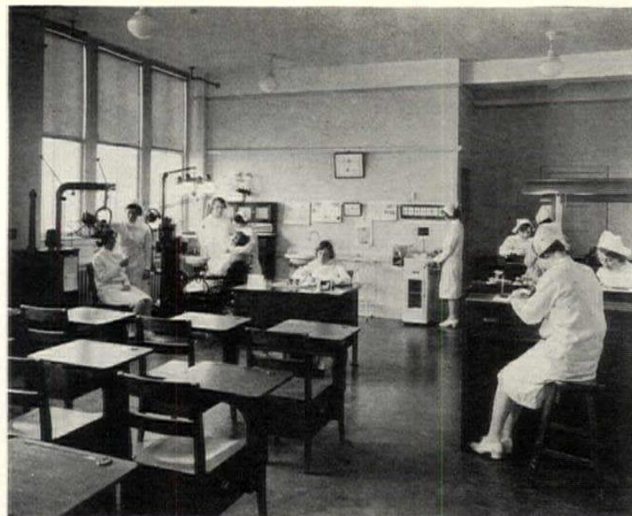
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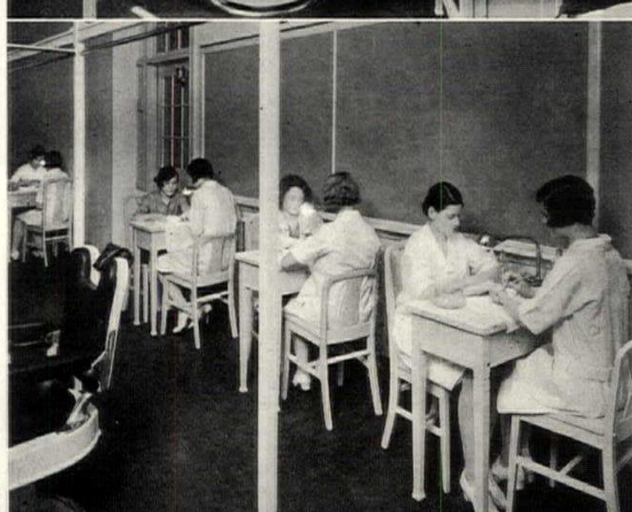
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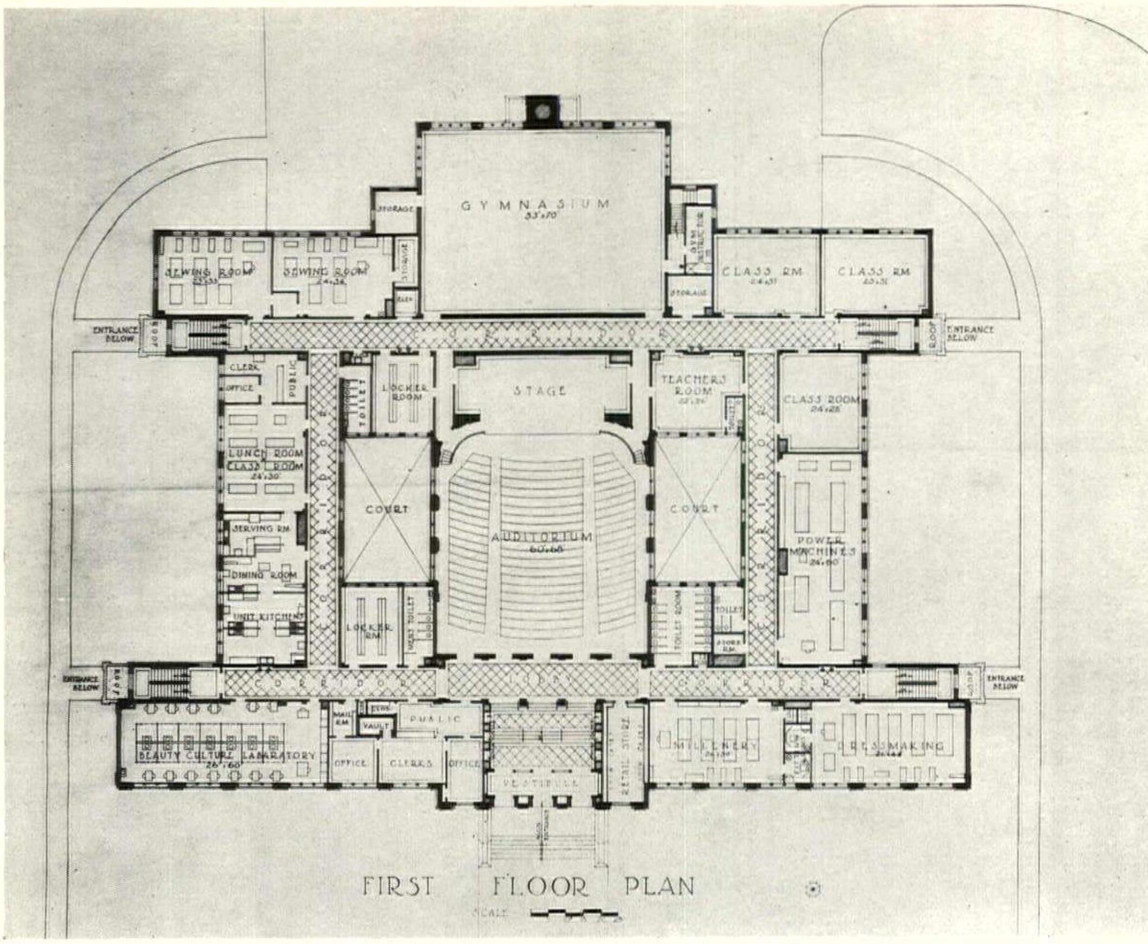
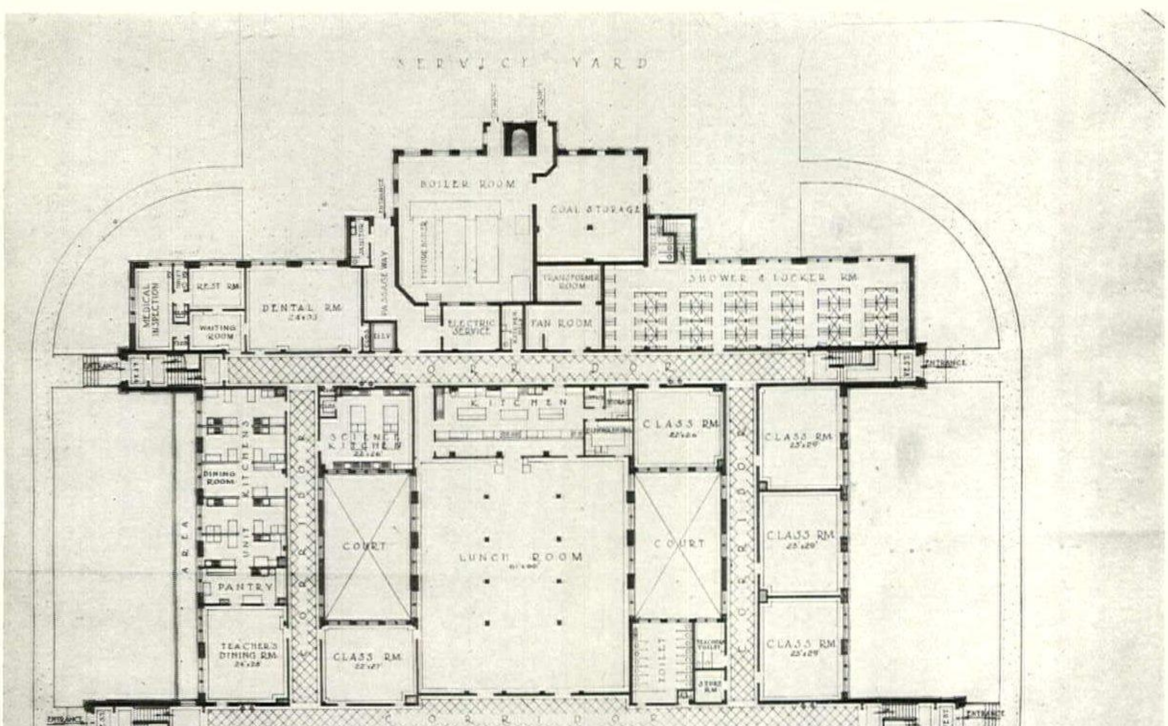


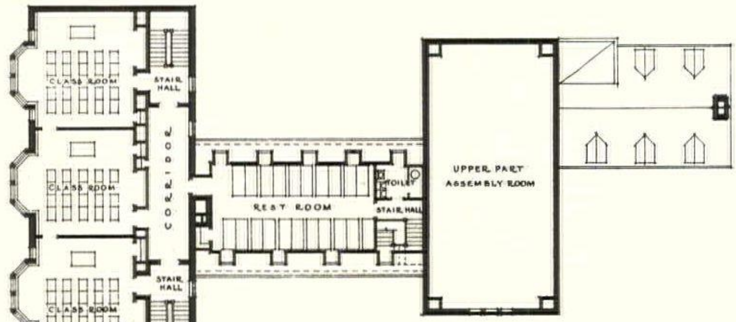
FIRST FLOOR PLAN

ESSEX COUNTY GIRLS VOCATIONAL SCHOOL AT NEWARK, NEW JERSEY



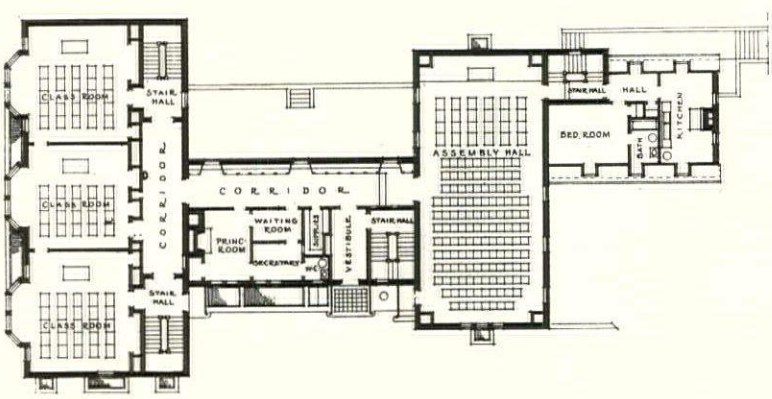
GROUND FLOOR PLAN

DEXTER SCHOOL AT BROOKLINE, MASSACHUSETTS
PERRY, SHAW AND HEPBURN, ARCHITECTS



SECOND FLOOR PLAN

SCALE



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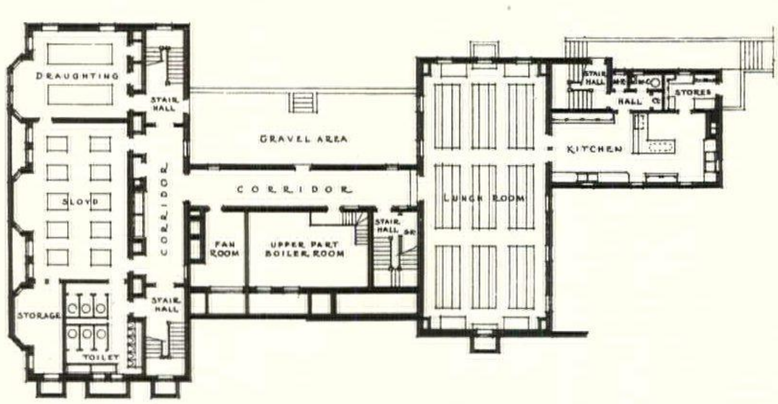
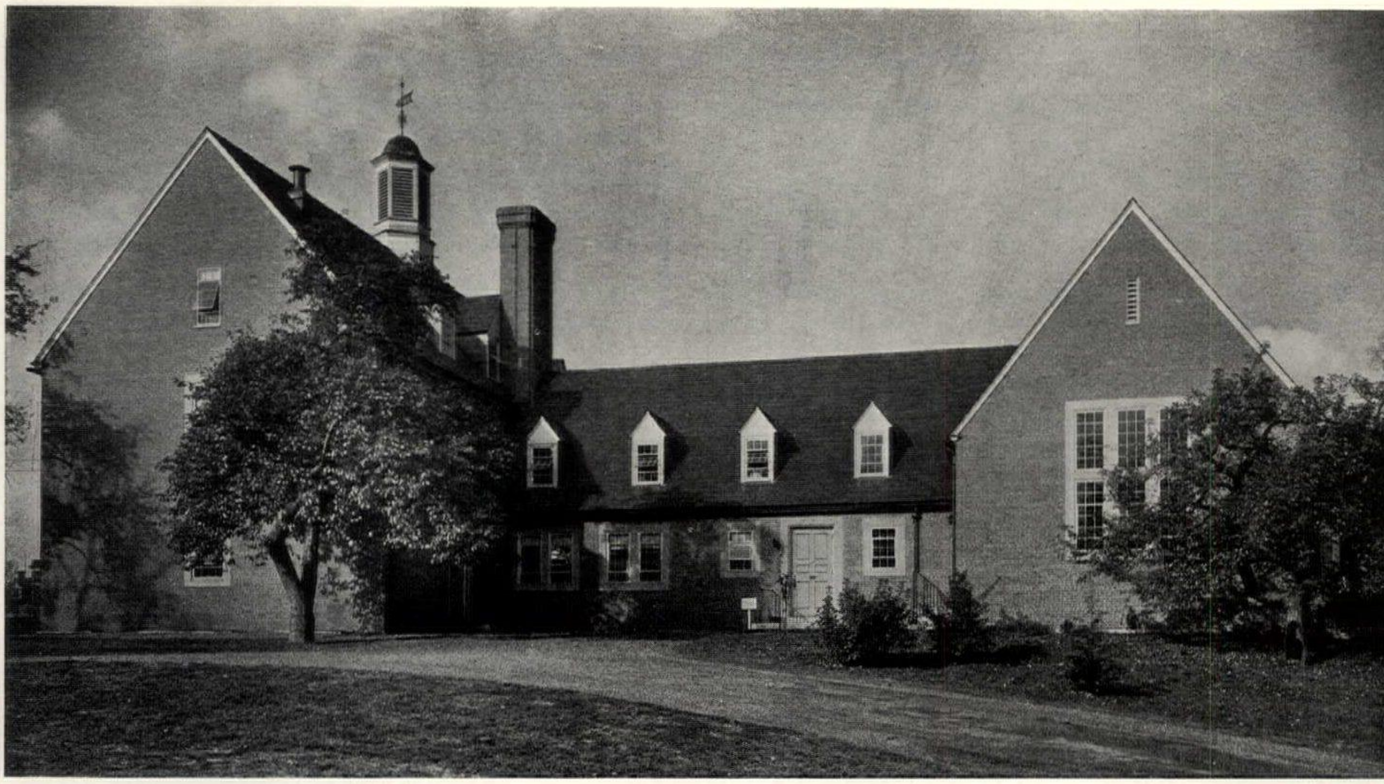
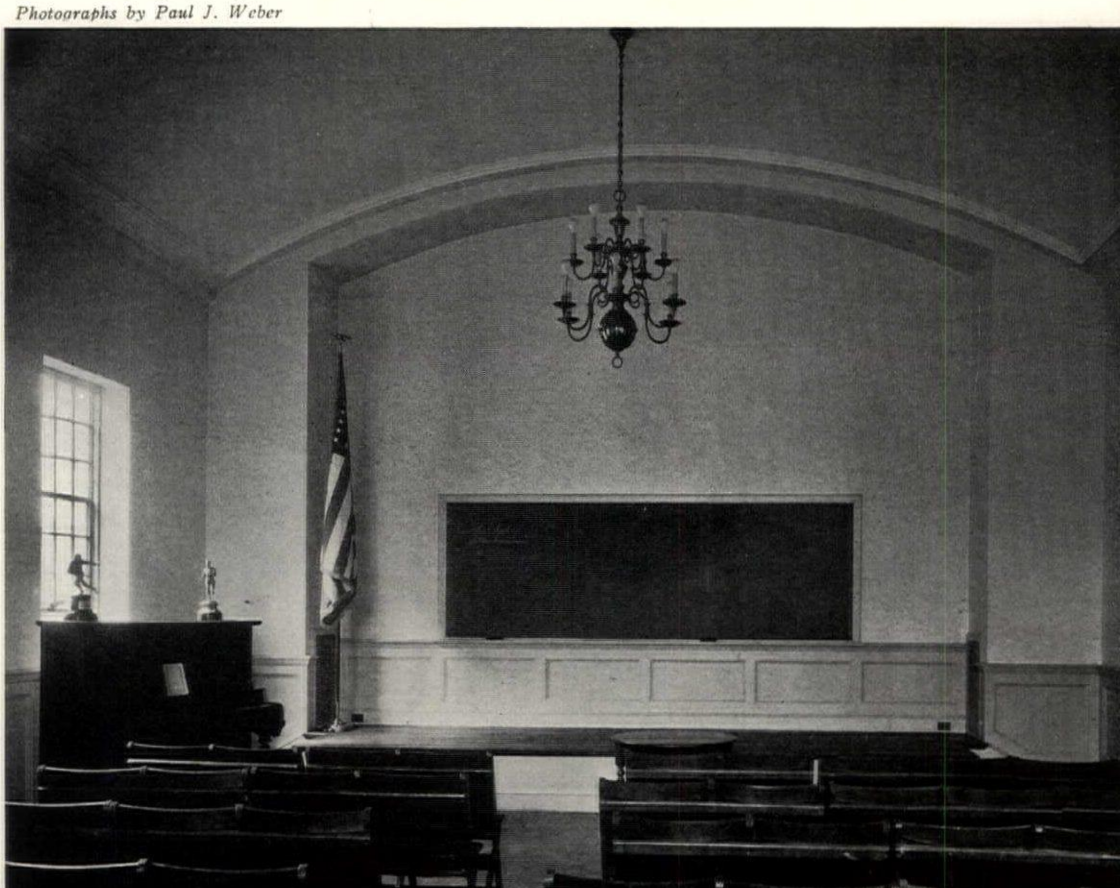


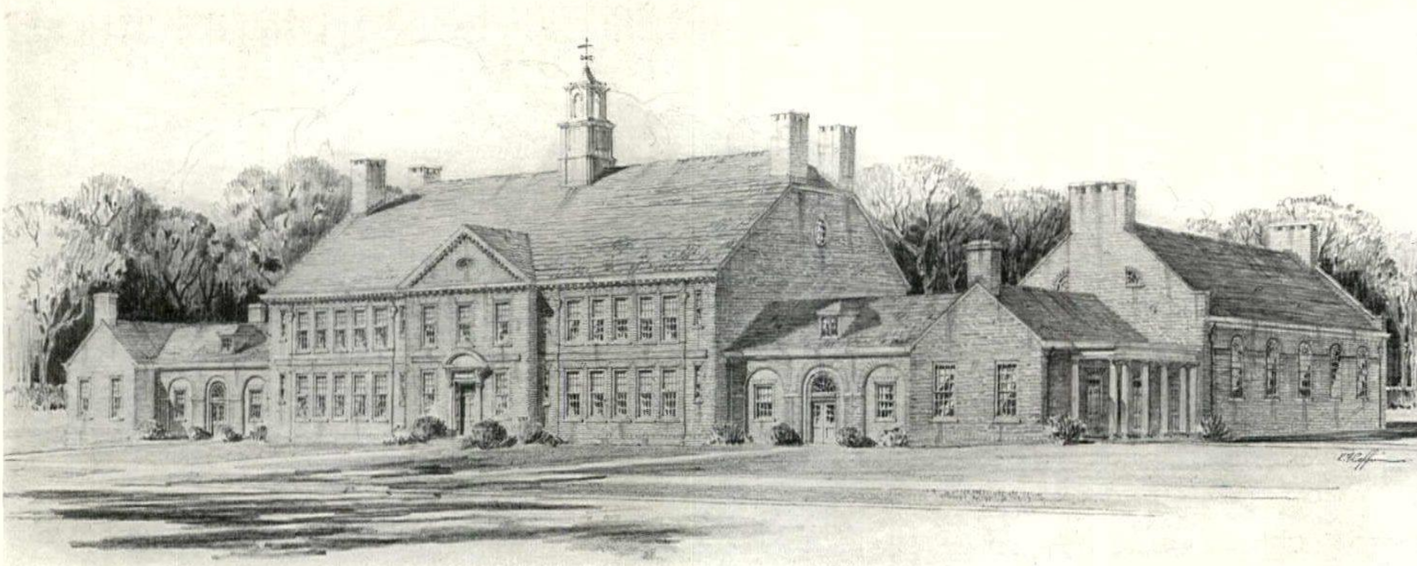
BASEMENT PLAN



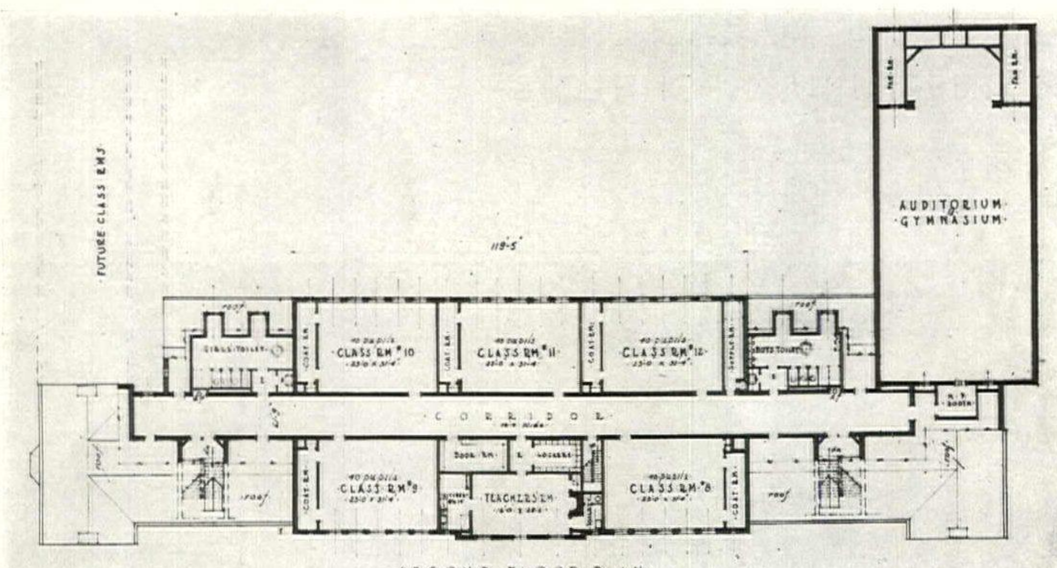
DEXTER SCHOOL AT BROOKLINE, MASSACHUSETTS
PERRY, SHAW AND HEPBURN, ARCHITECTS

Photographs by Paul J. Weber





WOODROW WILSON GRADE SCHOOL— WESTFIELD, N. J.
COFFIN AND COFFIN, ARCHITECTS

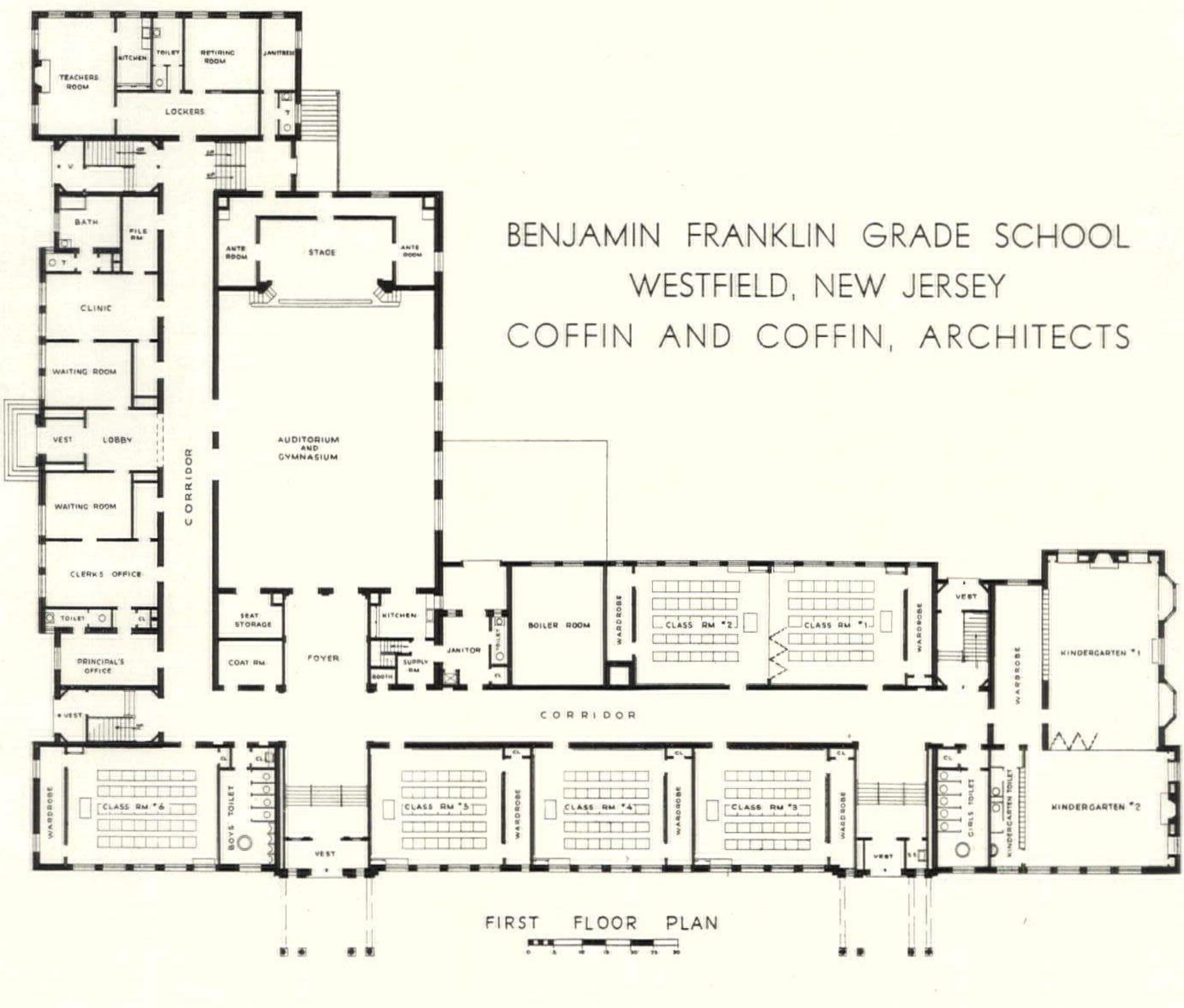


SECOND FLOOR PLAN

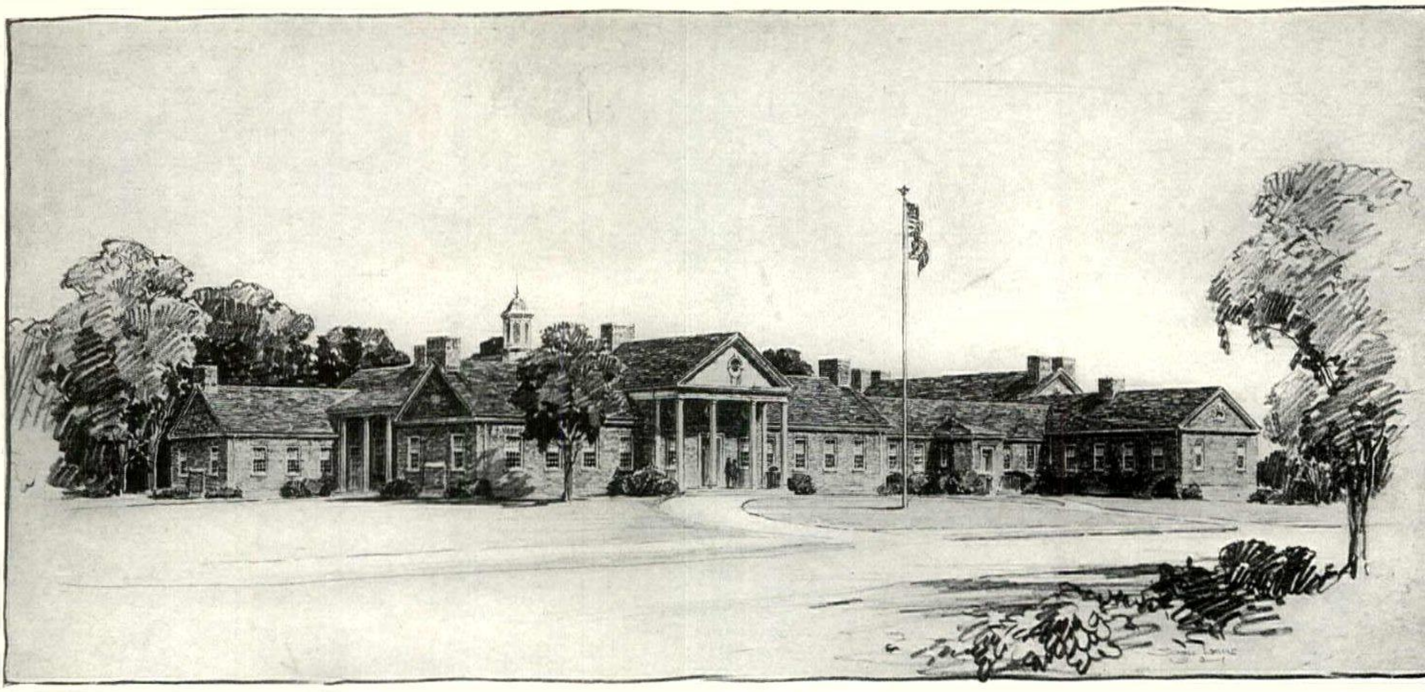
FIRST FLOOR PLAN

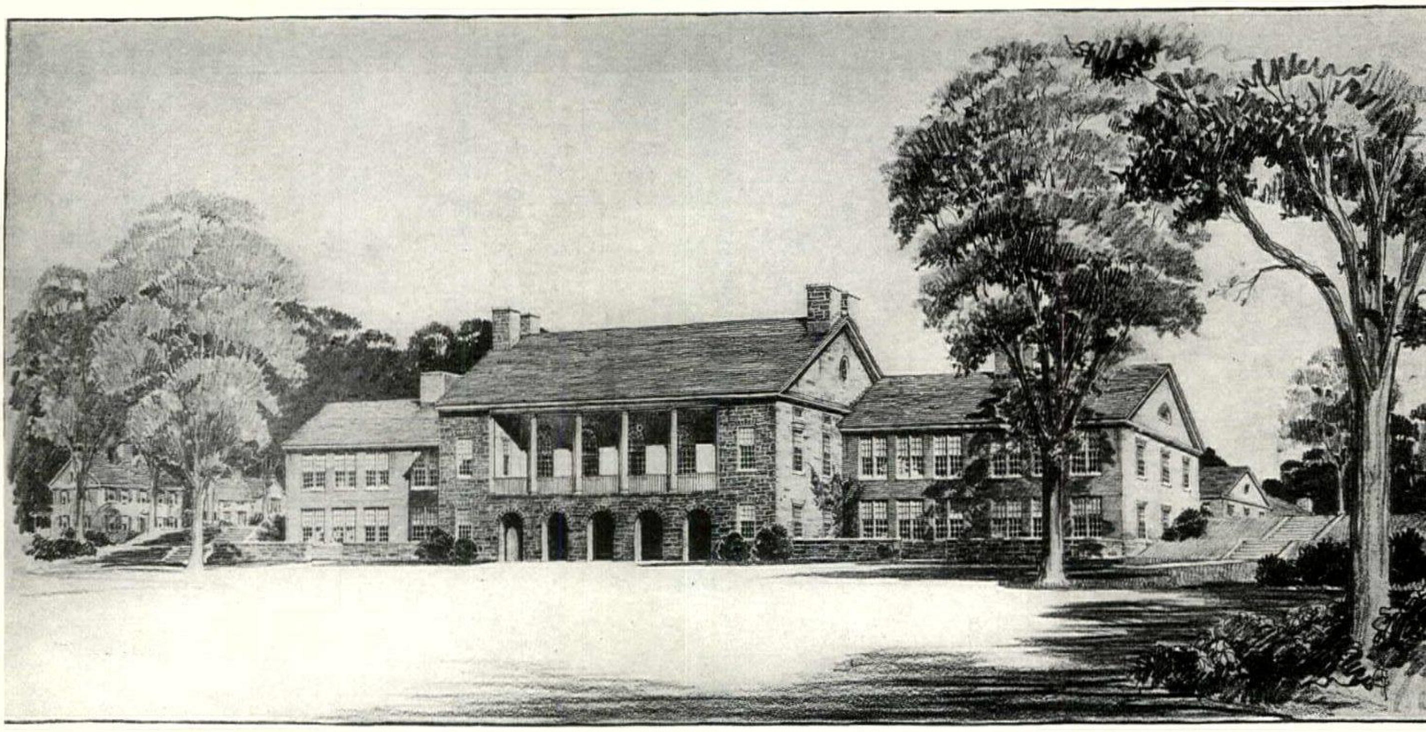
This school, a PWA project, is now under construction.

BENJAMIN FRANKLIN GRADE SCHOOL
WESTFIELD, NEW JERSEY
COFFIN AND COFFIN, ARCHITECTS



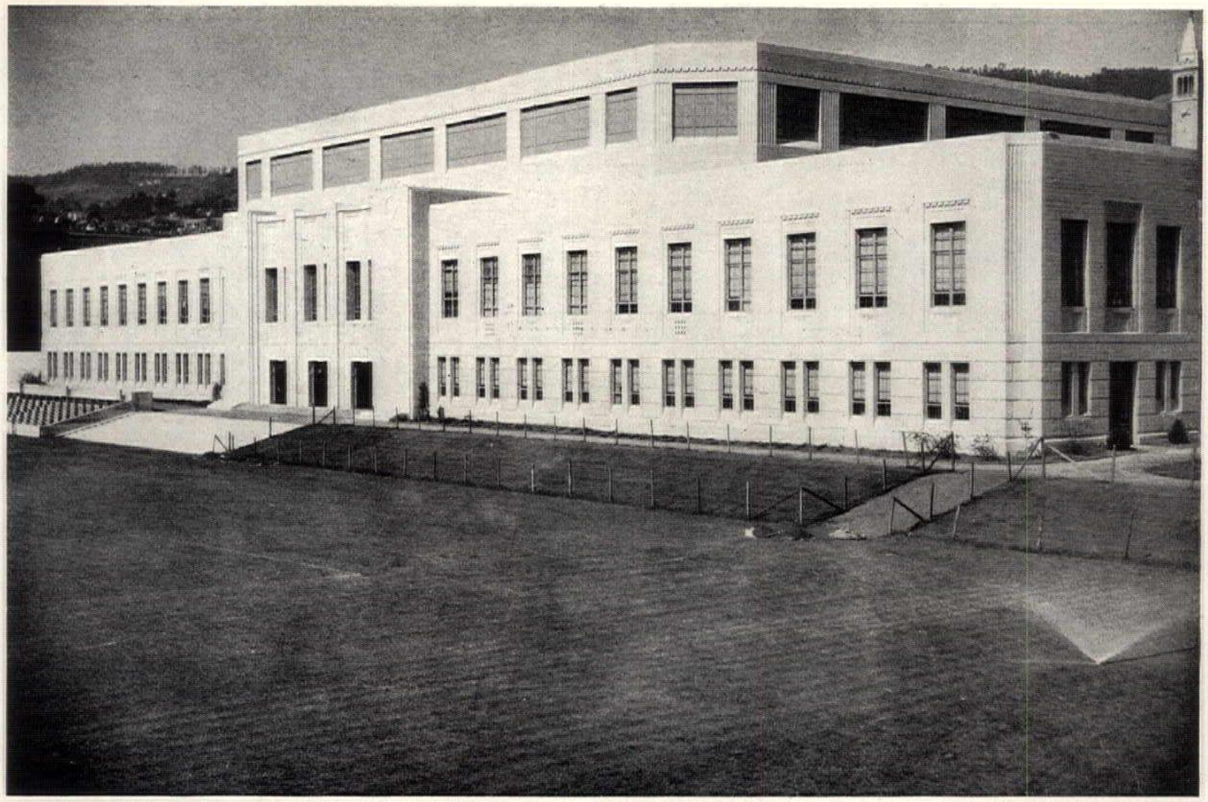
FIRST FLOOR PLAN





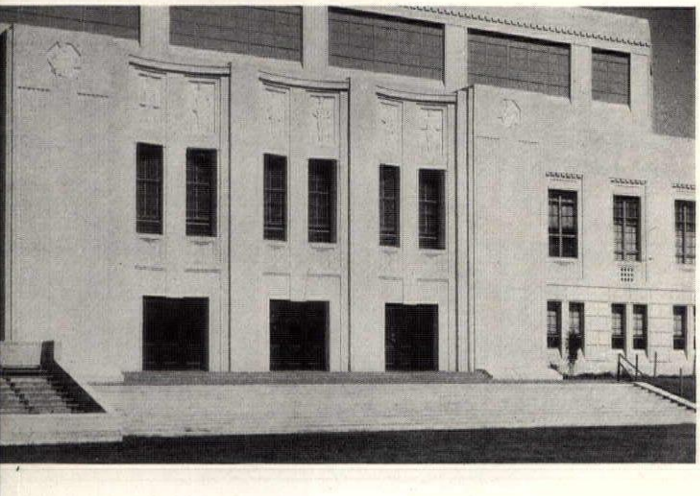
ERNEST SIBLEY, ARCHITEC
GEORGE M. CADY, ASSOCIAT

SOUTH MOUNTAIN ESTATES
ELEMENTARY SCHOOL
MILLBURN, NEW JERSEY

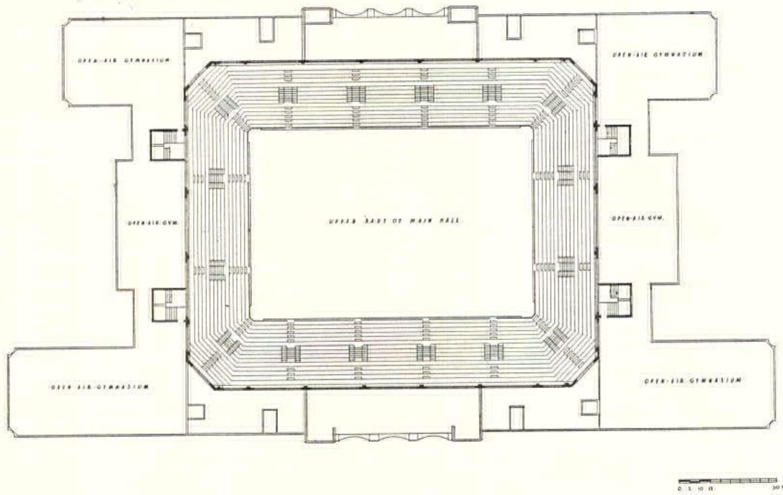


GYMNASIUM FOR MEN, UNIVERSITY OF CALIFORNIA (BERKELEY)

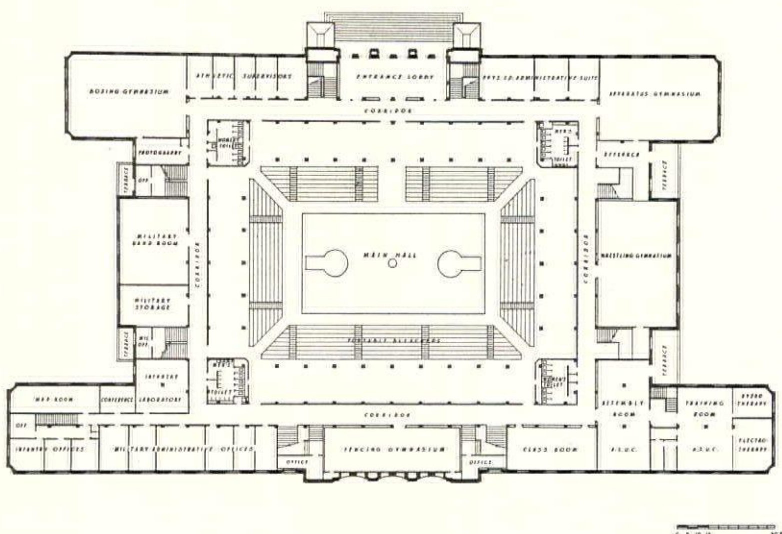
MAIN ENTRANCE DETAILS



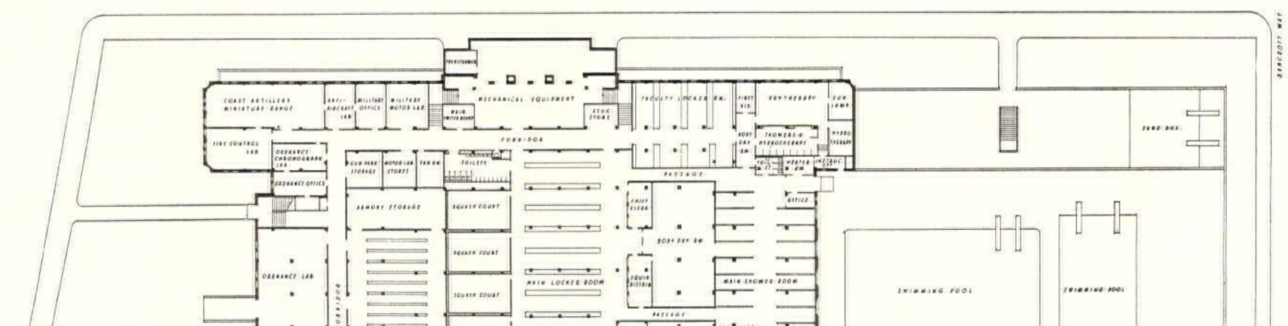
GEORGE W. KELHAM, ARCHITECT



BALCONY



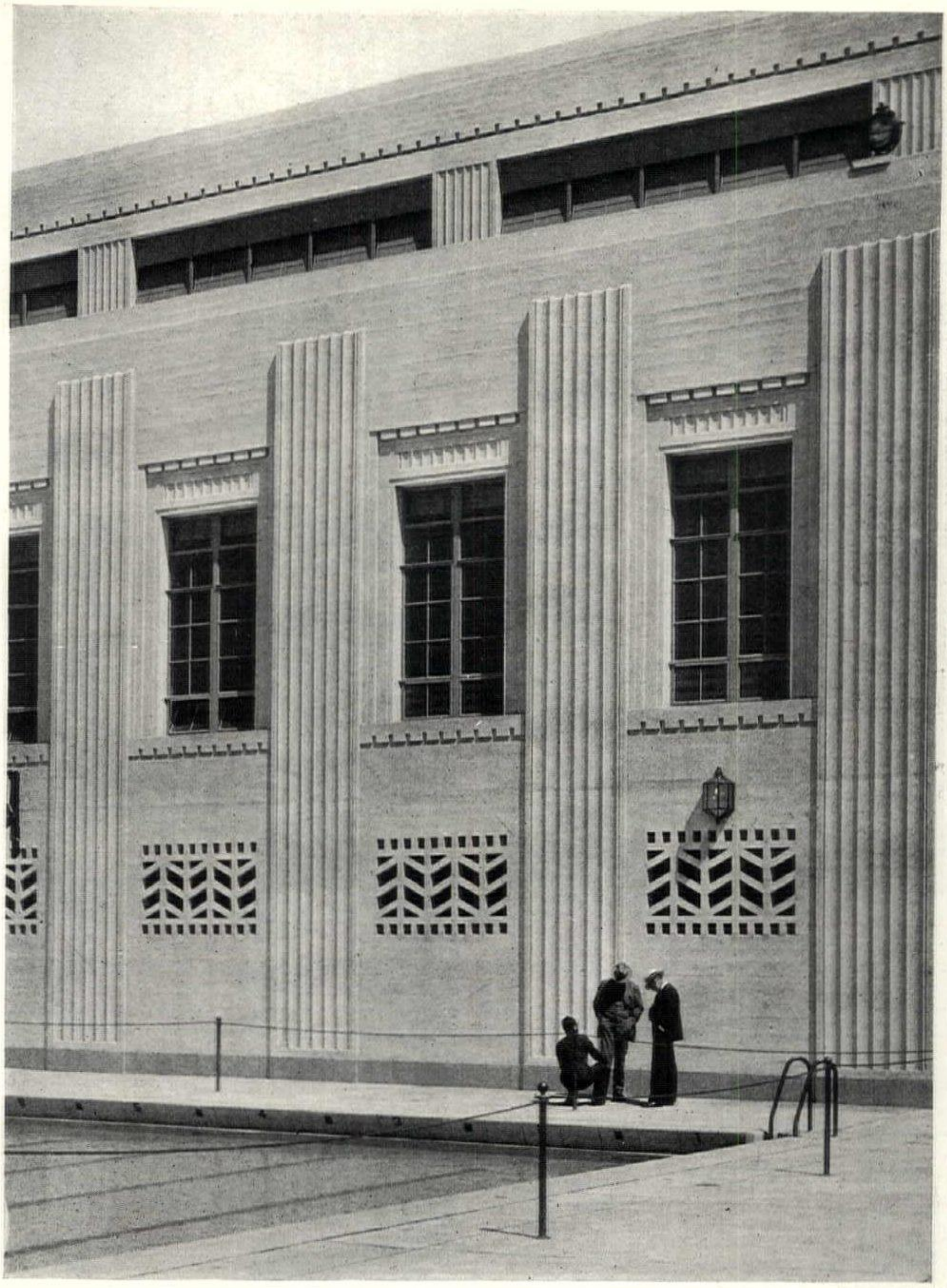
FIRST FLOOR



GROUND FLOOR

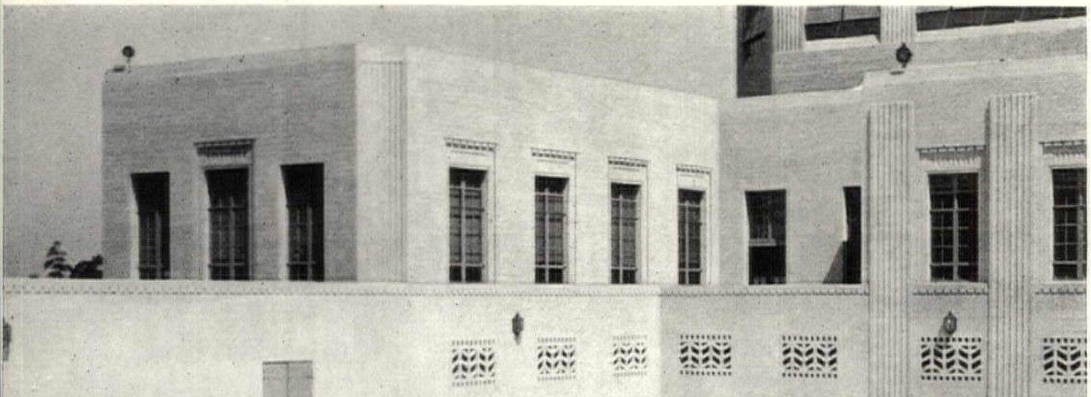
GYMNASIUM FOR MEN
UNIVERSITY OF CALIFORNIA
BERKELEY

GEORGE W. KELHAM
ARCHITECT



DETAIL OF WALL FACING POOL

SWIMMING POOL AREA



GYMNASIUM

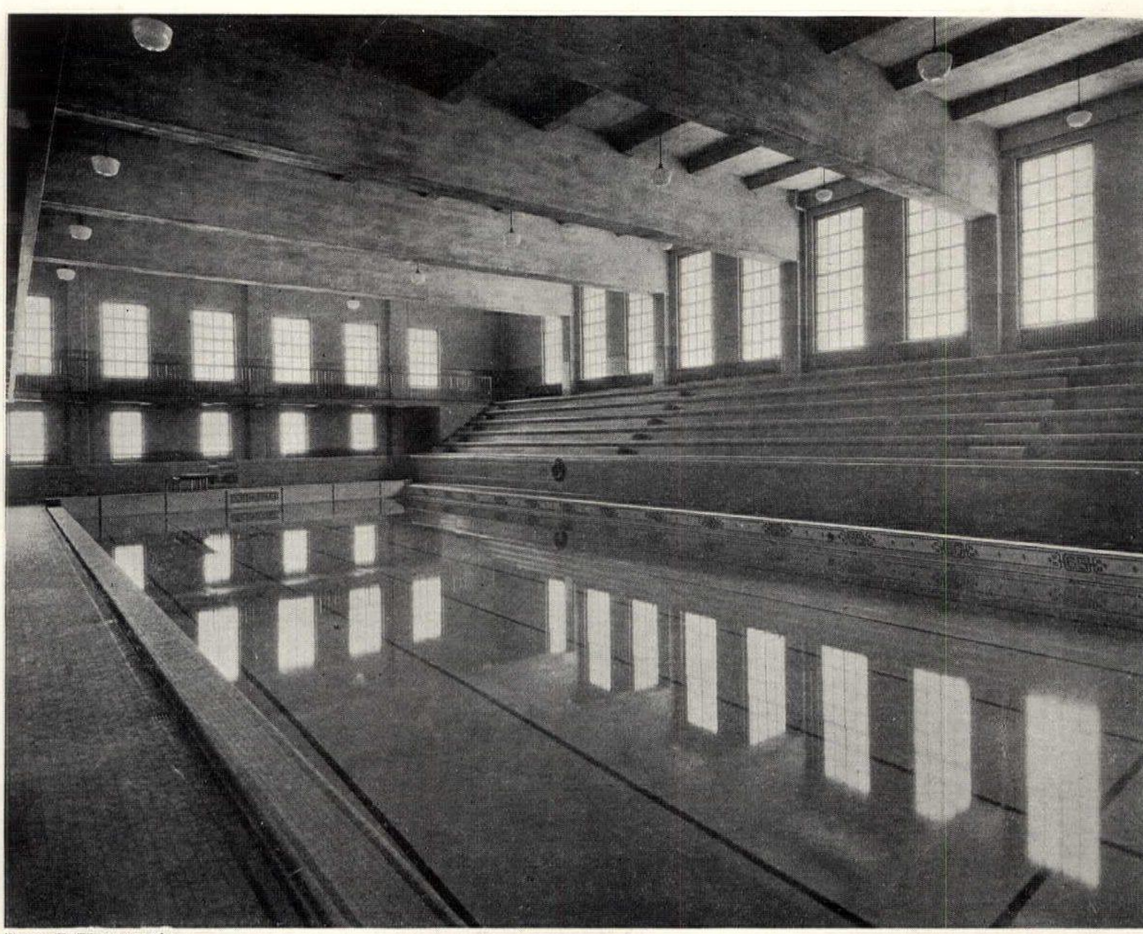
PHYSICAL EDUCATION BUILDING, MEN'S COLLEGE
GORDON AND

BASKETBALL ARENA

BASEBALL CAGE

UNIVERSITY OF ROCHESTER, NEW YORK
KAELBER, ARCHITECTS

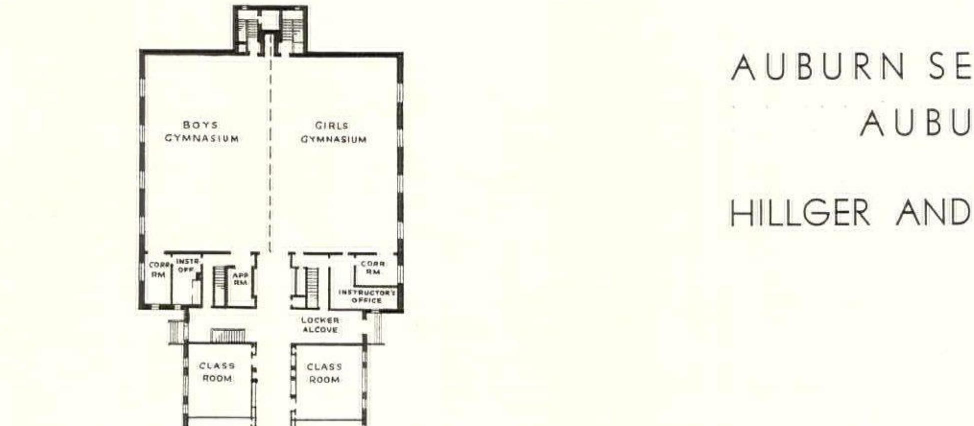
NATATORIUM



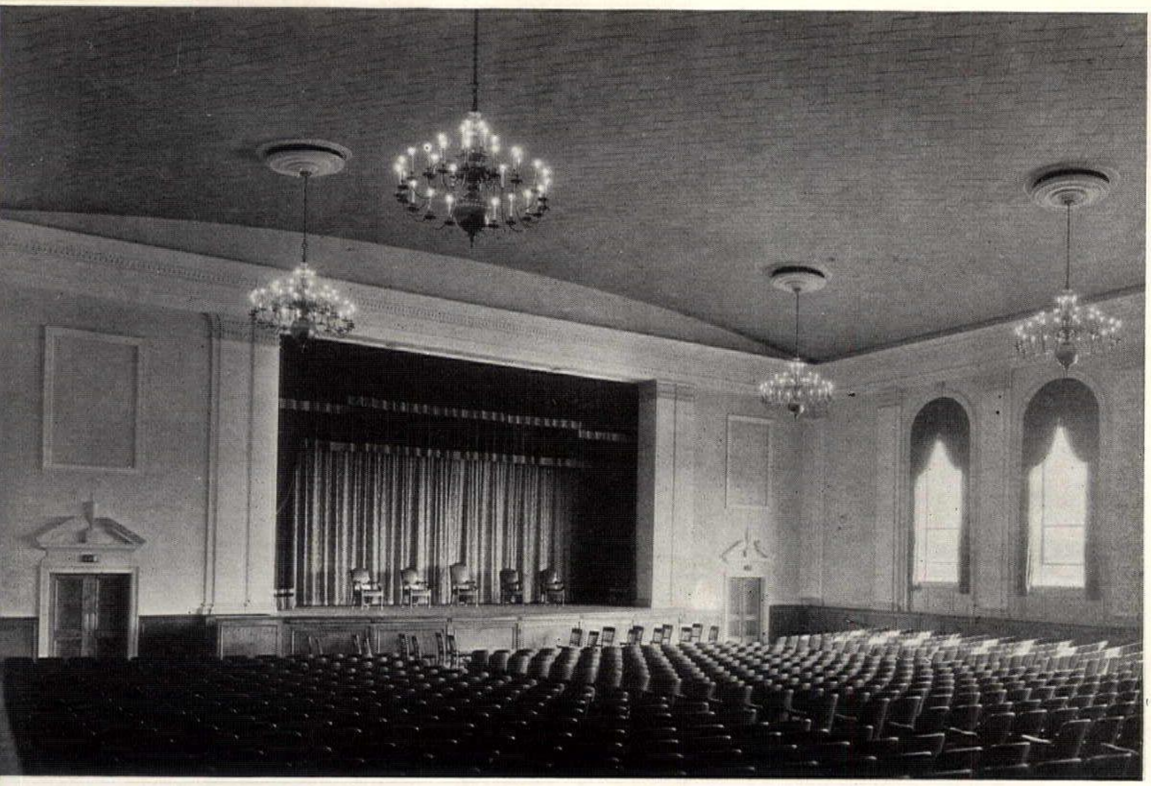
Bunnell Photographs

AUBURN SENIOR HIGH SCHOOL
AUBURN, NEW YORK

HILLGER AND BEARDSLEY, ARCHITECTS



FIRST FLOOR PLAN



AUDITORIUM

The first requirement was for a friendly ouilding where the children would be glad of their school hours, not dreading them. Therefore the building was set low to the ground with many easy entrances.

Old Virginia brick was combined with a cast stone tinted a warm buff. The tile and marbles and terrazzo inside were seected for their warmth of color. The plaser throughout was tinted a soft buff. The acoustical treatment of the corridors, the gymnasium, the library, study hall, and many classrooms has likewise turned the time spent in "keeping order" to producive work in education. Motors and simlar equipment are carefully insulated and he innumerable ventilation motors and fans function without any one's awareness.

The general arrangement allows supervision of each floor by only one person. The disturbing elements—music room, cafeeria and gymnasium—are kept away from he classrooms, auditorium and library.

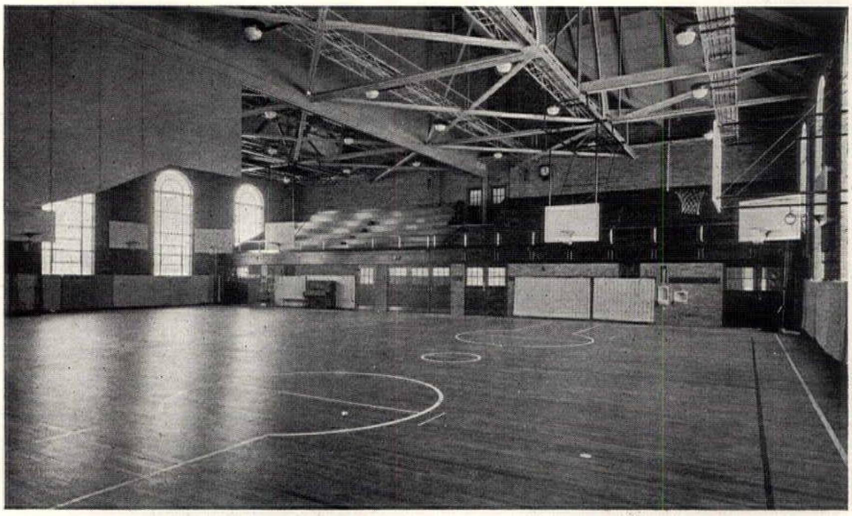
The gymnasium unit has a large folding door 98'-9" long and 23'-6" high. It is designed to slide over and completely divide the balcony bleachers as well as the main gymnasium floor.

The possibility of extending the building into a final hollow square plan when necessary is provided for. However, the present plan, designed for one thousand pupils, has proved so flexible that 1,150 pupils are now comfortably accommodated.

The auditorium seats 1,468, so that it is large enough not only for the school but as a much-needed community auditorium. It has a full-sized stage with full-height grid, skylight and sprinklers.

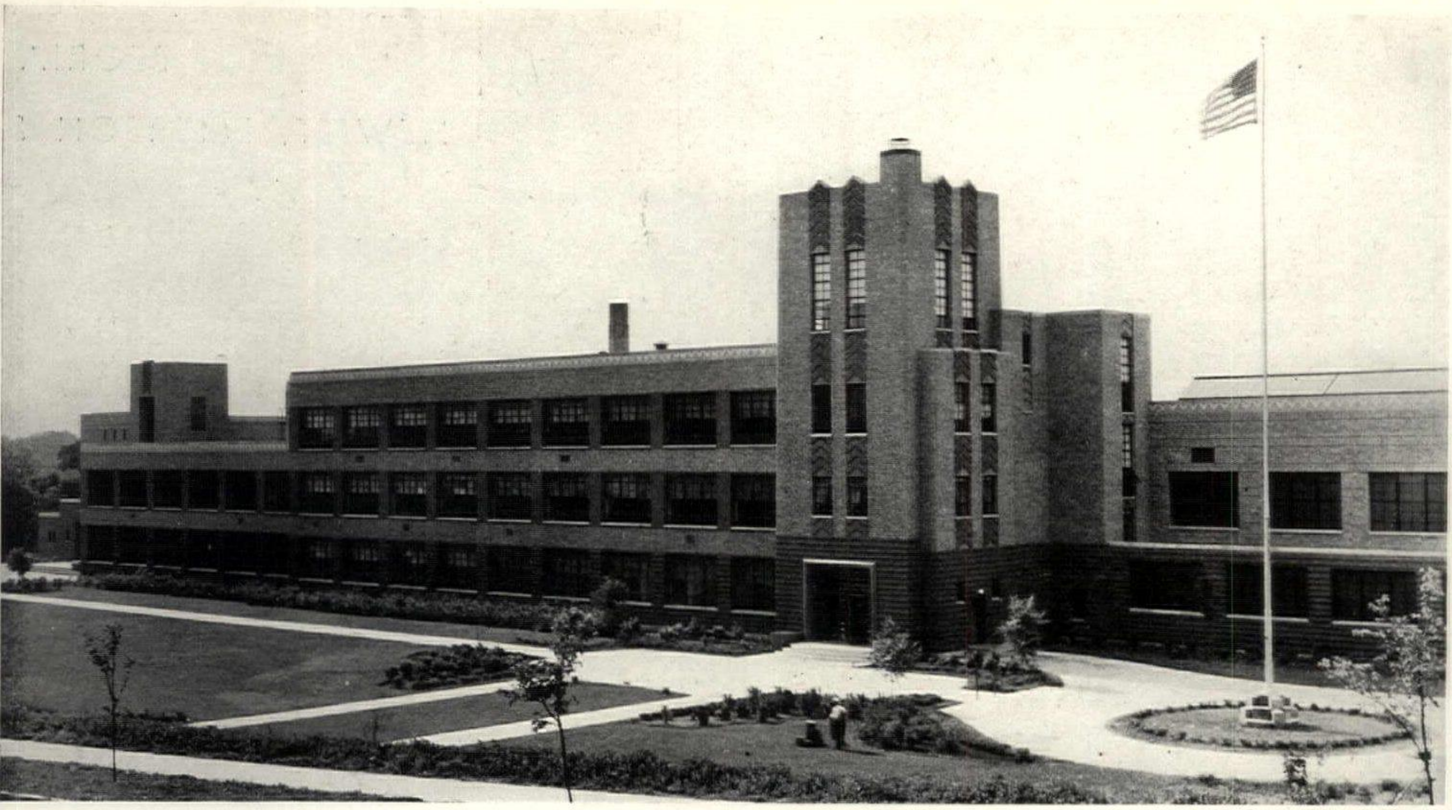
LIBRARY

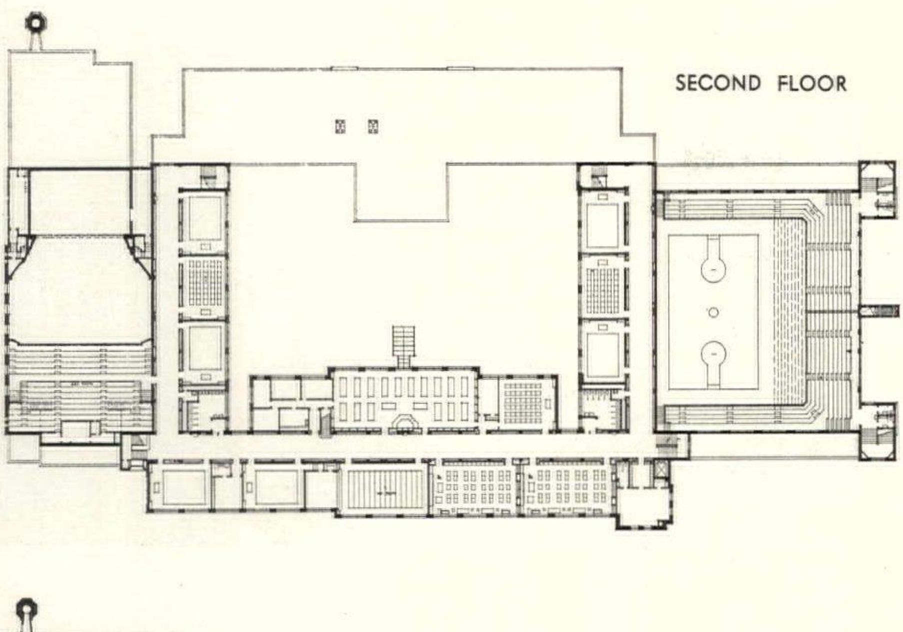
GYMNASIUM



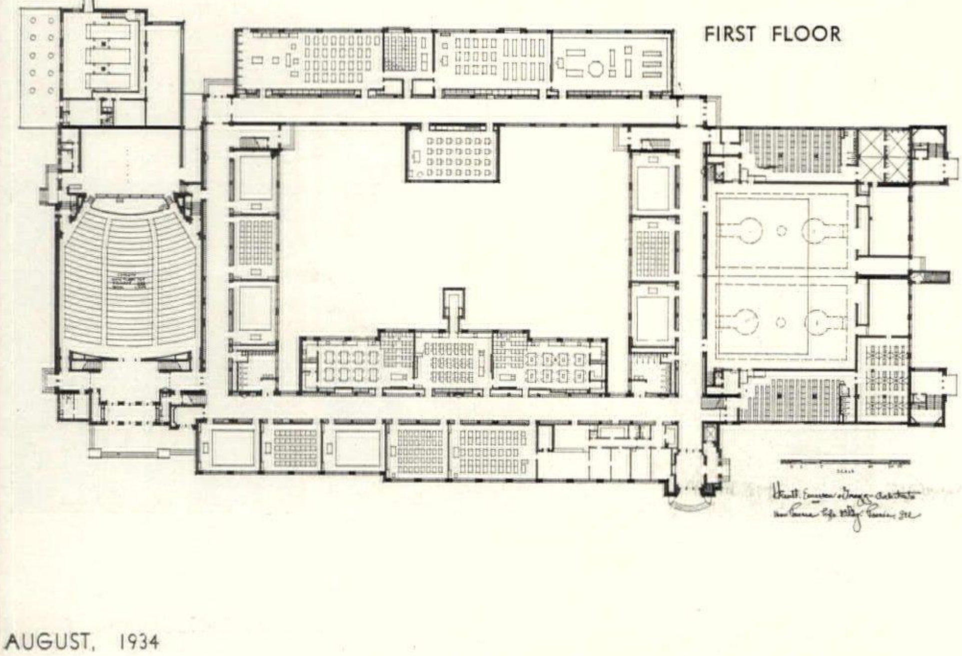
THEODORE ROOSEVELT
JUNIOR HIGH SCHOOL
PEORIA
ILLINOIS

HEWITT, EMERSON &
GREGG, ARCHITECTS





SECOND FLOOR



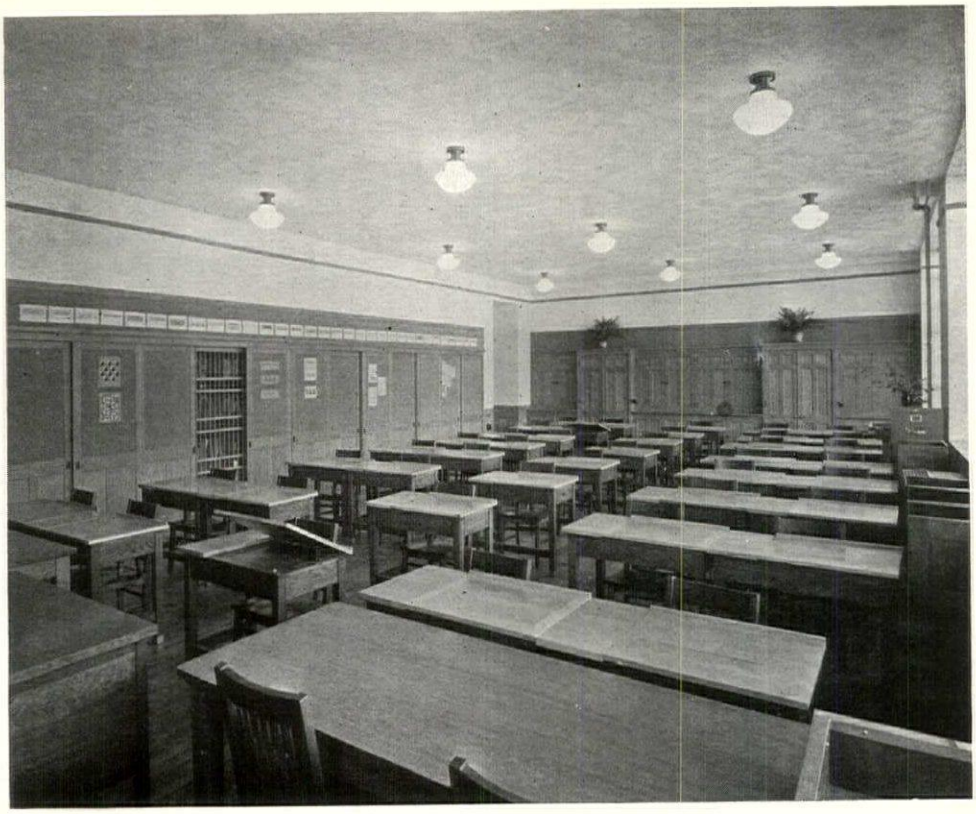
FIRST FLOOR

The plan is divided into four units: auditorium, classroom, gymnasium, and shop, placed on four sides of a large interior court. The units are connected by corridors and entrances and are so arranged that any unit can be used independently of the others.

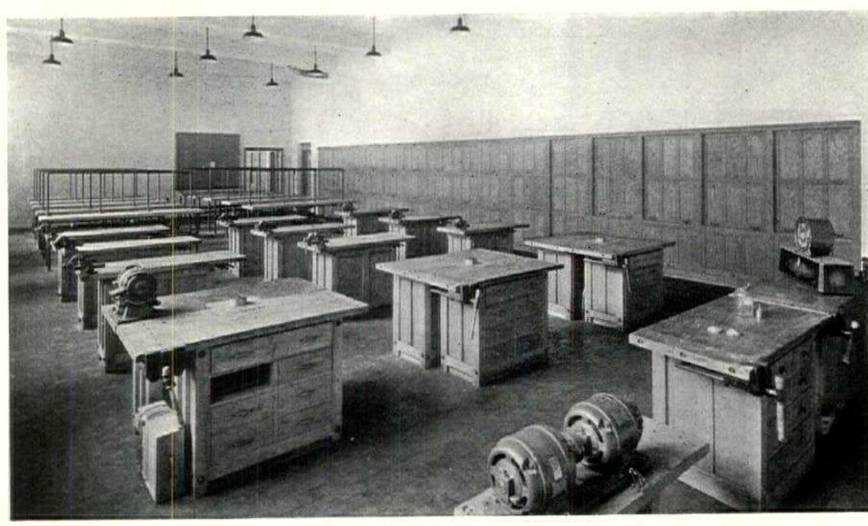
The total number of stations, including gymnasium classes, is 1,664. Over-all dimensions of building: 450′ x 232′. Total cubage: 2,444,362 cubic feet. Cost without equipment: $635,000. Cost per cubic foot: 26¢. Cost per pupil: $394.

Auditorium has 1,206 opera chairs. Seating around playing floor in double gymnasium is 1,200, with 500 additional seats in portable bleachers when required. Playing space in gymnasium: 90′ x 75′.

The building is fireproof throughout, with reinforced concrete floor construction. The exterior has two shades of brick with polychrome terra cotta trim. The main entrance is polished red granite with polished white metal grilles.



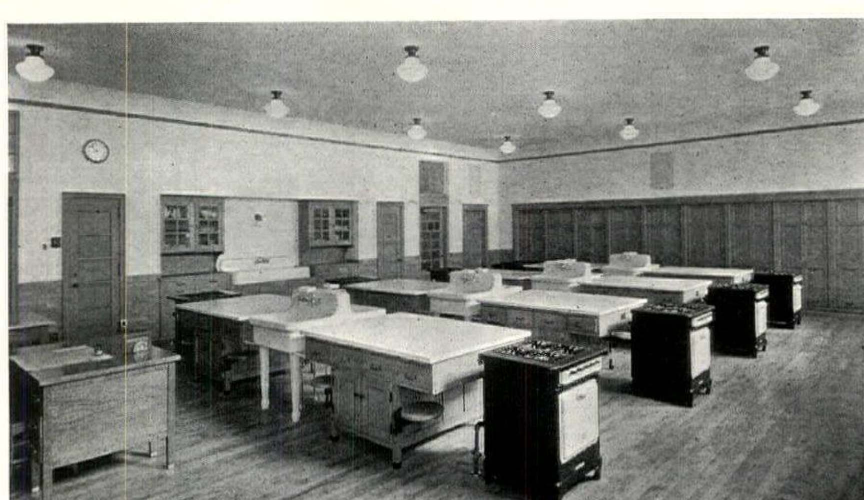
ART ROOM



ELECTRIC SHOP:

Creosote wood block floor. Common brick walls and structural concrete ceiling painted. Built-in cases for supplies.

DOMESTIC SCIENCE ROOM

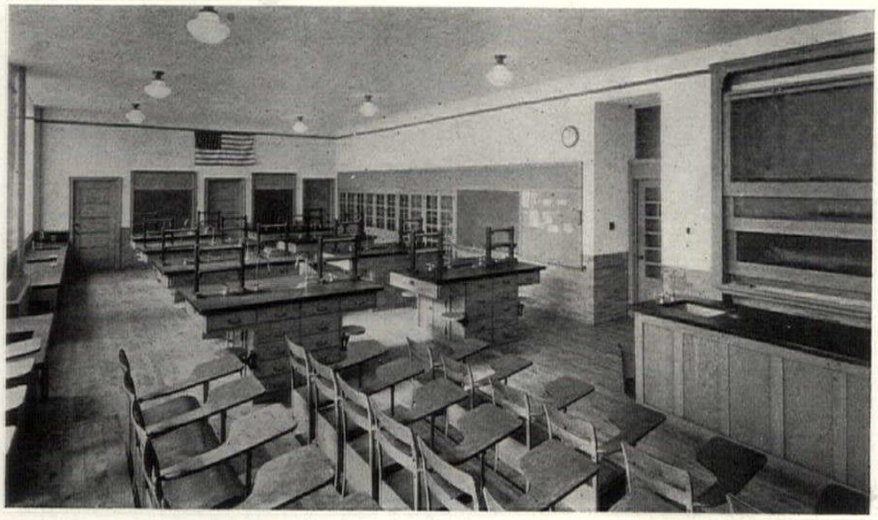


UNIOR HIGH SCHOOL
LLINOIS
GREGG, ARCHITECTS

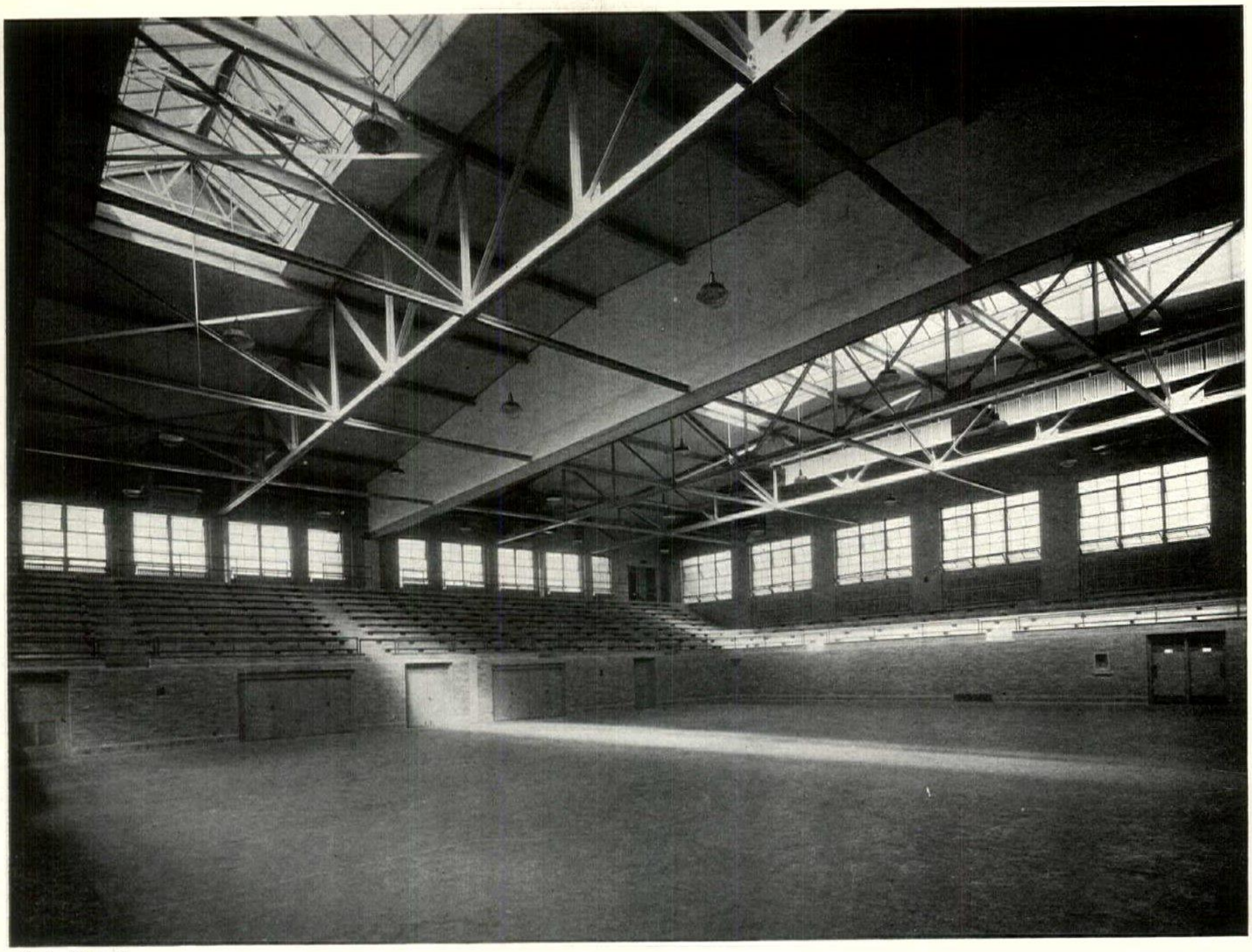
MECHANICAL DRAWING ROOM

LIBRARY:

Maple flooring. Plain red oak wainscot, random width "V" matched boards. Beveled Insulite (acoustic) tile paneled ceiling.



SCIENCE LABORATORY



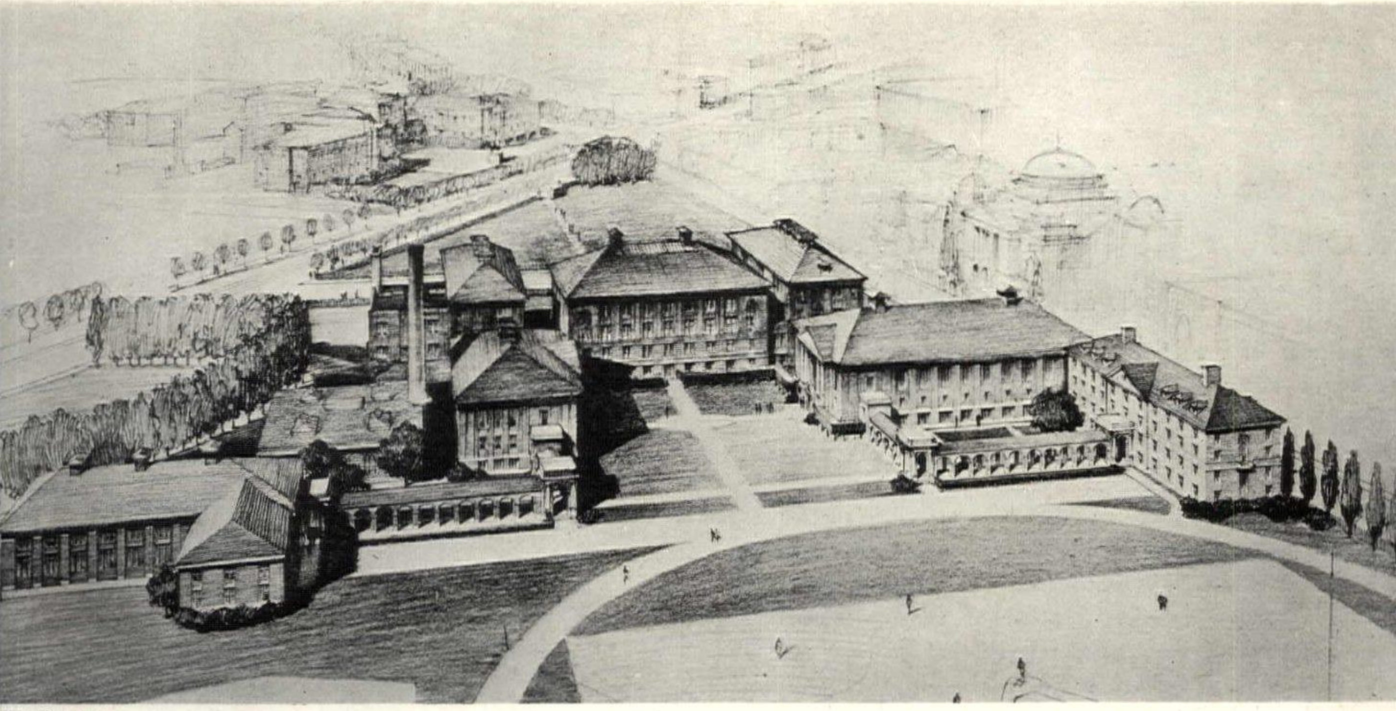
G. L. Venard

GYMNASIUM: Asphalt tile floor. Glazed brick walls. Celotex ceiling. Concrete bleachers.

BOYS: LOCKER ROOM:

Colored cement floor. Glazed brick walls. Plaster ceiling. Unit heaters with air supply from gymnasium. Exhaust fans on lockers.

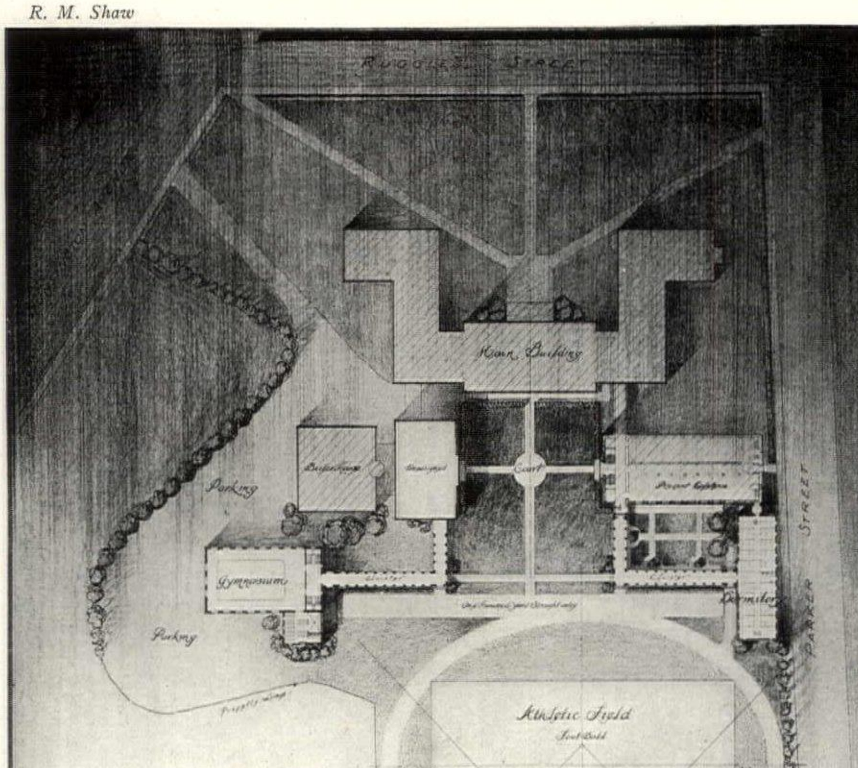
HEWITT, EMERSON
& GREGG, ARCHITECTS



W. Sampson

PROPOSED DEVELOPMENT OF WENTWORTH INSTITUTE, BOSTON
KILHAM, HOPKINS AND GREELEY, ARCHITECTS

R. M. Shaw



GARDEN APARTMENTS PROVIDE SCHOOL AND RECREATIONAL ACTIVITIES

The purpose of the Marshall Field Garden Apartments in Chicago, completed in 1927, was to provide moderate-priced living quarters to a selected tenancy close to the downtown section. This involved building in an area where surroundings were not of the standards desired within the apartments. Under the direction of Manager A. J. Parkin, a community has been developed within the tenancy. A model school for children of tenants was provided through the cooperation of the Pestalozzi-Froebel Teachers College, and recreational facilities for both children and adults are available in the playgrounds, baseball field, woodworking shops and auditorium. Dramatic programs, dances and card parties are held regularly. The shops serve as a place for tenants both to pursue their hobbies and to make or repair furniture.

Parents who work can have their children at school.

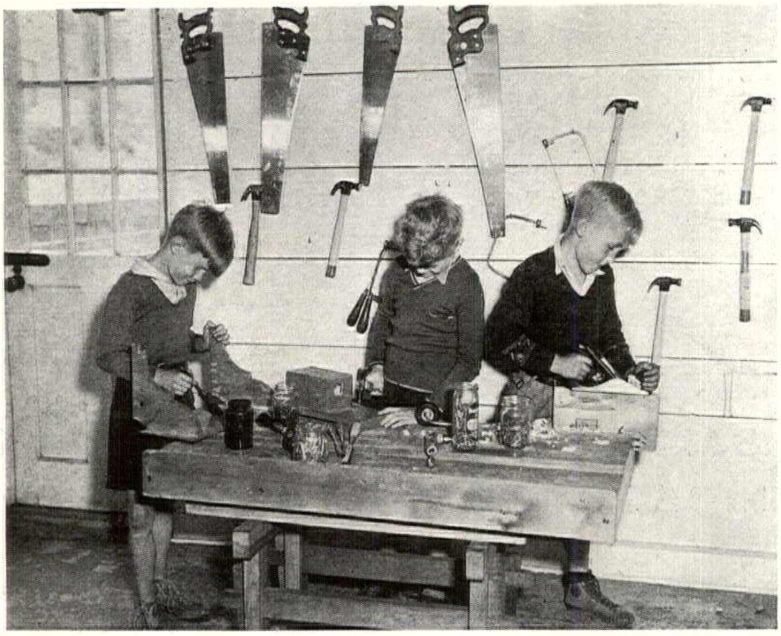
Apartments on two floo with south and east fro age, have been remo eled for school and pl rooms such as this.

Inclosed playgrounds under care of trained supervisors keep the children off streets.

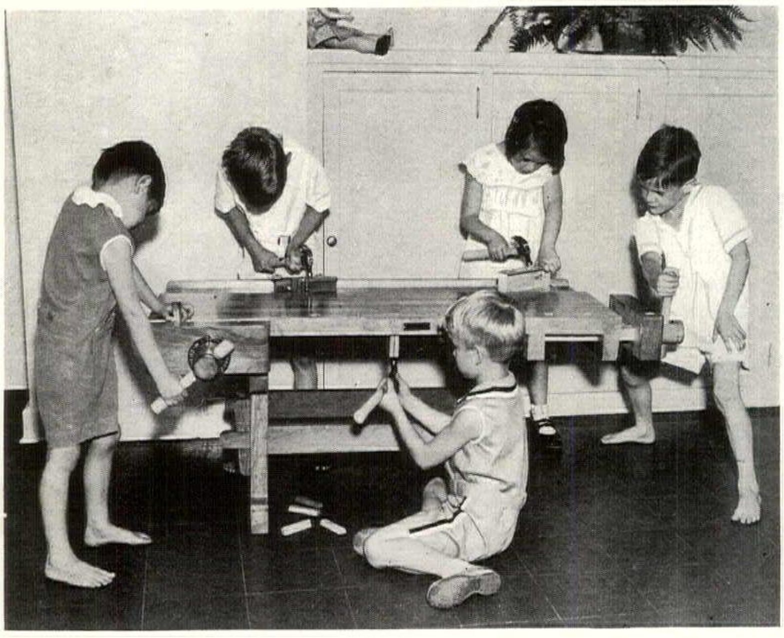
SCHOOL AND RECREATIONAL FACILITIES MARSHALL FIELD GARDEN APARTMENTS IN CHICAGO

The garden court provides out-door school activities in season.

A corner of one of the schoolrooms, equipped with child's size furniture, educational toys and facilities for kindergarten and primary school education.



A boy's workshop provides a place for older boys who are not in the kindergarten or primary classes.



Working benches and tools are part of the school equipment, and are used both in classes and in play-time activities.

MARSHALL FIELD
GARDEN APARTMENTS
CHICAGO

WAS THE HOME INSURANCE BUILDING IN CHICAGO THE FIRST SKYSCRAPER OF SKELETON CONSTRUCTION?

Before the 47-year-old Home Insurance Building, located on the northeast corner of LaSalle and Adams Streets in Chicago, was razed to make way for the new Field Building (published in this issue, pages 119-128), a committee of architects and others was appointed by the Marshall Field Estate to decide if it was entitled to the distinction of being the world's first skyscraper. This committee, after a thorough investigation, handed down a verdict that it was unquestionably the first building of skeleton construction.

The committee's decision, however, is challenged by Irving K. Pond, Chicago architect, who had first-hand experience in the construction work of that period. Mr. Pond argues that the structure of the original Home Insurance had little in common with modern skeleton construction, and little or no influence on skyscraper design.

Both sides in the controversy are presented herewith, and the reader is free to make his own decision.

REPORT OF THE INVESTIGATING COMMITTEE

The plan of the old building was first examined (October 9, 1931) and then daily inspection visits were made during the demolition period (October 9 - November 1). Careful measurements were made at a typical floor of columns and connections on the exterior, court and interior. Drawings were made of these measurements. At the committee's request W. J. Newman & Company, the wrecking contractor, exposed the metal framing in special ways for inspection and for photographs.

Members of the committee who reported the investigation were Thomas E. Tallmadge, chairman; Ernest R. Graham, Alfred Shaw, Earl H. Reed, Andrew Rebori, Benjamin H. Marshall, Richard R. Schmidt, architects; Charles B. Pike, President, Chicago Historical Society; Mark Levy, President, Chicago Real Estate Board; and O. T. Kreusser, Director, Rosenwald Museum.

Their report follows:

* * *

The Committee at its first meeting determined that its program would be,

First, to define "skeleton construction."

Second, to determine what, if any, priority the Home Insurance Building held over any building of similar construction, and

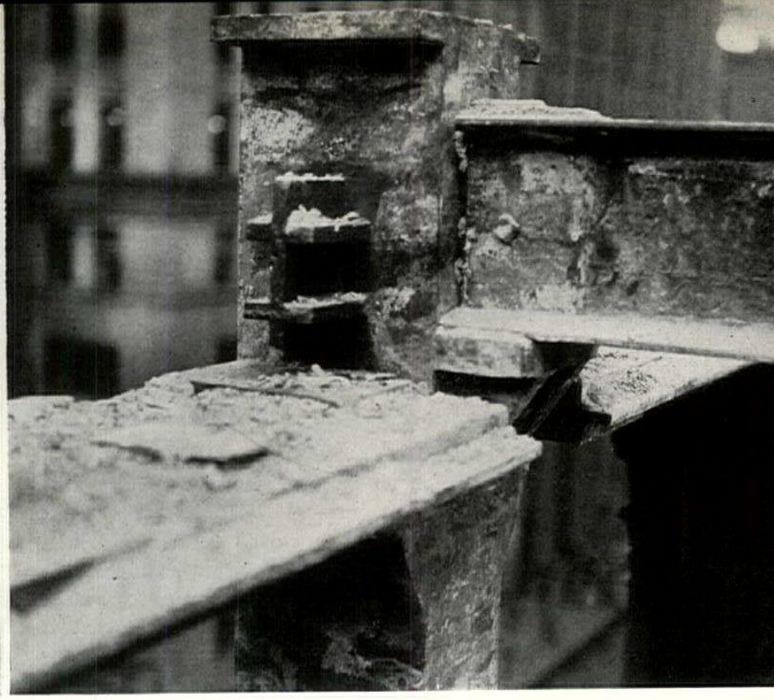
Third, to determine the nature and extent of the use of "skeleton construction" in the Home Insurance Building.

We feel that although not an essential part of this report, a brief statement as to the importance of skeleton construction and its part in the development of American and World architecture in the last fifty years will not be irrelevant. It has been stated many times and we believe it to be true, that the greatest contribution of America to architecture is the skyscraper. By skyscraper is meant a building that exceeds in height the practical limit of solid masonry construction. The absolute and first essential in the structural creation of the skyscraper is the

Chicago Architectural Photographing Co.

A special committee, after investigation, has handed down a verdict that the 47-year-old Home Insurance Building, razed to make way for the new Field Building, was unquestionably the first building of skeleton construction and can claim the title of "Father of the Skyscraper." The building was designed by William LeBaron Jenney, who got his idea for skeleton construction from bamboo huts in the Philippines.

Members of the committee, left to right: (seated) A. N. Rebori, Ernest R. Graham, W. B. Mundie, architects; Lou R. Crandall, contractor: (standing) George Richardson, trustee, Marshall Field Estate; Earl H. Reed, Jr., architect; Mark Levy, president, Chicago Real Estate Board; O. T. Kreusser, director of the Rosenwald Museum of Science and Industry; Richard E. Schmidt, and Howard J. White, architects.



(Left) Committee examining exposed column of the fifth floor of the Home Insurance Building. (Right) Close-up of head of column at fifth floor level, LaSalle Street front, showing wrought-iron floor girders and cast-iron lintel in place with the spandrel I-beams removed.

metal (ferrous) skeleton. The economic essential is the high-speed elevator. It follows, therefore, that the vast number of skyscrapers that have been built and are being built might be derived from and be dependent on the first building of this nature that was erected. If, therefore, it be found that the Home Insurance Building is the first skyscraper as above defined, its importance in architectural history is enormous, for the sequence of skyscrapers from 1884 is very well known and there is no claim that at this time or later was any skyscraper built independently and without knowledge of the peculiar construction of the Home Insurance Building.

The value of skyscrapers built in the United States since 1884 to the present time runs into billions of dollars. Their value in the economic development of the country and in the aesthetic development of architecture is inestimable.

DEFINITION

Webster's Dictionary describes skeleton construction as "a method of constructing buildings in which the chief members are of steel the wall being supported at the floor levels by the steel frame itself."

The *Encyclopaedia Britannica* says that in skeleton construction "steel takes up all the stresses to which a building is subjected; compression, tensile and shear."

We may also turn for authority to technical works on engineering and architecture. Russel Sturgis in the *Dictionary of Architecture* defines skeleton construction as "a manner of building in which, while the exterior is of masonry, the whole structure is of iron or steel which supports the exterior walls as well as the roof." In *Architectural Engineering* (J. K. Freitag, 1901) a distinction is made between "skeleton" and "cage" construction as follows: "a skeleton or simple framework of beams and columns depends largely for its efficiency upon the exterior and interior walls and partitions which serve to brace the structure and which render the skeleton efficient much as the muscles and covering of the human skeleton make possible the effective service of the component bones." While "cage" construction "partakes more of the character of a single unit so far as the steel is concerned for the framework is made complete in itself . . . and independent of any considerations as to aid or support from any external coverings." In other words, according to Freitag, where the metal frame depends on a certain amount of bracing from interior or exterior masonry walls it is "skeleton construction." Where all necessary bracing is furnished by metal members it is "cage." In this report the terms "skeleton and cage" will be regarded as synonymous.

The Chicago Building Ordinance states, "The term skeleton construction shall apply to all buildings wherein all external and internal loads and strains are transmitted from the top of the building to the foundations by a skeleton or framework of metal." There are many other descriptions from various sources but the purport of all of them is that in skeleton construction there is a cage or skeleton of metal which supports all interior and exterior loads, in other words, the floors, walls and live loads.

The Committee, at its first meeting, October 9, 1931, adopted the following as its definition of skeleton construction. "A type of construction in which a metal frame or cage composed of girders, beams and columns supports all internal and external loads and carries all stresses directly to the foundations." This definition does not require that such strains as wind pressure be taken up exclusively in the metal skeleton, neither does it include any particular type of foundation, nor require that the foundation be entirely underground.

PRIORITY

To substantiate the claim of any building or person to the honor of being the originator of skeleton construction, priority must first of all be proved. Our investigations show that although there are a number of buildings in which an iron frame has been used in one way or another, there are only three whose claims for authorship seem in any way to be justified. Before mentioning these, we will cite at this point several of the others whose claims did not seem worthy of more than a brief consideration:

(Left) This picture, taken from the street, shows stripped column near third floor level. (Center) Masonry removed from exterior columns demonstrates that the walls were supported by columns. (Right) Head of a column at the fifth floor level.

Of early buildings which used in one form or another metal frames or skeletons, and which thus made their contributions to the development of structural iron, there should be mentioned the Crystal Palace, 1851, and subsequent Exhibitions Buildings, particularly those of the Centennial Exposition in 1876.* There was also a 5-story factory built in 1872 at Noisiel, Seine and Marne, of a decorative iron skeleton of T bars in lozenge fashion exposed in the exterior; the open spaces of which were filled with brick and tile in ornamental patterns. Sturgis calls this a true example of skeleton construction. N. D. Morgan, in the *Western Architect* of March, 1926, states that in 1881 George B. Post, in the Produce Exchange Building (in the light court), used iron skeleton construction in a "limited sense."

Montgomery Schuyler in *Scribner's Magazine* says that in the Produce Exchange building, "an example not only of 'cage' construction but of 'skeleton' construction in the interior court was achieved." Number 50 Broadway, New York City, a very narrow building whose floors were spanned by girders from party wall to party hall, had a bronze inscription which stated, "the earliest example of skeleton construction in which the entire weight of the walls and floors is borne and transmitted to the foundation by a framework of metallic parts and beams, date 1888-9." This building is clearly outdated, according to its own record by the Home Insurance Building.

The claims we will discuss in detail are those of the Home Insurance Building (demolished), William LeBaron Jenney, architect; the Tacoma Building (demolished), Chicago, Holabird and Roche, architects; and the letters patent of Leroy S. Buffington. Considering these in reverse order—

Mr. Buffington, an architect of Minneapolis well known in his profession,† in reading an essay by Viollet-le-Duc, was struck by a statement of the great Frenchman that with an iron frame buildings could be built to an unlimited height. Based on this idea, he secured, May 22, 1888, letters patent covering an iron frame for tall buildings. This iron frame was essentially different from any that was used subsequently. The columns, for example, were solidly composed of iron slabs staggered and bolted together, a design impossible in a practical application. In 1884, Buffington designed a 16-story building with a frame of cast-iron columns and iron beams in which the curtain walls were supported at each floor by the iron beams. This building, however, was never built, at least with this form of construction. In 1888, he made a perspective design for a 28-story skeleton building which he called a "cloud scraper." Although Buffington never built a skeleton building, he attempted through the courts to collect royalties on various others that had been built as infringements of his patents. In every instance he lost his suit though the owners of the Rand Tower, Minneapolis, built in 1928, voluntarily paid him one-eighth of one per cent of the cost of the steelwork.

The Tacoma Building, demolished in 1929, stood at the northeast corner of LaSalle and Madison Streets, Chicago. It was built from plans of Holabird and Roche. The building was started on May 1, 1887, and finished July 1, 1888. In the case of the Tacoma Building the claim has usually been made that it was the first skyscraper ever erected in which skeleton construction was used throughout or that it was the first "complete" example of skeleton construction. Holabird and Root, successors, in a published letter** say "The construction is cast-iron supporting columns, cast-iron spandrel lintels, wrought-iron girders and beams, hollow tile arches and spread foundations made of concrete reinforced with railroad rails." Freitag in *Architectural Engineering* refers to the Tacoma Building as "probably the first complete type of skeleton construction." George E. Pistor, treasurer of the American Institute of Steel Construction,‡ "The Tacoma building . . . was supported entirely by a metal frame and the walls did not more than curtain off the elements."

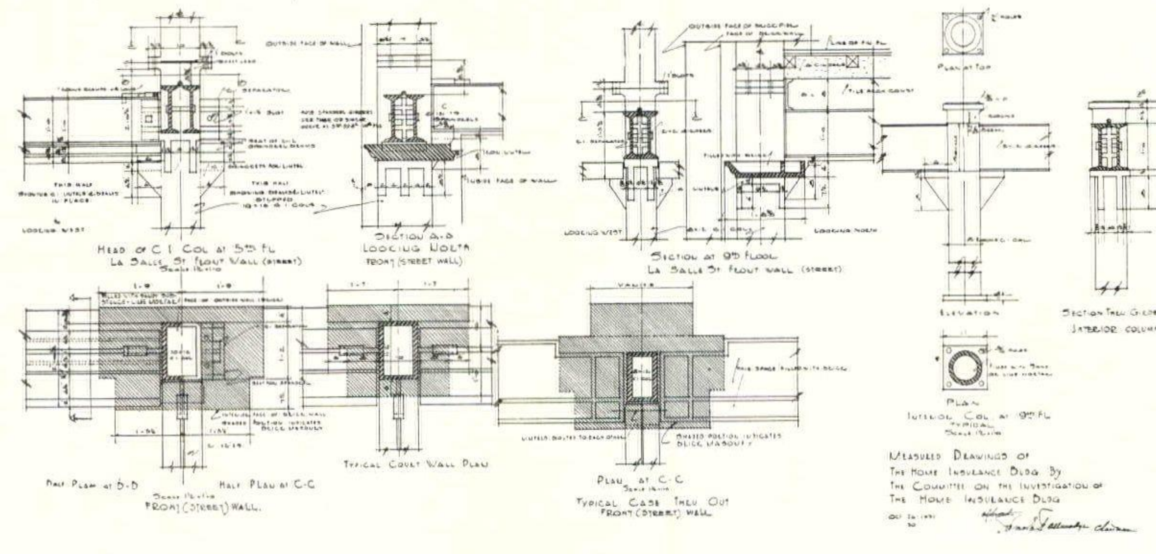
*Illustrated in *Dictionary of Architecture*, Russel Sturgis.

†Obituary of LeRoy S. Buffington by Robert Craik McLean, *Western Architect*, March 1931.

***Story of Architecture in America*, p. 179.

‡*Traces Evolution of Skyscrapers*, The Associated Builders of Chicago.

STRUCTURAL DETAILS OF THE HOME INSURANCE BUILDING



The *Story of Architecture in America* captions a picture of the Tacoma Building thus, "The first complete steel skeleton (iron) building ever erected."

The destruction of the Tacoma Building showed that the north lot line wall and east alley walls were of solid brick. The court walls as well were of self-supporting masonry. There were in addition two solid masonry transverse dividing walls that ran from the basement to the roof. These divided the building into three sections. A 20-inch girder extended diagonally between these transverse bearing walls resting on an unusual arrangement of cast-iron lintels and door jambs which framed the corridor openings and supported the girder. There were five interior columns on each floor—two in the east section, three in the center and none in the north. The lot line walls, court walls, alley ways and interior bearing walls thus absorbed roughly 75 per cent of the floor load so there is only a small proportion exclusively supported by the iron construction.

The Home Insurance Building was designed in the early part of 1884. The building permit was issued in March 1884. Ground was broken May 1, 1884, and the first tenants moved in in the fall of 1885.

CONSTRUCTION OF THE HOME INSURANCE BUILDING

The Home Insurance Building, as it was built in 1884-5, consisted of ten stories. To these, two additional stories were added in 1890-91. With this exception the building remained substantially without change and without defects appearing in its construction down to its date of demolition, October 1, 1931. The two stories added in 1890-91 will be ignored except to say that they were of skeleton steel construction which though different in design from the underlying construction was joined to it and continued it without rearrangement of column centers or framing.

The original building therefore, as constructed, was in the main a rectangle, 138 feet on LaSalle Street, and 98 feet on Adams Street with an ell on the northeast corner 60 feet by 26 feet. On the east side at about the center, the rectangle was indented with a light court, 49 feet north and south by 33 feet east and west. The superstructure was supported by foundations consisting of isolated footings of the spread variety of dimension stone under each pier center on the street fronts, under each column center on the courts and under each interior column, and continuous spread footings under the party walls. The first two stories on the street fronts were of solid rock faced granite backed with tile. These walls were battered from 4 feet at the bottom to 2 feet and 10 inches at the top. Above the granite on the street front the façades of the building were of red pressed brick unvitrified with continuous stone sill and lintel courses confining spandrels of brick or terra cotta. At the fifth, eighth and tenth floors heavy stone belt courses of cornice type extended the full length of the street fronts. At occasional places such as the corners of the façade and apparently for the sole purpose of architectural design brick pilasters, seven in all, 8 inches thick projected beyond the typical face of the piers. Of the typical piers there were twelve on the street fronts and six on the court and one on the alley. Each bay, of which there were in all eighteen on the street fronts, contained a pair of windows separated by a heavy ornamental cast-iron mullion.

The party walls on the north and on the east sides and on the west side of the ell were of solid masonry, composed of common brick and continuing from the foundations to the roof. On the two street fronts beginning at the level of the third-story window sills and on the north, south and west walls of the light court and on the alley (north) elevation of the ell above the top of the foundations cast-iron columns were superimposed, one for each pier and each, one story in height. Within the circumference of the walls all floor loads throughout were carried on superimposed cast-iron columns of which there are thirty-nine on each floor, extending from the foundations to the roof. There were no masonry interior walls except a small vault inclosure against the north party wall.

The exterior and light court columns and their connections may be described briefly as follows: There was a hollow cast-iron column 10 inches by 14 inches in the fifth story; 8 inches by 12 inches in the ninth. This column supported on either side on cast-iron integral brackets heavy cast-iron lintels the full thickness of the wall, and extending from column to column. Three-quarters of an inch above the lintels at the third, fifth, eighth and tenth floors extending from column to column were two or more wrought-iron I-beams typically twelve inches in height supported on cast seats and heavy cast-iron separators integral with the columns. These beams were further secured to the columns by 1-inch diameter wrought-iron clamps 9¾ inches long, screwed into the column and turned down and let into the flanges of the beams. The function of these beams was dual: as bracing and ties for the columns, and as support for the masonry spandrels and cast-iron mullions. As the columns are in sections each a story in height, they were flanged at top and bottom and fastened to each other on a sheet lead bearing with 1-inch bolts through the flanges. Extending from each exterior column to the nearest and opposite interior column were two 12-inch wrought-iron girders supported on cast brackets and also secured as described by wrought-iron clamps. The columns and connections for the light courts and the alley front of the ell are so similar that they need not be described. The interior columns were around 9 inches in diameter on the ninth story and increasing on the lower stories. They had square top and bottom flanges and were bolted together through their flanges with ¾-inch bolts. They and the exterior columns as well seem to have been filled with cement mortar which it was believed would render them more fireproof. The girders connecting the interior columns were composed typically of two 12-inch wrought-iron beams supported on cast-iron brackets and separators and clamped as described.

Something more should be said about the peculiar construction of the cast-iron exterior lintels. These lintels were for typical situations, 2 feet wide and 4¾ inches thick. They were of a very heavy metal molded on exterior and interior edges and being troughlike in section were filled with concrete. Each lintel was jointed in the center over the cast-iron mullion and the ends bolted together. The under portions were exposed to the elements and the lintels were intended to be a part of the architectural design as well as an important element of construction. At a distance of 1 foot 9 inches from the center line of the columns the lintels were notched back on their exterior face 3⅜ inches to allow for the unobstructed construction of the brick pier facing normally 4 inches but in places 12 inches in thickness including wall and pilaster. Wherever the iron lintels occur there are midway in their span heavy ornamental cast-iron mullions extending from lintel to lintel and thus forming a continuous metal support from top to bottom of the building except that they were not very securely bolted. As not pertinent to the purpose of this investigation, no description will be made here of the secondary framing or construction or of the fireproof floors or partitions except to say that the floor beams were typically of 8-inch wrought-iron beams, 5 feet centers, supporting flat tile arches.

There can be no possible question that the metal frame described above assuming the presence of the party walls and the lower two stories of granite on the street fronts (which can be regarded as superterrene foundation) was a perfectly rigid and stable metal cage. In other words, it did not depend in any degree for its stability on any masonry or other construction. Under our definition of skeleton construction, however, it would be necessary to prove that this rigid metal cage supported all the loads of floor and wall. Here again, there can be no question of floor loads for which there is no support other than the columns (except for floor contiguous to party walls) and there is no question of the spandrels which are directly supported by cast-iron lintels and the spandrel girders, which, in turn, are supported by the cast-iron columns.

In the important matter of the masonry piers, the conclusion is not so obvious. In the *Inland Architect* for November, 1891, Major Jenney says of the Home Insurance Building, "it was necessary to make the piers narrow for light and light (in weight) on account of the foundations (nature of the soil); a column in each pier furnished the natural solution." In other words, Major Jenney courageously concluded that by taking the floor loads on his exterior columns he could reduce his piers to a minimum in width and weight. This is virtually what he did in the Leiter Building, corner of Franklin and Adams Streets, Chicago, Illinois, built in 1879; except in that case the exterior columns are independent of the walls which are clearly self-supporting and the framing is of wood. He must, however, have known in the case of the Home Insurance Building that his piers would be dependent for their stability if not for their support on the columns that they completely encased. Brick piers of their tenuity ten stories in height could not have stood without the contiguous presence of the iron columns. It therefore comes down to a question of what if any support is furnished by the exterior columns to the exterior piers.

N. D. Morgan, in the *Western Architect* of March 1926, says of the Home Insurance Building, "this building was a ten-story structure in which the floor loads were carried by Bessemer and wrought-iron beams attached directly to cast-iron columns embedded in self-supporting brick walls."

Montgomery Schuyler in the September, 1907, number of *Scribner's Magazine* describes "cage" construction as a metal frame that carries all of the loads except the walls (piers?) which carry themselves. He then says that the Home Insurance Building is of the "cage" type, in other words that its piers are self-supporting.

The opportunity of determining whether or not the exterior masonry piers were completely supported by the inclosed iron columns and the contiguous iron frames was furnished during the wrecking of the building and our Committee took advantage of the opportunity to determine the matter. Accordingly, the two typical piers were stripped or girdled, one midway between the fourth and fifth floors and the other in the third story at the top of the window level. In each case the masonry was entirely removed for a space of two feet, completely exposing the column; the masonry piers above remaining undisturbed to the height of the remainder of the story on the fourth floor and a full story on the third floor. The stripping was left undisturbed and unshored until the building was wrecked down to that point, a matter of one day. No cracking of the piers or other failure of the masonry was apparent during the interval. This indicates to the Committee that regardless of Major Jenney's intention in the matter, and of the opinions of various commentators on the building, the piers were in fact supported by the structural skeleton. This is not surprising. In fact, it is inevitable when it is considered that the superficial horizontal area of the typical masonry pier was 800 square inches, of this 640 square inches was supported directly by the cast-iron lintels and the doubled 12-inch spandrel beams and the doubled 12-inch floor girders. The remaining 160 square inches, one-fifth of the area, represents in typical cases the pier facing 4 inches in thickness and 3 feet 6 inches in width. As this facing was bonded into the pier, it could not help but be supported by corbel action from the main body of the pier. There was in addition, though unessential to its support, considerable adhesion to the iron column to which the brickwork was closely pressed. Furthermore, at certain places stone lintels and stone belt cornices directly supported by the iron framing traversed the piers and was bonded into them forming a cantilever and a beam action which aided in the support of the brick facing in the function of a shelf. An important exception occurs to the typical column design in the three street front corner piers. In these columns, at each floor, an iron flange extends 4 inches from the outside faces of the columns into the masonry pier which at this point is 12 inches in thickness. This obviously was intended to support at least part of the pier. It also illustrates the "cutting line" which encircled the entire building at each floor at the juncture of the columns. We are informed by William D. Mundie, a draftsman of the building, that this "cutting line" was intended by Major Jenney to take up vertical expansion and contraction in the iron columns, and to divide the building in "layer cake" fashion into its integral sections of one story each.

Conceding then that wherever the metal skeleton is present it did in fact support all loads, we have then to weigh its importance and position in the evolution of the skyscraper. We believe that the claim of Leroy S. Buffington as the inventor and the father of the skyscraper should be dismissed for the reasons that he never erected a building embodying his patent (issued after the erection of the Home Insurance Building), that his infringement suits were decided in court against him, that he himself stated that his idea of an iron skeleton was suggested by the writings of Viollet-le-Duc, in which case Viollet-le-Duc would have as good or better claim than Buffington.

The other claim for first honors is that of the Tacoma Building. The claim usually takes the form of the first "complete" skeleton skyscraper or the first skyscraper in which the metal skeleton was "completely" developed. This building was built three years after the Home Insurance. The Tacoma Building introduced many important improvements over the construction of the Home Insurance Building and that it marked an advance in the science of skyscraper design there can be no doubt. The most important of these improvements was a continuation of the skeleton on the street fronts from grade to roof line. The next of importance was a direct support of the masonry piers by cast-iron angle brackets, a feature as stated, lacking in the Home Insurance Building except in the corner columns on the street fronts. The use of terra cotta for lintels and the like in order to tighten the load was a further improvement. In the aesthetic appreciation of the problem, the expression of its construction by its architecture was far ahead of its time, in which aspect it is a question if it has ever been excelled even to this day. Nevertheless the Tacoma Building still made use of cast-iron columns and all shapes other than the beams and girders which were of wrought iron.* It also had solid masonry lot line walls, cart and alley walls which could have been made skeleton construction and in our opinion showed a retrograde step in the introduction of the transverse masonry walls which assumed a very large proportion of the floor loads; whereas the interior of the Home Insurance Building was entirely free from self-supporting masonry. The use of solid masonry party walls were obligatory under the Chicago Building Laws in 1885 and 1887 so it is manifestly unjust to condemn their presence in the Home Insurance Building. The Tacoma Building, however, was not so bound when it elected to use lot line instead of party walls. Probably the first all-skeleton skyscraper in Chicago was not built until 1889, when in the Manhattan Building (Jenney and Mundie, architects) all the inclosing walls were made of skeleton construction.

CONCLUSION

As in the case of every great invention skeleton construction in its completeness was not nor could it have been discovered by any one man nor expressed in any one building. The early buildings for this reason are all more or less transitional and experimental. Each learned from the experience of the preceding and added its contribution in the development of the idea. It is, however, entirely possible, from a consideration of the evidence, to appraise the relative importance of each in terms of its originality and its influence on the work which followed. Acting on this conviction we have no hesitation in stating that the Home Insurance Building was the first high building to utilize as the *basic* principle of its design the method known as skeleton construction, and that there is convincing evidence that Major Jenney in solving the particular problems of light and loads appearing in this building discovered the true application of skeleton construction to the building of high structures and invented and here utilized for the first time its special forms.

We are also of the opinion that owing to its priority and its immediate success and renown the Home Insurance Building was in fact the primal influence in the acceptance of skeleton construction: the true father of the skyscraper.

Submitted by the Committee, November 24, 1931.
THOMAS E. TALLMADGE, *Chairman.*

NEITHER A SKYSCRAPER NOR OF SKELETON CONSTRUCTION — IRVING K. POND

NO 8-story structure—which the Home Insurance Building, designed by Major W. L. B. Jenney in 1884, really was as involving metal supports in outer walls—can by any stretching of the term be called a skyscraper. For centuries, probably, 8- and 10-story buildings were commonplace the world over and attracted no attention by their height. When one realizes that the 21-story Masonic Temple (Capitol Building), the first of Chicago skyscrapers, or the completed 12-story Home Insurance Building, doubled in height, would rattle inside the dome of St. Peter's in Rome, one can understand how minor an affair a mere 8- or 10-story building would be to the traveled or knowing.

In the masonry-walled water tower designed by S. S. Beman for the town of Pullman, and which might well fall in the category of skyscraper, Phoenix rolled shapes were used in braced columns some two hundred feet in height; these and the walls supporting an iron tank 40 feet in depth and of the same diameter! This tower antedated by about two years the Pullman Building in Chicago, on which construction was begun in the spring of 1883 and which is 10 stories in part. As I had charge of the structural design of both edifices, I am fairly conversant with the matter.

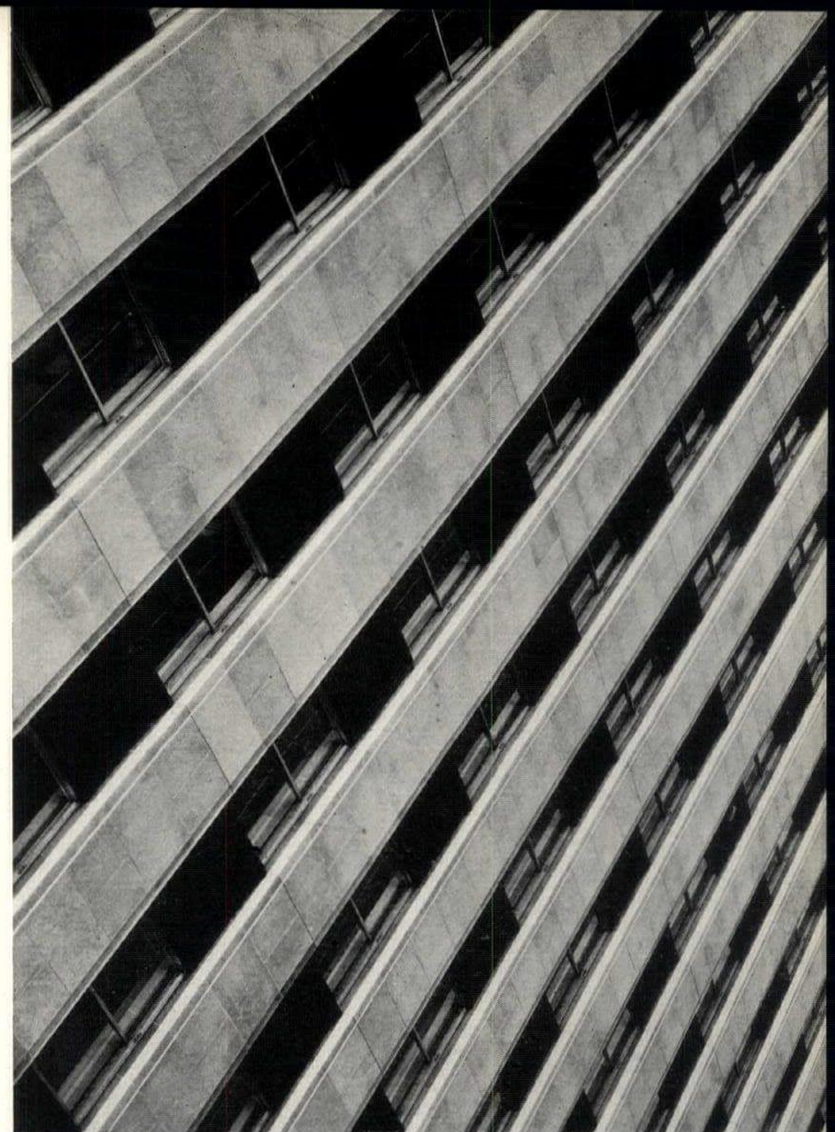
Now as to the "skeleton frame" of the Home Insurance Building: All vertical supports, in walls or otherwise, were, as in the Pullman Building, of cast iron with beams and girders of rolled iron. The wall verticals, which occurred in the Home Insurance Building only, and there in but eight stories, from the third to the tenth inclusive, were bolted at the joints. These verticals rested upon a plinth consisting of two stories of massive granite masonry which are ignored in this discussion as having "nothing to do with the case" except to confine the metal of the street fronts to eight stories. Up to and including the third floor system floor beams and girders were wall-bearing on the two street fronts as were the beams and girders of all floor and roof systems on the massive alley and dividing line walls; and floor systems could not be installed until walls were up and ready to receive them. At

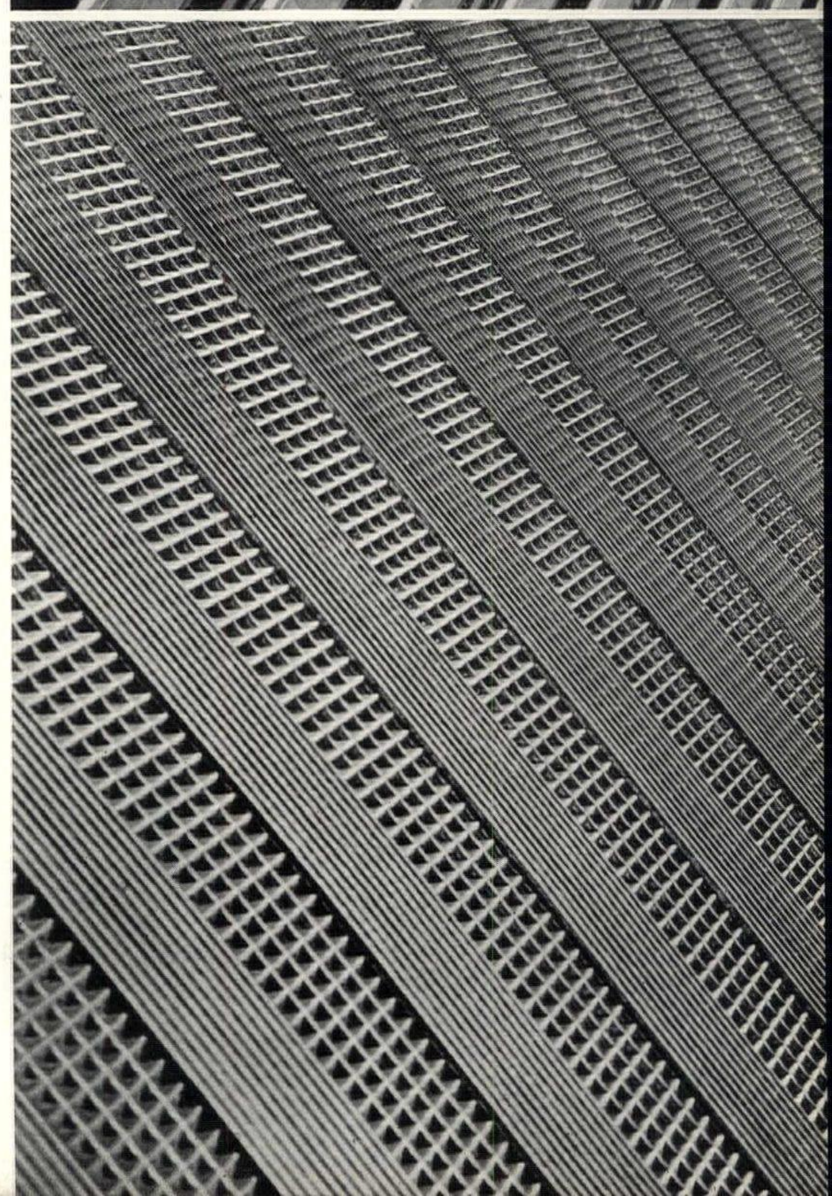
(*Concluded on page 32, advertising section*)

*Letter of Holabird and Root cited above. The superintendent of the wrecking contractor states that above the third floor all beams and girders were of steel; below, of wrought iron.

FIELD BUILDING
CHICAGO

GRAHAM, ANDERSON
PROBST AND WHITE
ARCHITECTS

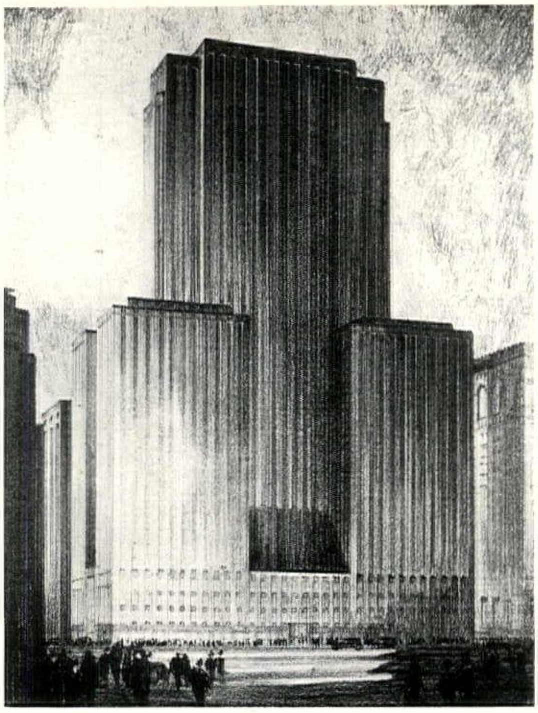




THE FIELD BUILDING

CHICAGO'S NEWEST SKYSCRAPER

GRAHAM, ANDERSON, PROBST AND WHITE
ARCHITECTS



PROJECT RENDERING

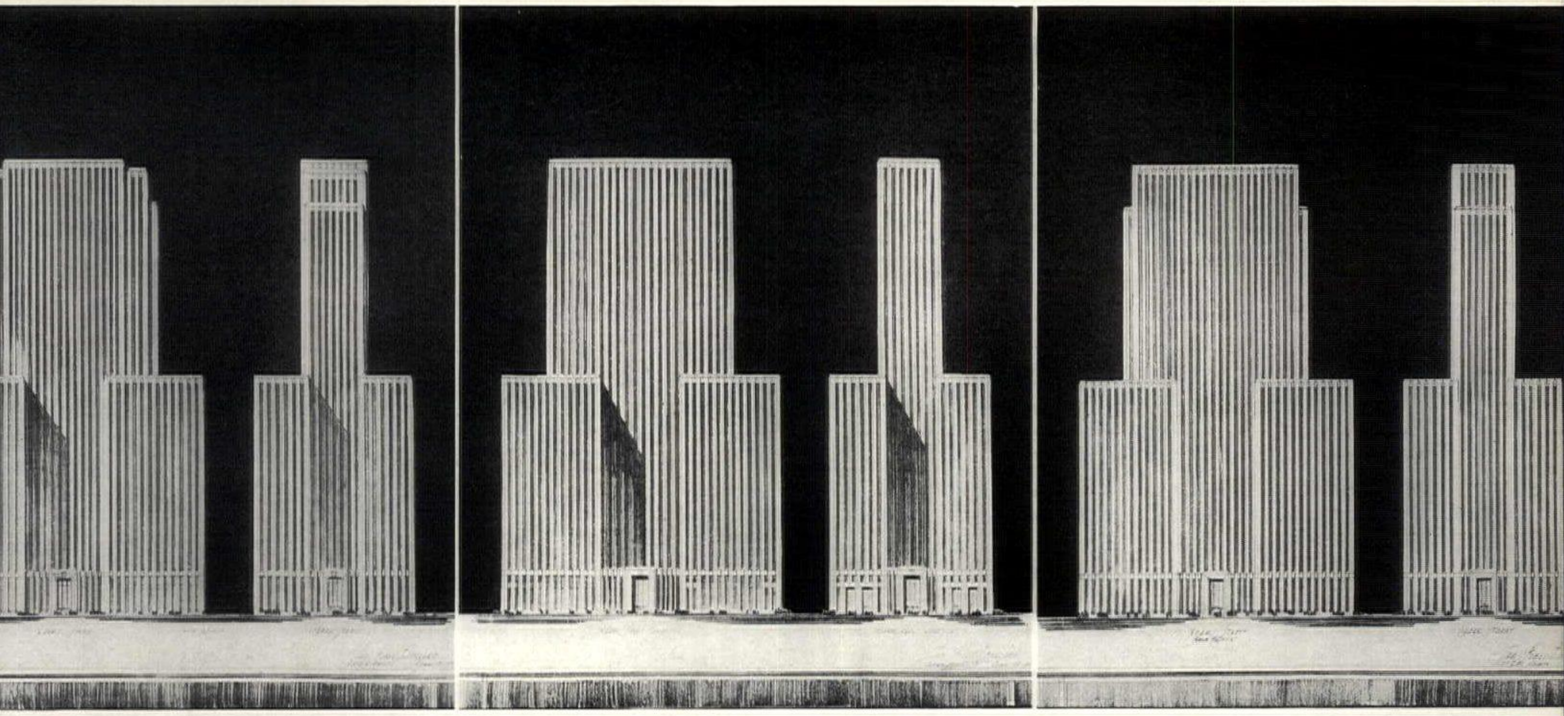
One million square feet of net rentable floor area became available with the opening, on April 28, of Chicago's newest and largest office building—the fourth highest office building in the world. It rises 535 feet above the street level, has 43 stories in its tower section and occupies a site that required the demolition of six structures, including the old Home Insurance Building. The building stands in the financial district of Chicago and occupies a full half block bounded by La Salle, Adams and Clark Streets.

Preliminary sketches for the Field Building were started in June, 1928, and in the two following years some forty sets of sketch drawings and financial set-ups were prepared. Selected examples of these sketches are illustrated with this article. Final sketches were approved in November, 1930. Working drawings were issued on June 8, 1931.

The Field Building was erected in three stages or units and the tower, each separately completed for occupancy. The building base is faced with a polished black granite while the facing of the superstructure is Indiana limestone. Window spandrels screening the floor edge are of cast aluminum. A white bronze trim was utilized for the window and door frames at the ground floor. Window frames for offices throughout are of aluminum, an innovation that contributes to ease of operation and improved lighting. Aluminum frames, because of their moderate sash width, permit a glass area 10 per cent greater than obtainable with wood frames. By precision in their manufacture there is virtually no rattle or air and dust leakage.

Physical training facilities, including courts for squash, racquets, and handball, are provided for tenants of the building. There are also exercise rooms, vapor and steam baths. These accommodations are available on the ground floor and are conveniently reached from the main arcade that extends through the block from La Salle to Clark Street. This main floor arcade is two stories in height and 305 feet in length. It gives quick access to the four elevator towers. The arcade is served by shops designed primarily for the convenience of the building tenants.

Elevator service provides speed up to 1,000 feet per minute. Each cab has a combination car-stop and position indicator to give the pas-



PRELIMINARY SKETCHES MADE ON APRIL 16, APRIL 18 AND MAY 5, 1930, RESPECTIVELY

sengers visual indication of the position of the elevator. The car-stop indication is a new device in elevator engineering. In connection with elevator signal lighting a radio device is installed to detect burned-out bulbs in hall signal lanterns. Ordinarily there is no way to discover this defect other than by chance observation. A burned-out bulb is indicated by radio equipment located in the penthouse where, by turning the dials, the elevator maintenance men can test the bulbs and arrange for replacements.

An automatic reversing arrangement reduces the unnecessary car travel during the rush hours. With this system a cab rising to the top of a shaft is automatically reversed in direction at the highest signal light in the shaft. The same system can be applied on the local and express cabs for holiday or daily after-hour service.

A lengthy study was made of the ventilation of the elevator cabs. After research it was decided to install a blower with a capacity of 4,000 cubic feet of air a minute in order to force air into a compartment at the top of each cab and thence through specially designed openings into the cab. As a result of this design there is positive ventilation that is quite independent of the elevator movement or its position in the elevator shaft.

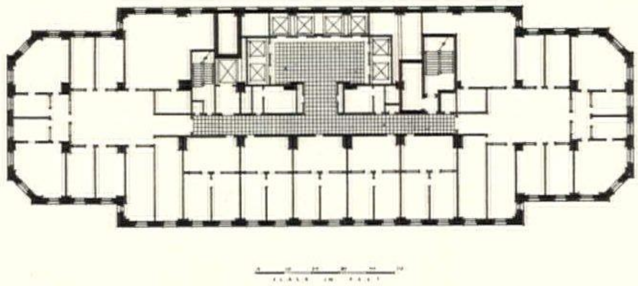
Heat is supplied by a two-pipe vacuum heating system with individual riser control. Four different types of heating are, in fact, possible. First, for cold weather there are two 500-horse power Babcock & Wilcox coal-burning boilers, fired with chain grate stokers of the same make. Second, for mild weather, there are two 250-horse power B. & W. oil-burning boilers, with Bethlehem oil burners. Third, these oil-burning boilers can be converted for gas without important changes. Fourth, for stand-by service and for heating water during the non-heating season, there is central station steam. With this flexibility in selecting fuel, it is anticipated that heating costs can be kept to a minimum.

Because of the great height of the building and the excessive pressure required, it was decided to split the domestic water supply system into two independent zones—one for the tower and another for the main lower part of the building. Each system has its own storage tanks, pumps and equipment and is independently complete.

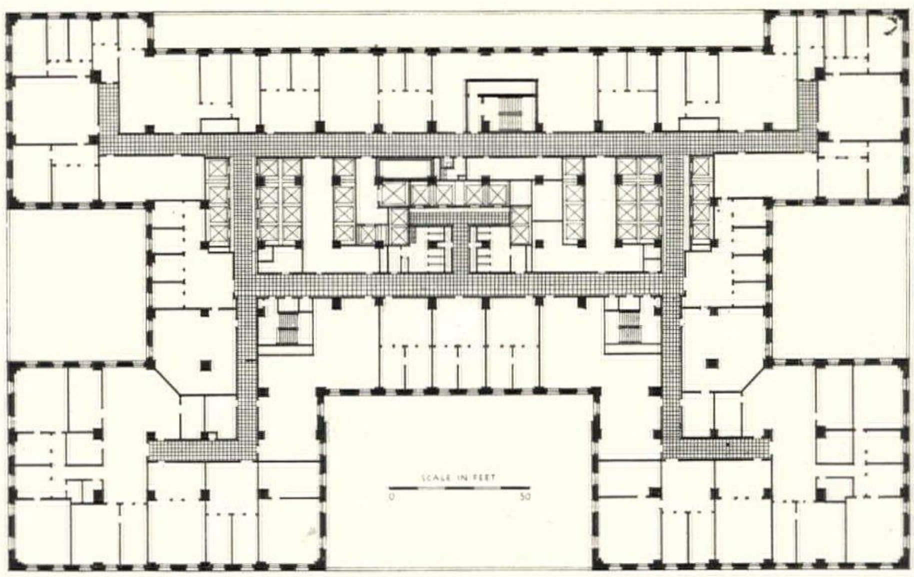
Hedrich-Blessing Photographs

THE FOURTH LARGEST OFFICE BUILDING IN THE COUNTRY

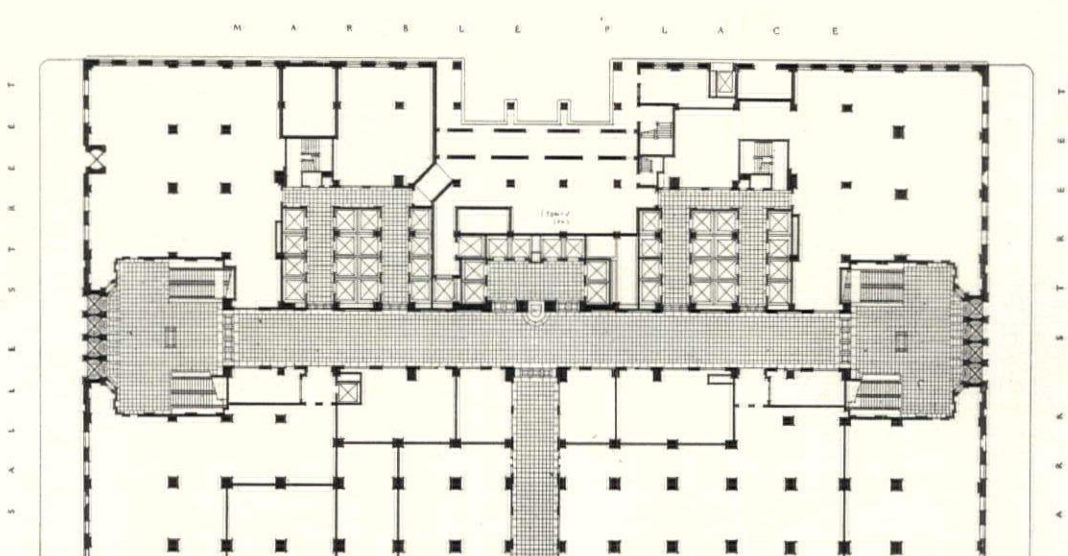
TOWER FLOOR



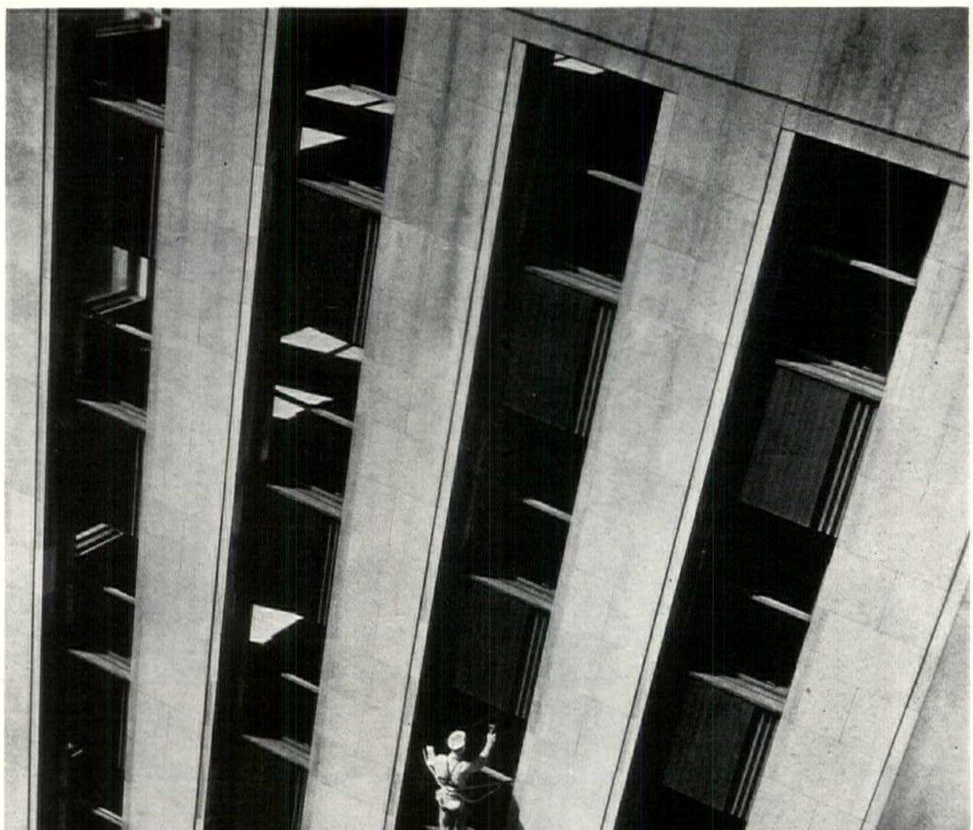
TYPICAL FLOOR



GROUND FLOOR



Hedrich-Blessing Photographs




Chicago Architectural Photographing Co.

DETAIL VIEWS OF CHICAGO'S LARGEST OFFICE BUILDING

GRAHAM, ANDERSON, PROBST AND WHITE ARCHITECTS

Chicago Architectural Photographing Co.

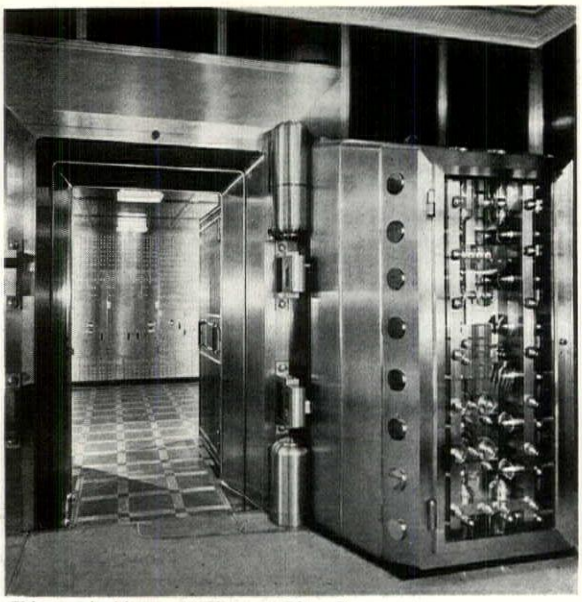
1,000,000 SQUARE FEET OF NET RENTABLE AREA

Hedrich-Blessing Studio

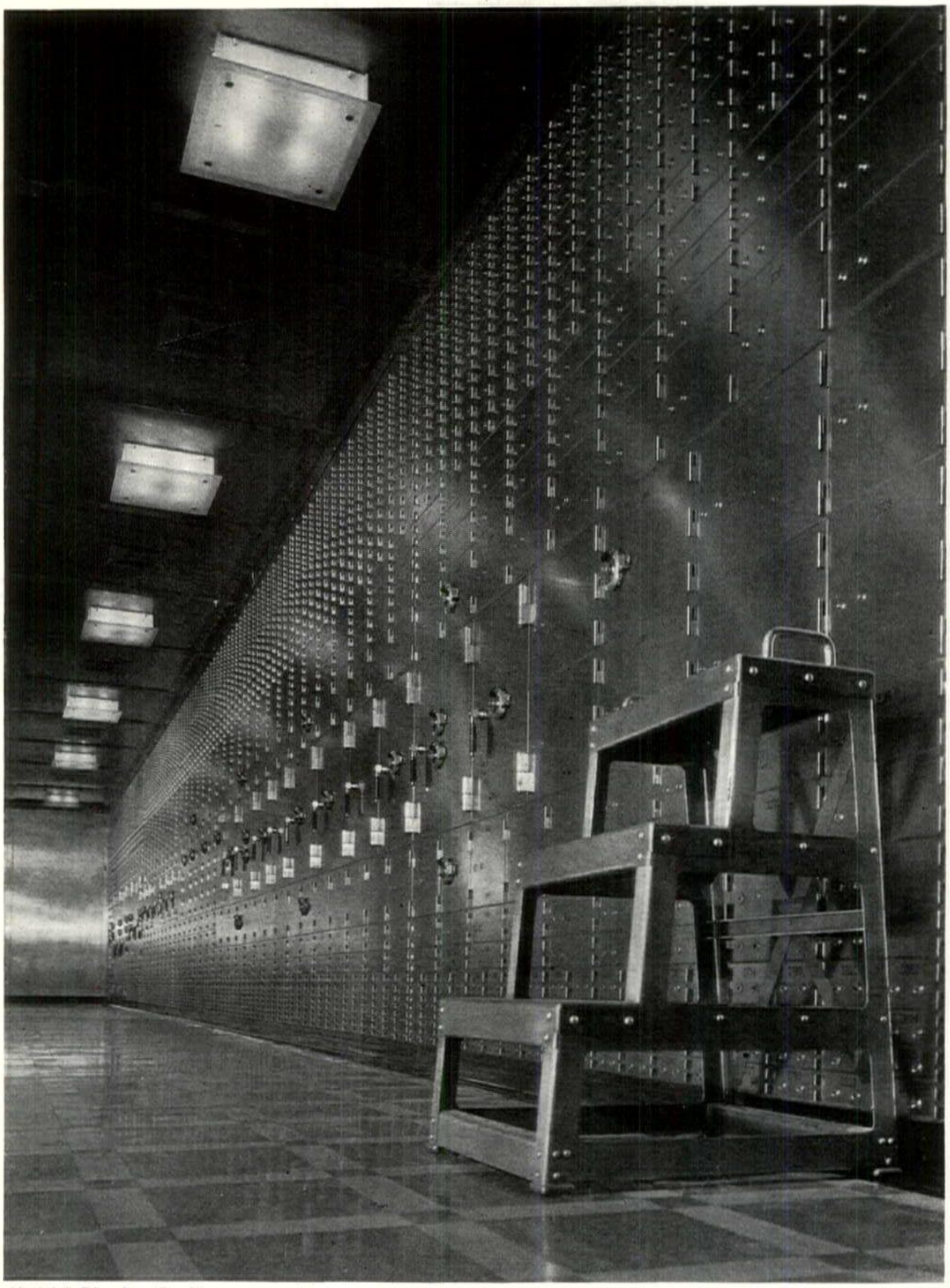
GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS

The safe deposit vaults for the building are available not only to tenants, but also to firms and individuals in the neighboring buildings.



Chicago Architectural Photographing Co.



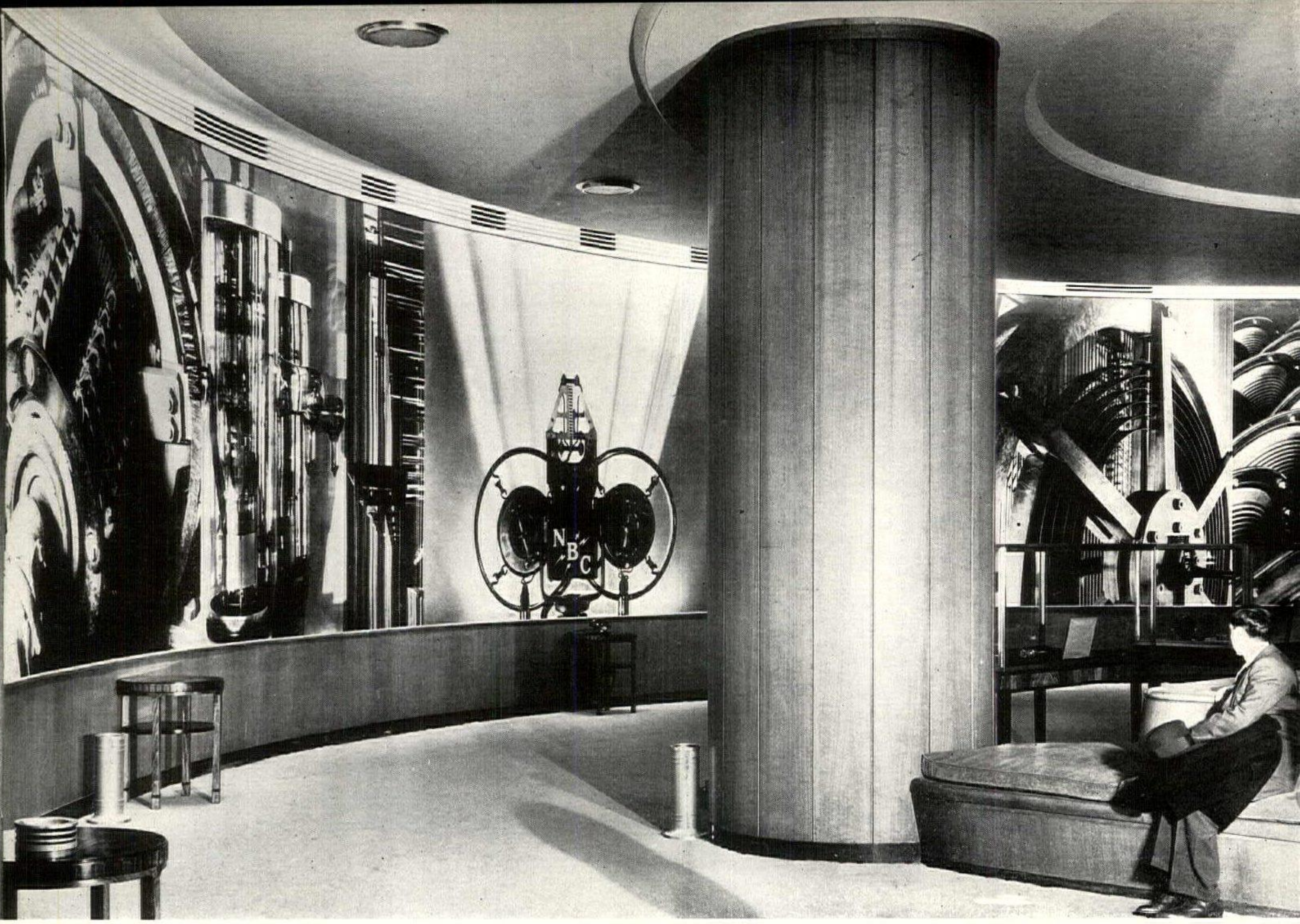
Hedrich-Blessing Studio

PHOTOMURALS IN NBC STUDIOS

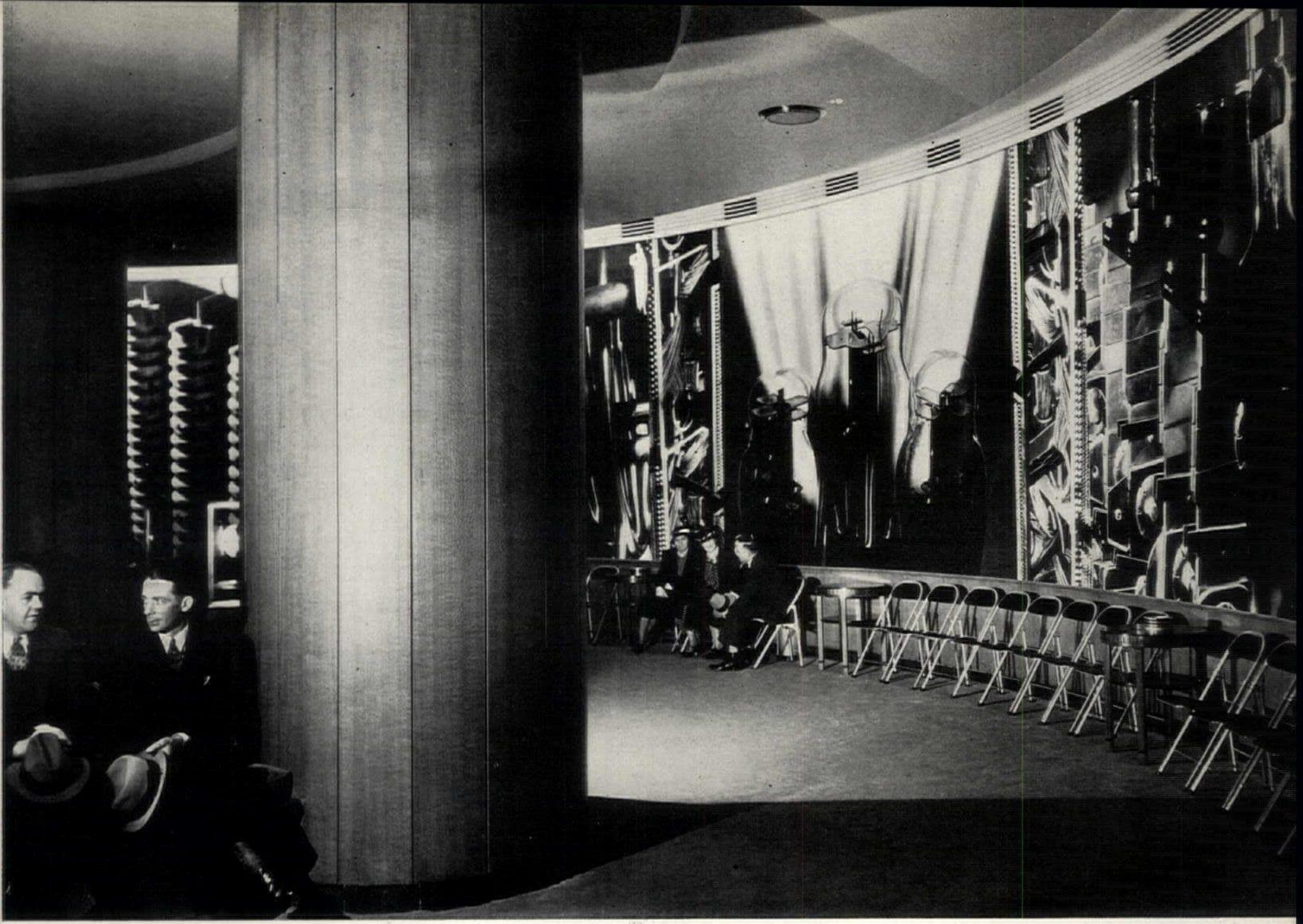
R. C. A. BUILDING, RADIO CITY, NEW YORK

PHOTOGRAPHS BY MARGARET BOURKE-WHITE

This view shows Miss Bourke-White in front of an antenna tower panel.



SOUTH WAL



NORTH WALL

INFORMATION ABOUT BOURKE WHITE PHOTOMURALS NBC STUDIOS, R. C. A. BUILDING, NEW YORK CITY

The mural was composed entirely of industrial subjects which would tell the story of the mechanics of radio. It was hung in the large circular reception room of the National Broadcasting Company's studios at Radio City. Access to this rotunda from the main lobby is by means of a wide staircase which, with four large supporting columns, forms the axis of the room.

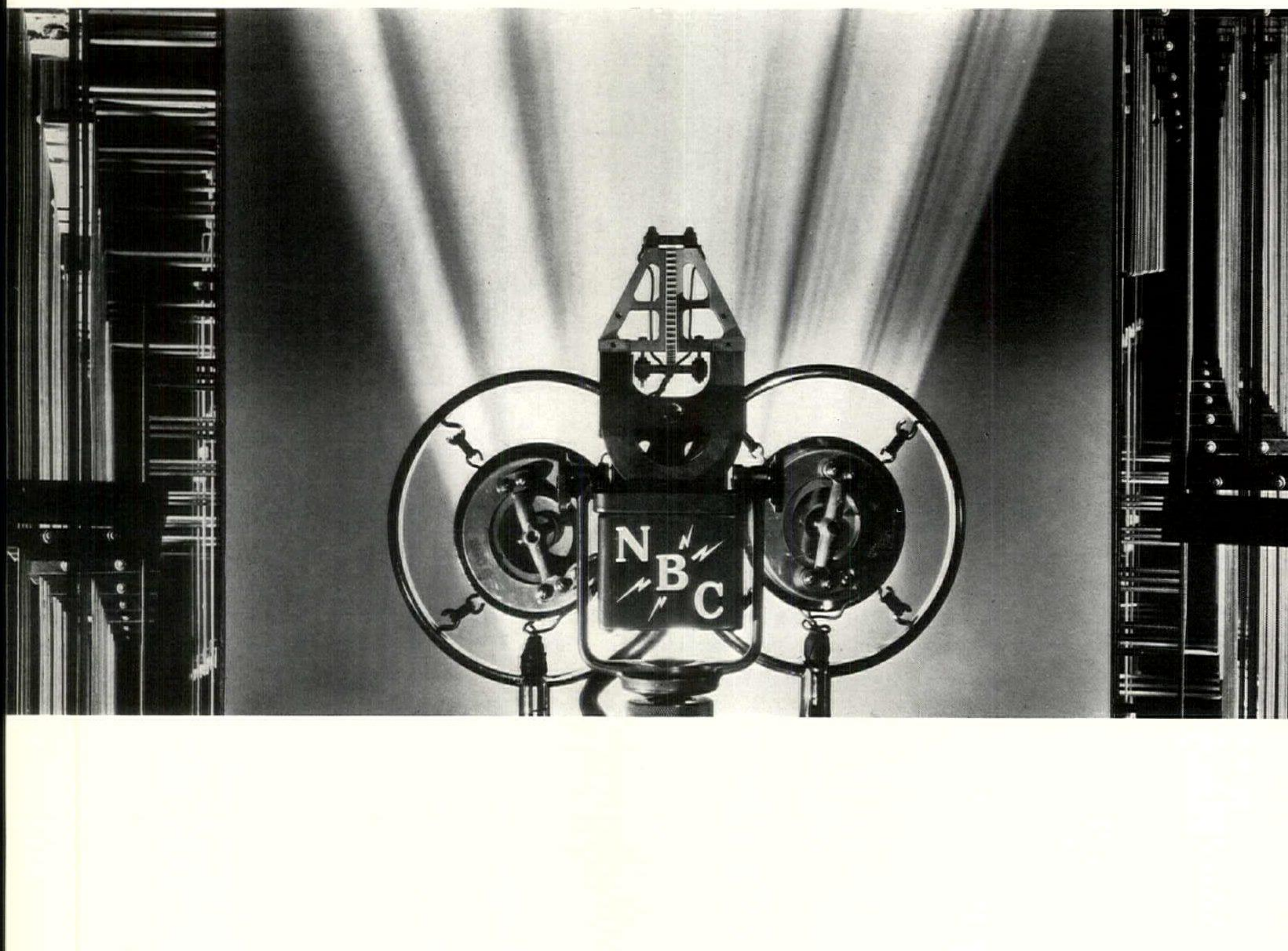
The walls were acoustically treated, and the murals were mounted on felt to preserve the acoustic quality.

The negatives were enlarged directly on canvas coated with photographic emulsion, instead of the usual photographic paper which is approximately half the cost. Neither material exceeds the price range of the better wall papers. Either can be coated with transparent lacquer, which makes cleaning possible, and neither will fade.

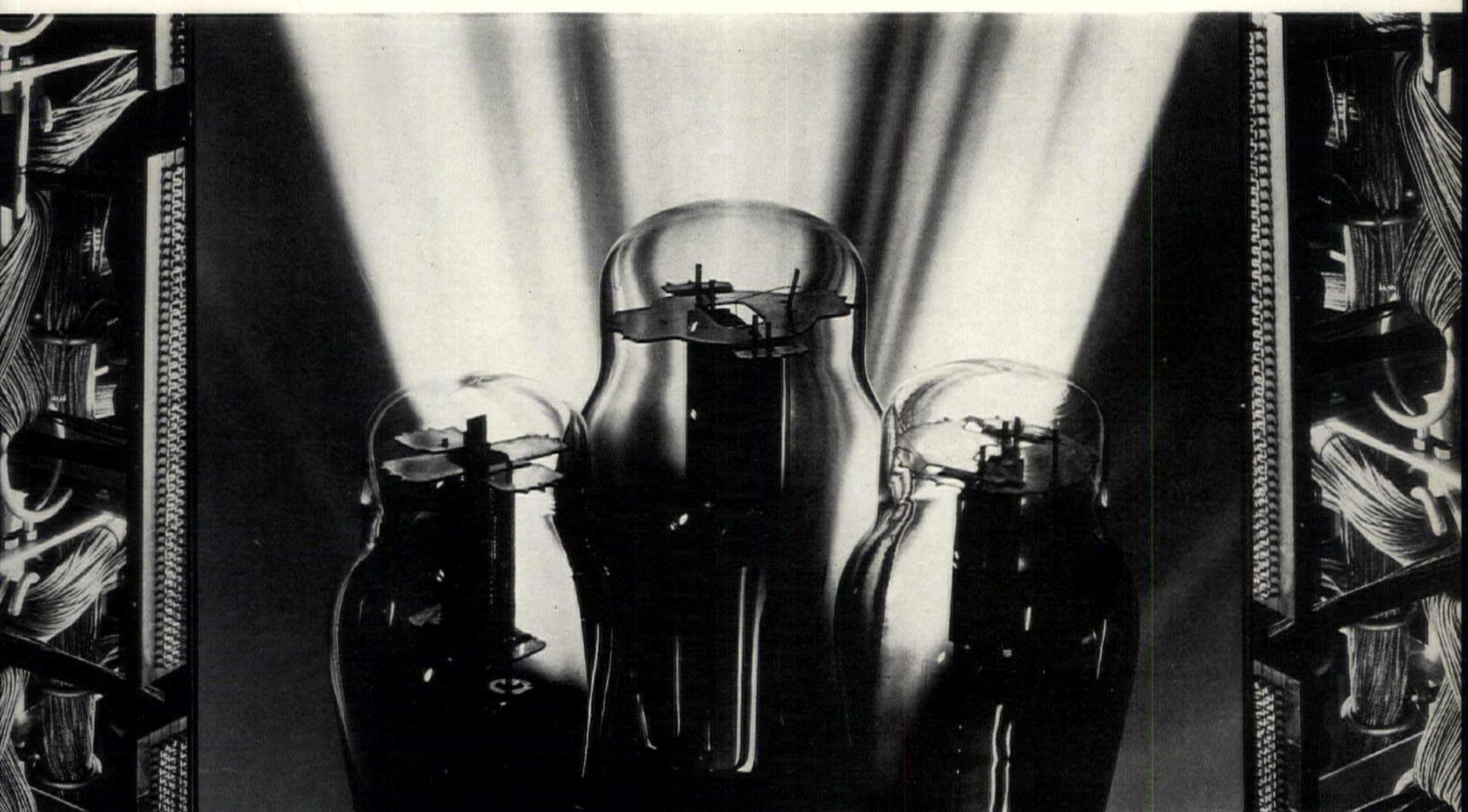
The enlarging was done in strips of 40-inch width, the central panel comprising four strips, and the other panels two or three, which required careful matching. Perfect definition in the photographs was important because the usual "printing in" and dodging devices common to photographic enlarging are not possible with mural enlarging since matching is made difficult or impossible.

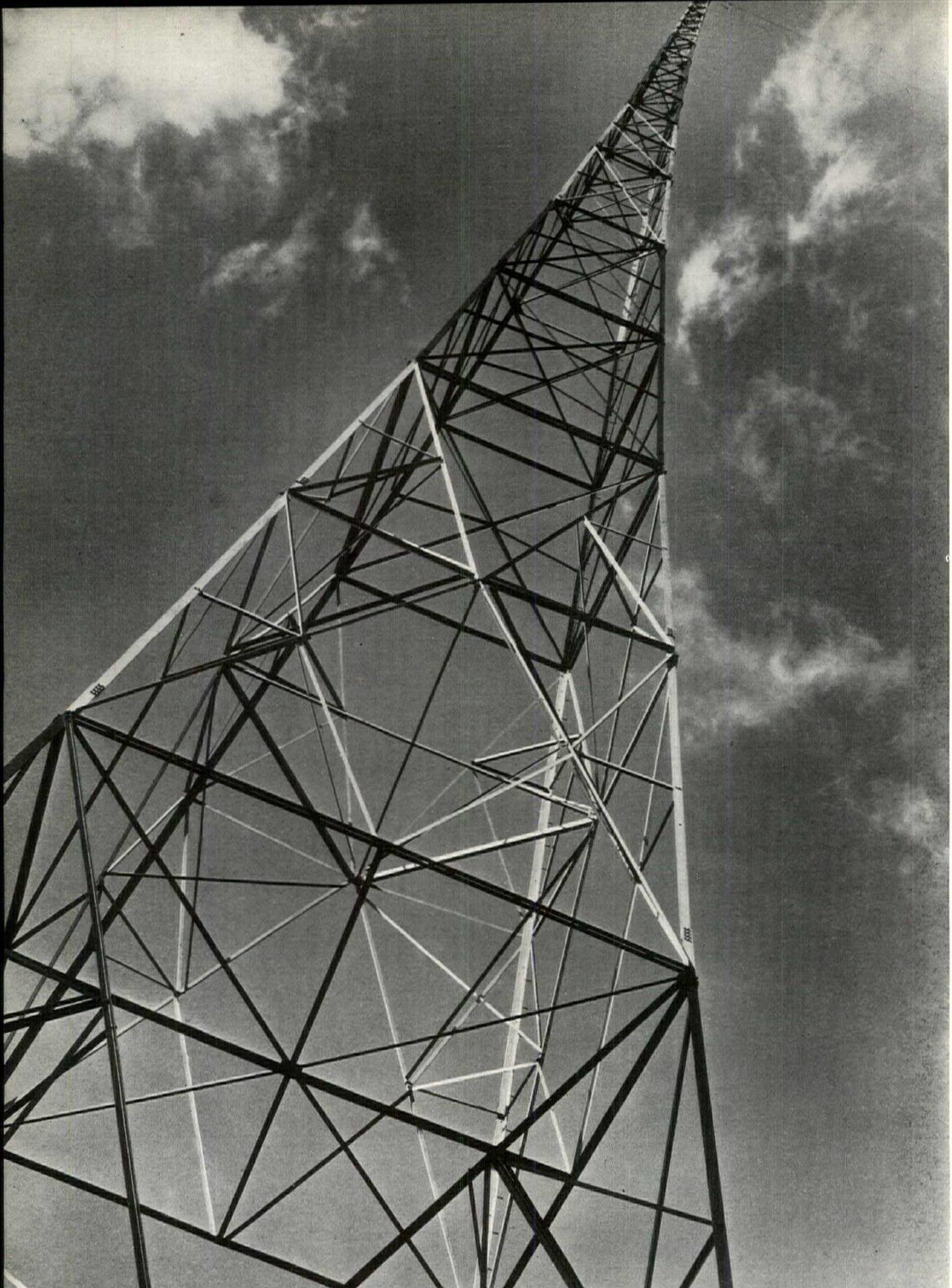
Eastman panchromatic film was used, the negatives being 5" x 7" or 8" x 10". The negatives were developed in fine grain borax developer. In composing the photomurals several hundred negatives were made. Each subject was photographed from many points of view and under different types of lighting. This was done to give a wide selection so that in the final design as close harmony as possible could be achieved. The mural was composed to harmonize with the architectural features of the room.

CENTRAL PANEL ON SOUTH WALL: MICROPHONES SYMBOLIZE OUTGOING SOUND. ON EACH SIDE ARE BUS-BARS. PHOTOGRAPHS BY MARGARET BOURKE-WHITE

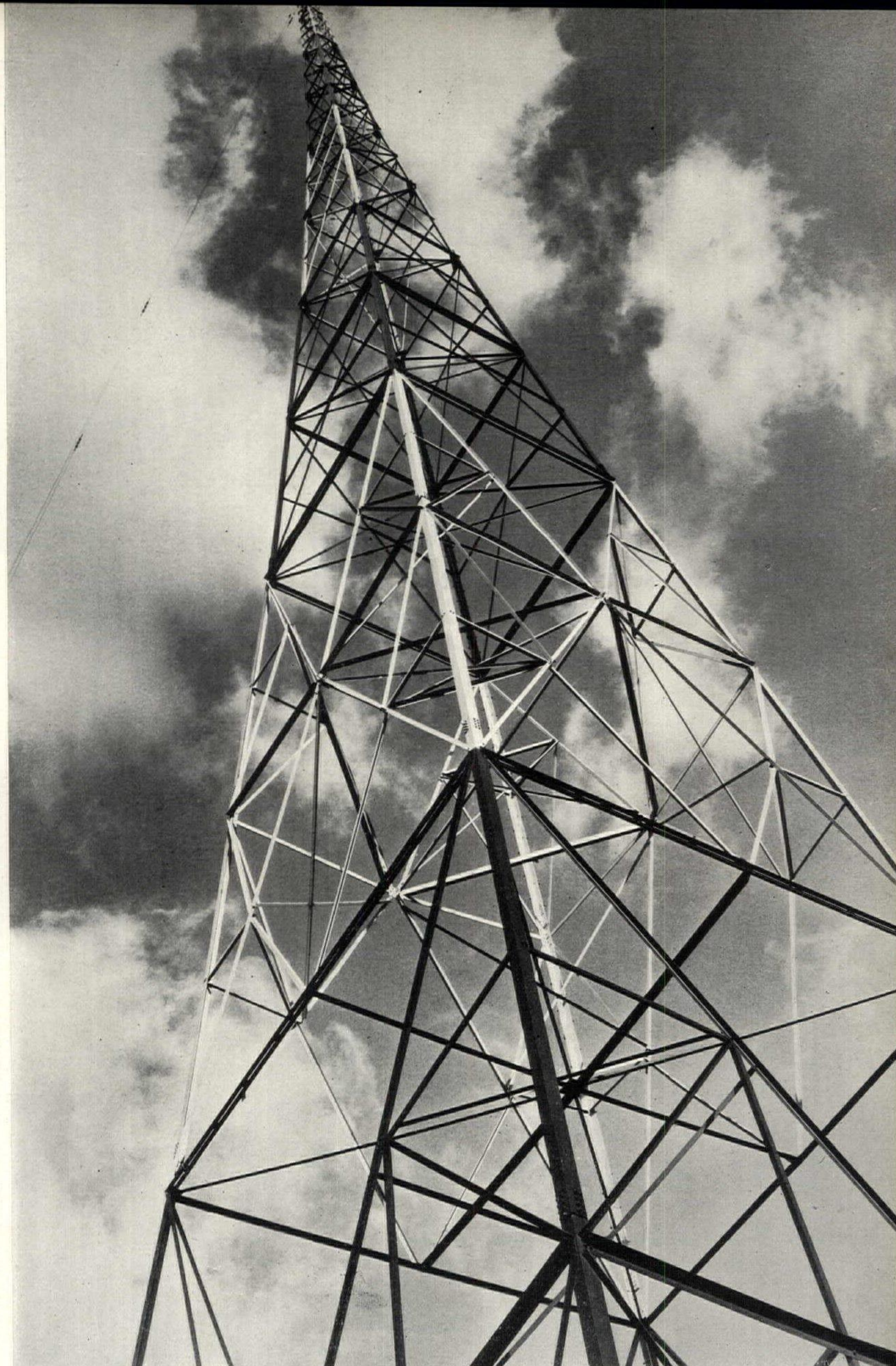


CENTRAL PANEL ON NORTH WALL: RECEIVING TUBES SIMILAR TO THOSE IN HOME RADIO SETS SYMBOLIZE INCOMING SOUND. PANEL BOARDS AT SIDES

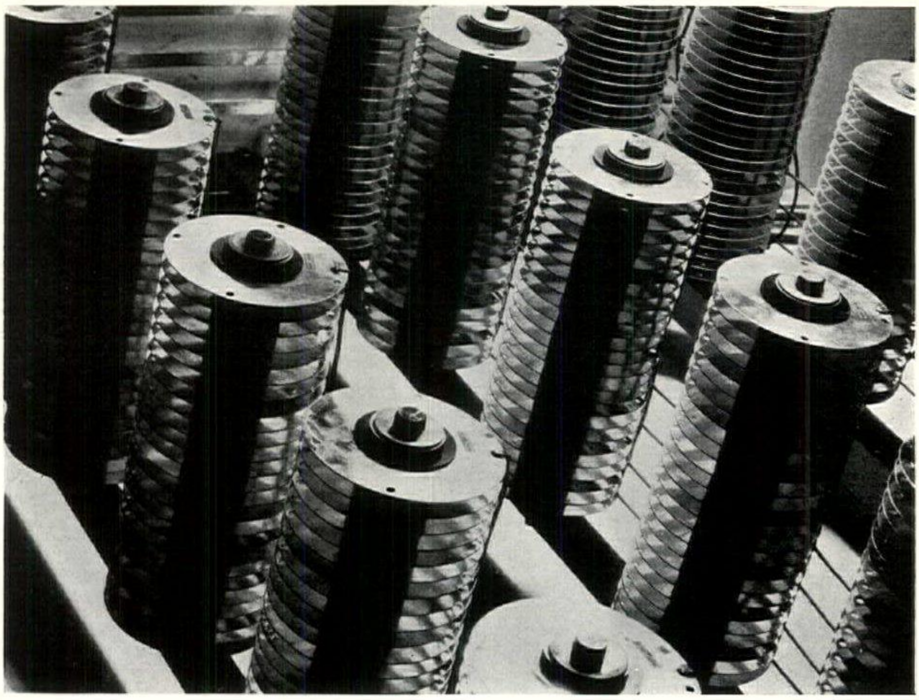




ANTENNAE TOWERS AT BELLMORE, LONG ISLAND

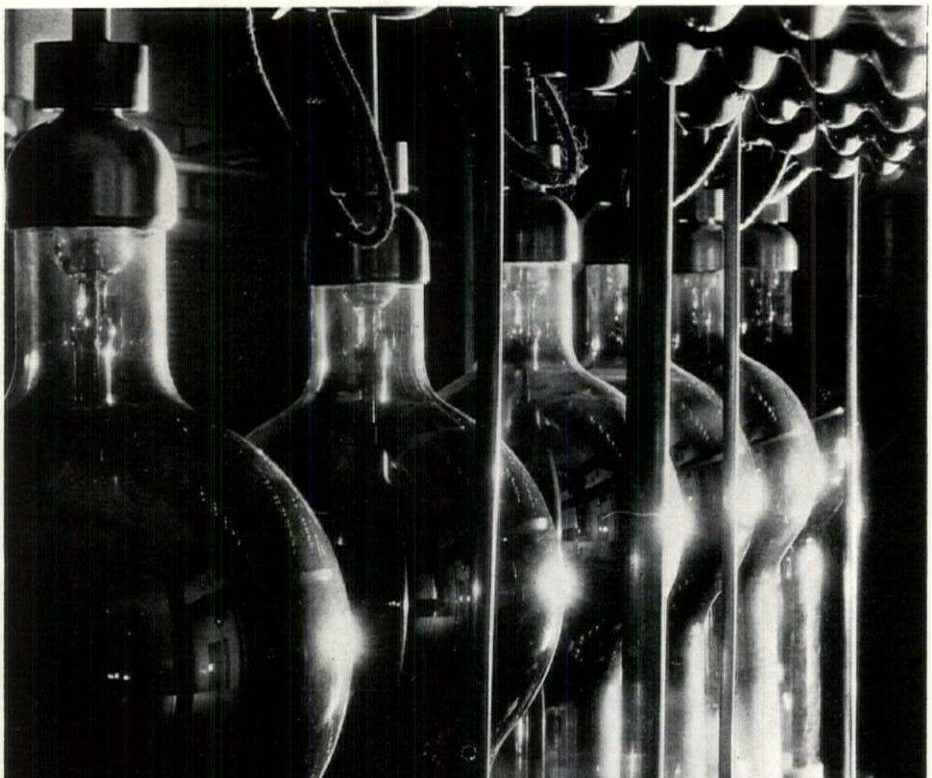


PHOTOGRAPHS BY MARGARET BOURKE-WHITE



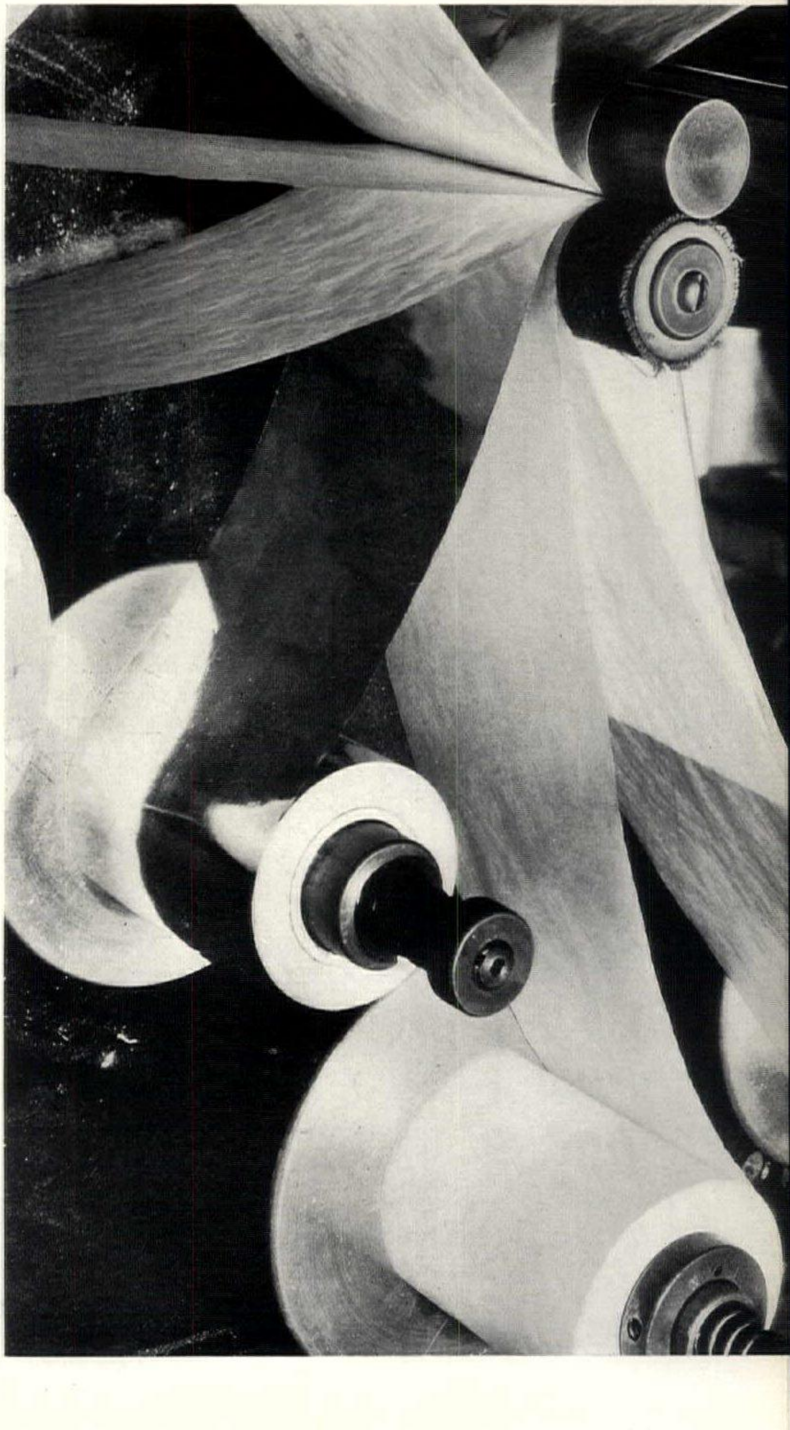
RECTIFIERS FOR RECTIFYING CURRENT FOR METERS

10-KILOWATT POWER TRANSMISSION TUBES

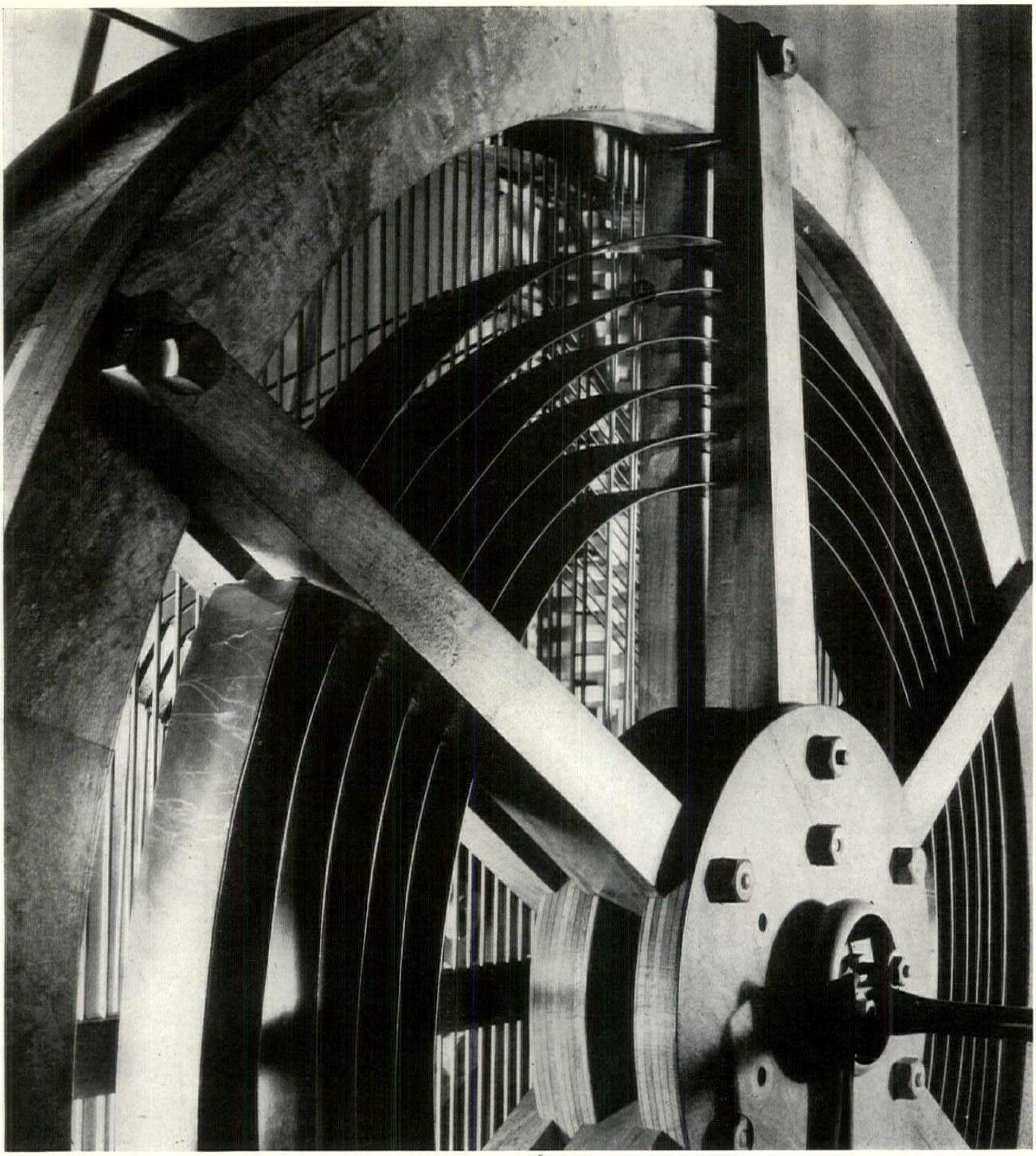


LOUD-SPEAKERS IN FACTORY
AT CAMDEN, NEW JERSEY

WINDING CONDENSER COILS



PHOTOGRAPHS BY
MARGARET BOURKE-WHITE



TRANSMISSION STATION HELIX — PHOTOGRAPH BY MARGARET BOURKE-WHITE

TECHNICAL NEWS AND RESEARCH

BY HAROLD R. SLEEPER

REDUCING CONSTRUCTION COSTS—Part 2

WHEN BIDS AND BUDGET DO NOT BALANCE

HOW TO REDUCE CONSTRUCTION COSTS

By
HAROLD R. SLEEPER, Architect
Office of Frederick L. Ackerman

Part one of this study appeared in December, 1933. The purpose of the study, which was undertaken at the suggestion of this magazine, was indicated in the opening paragraph: "The architect today is faced more than ever with the fact that incoming bids may exceed the owner's budget. Costs may have dropped 15 or 20 per cent below normal, but the owner's expectancy has dropped as much as 50 per cent." Part One dealt mainly with the following topics: temporary office, photographs, telephone service, temporary heat, cleaning, samples and models, grading, footings and foundations, floor slabs, concrete specifications and forms, basement. The study is of practical value to architects who have work in prospect and Part Two is published now in the belief that the modernization movement promoted by the National Housing Act may induce quite a few owners to restudy projects whether or not these come under the provisions of the Act. Harold R. Sleeper is co-author, with Charles George Ramsey, of "Architectural Graphic Standards," published by John Wiley & Sons, Inc., 1932.—The Editors.

PART TWO

MISCELLANEOUS MASONRY

Brick:

Change bonds of brickwork from Flemish or English to common bond.

Change brick joints from rodded or tooled to struck or weathered type.

Allow brick to be laid from inside of wall with joints struck while wall is going up.

Solid exterior brick walls may be changed to brick veneer on wood studs.

Brick veneered walls may be changed to stucco.

Omit ground brick arches and use mortar joint instead.

Partitions:

Interior bearing partitions may be made of double brick instead of common brick with economy if double brick is available near the job; or these partitions may be made of concrete blocks.

If the loads are slight, consider the use of heavy clay hollow tile blocks for these bearing partitions.

Granite facing may be replaced by machine-made terra cotta blocks with edges ground to level.

Mortar:

Satisfactory exterior mortar may be secured at a saving by use of 1 part cement, 1 part hydrated lime and 6 parts sand.

MASONRY

All types of material for fireplaces.

Facings and Outer-hearths:

Materials specified.	*Suggested substitutes.*
Marble	Phenolic compounds in sheets. Asbestos imitation marble. Slate imitation of marble. Cast plaster marble imitation. Plaster painted to imitate marble. Zenitherm.
Limestone, sandstone, Travertine	Cast cement. Cast plaster. Zenitherm. Domestic travertine.

Materials specified.	*Suggested substitutes.*
Face brick	Common brick.
Brickettes	Second-hand brick.
	Omit patterns in laying, such as herringbone.
(With lower costs than any of the above types but changing the character of the facing.)	Soapstone.
	Terrazzo hearths.
	Slate, structural.
	Tile.
	Fieldstones.
	Local stone as available.
	Plaster painted.
	Stucco.
	Structural glass.
Faience tile	Quarry tile or other cheaper tile.

Linings and Inner Hearths:

Materials specified.	*Suggested substitutes.*
Face brick	Fire brick painted.
Brickettes	Black brick (fire-resisting).
Tile	Common well-burned brick.
	Soapstone (fire-resisting kind).
	Quarry tile.

Other items that may be omitted on fireplaces are:

1. Ash dumps.
2. Gas lighters.
3. Dampers on very large openings. Use steel angles and the like. Use poker type dampers when others have been specified.

Build all masonry complete in the first rough operation and not in two separate operations.

GRANITE

Consider use of granite veneers (2″ to 4″ thick) facing instead of granite walls.

The cheapest finish for this material is bush-hammered or pointed finish (except the sawed or sandblasted finishes). Certain types of lettering and carving can be executed by sandblasting and this is much more economical than hand cutting.

Cut cast stone may be more economical.

Terra cotta machine-made ashlar is an economical substitute.

EXTERIOR MARBLES

Certain domestic marbles may be found that are satisfactory for use in place of the more expensive imported marbles. New domestic marbles are constantly being put on the market.

Other substitutes are cut-cast cement, cast cement with colored finish, limestone and sandstone.

LIMESTONE

Sawed strip limestone may be used for ashlar facings at considerable saving over the usual cut limestone work.

Limestone costs are reduced if one tone of stone is not required and the variegated type used.

Economical finishes are sand or shot sawed or smooth planed.

If 1/4″ joint is acceptable it will be an economy over the usual 3/16″ joint.

When stone is used in conjunction with brickwork an economical mortar is 1 part lime, 1 part cement, 6 parts sand.

Zenitherm is used as a substitute for limestone. Cast plasters for interior work are used.

Cast cement may be used in place of limestone for chimney caps, door sills, window sills.

IRON AND STEEL

Miscellaneous Items:

Omit area gratings (if protection is needed, use railing).

Omit steel disappearing stair to attic. Use trap door instead.

Stock spiral stairs may be used in place of the usual stairs for cramped spaces and are very good for alteration work.

Use ship ladders instead of stairs for access to spaces, such as machine rooms and elevators.

Omit leader shoes and use clay tile connections.

Simplify all wrought-iron stair rails, balusters, handrails and change to wood where possible.

Omit or simplify all cast or wrought-iron grilles, gates, brackets, and the like.

Change steel stairs to concrete if labor costs are low. See grilles under sheet metal.

Metal Bucks:

Type of metal buck without trim for service spaces and utility rooms may prove economical.

Consider metal bucks in place of wood bucks, trim, grounds, etc. In some work this type of construction on account of low labor costs will be advantageous.

STEEL WINDOWS

Where heavy or intermediate weight sash have been specified use stock size lightweight sash. These are sufficiently heavy for small-size openings. Stock wood frames may be used instead of specially designed frames for steel windows. All wood frames may be omitted and steel frames held in masonry wall with fins. Use of friction hinges will save cost of stays and will operate satisfactorily.

Get estimates on use of wood windows as well as steel sash.

HOLLOW METAL DOORS

Design them so that they are in accord with the Simplified Practice Recommendation R-82-28 as established by the U. S. Department of Commerce Bureau of Standards. This pamphlet specifies the gauge of metal thickness, dimensions of rails, stiles, rebates, bevels, and the like. Doors following these standards will be more economical than those specially detailed.

Check class of underwriters label specified to see that this is in accord with the minimum demanded. Do not ask for labels where not actually needed.

Omit graining on steel doors.

KALAMEIN DOORS

The U. S. Department of Commerce Bureau of Standards Simplified Practice Recommendation R-83-28 gives specifications for these doors, including stock sizes. The same suggestions as made for hollow metal doors refer also to kalamein doors.

In certain localities hollow metal doors may cost less, in quantity, than best grade kalamein doors.

STRUCTURAL STEEL

Consider use of bolts for field connections instead of rivets on jobs where steel tonnage is small. Also on such work consider substitution of two small steel members in place of one larger girder as this decreases erection costs. Where steel framing for roofs has been specified substitute frame roof with (a) slow-burning construction or (b) ordinary wood framing. If remainder of building is of fireproof construction, this change will not alter fireproof insurance rating but will slightly increase the insurance premium. Such substitution is especially worthwhile in roofs involving dormers, hips, valleys, and the like.

ROOFING

Flat roofs of slate, tile or sheet metal may be changed to built-up roofing with heavy composition wearing surface where required or wood construction with canvas deck may be used at a still greater saving.

Where slate roofs of graded type have been specified change to 3/16" or ⅜" thickness and make all slate same length.

Where tile roofs are specified change to slate or where hand-textured flat shingle tile are specified change to machine-textured tile.

The comparative cost of asbestos shingle and slate should be determined by estimates.

Change lead-covered copper roofing and flashing to copper.

Where lead roofing and flashing is specified change to lead-coated copper.

Use stock gutters, stock gutter brackets, stock leaders in place of specially detailed work.

Change all built-in gutters to hanging gutters.

Window flashing at window heads may be of heavy tarred felt or of tarred fabric.

Consider Armco as well as copper and aluminum.

CARPENTRY

Rough Carpentry:

Check all lumber grades to see that requirements are not more severe than necessary. Structural lumber should be No. 1 Common but roofers, sheathing, subflooring, furring, etc., may be No. 2 and when some of the Western woods are used even No. 3 may be used. Collar beams, ties, bridging, partition studs on small work may be changed from No. 1 to No. 2 Common lumber.

Sleepers may be reduced from 2" x 4" to 2" x 3" and from No. 1 to No. 2 Common without any serious sacrifice. These may be run at right angles to the room walls rather than diagonally so as to save a little labor. Spacing of sleepers may be increased from 12" to 16" for floors with light loads.

Douglas fir in most localities is more economical than spruce.

Omit yellow pine and substitute fir for framing.

Omit cross furring on ceilings when metal lath is used.

Use straight sided boards instead of T & G boards for subfloors over concrete slabs as they are cheaper and safer.

Omit rough flooring in unfinished attics and place a narrow runway only.

Use ⅞" x 2" shingle strips for all shingle roofs in place of roofers.

Finish Carpentry, Exterior and Interior:

Use short shingles 16" and 18" long. If thick butt shake effect is desired, use machine-made shake. Thick shingles may be simulated by doubling shingles on walls and lapping side joints.

Omit blinds on windows that are not easily seen.

Change sash from 1¾" thick to 1⅜".

Omit all built-in gutters as they are very expensive.

Omit any dormers possible.

Eliminate bay and oriole windows.

Grades of wood are often better than needed for the exact requirement. Where antique stained effects are desired consider use of "C" grade material. If not, "B" should be used. For painted work "D" grade can often be used, in all cases "B" is possible.

Check all trim details to see that no profiles or trim are just too large to be finished out of the stock size larger. A 4" stock board, when dressed will only produce a 3½" finished board. Architects have a habit of showing rails and stiles and other woodwork 1¼" finished; such pieces must be taken from 1½" stock. Whereas if it is indicated 1/16" thinner or 1-3/16" it can be made from the 1¼" stock.

Pare down the thickness of all window sills so that they can be made out of thin stock, not over 2" rough or 1⅝" dressed.

Door jambs may be ⅞" thick with planed stop instead of 1⅛" or 1⅜" as often specified. Blocks for butt screws must then be used.

Consider the use of stock interior and exterior trim instead of special molds, stock window frames and sash and stock doors.

Door saddles may be omitted, especially from closets and secondary spaces.

Wood walls and wainscots may be economically secured to ½" or ¾" strips secured to masonry partitions instead of to 2" x 4" studs. Two coats of plaster under wood paneling are not necessary; they may be omitted and roofing felt used to better advantage.

Change doors from 1¾" thick to 1½" where possible, such as in closets, baths, etc.

Omit circular or round windows.

Instead of wood panels use thin wood veneer mounted on cloth and applied as wall paper. This is economical on old work that has plastered walls. This may be used over wall boards.

Change circular or curved stairs to straight run.

Panels:

Panels are often specified thicker than required. Three-ply panels where not over 18" x 18" need only be ¼" thick.

See that built-up 3 or 5-ply panels have not been specified where solid wood would be more economical.

Five-ply panels are made ⅜", ½", ⅝" and 13/16".

For wood paneling substitute boards vertically or horizontally laid. These are not much more expensive than plaster.

Inexpensive woods to consider for such are cypress, fir, spruce, Arkansas pine, Pondosa pine, redwood.

Closet Equipment:

Omit brass poles and sockets; use ⅞" wood pole and holes cut in hook strip.

Omit shoe shelves or racks.

Make shelves only one foot wide, one shelf only.

Wall Boards:

To be used in place of plaster for walls and ceilings; make substitutes in basement and attic.

Beveled joints showing frankly are most satisfactory.

If boards are to be covered with textural paint, joints must be taped and nails set and covered with composition. Other possibilities for covering joints are batten strips, metal molds, shiplap joint or ashlar joints.

HARDWARE

Consider omissions of all locks for bedroom doors, closet doors, first-floor doors and use of latches only in residential work.

Consider butts for painting rather than plated or solid brass.

LATHING AND PLASTERING

See whether any furred ceilings can be omitted.

Cut gauge of lath to minimum. Galvanized lath not needed indoors.

Paper-back lath may cut plastering cost.

Consider the use of plaster board or plaster lath with two coats of plaster or one coat of plaster and one coat of plastic paint instead of metal lath and three coats of plaster. Use ½" grounds with this instead of ¾" as usual.

Plaster reveals in place of wood trim in windows.

Standing metal furring for fireproof construction in place of hollow tile furring.

Lath and plaster partitions in place of block partitions. This also saves space as partitions may be made 2¼" to 2½" thick.

Wood lath in certain localities is a slight saving.

Substitute hard white plaster finishes for sand finishes.

Omit all cement finishes where possible as these cost more than Gypsum finishes.

Secure prices on substitution of finished coat of colored plaster in place of plaster with usual paint finish. These are available both with oil colors and with water colors mixed in finish.

Use job mixed plaster instead of ready sanded type.

Consider use of wall boards with prepared fabric applied on same in place of plaster.

Omit plaster walls and ceilings in basement and attic; use wall boards.

GLASS AND GLAZING

Reduce plate glass to ⅛" thickness for windows and doors.

Window glass specified double strength in small lights may be changed to single strength.

Omit all curved window glass in curved bays.

In casement sash omit leaded glass and use steel muntins.

Omit large mirrors or reduce in size.

INTERIOR MARBLE

Omit marbles that require sticking, waxing or filling and substitute sound marbles that need no filling, sticking or liners to reinforce them. See that marble thicknesses are the minimum:

Marble floor tile ⅞" thick.

Marble wainscot over 12 feet high not over 1¾" thick.

Stair treads, platform, window stools, 1¼" thick.

Stall fronts and partitions may be 1" thick if well braced.

Use two angle connections for every stall instead of the usual three.

CERAMIC TILE

Substitute ceramic mosaic type for larger size floor tile as they are usually more reasonable.

Second-grade tile may be considered in certain types of work.

Machine-made floor tile may be considered as a substitute for faience floor tile.

Machine-made wall tile may be used in place of faience tile for walls with considerable saving.

Bathrooms:

Floors—cork, linoleum, mastic tile, rubber.

Walls—plaster with linoleum, canvas painted, waterproof paper, oilcloth or simply cement plaster with color, asbestos imitation tile, metal sheet tile, strip rubber wainscot.

Kitchens:

Floors—linoleum, rubber, cork.

Walls—Keene cement with paint, plaster with canvas and paint, oilcloth, linoleum, waterproof paper, asbestos imitation tile, metal sheet tile, rubber wainscot, colored cement—color troweled in.

TERRAZZO

Magnesite terrazzo floors may be laid over wood and are only ¾" thick.

New type of diamond terrazzo strip allows cement terrazzo floors to be laid over wood at a low price.

Where floor area is large terrazzo may prove cheaper than tile.

Consider the use of other bases with terrazzo floor. The expensive part of terrazzo flooring is the border near the wall and the base. The combination of terrazzo floor with tile border and base or mastic tile border and base or magnesite border and base may reduce cost.

Omit heavy division strips for economy. Divisions may be maximum of 25 square feet with no side longer than 5 feet.

Terrazzo stairs, treads and risers may be substituted for expensive materials. Secure figures on both precast and made-in-place type.

For terrazzo floor substitute low-cost tile such as ceramic mosaic, Flint's or slate, soapstone, colored cement, magnesite.

CORK FLOORING

Large sheets of cork 18" x 36" are most economical for both material and labor as this is the size of manufactured sheets; ⅝" thickness is sufficient but ½" must be used on floors over earth.

Cork floors with a cork tile finish often prove less expensive than wood floors of the better type.

LINOLEUM FLOORS

Floors of 16 mm. thickness though necessary on commercial work are not necessary for residential work. For ordinary bath or kitchen floors "B" thickness is sufficient. Inlaid designs are usually more expensive than plain colors or Jaspé. For halls with heavy traffic 3/16" thickness may do in place of 16 mm.

Linoleum base may be used with more expensive floors.

Linoleum center strips with border and base of colored cement may be used in place of more expensive soft floors such as cork or rubber.

ASPHALT TILE

This is low in price at present and good colors are obtainable. It may be substituted for more expensive floors such as tile and rubber or cork except where grease is prevalent. Asphalt base may be used for other bases and costs little more than wood base.

RUBBER TILE

Wide rubber strips are now obtainable in place of tile for use in halls and corridors and the setting price is lower. Rubber wainscots may be used in place of marble or other expensive materials. Interior rubber-faced columns are more durable than imitation marbles of the plaster type and very reasonable.

CEMENT FLOORS

Lay cement floor integral on basement slabs to save material.

Omit integrally colored cement floors and apply color to surface and trowel in or omit all color.

In unimportant basement spaces omit troweled floors and float the finish; or omit cement floors on slabs in such spaces.

WOOD FLOORING

Solid wide oak boards are being successfully used in place of veneered boards.

Strip oak flooring may be substituted for the above.

Red oak will prove more reasonable than white oak and straight grain will cost less than quartered. A mixture of quartered and plain grain will show a saving over all quartered plank flooring.

Rift grain pine flooring wears well and is low priced.

Masonite cushioned flooring gives the effect of a wood floor at a low price.

Often it is possible to use a very cheap grade of wood for plank floors when an antique effect is desired because small knots rather help than disfigure the effect. In such a case No. 1 Common board may be used in place of the usual clear or select grade.

PAINTING

Consider kalsomine for ceilings in place of oil paint.

For storage rooms and basement cold water paint in place of oil paint.

Casein paints are proving economical because of their covering capacity in a few number of coats.

Where stained effects are required these can often be obtained by the use of thin coat of stain, shellac and wax in place of several coats of varnish. Two coats of stain such as Minwax give results both inside and outside at minimum expense.

Quick drying varnishes save considerable time and money in application over the old type of slow drying varnish.

Where four or five coats of paint are specified for interior work, cut to two or three coats, so that when plaster cracks have occurred, other coats may be applied to cover at a later date.

SCREENS

Architect's specifications are usually very stiff in screen requirements and where cost must be cut to the limit screens such as used by the builders must be considered. Full-length screens on the outside of double-hung windows and half-length screens are much less expensive than the twin sliding or hinged screens.

PLUMBING AND DRAINAGE

See that advantage is taken of all parts of the plumbing code where savings can be made. Many small towns allow loop venting for houses. Often a nonsyphon trap in place of the usual vent will cut costs.

Tubs built in alcoves cost less than corner tubs and require no more wall surface.

Consider rearrangement of fixtures to cut down piping cost. The cheapest arrangement is toilet with soil pipe behind; then tub and lavatory on same wall or adjacent to each other.

Baths should be located over other plumbing fixtures and back to back where possible.

Vents may be connected together in roof space requiring only one vent through roof.

Size of water lines may be reduced by installing tanks for toilets in place of flush valves.

Fixtures mav be reduced in size such as 5′ tubs in place of 5′ 6″; 20″ x 24″ lavatories in place of 27″ x 22″, etc.

Stop cocks on lines may be omitted.

Circulating hot-water system may be omitted or limited.

Number of hose bibbs may be reduced.

Catch basins in yard may be made of sewer pipe on end with cast-iron grating instead of building brick or concrete catch basins.

In porous soil omit leader drains and spill on stone slabs or brick. This is very feasible where no basement is built.

All plumbing fixtures may be enameled iron instead of china.

Closets may be reverse trap type instead of syphon jet.

Omit shower inclosures around tubs where same are of glass. Substitute curtains.

Glass, marble or tile shower inclosures may be changed to ready-built steel painted inclosures.

Omit showers and curtains over tubs.

Shower partitions and toilet stalls may be made of enameled steel rather than more expensive materials.

Omit area drains and pave with loose brick, gravel or crushed rock.

Omit floor drains and fixtures from basement so that house sewer may be raised to save deep trench and the like. Omit garage floor drain and pitch floor to doors.

ELECTRIC WIRING

BX cable instead of conduit in frame construction.

Re-locate panel boards and fuse boxes to shorten runs.

Consider lightweight conduit instead of standard conduit in fireproof construction.

Cut down number of outlets where possible making all convenience receptacles duplex and grouping outlets near together and back to back. Convenience outlets located at corners of rooms will serve both walls.

Consider use of new type of box and cover which allows for three items in each in place of the usual two.

Omit three-way switches where not essential.

Use pull cord on all fixtures where possible.

HEATING

Triple-duty boiler to combine:
- Incinerator.
- Water heater.
- Boiler.

Omit oil or gas burner but consider extra cost of coal bunker and chute.

If vapor system is specified it may be changed to a two-pipe steam or, in small work, to a one-pipe steam system with vacuum air control valves.

The hot-water heating system may be reduced in cost by substituting a steam or hot-air system.

Hot-air systems for small houses may save over other types.

Radiator Inclosures:

Instead of half-inch asbestos radiator lining with galvanized iron over same, build of half-inch wall board with sheet aluminum foil facing. The efficiency of such an inclosure is high.

LANDSCAPE

Exterior work may often be accomplished more economically if divorced from the general contract and done after the building is completed.

This work may include paths and walks.

Paths may be considerably cheapened if construction is flag or slate on cinder concrete slab with cinders under.

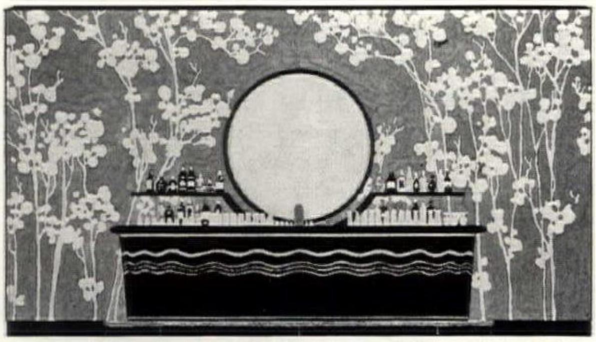
ILLUSTRATED NEWS

Keystone

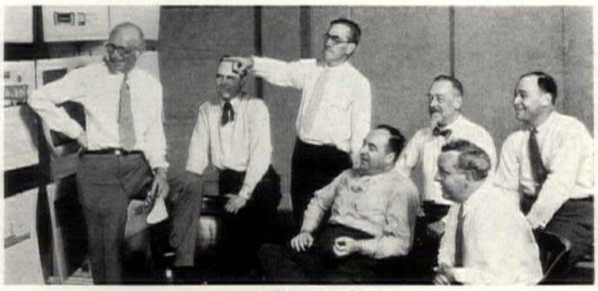
FIRST PWA HOUSING PROJECT. With $84,000 loaned by the Public Works Administration, the first project completed under the housing and slum clearance provisions of the National Industrial Recovery Act has resulted in making available a group of small bungalows in Alta Vista, Virginia. The project was promoted by a limited dividend corporation. Rental Schedules vary from $16 to $20 a month, the higher rentals being asked for houses situated on corner lots.

Galloway

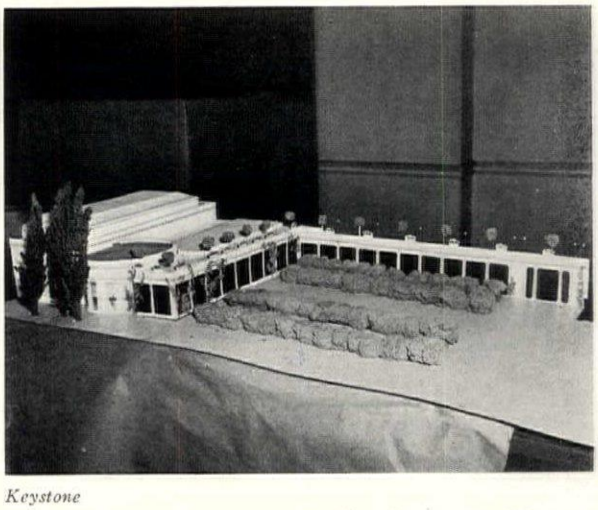
NEW ELEVATED TRACKS of N. Y. Central Railroad in lower west side warehouse district of New York City. This is a view of the tracks where they run through a terminal warehouse at 10th Street and 8th Avenue, Manhattan.



A PRIZE-WINNING DESIGN in a nation-wide competition for new ideas for bar design. Donald M. Douglas, winner of first prize for service bar.



JURY FOR BAR DESIGN AWARDS. Left to right: Harvey Wiley Corbett, Benjamin Marshall, John Holabird, Ernest Byfield, Karl Eitel, Ralph T. Walker and Robert F. Bensinger, president of the Brunswick-Balke-Collender Company which provided the prizes for the contest and which will manufacture bars from the winning designs.



Keystone

ADDITION TO THE WHITE HOUSE. Contracts were recently awarded for the construction of an addition to the White House at a cost of $303,087. Eric Gugler, architect, is in charge of alterations. Space is utilized that had been used as a clothes-drying yard and it will not conflict with the form of the executive mansion. The enclosed porch at rear will look out upon formal gardens.

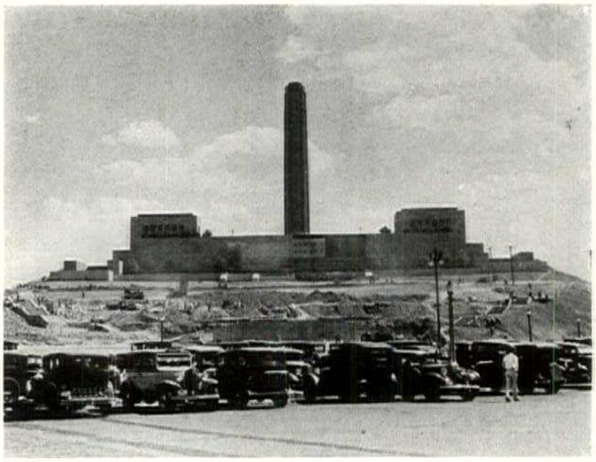
Llewellyn Thomas

DISPLAY ROOM OF CHICAGO WORKSHOPS.

"Chicago Workshops" is a group of architects and craftsmen who are designing furniture and interiors. Selection and approval of designs are based upon present-day requirements arising from new social and economic conditions. At present the products of the group are custom-made by the small craftsmen, but they are designed and made so as to be adaptable for quantity production later. Orders are taken for the objects when they are shown in their display rooms; special commissions also are filled. Their selling methods at present have been through furnishing houses at exhibits and with cooperation of manufacturers. Another important problem under consideration by Chicago Workshops is that of home planning. There is a growing realization that the real home of today must be in accordance with our life and habits, and that the "period" craze of the last decades has no place in our present-day living. One fact has not yet been sufficiently emphasized; that is the necessity for making the house a unit in its exterior and interior. The house develops as an organic growth, the furniture simply follows and completes the architect's plans for the needs of the occupant. Furnishings should organize space, not decorate it. Chicago Workshops has endeavored to show these principles in planning the Crystal House and the General Houses Exhibition House at A Century of Progress, Chicago.

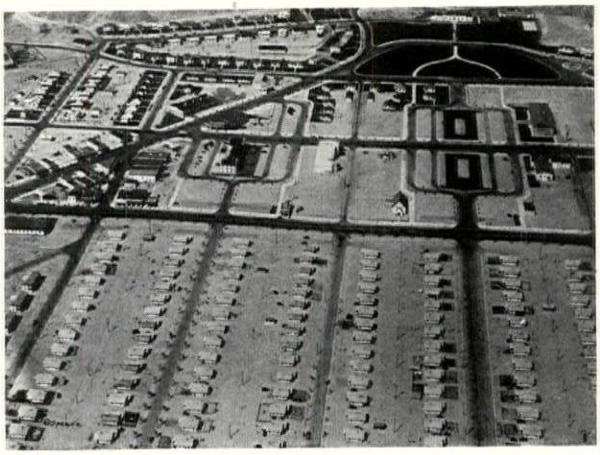
NEUTRA TO DESIGN EXPERIMENTAL SCHOOL. Richard Neutra, architect of Los Angeles, has been designated as architect for an experimental public school at Corona, California. The building suggested for the school is one-story, having as its chief difference from the ordinary structure, an outdoor classroom adjoining each indoor room. The outdoor classroom opens up into a central patio.

CASEIN PAINT. The widespread use of casein paint on the interior and exterior of the buildings at the Century of Progress Exposition has drawn attention to some unique properties inherent in this paint derived from milk. It was selected by the late Joseph Urban, after much experimentation, principally because of its very high reflectivity and also because of its ability to hold brilliance.



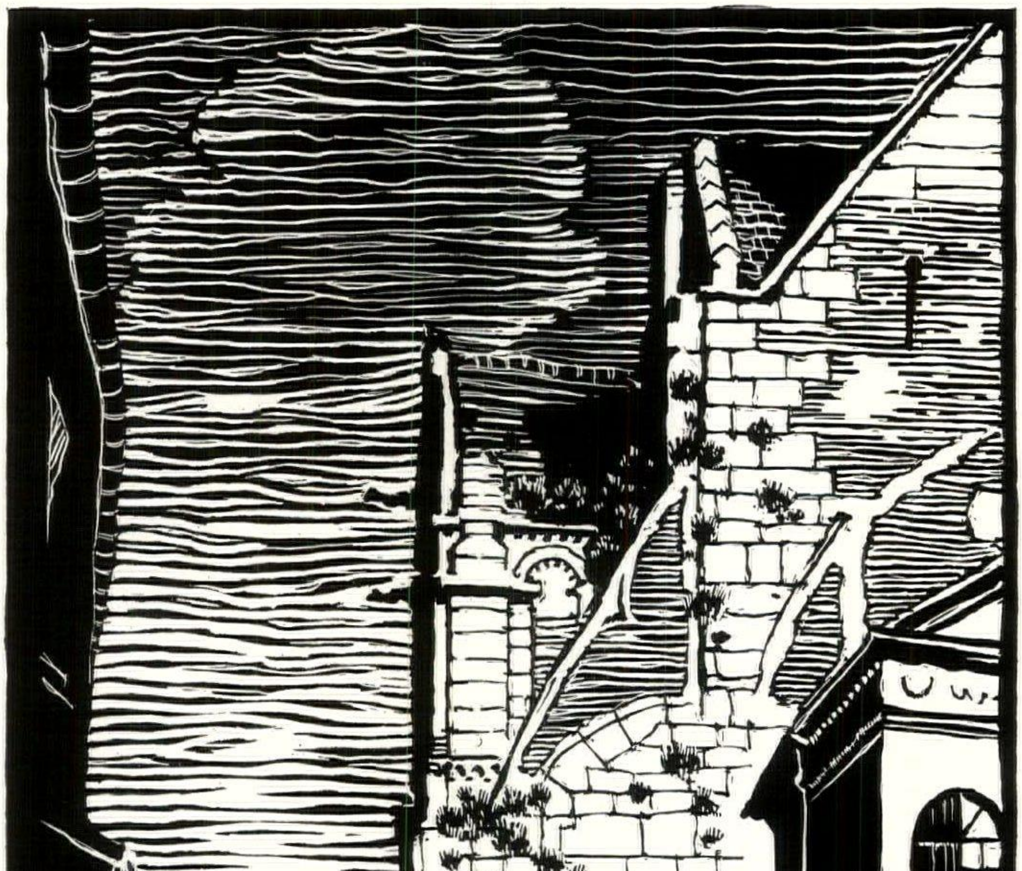
Galloway

KANSAS CITY MEMORIAL TO BE COMPLETED. C. W. A. workers have been improving the grounds around the Kansas City Memorial. Workmen have graded the ground, sodded the plot and are building a stone wall at the border of the park. H. Van Buren Magonigle was architect for the building. Mrs. Magonigle was designer of a sculptural frieze that remains to be completed on main façade.



Galloway

BOULDER CITY NEAR COMPLETION. This modern desert town with a present population of 5,000 was built under the direction of the U. S. Bureau of Reclamation; S. R. De Boer, city planner. Houses occupied by workers and their families appear in the foreground. The town is the headquarters for the construction of the dam and power plant, and for the operation of the power plant and reservoir when completed.



A STREET IN SENLIS, FRANCE DRAWING BY SAMUEL CHAMBERLAIN

VOL · 76 NUMBER 3

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SEPTEMBER

THE ARCHITECTURAL RECORD

Architects' Participation in The Modernization Program

Bulletin No. 1 of the Federal Housing Administration was released on August 10. It is entitled "Modernization Credit Plan: Information for National Banks, State Banks and Trust Companies; Industrial Banks; Finance Companies." This initial bulletin has been distributed to all institutions permitted by law to make loans on notes without mortgage security and to purchase such notes. Bulletin No. 2 supplies corresponding information for building and loan associations, savings banks, insurance companies and similar institutions which are required to loan against mortgage security. Other publications explaining phases of the modernization program are promised, including an illustrated booklet, "How Owners of Homes and Business Property Can Secure the Benefit of the National Housing Act," which explains the financing plan and suggests desirable work to be done.

The publications are placed on file with the chapters of the American Institute of Architects and with the state societies of architects as they appear. The organization and procedure of the Housing Administration will have been perfected before this issue of The Record appears. The Institute is cooperating with the Administrator at his request, and is in a position to give to its chapters the earliest possible authentic information as to opportunities for architects as private practitioners in connection with the modernization program. In the meantime, it has urged all chapters to develop collaborative plans adapted to local conditions for promoting the program and furthering the use of architectural services. One collaborative plan contemplates the repair of a group of school buildings; another, the modernization of several block fronts of retail stores; others, the improvement of groups of dwellings. Where more than one owner is concerned, each property is dealt with according to its own requirements under a separate contract, but the total of the contracts is large enough to warrant expert service in design, supervision and contract letting. Architects who have private work in view will do well to call in person at the various lending institutions in their communities.

Two questions certain to be raised by prospective clients for modernization work are: Is credit available? Are prices and wages favorable?

The first is answered by Bulletin No. 1 as follows: "To date, adequate credit has been lacking. First, the liquid assets of property owners in general have been depleted. They, therefore, have been unable to provide collateral which would safeguard our banks and other financial institutions in extending them credit. Second, the current incomes of many property owners, while better assured than they were, may not be sufficiently assured to be accepted by financial institutions as a basis for credit in the absence of collateral. Third, unsecured personal loans, of adequate term for the purpose needed, even to bona fide property owners of highest integrity, have not provided sufficient liquidity to meet the proper requirements of good banking practice.

"The National Housing Act provides the means to bridge this gap. It enables financial institutions to make investments having the same degree of security and liquidity as is possessed by their best collateral loans."

As to prices and wages, no statement has at this writing been made by the Administrator. A reduction averaging 10 per cent has been announced by the Retail Lumber Dealers Code Authority in retail prices of lumber, lumber products and sundry other so-called housing items sold in retail yards to aid the modernization and home building plans contemplated in the Housing Act. Thus far no reductions are known to have been obtained from the Builders Supplies Trade Code Authority pertaining to fire-resistant supplies, such as cement, ceramic tile, common brick, gypsum products and the like. Nor do concessions appear to be forthcoming from the railroads in the matter of freight rates. In a few of the area codes applied for under the Construction Code labor proposes to accept a lower wage for repair work than for new construction.

In the absence of complete and final information concerning prices and wages, the safe procedure for architects is to confer with reliable contractors.

Meanwhile, it may be said that the announced concessions in building material prices noted above remove a good part of the disparity between this price group and the general (wholesale) price level. Before the concessions were made, a weighted combination of building material items at retail entering into home construction showed a decline of only 6 per cent below the average for 1926. With the announced cut in housing items the retail index is 16 per cent below 1926. The general price level is 25 per cent below the 1926 base, but the general price level will be to a marked degree influenced by the future trend of agricultural prices.

HOUSING SHORTAGES AND NEEDS FOR REPAIRS AND IMPROVEMENTS

By THOMAS S. HOLDEN
VICE-PRESIDENT IN CHARGE OF STATISTICS AND RESEARCH, F. W. DODGE CORPORATION . . . CHAIRMAN OF MAYOR LA GUARDIA'S ADVISORY COMMITTEE ON REAL PROPERTY INVENTORY OF NEW YORK CITY . . .

NECESSITY for the National Housing Act was emphatically demonstrated to the President and Congress by the housing shortages and needs for repairs and improvements reported in the real property inventories conducted early this year by the United States Department of Commerce. The present study is based on reports from fifty-seven of the cities surveyed. They include 1,656,624 family dwelling units and therefore represent approximately 5 per cent of the country's total, giving a fair sample of housing conditions throughout the nation. The figures are, however, still subject to some correction after seven additional cities have been reported by the Commerce Department and after the New York inventory is reported by the New York City Housing Authority. For a complete picture of housing conditions in the United States, there should be added not only the statistics for these eight additional cities, but also the results of the farm housing survey conducted by the United States Department of Agriculture, on which a preliminary report was published in the April, 1934, issue of THE ARCHITECTURAL RECORD.

HOUSING SHORTAGES

Definite housing shortages exist in thirty of the fifty-seven cities, as shown in Table I. Each city listed in Group A has more families than dwelling units, irrespective of fitness of the dwelling units for habitation. In the thirty cities as a group there are 21,070 more families than dwelling units. Each of the Group B cities, seven in number, has a small excess of family units over families, but the number of surplus units is in each case less than the number of dwelling structures rated as unfit for use. The twenty cities in Group C each have more fit dwelling units than families, but in most cases only a moderate surplus; potential demands for certain types of dwellings may conceivably exist in the cities of this group, even though undisclosed in the statistical report.

In the list of fifty-seven cities as a whole the number of structures rated as unfit for use amounts to only 2.3 per cent of the total number of structures, indicating that the investigators were conservative in applying that rating. The reports do not disclose the numbers of dwelling units included in the unfit structures.

On the basis of these figures we may conservatively assume a total shortage of 30,000 units, which would allow for replacement of something less than half the unfit dwellings in the Group A and Group B cities. If this figure may be assumed as typical of the entire country, a shortage of 600,000 dwelling units is arrived at, as a quite conservative estimate. As will be explained later, the immediate potential demand is probably some fraction of this figure. Various authorities have estimated the shortage at 635,000 units, 800,000 units and 1,000,000 units. The last figure seems somewhat excessive. The definite figure is relatively unimportant. The number of people with the money and the desire to build is the determining factor.

TABLE I— NEW HOUSING NEEDS IN 57 CITIES	GROUP A 30 cities, each having more families than dwelling units	GROUP B 7 cities, each with surplus dwelling units, but surplus units fewer than unfit structures	GROUP C 20 cities, each having more fit dwelling units than families
Number of existing units	728,673	239,561	688,390
Number of vacant units	42,154	20,669	61,299
Number of occupied units	686,519	218,892	627,091
Number of extra families doubled up	63,224	18,723	33,541
Total families	749,743	237,615	660,632
Excess families over units	21,070	......	......
Excess units over families	......	1,946	27,758
Number of structures unfit for use (Containing an unknown number of dwelling units).	14,582	6,374	8,670

TABLE II—NEEDS FOR HOUSING REPAIRS IN 57 CITIES

Class	Number of of cities	Median family rental or equivalent	Number of of structures	Needing minor repairs	Needing structural repairs	Unfit for use
I	2	$30.00 up	48,718	45.3%	9.2%	1.1%
II	6	$27.00 - $29.99	98,839	42.6	11.1	1.5
III	11	24.00 - 26.99	253,103	43.9	13.3	1.5
IV	14	21.00 - 23.99	456,256	43.5	16.7	2.1
V	7	18.00 - 20.99	85,809	47.6	18.0	2.5
VI	9	15.00 - 17.99	169,599	46.7	19.6	3.3
VII	8	under $15.00	170,537	41.1	22.8	3.6
Totals	57	....	1,282,861	44.7%	16.6%	2.3%

TABLE III—NEEDS FOR HOUSING IMPROVEMENTS IN 57 CITIES

Class	Number of dwelling units	Units without gas or electricity		Units without plumbing facilities			Units without central heating
		For lighting	For cooking	Running water	Water closets	Tubs or showers	
I	72,651	2.0%	9.4%	2.8%	8.3%	13.9%	15.9%
II	143,574	4.3	20.7	4.5	14.6	20.0	27.2
III	347,210	2.8	17.9	5.1	11.6	17.3	51.4
IV	579,859	7.3	32.2	7.7	18.0	19.8	56.1
V	106,247	8.3	26.4	10.0	19.9	25.8	56.6
VI	199,092	21.2	43.1	15.8	29.5	38.8	79.6
VII	207,991	32.1	57.2	16.4	36.1	48.2	83.9
57 cities	1,656,624	10.7%	31.3%	8.9%	19.7%	25.3%	60.5%
25 Northern cities	796,033	2.8%	24.9%	4.5%	12.0%	17.5%	33.4%
32 Southern cities	860,591	18.0%	37.2%	13.0%	26.8%	32.5%	79.0%

TABLE IV—ALTERATIONS AND IMPROVEMENTS IN PAST 18 MONTHS
as recorded by F. W. Dodge Corporation for 37 Eastern States

(For rough approximation for the entire country add 20 per cent to figures here shown—th
Western area has maintained a relatively better building volume than the East in recent years

Class of structures	First half 1933	Second half 1933	First half 1934	Eighteen months	Per cent planned by architects	REMARKS
Commercial and industrial buildings	$44,081,800	$53,110,300	$61,579,700	$158,771,800	44.0%	Income property
Public and institutional buildings, etc.	13,204,700	39,214,800	58,908,100	111,327,600	58.1	Partly financed by PWA
NON-RESIDENTIAL BUILDINGS	$57,286,500	$92,325,100	$120,487,800	$270,099,400	49.8%	
Apartments, hotels, etc.	$8,282,300	$7,507,900	$9,635,900	$25,426,100	64.3%	Income property
Rent houses, 1 and 2-family	1,948,500	1,721,300	1,890,400	5,560,200	25.4	Income property
Owner-occupied homes*	10,418,300	10,118,100	17,686,600	38,223,000	40.7	Partly financed by HOL
RESIDENTIAL BUILDINGS	$20,649,100	$19,347,300	$29,212,900	$69,209,300	48.1%	
Public works	$3,000,700	$12,709,500	$40,102,800	$55,813,000	0.7%	Largely financed by PW
Public utilities	3,395,400	10,418,100	10,603,600	24,417,100	13.2%	Partly financed by PWA
ENGINEERING STRUCTURES	$6,396,100	$23,127,600	$50,706,400	$80,230,100	.....	
All classes	$84,331,700	$134,800,000	$200,407,100	$419,538,800	.....	

*Includes half of the 2-family houses

CLASSIFICATION OF CITIES IN TABLES II AND III (ACCORDING TO MEDIAN FAMILY RENTAL OR EQUIVALENT)

Class I.—Fargo, N. D.; Syracuse, N. Y.

Class II.—Binghamton, N. Y.; Reno, Nev.; Burlington, Vt.; Trenton, N. J.; Portland, Me.; Peoria, Ill.

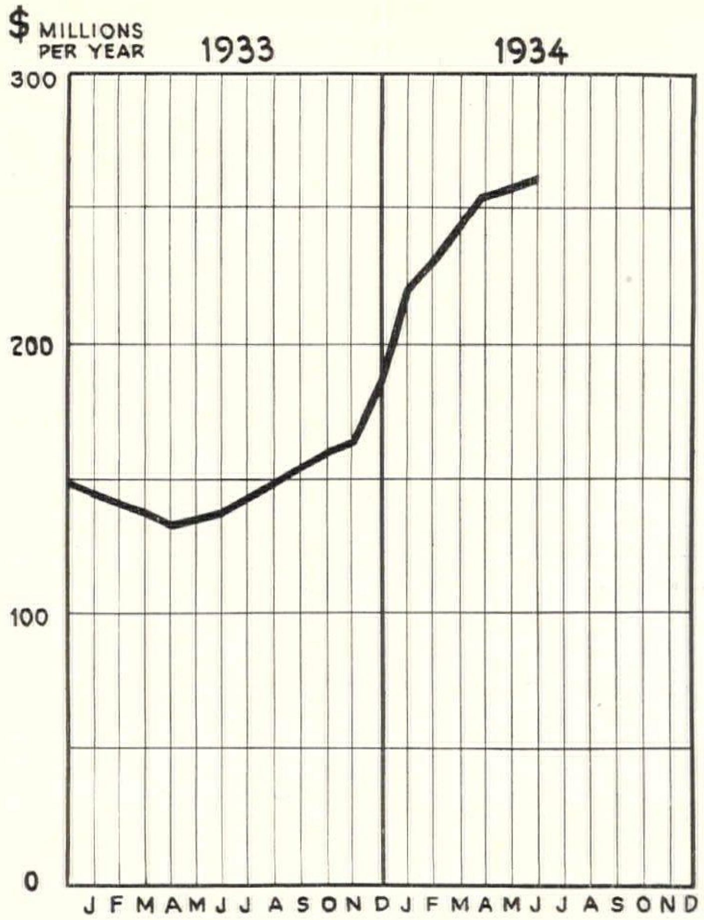
Class III.—Sioux Falls, S. D.; Erie, Pa.; Kenosha, Wis.; Lincoln, Neb.; Racine, Wis.; Worcester, Mass.; Waterbury, Conn.; Sacramento, Calif.; San Diego, Calif.; Santa Fe, N. M.; Des Moines, Iowa.

Class IV.—Williamsport, Pa.; Boise, Idaho; Lansing, Mich.; Albuquerque, N. M.; Richmond, Va.; Nashua, N. H.; Topeka, Kan.; Seattle, Wash.; Salt Lake City, Utah; Dallas, Tex.; Austin, Tex.; Oklahoma City, Okla.; Frederick, Md.; Portland, Ore.

Class V.—Decatur, Ill.; Baton Rouge, La.; Hagerstown, Md.; Phoenix, Ariz.; St. Joseph, Mo.; Wichita, Kan.; Casper, Wyo.

Class VI.—Wheeling, W. Va.; Zanesville, Ohio; Greensboro, N. C.; Butte, Mont.; Springfield, Mo.; Jacksonville, Fla.; Shreveport, La.; Little Rock, Ark.; Asheville, N. C.

Class VII.—Knoxville, Tenn.; Jackson, Miss.; Columbia, S. C.; Pueblo, Colo.; Wichita Falls, Tex.; Charleston, S. C.; Paducah, Ky.; Birmingham, Ala.



REPAIRS, ALTERATIONS AND MODERNIZATION WORK ALL CLASSES OF BUILDINGS—37 EASTERN STATES
(12 months moving totals)

THE NEED FOR HOUSING REPAIRS

In Tables II and III the fifty-seven cities are grouped into seven classes in accordance with the median family rentals or rental equivalents, this median rental figure being in all probability the best single index of the prevailing housing standards of the several communities.

The need for minor repairs is fairly uniform throughout the list of cities and averages 45 per cent of the dwelling structures. If this percentage applies to all the residential buildings of the country, the need for repairs is something enormous, and the potential demand is considerable.

Structural repairs are needed by one out of every six residential buildings in the entire list. However, in this case, only 9 per cent of the buildings in the Class I cities need structural repairs, and nearly 23 per cent of the buildings in Class VII need them. The need is much greater in the low-standard, low-rent communities, and the gradation is uniform down the seven classifications. A similar gradation occurs in the rating of structures as unfit for use. Obviously the potential demand for structural repairs is apt to be a small fraction of the need indicated in the statistics.

IMPROVEMENTS NEEDED

Many housing units need enlargement. In the fifty-seven cities there were 265,500 units reported as crowded or overcrowded (having more than one person to a room). Since this is greatly in excess of the number of extra families reported as doubled up (115,488) the indication is that about 9 per cent of the existing units need to be enlarged by one room or more, provided, of course, the families can afford additional space. Apparently, only a fraction of the overcrowded families might expand their living quarters, since the percentage of overcrowding is much the greatest in the low-rent communities.

The lack of standard housing conveniences is shown in Table III. Dwelling units without gas or electricity for lighting are 10.7 per cent of the total; without gas or electricity for cooking, 31.3 per cent; without running water, 8.9 per cent; without private indoor water-closets, 19.7 per cent; without tubs or showers 25.3 per cent; without central heating, 60.5 per cent. The tables clearly show, with respect to all these needed facilities, a definite gradation of needs as between the low-rent and the high-rent communities and also as between northern and southern cities.

There should be something of a market for these facilities among the families not now enjoying them. Perhaps an even greater potential market exists among families now enjoying comforts and luxuries and now able to replace outworn equipment or to acquire additional facilities. Less than 6 per cent of the dwelling units have two or more indoor water-closets; just over 3 per cent have two or more bath tubs or showers; less than 17 per cent have mechanical refrigeration.

GARAGES AND AUTOMOBILES

Sixty per cent of the residential structures are reported as having garages. These 763,185 garages have a capacity for housing 1,057,510 cars, and 846,478 cars are owned. Garage vacancies thus indicated represent space for 221,032 cars, against housing vacancies (in fit and unfit units) representing accommodations for 124,122 families. This seems to indicate a restricted demand for new garage facilities and possibly a quite considerable demand for new cars. It suggests that among those families who have the wherewithal for major purchases, the claims of new cars may compete strongly with those of housing improvements in decisions about their expenditures. With the new financing terms to be offered under the Housing Act, the automobile will at least no longer enjoy the sales advantage of easier credit.

ESTIMATES OF BUILDING VOLUME IN NEW HOUSING AND REMODELING

It is a very easy matter to estimate housing, repair and improvement needs in terms of many billions of dollars. It is obvious, however, that any actual potential demand is some fractional part of such an estimate of needs. The facts of recent activity in these lines are very pertinent to the situation, and should be carefully examined. Table IV gives the record for alteration and modernization work done in the past eighteen months

This table brings out a number of highly significant facts:

1. Alteration and modernization work has amounted to about 20 per cent of all construction.

2. There has been and is a continuous upward trend in this class of work.

3. Income property of all kinds has been a better prospect for improvement than owner-occupied property. Improvement of rent-property tends to enhance the revenue from the property; improvements on owner-occupied property come out of the owner's income (present and future). Fortunately, the National Housing Act, as finally passed, provides for insuring modernization loans on all classes of real property.

4. In nonresidential and residential building improvements, architects' plans and specifications have accounted for half the total dollar volume. As in the case of new building work, architects have been responsible for the larger projects. They may handle an even larger proportion of modernization work developed in the national campaign.

The National Modernization Program is to be effective to December 31, 1935, or during the eighteen months following the period covered in the Table. Its effect will be much stronger next spring than this fall. It would seem easily possible that the stimulation of financing and a promotional campaign would in the next eighteen months double the volume of the past eighteen months; that would be a conservative estimate of results. To produce $1,500,000,000 in repair and modernization work in these eighteen months, as estimated by the Administration, would require that the volume of the past eighteen months be trebled. While this is a very high rate of increase, it may be possible of attainment.

NEW HOUSING

Whether the present shortage is estimated at 600,000 or 800,000 dwelling units, the amount of new housing to be constructed in the next eighteen months is likely to represent a gradual increase over the current rate of construction. This writer estimates that 48,000 new family units were built in the entire country in 1933; and that 20,000 units were started in the first half of this year. (While this is a decline in units, the total dollar volume for new housing is running somewhat higher this year.) This makes a total of 68,000 units in the past eighteen months. The machinery for new financing under the National Housing Act will not be put into operation until after the modernization campaign is under way, which means that increased new home-building will come mainly next year. The outlook for a substantial increase in 1935 is very good, and it is anybody's guess as to what that increase may amount to; it will depend largely on the rate of increase of national income and improvement of confidence in the future, as well as on the very advantageous new mortgage-credit facilities. It will also depend largely on whether speculative builders come into the market in any considerable degree. If 100,000 new dwelling units are built next year, which seems possible, that would more than double this year's volume and be a very welcome increase. The writer does not know at this time whether that is a conservative or an optimistic estimate; it may serve as a useful figure for business-planning at this time, subject to check and revision as the trends become definite.

CONCLUSION

The outlook for substantially increased volume of repair and modernization work and for new residential building under the admirable and timely National Housing Act is good, though the results will be felt to a moderate extent in 1934 and to a much greater extent in 1935. The Act will probably not accomplish much toward raising the general housing standards of low-income groups, whose needs for space and facilities are greatest. This is at present the responsibility of the Housing Division of the Public Works Administration, whose accomplishments to date have not been considerable. Nor is the Housing Act alone likely to bring about full recovery of the construction industry, general business or the national income. It is this writer's opinion that the one means now visible which can accomplish these larger purposes is a national public works program bigger than any we have yet had. The recommendations of the National Planning Board, to be laid before the President in the coming fall, will be awaited with much interest. At some stage the American people will begin to see clearly the economic absurdity of pauperizing American families and hamstringing prosperity by putting unemployed people on relief, when the manpower, technology, materials and credit resources exist to put every able worker on a real job improving the public and private living facilities of the people.

PORTFOLIO

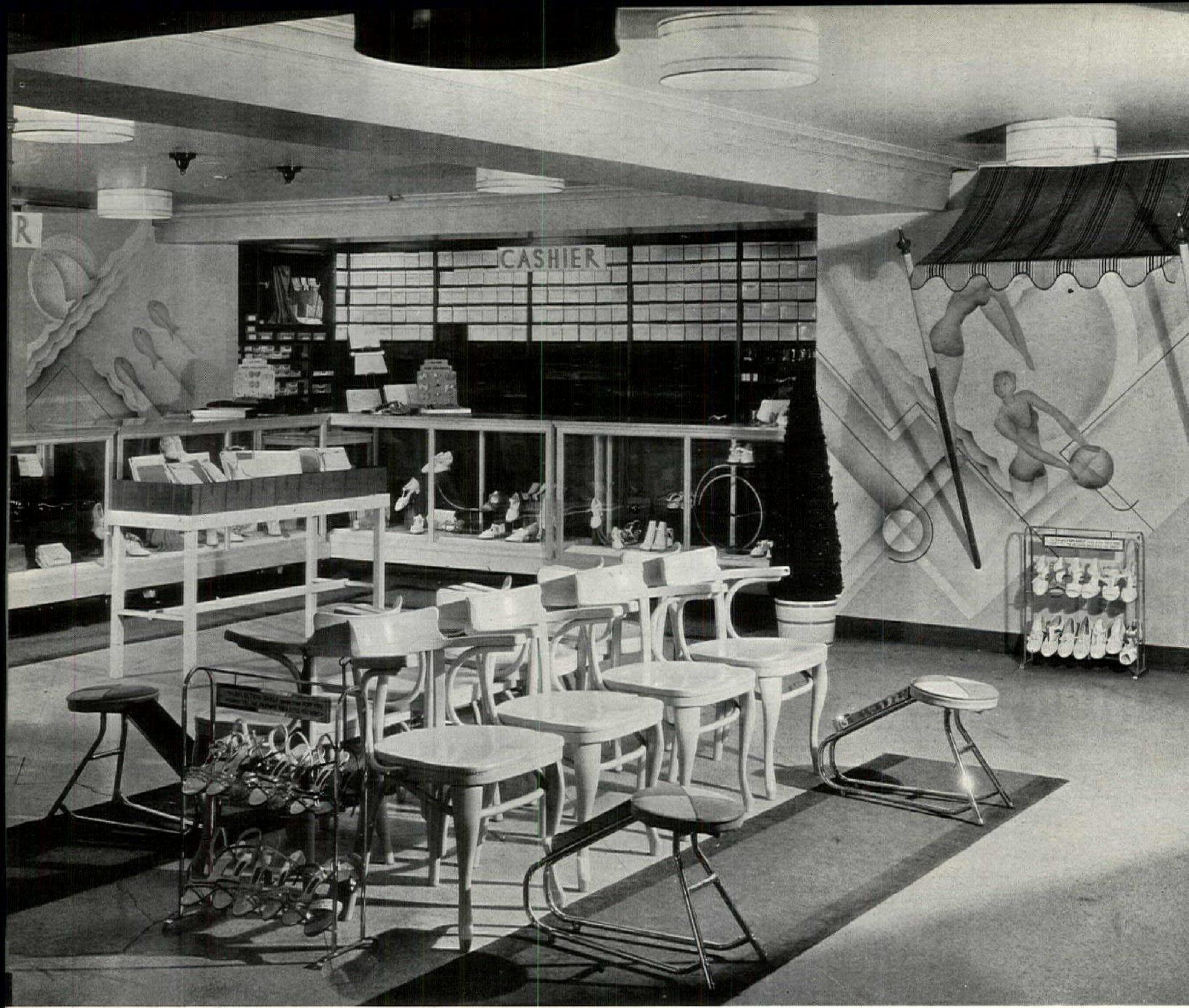
MODERNIZATION OF SMALL SHOPS

Hedrich-Blessing Studio

DRESS SHOP

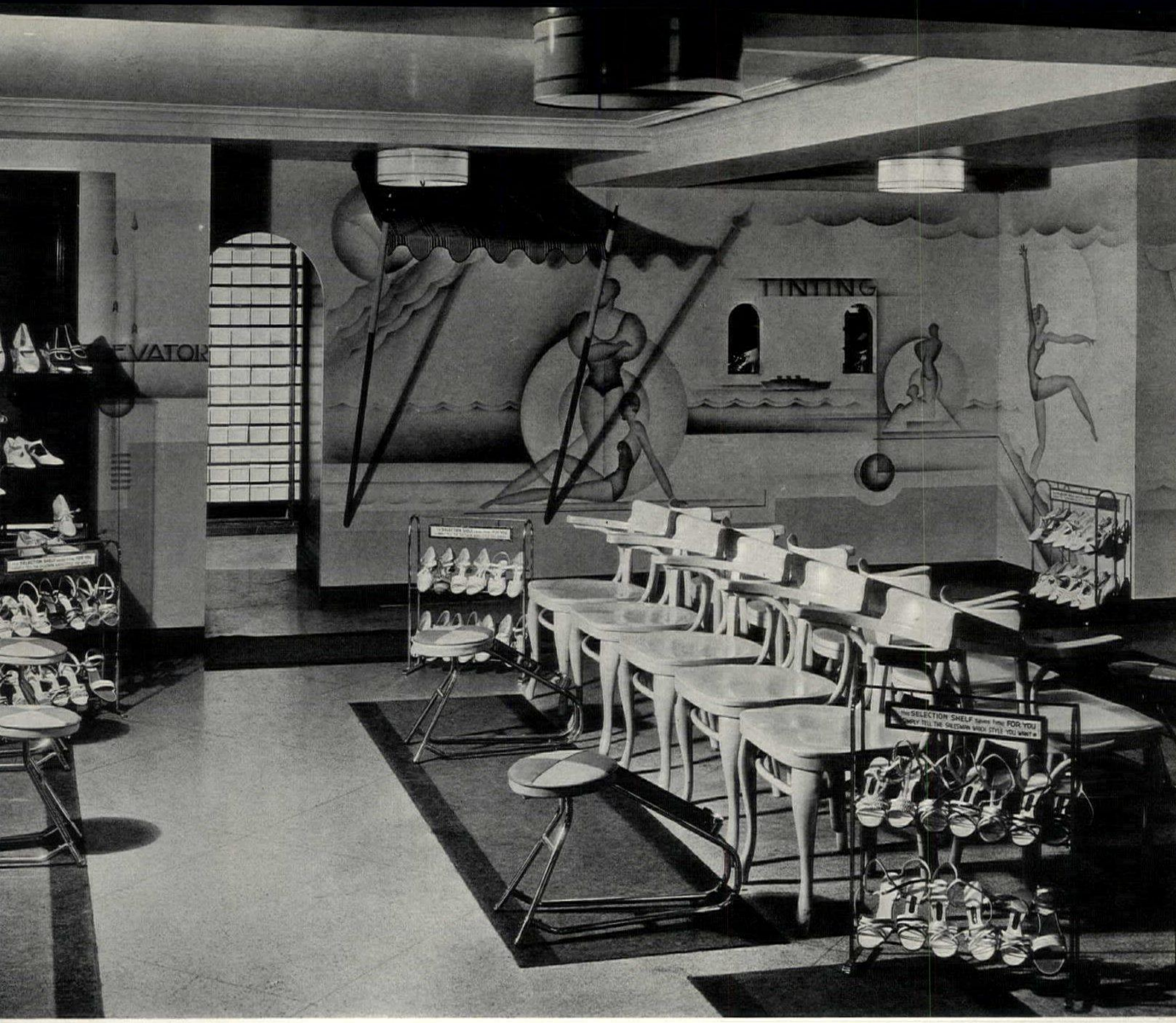
ON NORTH MICHIGAN AVENUE, CHICAGO.
BASE AND OUTLINE FACING ARE OF BLACK GRANITE.
ALUMINUM IS USED FOR DOORS AND WINDOW FRAMES.
THE NAME IS SILHOUETTED WITH FORMICA IN FRONT OF GLASS WITH REFLECTORS BEHIND.

LEE SACKS, INC.—CHICAGO
SOBEL AND DRIELSMA, ARCHITECTS



Hedrich-Blessing Studio

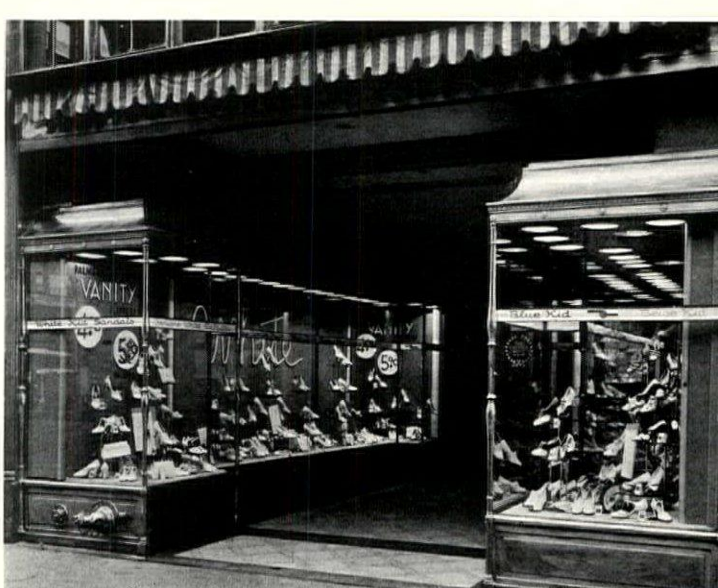
SANDAL ROOM, CUTLER SHOE STORE
STATE STREET, CHICAGO
SOBEL AND DRIELSMA, ARCHITECTS



A WASTED BASEMENT OF THE PALMER HOUSE SHOP WAS TRANSFORMED INTO A SALESROOM FOR SUMMER SHOES. WALLS ARE DECORATED WITH AIR BRUSH. DESIGNED AND EXECUTED BY HANNS R. TEICHERT. THE COLORS USED ARE BURNT ORANGE, LEMON YELLOW AND BURGUNDY RED. LEMON YELLOW CHAIRS REPEAT THE COLOR OF THE MURALS. THE FITTING STOOLS ARE CHROMIUM-PLATED TUBING WITH FABRICOID SEATS. THE LIGHTING FIXTURES ARE SHADED WITH PARCHMENT. THE AWNINGS ARE YELLOW, RED AND BLUE STRIPING.

Hedrich-Blessing Studio

BEFORE ALTERATION



UNNEEDED SPACE ABOVE THE TWO DISPLAY WINDOWS WAS UTILIZED TO ADVERTISE THE NAME OF THE STORE. A NEW METAL LATH AND PLASTER CEILING WAS ADDED ON A LEVEL WITH THE TOP OF WINDOWS. THE SILHOUETTED GLASS NAME PANEL IS LIGHTED WITH REFLECTORS. THE FACING OF THE FRONT IS OF CARRARA GLASS.

PALMER HOUSE BOOT SHOP
STATE STREET, CHICAGO
ALTERATION BY
SOBEL AND DRIELSMA, ARCHITECTS

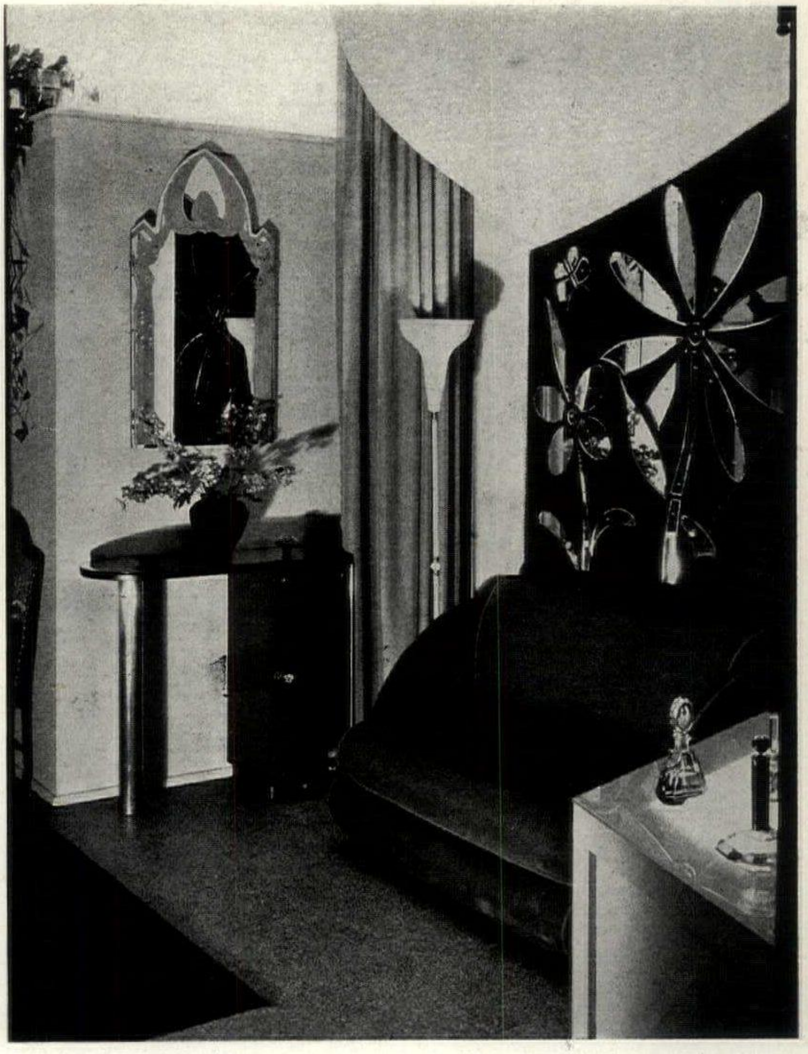
W. P. Woodcock Photos

MYER SIEGEL AND COMPANY STORE, LOS ANGELES
FIEL AND HUNTER, ARCHITECTS

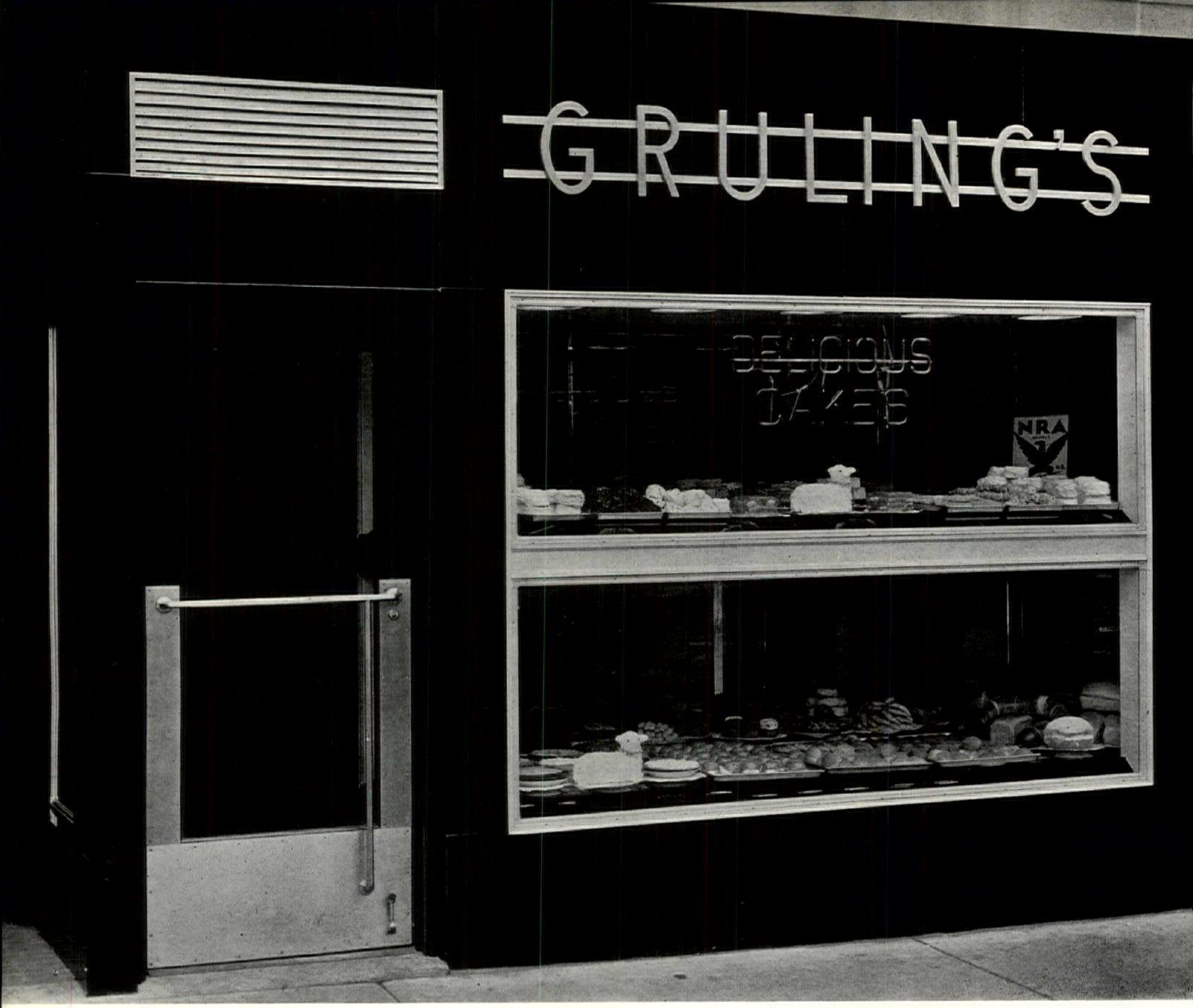
ENTRANCE IS SHOWN ABOVE, DISPLAY WINDOWS BELOW

PERFUME SHOP, DIANA COURT, CHICAGO
DESIGNED BY
ANTON EICHMEIER

Hedrich-Blessing Studio



THE MAIN INTERIOR OF THIS SHOP IS DIVIDED BY HANGINGS INTO AN OUTER AND AN INNER SHOWROOM. THERE ARE ALSO ROOMS WITH PRIVACY FOR CONSIDERATION OF PERFUMES AND COSMETIC MAKE-UP.



Hedrich-Blessing Studio

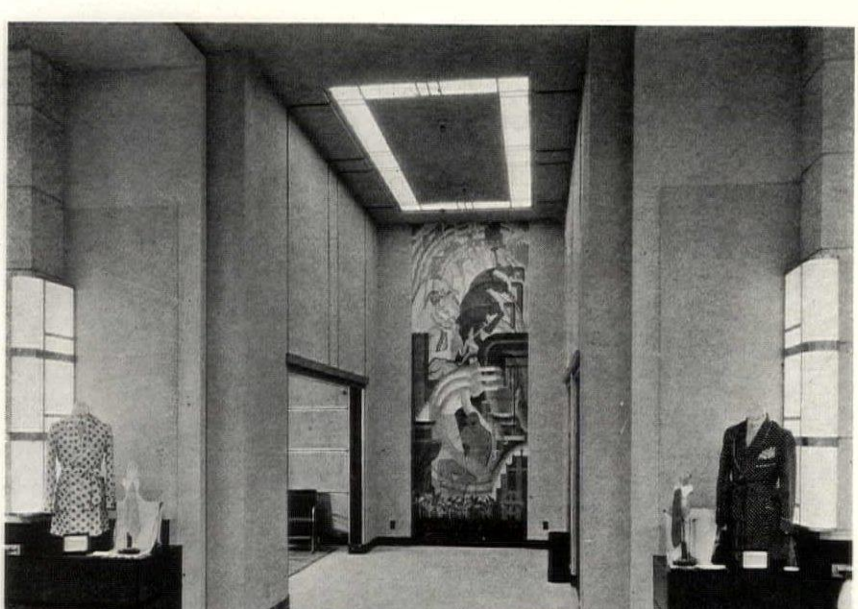
THE ALTERATION POSSIBILITIES FOR THIS STORE WERE GREATLY LIMITED BY THE OVER-ALL STORE WIDTH OF NINE FEET SIX INCHES. FEATURES OF THE STORE THAT ARE OF INTEREST INCLUDE A LARGE DISPLAY WINDOW AT REAR OF STORE INTERIOR WHICH REVEALS OPERATION OF A MODEL BAKERY; ALL WALL AND FLOOR DISPLAY CASES HAVE THEIR OWN ILLUMINATION.

A BAKERY, WINNETKA, ILLINOIS
VANCE WILKINSON, DESIGNER

BULLOCK'S MEN'S STORE, SOUTH HILL STREET, LOS ANGELES
JOHN PARKINSON AND DONALD B. PARKINSON, ARCHITECTS

BULLOCK'S MEN'S STORE, SOUTH HILL STREET, LOS ANGELES
JOHN PARKINSON AND DONALD B. PARKINSON, ARCHITECTS

Associated Photographers, Inc.



INTERIORS OF
BULLOCK'S MEN'S STORE
LOS ANGELES

Hedrich-Blessing Studio

INTERIOR: FLOOR—BLUE VIOLET RUBBER TILE WITH 1/2" WIDE STRIPE AROUND THE ROOM.

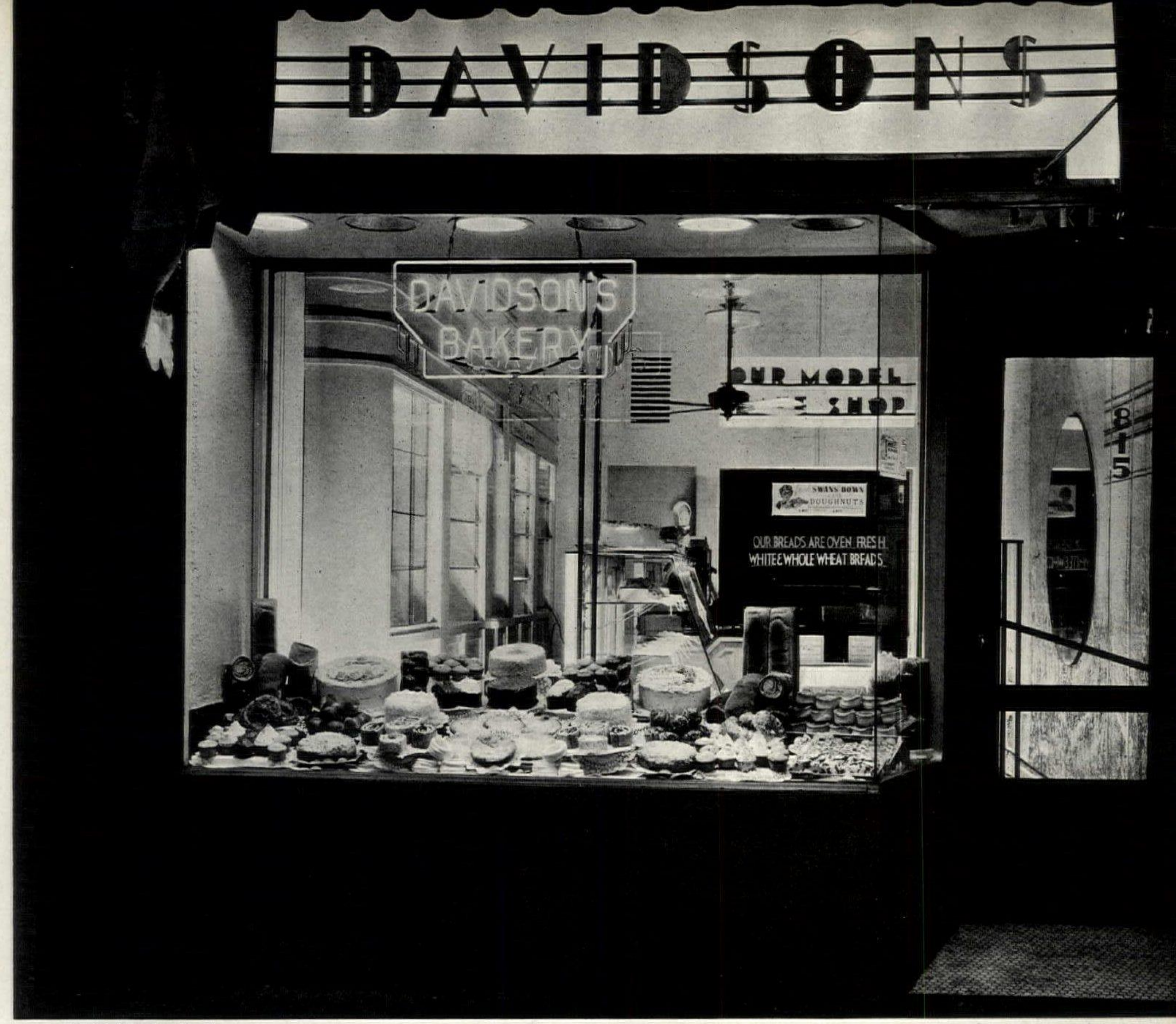
BUILT-IN CASES OF DARK STAINED SYCAMORE, WHITE RUBBER TILE BASE; BLACK GLASS BACK FOR BOTTLE DISPLAY; STORAGE CABINETS BELOW COVERED WITH A BLACK EBONIZED SHELF AND ALUMINUM TRIM.

ALL WALLS ABOVE DOOR HEIGHT IN PLASTER IN OVAL SHAPE.

FREE SUSPENDED CEILING WITH LIGHTING ABOVE.

EXTERIOR: FINISH IN ALUMILITE AND CARRARA GLASS.

PALMER HOUSE LIQUOR SHOP, CHICAGO
HOLABIRD AND ROOT, ARCHITECTS



Hedrich-Blessing Studio

STORE FRONT MODERNIZED WITH MINIMUM COST. THE DOUBLE-TIER SHOW WINDOW IS AN INNOVATION SUITED TO DISPLAY OF FOODSTUFFS. THE STORE FACING IS OF BLACK CARRARA GLASS. WHITE CARRARA GLASS WAS USED AS A FLOOR FOR DISPLAY WINDOWS.

DAVIDSON'S BAKERY, EVANSTON, ILLINOIS
GORDON S. GUNDLING, DESIGNER

Hedrich-Blessing Studio

HOWARD BAKE SHOP, CHICAGO
GORDON S. GUNDLING, DESIGNER

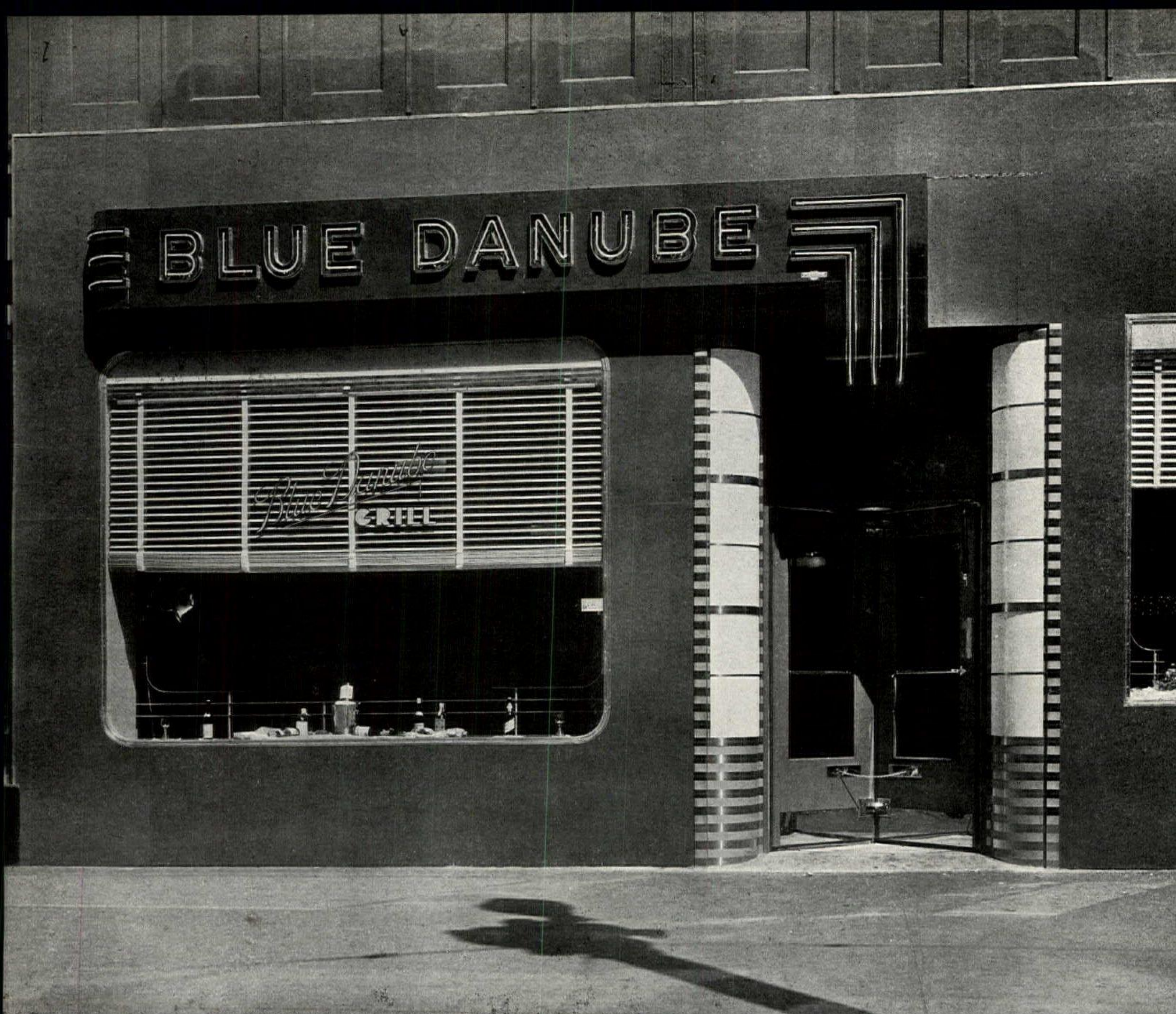
THIS STORE HAS AN UNUSUAL FEATURE IN THE FACT THAT ALL OF THE BACK WALL IS LAID OUT ON A HALF CIRCLE. THE SUSPENDED CEILING WAS INSTALLED OVER A BACK COUNTER AREA WITH A BEAM IMMEDIATELY ABOVE THE MAIN FLOOR CASE. ALL OF THE BACK WALL CASES ARE ILLUMINATED. THE COLOR SCHEME IS EGG PLANT RED, CANARY YELLOW AND PEACH, WITH LINOLEUM IN YELLOW AND RUBY RED. THE DISPLAY WINDOW BULKHEAD HAS BLACK GLAZED TILE AND IS FRAMED WITH ALUMINITE ON THE EXTERIOR. THE COLOR OF THE SIGN IS BURGUNDY RED AGAINST A YELLOW BACKGROUND.

Hedrich-Blessing Studio

ALBERT'S DELICATESSEN AND GRILL, CHICAGO
GORDON S. GUNDLING, DESIGNER

FOOD SHOP AND DELICATESSEN:

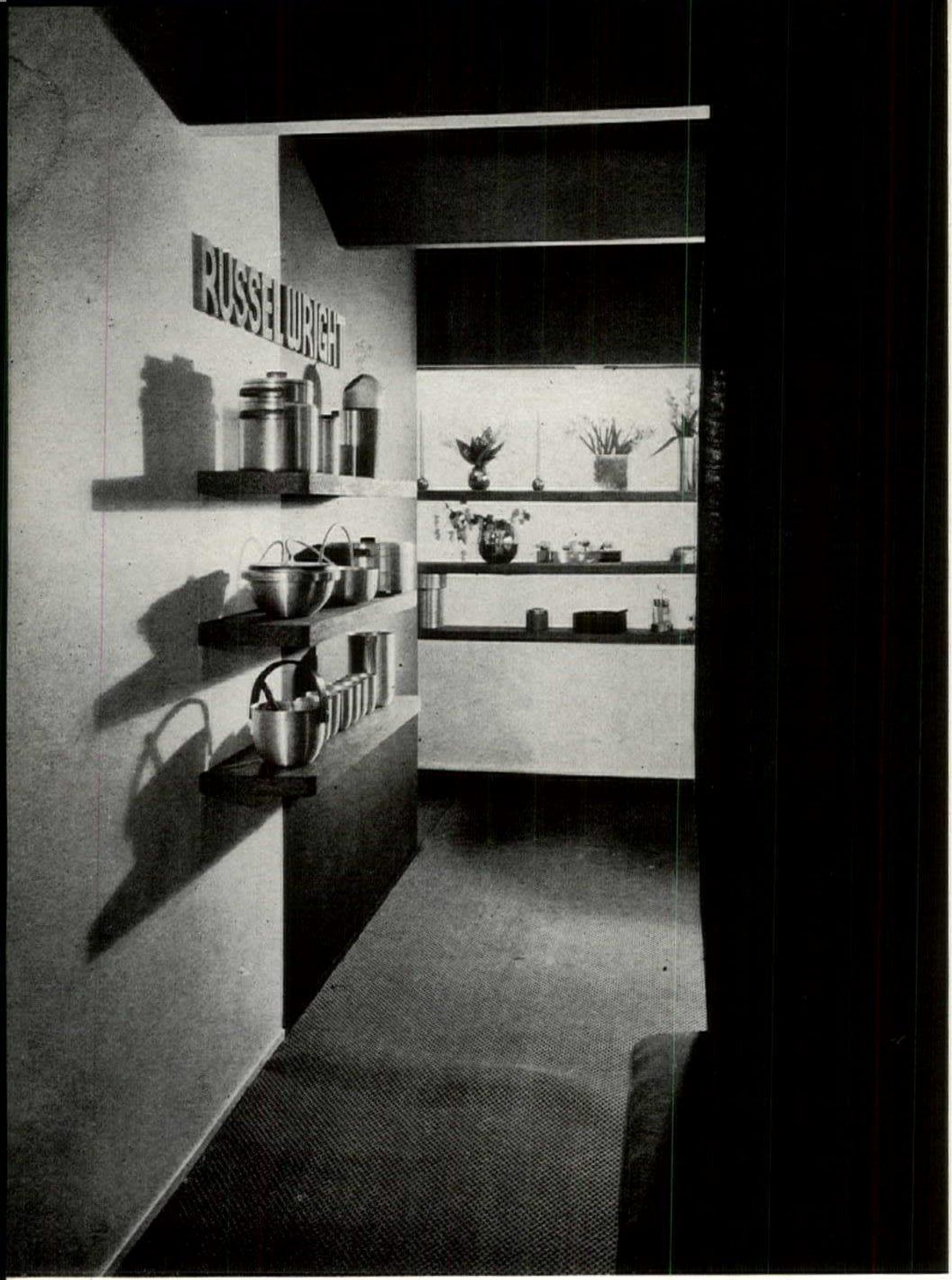
ALL OF THE STORE FIXTURES ARE OF WALNUT WITH FLUTED CHROME COLUMNS AND BLACK MARBLE BASES. OVER THE FOOD COUNTER AND OVER THE BAR THERE IS A CANOPY AND IN THE CANOPY ARE REFLECTORS FOR FLOODLIGHTING. THE CANOPY IS SUPPORTED FROM THE CEILING BY CHROMIUM RODS. THE FLOOR IS BUFF AND BLACK TERRAZZO. THE COLOR SCHEME OF THE STORE IS IN SEVERAL SHADES OF GREEN AND WHITE. CHAIRS AND BAR STOOLS ARE UPHOLSTERED IN CHARTREUSE GREEN.



Hedrich-Blessing Studio

THE EXTERIOR FACING OF THIS STORE IS OF BLUE FORMICA. THERE IS CURVED, SANDBLASTED GLASS ON EITHER SIDE OF THE ENTRANCE, TRIMMED WITH STAINLESS STEEL. THE REVOLVING DOOR IS IN ROYAL BLUE. INTERIOR BOOTHS ALTERNATE WITH A BLUE AND YELLOW COLOR SCHEME. THE BAR IS OF BLUE FORMICA; THE BACKGROUND OF THE BAR IS YELLOW; THE CEILING OF THE BAR CANOPY IS CREAM COLOR. TABLE TOPS ARE OF IVORY COLORED FORMICA. THE FLOOR LINOLEUM IS IN CADET BLUE; FURNITURE IS UPHOLSTERED IN ROYAL BLUE.

BLUE DANUBE GRILL, CHICAGO
GORDON S. GUNDLING, DESIGNER



STUDIO AND SHOWROOM OF RUSSEL WRIGHT NEW YORK

RUSSEL WRIGHT, DESIGNE

IN BACKGROUND IS THE CHROMIUM DISPLAY
GLASS AGAINST MIRRORS
DRAPES, DARK BROWN
SOFA, LIGHTER BROWN
RUG, CORK COLOR
BEAMS, WHITE AND BROWN
WALL, WHITE
SHELVES, CORK

The display material is made up of several ensembled groups; pottery, chromium-ware, aluminum "stove to table ware" and aluminum informal serving accessories. Because of this variety within the "line," the main problem was to separate these groups into secluded units, at the same time keeping a uniform and unified whole. To solve this problem the space was divided into a series of interlocking L-shaped partitions, each partition performing the double service of secluding a separate group and leading into the adjacent group.

Color as well as form was employed in solving this problem of separating groups within a harmonious whole. White, dark brown and cork tones are used alternately, so that no two adjacent partitions are painted the same color, yet the alternating colors combine in a design for the entire space.

Guild Photography

SHOWROOM AND OFFICE FOR A. H. JEJIZIAN
NEW YORK CITY — Designed by ZAREH M. SOURIAN

F. S. Lincoln Photographs

ELEVATOR HALL:

WALLS: PLASTER, PAINTED; COLORS: LIGHT BLUE-GREY, RED, GUN METAL.

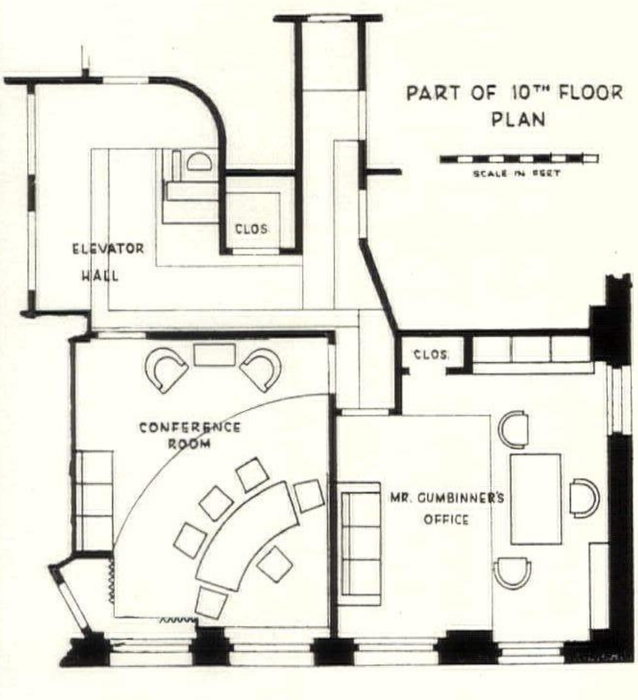
DOORS: COLOR: GUN METAL.

CEILING: COLOR: LIGHT BLUE-GREEN.

FLOORS: COVERING: LINOTILE. COLORS: RED, BLACK AND DARK GREY.

TELEPHONE BOOTH: WOOD: ASPEN WOOD AND BLACK LACQUER.

LAWRENCE C. GUMBINNER ADVERTISING AGENCY
9 EAST 41 STREET, NEW YORK CITY



CONFERENCE ROOM:

WALLS: PLASTER, PAINTED. COLORS: BLUE, BEIGE, AND YELLOW. FLOORS: SEAM-LOC CARPET. COLORS: MODERN BLUE AND SILVER GREY.

CONFERENCE TABLE: WOOD: GONZALES ALVES.

ARM CHAIRS: WOOD: PADOUK, UPHOLSTERED WITH BLACK TWEED.

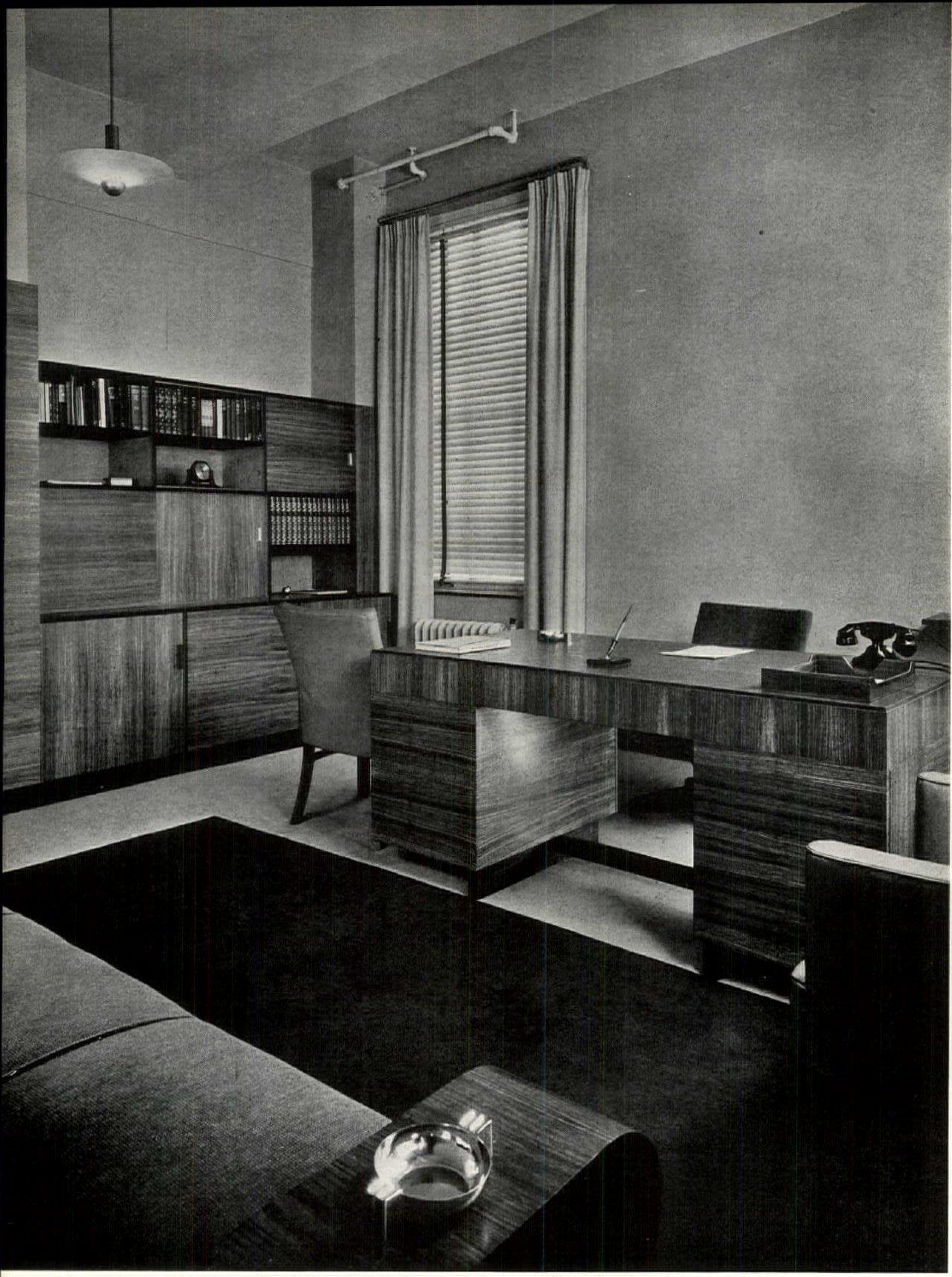
COUCH: UPHOLSTERED IN CORAL COLOR MOHAIR REP.

EASY CHAIR: UPHOLSTERED OUTSIDE IN CORAL COLOR MOHAIR REP; INSIDE NATURAL COLOR ROUGH TEXTURED MOHAIR.

DRAPES: DOE COLOR MOHAIR CASEMENT.

WINDOW: THE WINDOW NOT DRAPED HAS BEEN FURRED OUT AND THE LIGHT ADMITTED THROUGH SANDBLASTED GLASS LOUVERS.

ELEANOR LEMAIRE, DESIGNER



F. S. Lincoln Photographs

OFFICE MANAGER:

WALLS: PLASTER, PAINTED. COLORS: GUN METAL, CITRON, GREY, AND OFF-WHITE.

FLOORS: SEAM-LOC CARPET, SILVER GREY AND NOMAD BROWN.

DESK AND CABINET: BEAN WOOD.

SOFA: BEAN WOOD AND TAUPE TWEED UPHOLSTERY.

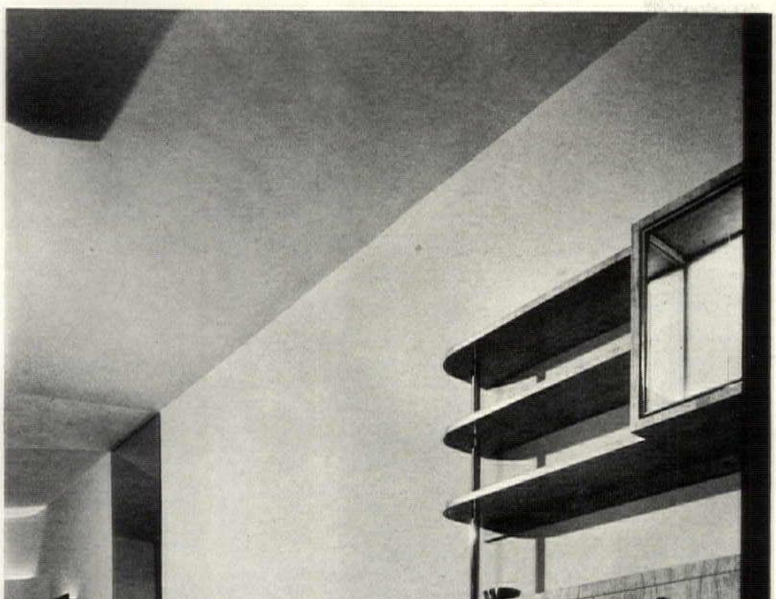
DRAPES: LEMON COLOR CHEVRON.

GUMBINNER ADVERTISING AGENCY, NEW YORK

ELEANOR LEMAIRE, DESIGNER

F. S. Lincoln

OFFICE LOBBY OF
MARSCHALK AND PRATT, INC.
NEW YORK CITY

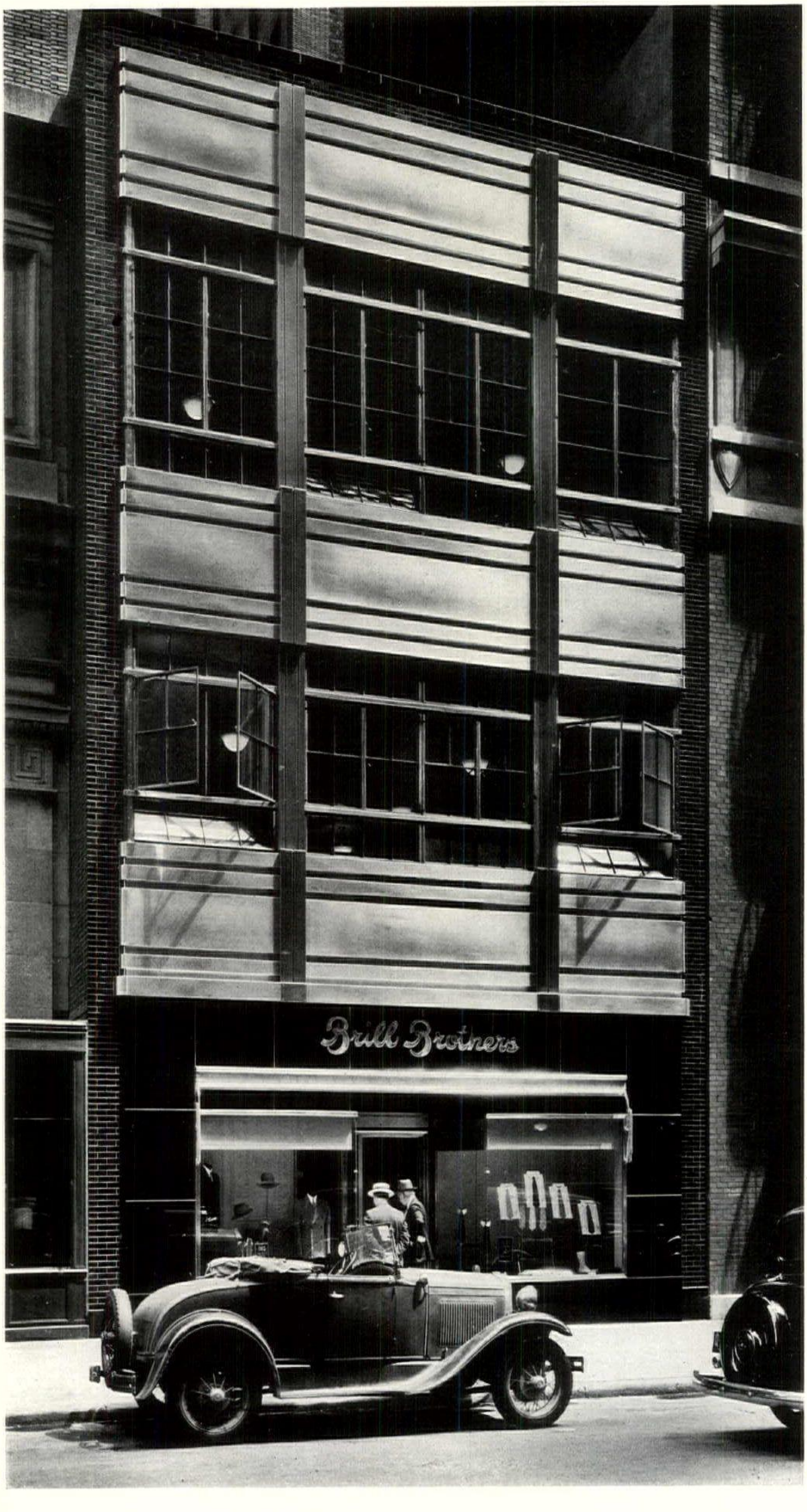


Nyholm and Lincoln

A SHOWROOM, NEW YORK CITY
HOWE AND LESCAZE, ARCHITECTS

BRILL BROTHERS STORE, NEW YORK CITY

SHREVE, LAMB AND HARMON, ARCHITECTS

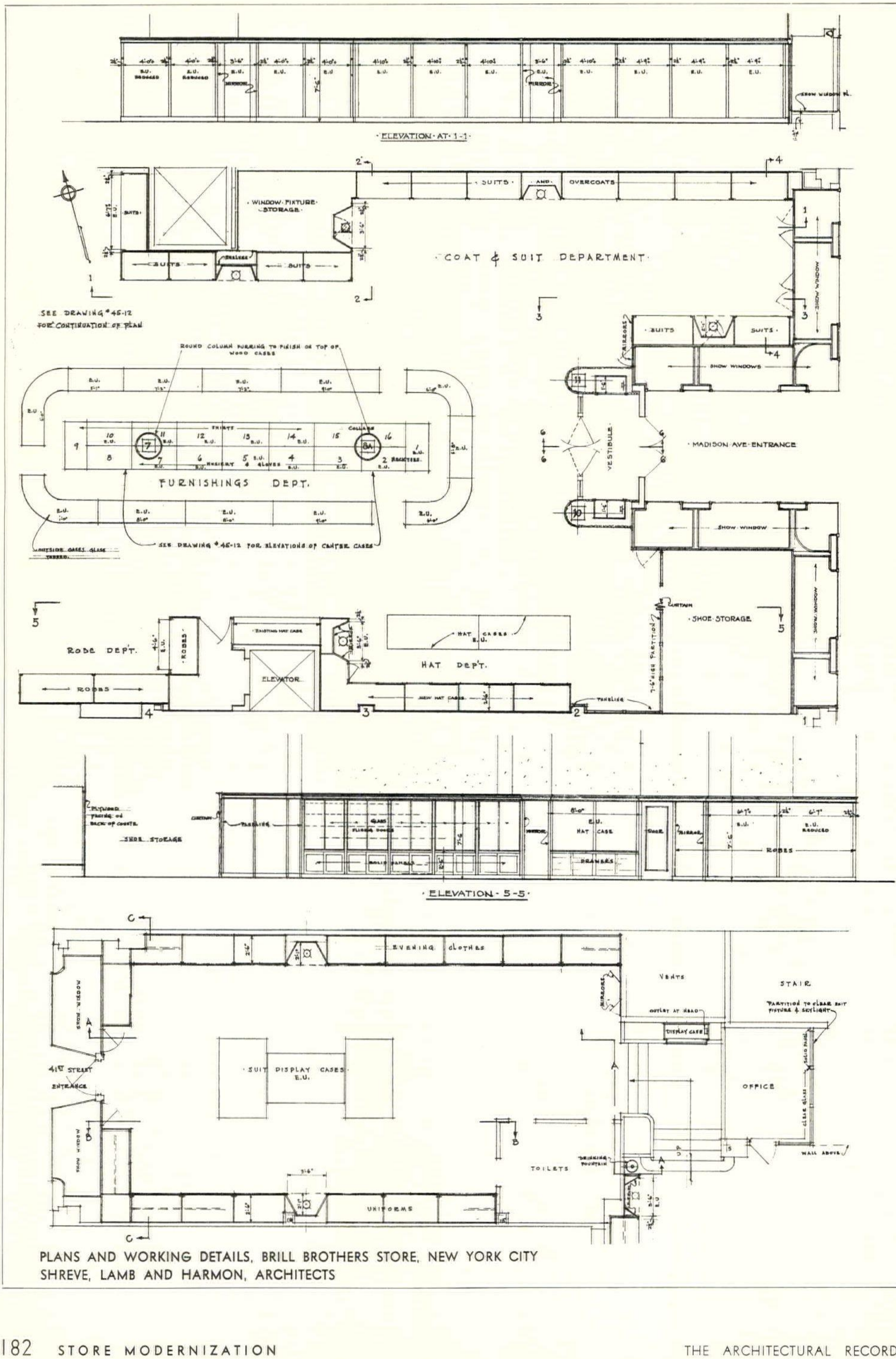


FORTY-FIRST STREET FACADE

The facing materials are stainless steel, glass and brick.

F. S. Lincoln Photos

FACADE ON MADISON AVENUE. The L-shaped plan has frontages on two streets at right angles to one another. Shreve, Lamb and Harmon, architects.



PLANS AND WORKING DETAILS, BRILL BROTHERS STORE, NEW YORK CITY
SHREVE, LAMB AND HARMON, ARCHITECTS

Manning Brothers, Inc.

HICKEY MEN'S STORE IN DETROIT: Façade of waterproofed panels veneered with Congola Alvez. Trimmed in teakwood, stained black, and aluminum. Window backs are in natural finish, pin grain oak. Lancelot Sukert, architect, and Kenneth C. Welch, associate.

PLANNING A SMALL MEN'S SHOP

By KENNETH C. WELCH, A.I.A., and Vice-President, Grand Rapids Store Equipment Company

THE problem was to design a small men's shop in a given space on the first floor of an existing building, replacing a much larger store previously operated by the same organization.

REQUIREMENTS

The site acquired was on a high grade shopping street. The building at the front was 33 feet wide inside; 36 feet at the rear; 99 feet deep; rather irregular in shape and the columns in the front did not line up with those in the rear.

DESIGN

The previous store in another location, having been built some fifteen years before, was typical of that era. It was decided that the new one should be modern but a type of modern that would have a masculine appeal. A modern type was adopted for several reasons:

First, it was felt that it is best adapted to featuring of the merchandise.

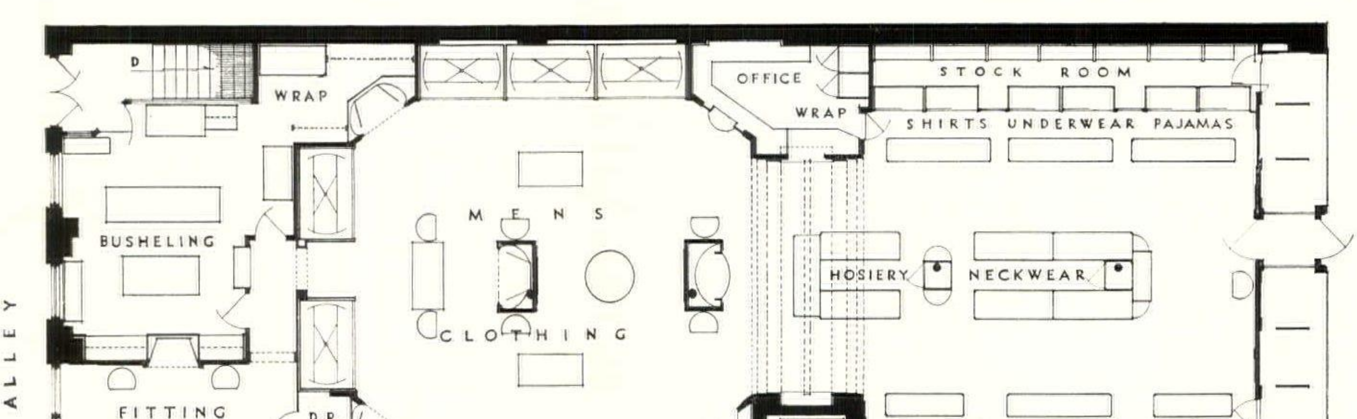
Second, it was desirable to make the store look entirely up to date.

Third, it was felt that it offered the greatest possibilities for adequate and proper lighting.

Manning Brothers, Inc.

E. J. HICKEY MEN'S STORE, DETROIT

LANCELOT SUKERT, ARCHITECT—KENNETH C. WELCH, ASSOCIATE



Detail view showing wrapping station ledge. Men's clothing section is in area beyond.

ral view of interior g toward rear of store. y outlets for condi- d air are concealed d cornice in the light- ecess.

GENERAL

Provision was to be made for a men's furnishings section; men's clothing section; busheling room; a small centrally located office and a separate room for fitting.

An elevator shaft serving another portion of the building projected into the space on one side which limited the size of the men's furnishings department. However, the width of the space permitted placing a stock room for men's furnishings on one side leaving room for a center island composed of show cases. This gave the necessary perimeter of show cases for selling merchandise, and the stock room with shelving 7½ feet high together with the usual wall cases permitted the carrying of necessary stock. Carrying highly standardized merchandise such as certain types of men's shirts, underwear, collars and the like in the stock room permitted the use of the visible space for display of style merchandise.

The show cases were all designed with drawer bases; the drawers open on the clerk's aisle. A certain amount of small wares stock, such as neckwear, hosiery and gloves, is carried in the show cases themselves.

The office and central wrapping desk was placed between the men's clothing and the men's furnishings section—a central location, since every transaction in either department requires contact with this spot.

In the men's clothing section revolving cabinets were utilized from the old store but modernized by means of new cornice, pilasters and lighting. In order to balance the two sections and place them on a common axis, a display and triplicate mirror was built around the columns which were off center with those in the front. This also made available a reserve stock room for men's clothing along one wall.

The problem in the men's clothing section was to provide sufficient hang rod space, flexible enough to handle overcoats in season, single height, or men's suits double decked. In this particular instance the revolving cabinets provided a maximum capacity within a limited area.

HICKEY MEN'S ST
IN DETROIT

LANCELOT SUK
ARCHITECT

KENNETH C. WE
ASSOCIATE

Left:

Detail of triplicate mirror with rectly lighted slot at front edg wings. Illumination in this sl greatest at bottom and fades ou wards top, throwing light where desired—on front and back of ment.

Right:

View from men's clothing depart looking into hat department.

The extreme rear portion of the store was assigned to the busheling room and directly next to it the fitting room space. It is desirable in most men's stores to segregate the fitting service from the actual sales floor. Requirements were to provide three dressing rooms, an open floor area of approximately 12 by 19 feet with daylight, and a long narrow table in the center which could be used for measuring clothing. The close proximity of this room with the busheling room made it convenient for the fitters who are constantly traveling between these two departments.

LIGHTING

One of the most important features was the illumination of the store. A rather unusual combination of lighting was developed, especially in the men's furnishings section. The wall cases with plate glass, metal framed, sliding doors and plate glass shelves on one side and rods for men's hats on the opposite side, were to be strongly illuminated to emphasize the display of merchandise.

The illumination behind the cornice in addition to illuminating the case below indirectly illuminates a dull stippled white recess above the case. Forty-watt lamps spaced approximately 18-inches on center not only uniformly light the merchandise but also uniformly light the recess above, adding much to the illumination of the room. Most important, this gives the only effect of light since the major source is entirely concealed. A patent has been applied for on this method of illumination—combining display lighting with indirect illumination above. This same light recess is also effective for silhouetting movable departmental or advertising signs, the latter being the one form of ornament that was used.

The major source of illumination in the men's furnishings section is from concealed recessed lights 4' 6" on center and on a line and directly over the show cases. These consist of a reflector, a ribbed lens, and

Manning Brothers, Inc.

an egg crate grid, the latter with a special dull black finish. The ribbed lens tends to send the light parallel with the show cases in the same manner that modern automobile headlights direct a band of light. The result is that by using only 3.8 watts per square foot (exclusive of the lights in the show cases) 45 foot-candles are produced on the top of the show case. This is better than four times the amount of light in the average men's store and as a consequence any merchandise displayed either in the show case or on top of it is brought out in sharp contrast with the surroundings.

A similar type of lighting is used in the men's clothing section over the wall cases, but the ceiling lighting is changed to give the more general distribution required.

COLOR SCHEME

The woodwork throughout is in two-tone color of pin grained selected oak, with the large flakes generally found in quartered sawed oak eliminated so that the wood is small in scale and simple in pattern.

The insides of the cases are left practically a natural color whereas the exterior is stained a light, soft brown.

The carpet is in four tones of taupe. The plastered surfaces and wallboard surfaces that are painted are made to harmonize with the floor covering.

The old cast-iron columns at the front of the store are surrounded with a column enclosure, two sides of which are white glass lighted from behind. This lighting is decorative rather than useful although it adds to the general illumination.

Since the ceiling is in no way used to reflect light it is painted a dark blue with black bands connecting the lighting unit.

Most of the merchandise displayed is colorful, which together with the lighting scheme, the color scheme and simplicity of the equipment concentrates the customer's attention on the merchandise. This, after all, is one of the primary functions of retail store design.

STORE MODERNIZATION

A check list to serve as a reference guide for alteration of a building for improved retail store purposes.

PLANNING

Arrange public space, work space, counters to suit specific merchandising needs. (The U. S. Department of Commerce assists by supplying data on store types for retail trade.) Painstaking studies have been made to assist the processes of buying and selling. Store arrangement varies with the type of goods to be sold. (See Store Buildings and Neighborhood Shopping Centers by Clarence S. Stein and Catherine Bauer, THE ARCHITECTURAL RECORD, February, 1934, pp. 174-187. Also, Planning the Retail Store by K. Lönberg-Holm, June, 1931, pp. 497-514.)

Plot on sketch plans the departments of store, aisles, counter space, storage, offices, and so on.

Reduce store size to convenient sales and work area.

With speedy replacement of goods for sale from the central market or warehouse, store sizes have become smaller.

Enlarge area for sales by changing storage to basement or loft.

Sixty feet is generally a maximum depth for sales area for retail stores.

Subdivide with movable partitions (permitting later alteration).

Provide facilities for parking cars.

Consider a store front that can be entirely open, without obstruction during greater part of spring, summer and autumn. "The best store front is no front. The store itself is the best display window. Groceries, hardware stores, dry goods stores, bookstores and furniture stores have eliminated with advantage display windows with high backgrounds and make the whole store visible from the street."

REPAIRS AND ADDITIONS

Examine structural condition of walls, floors, roof.

Add structural supports required.

Repair brickwork, stonework and coping.

Patch stucco and concrete.

Enlarge windows for improved daylighting and ventilation.

Check windows to see that they work properly.

Replace panel doors with doors of flush type.

Scrape and refinish wood floors or

Relay floors with wood, tile, terrazzo or marble, or

Cover wood floors with linoleum.

Plaster walls and ceiling.

Face walls with plywood or flexwood.

Remove antiquated partitions, cabinets and counters.

Replace old cabinets and counters with new equipment.

Provide low, open shelves to facilitate self-service.

Use a clear, readable and well-lighted sign to designate store and attract trade.

"Well-designed lettering will do more to draw passing trade than show windows. Show windows are of little use to passers-by in automobiles."

Subordinate equipment display to display of merchandise.

Doors should be easily operated and at least 3 feet 6 inches wide; 4 feet is recommended. Larger stores should have separate doors for access and egress, or separate doors for each aisle. Center entrance is most desirable for smaller stores. Side entrances are generally objectionable.

Add Neon signs with colors to identify various departments.

Enlarge or reduce size of show windows (see requirements for correct display).

Provide sidewalk awning for windows with south and west exposures.

Add new heating plant.

Convert coal-burning boiler to oil-burning equipment for greater convenience and to save space.

Install automatic heat control.

Install ventilation equipment.

Replace antiquated plumbing fixtures with new.

Replace corroded iron piping with brass or copper piping.

Add washroom to first floor for customers and another for service.

Because of variety of color introduced by merchandise, it is generally preferable to adopt a single color for walls and trim.

Paint walls and fixtures.

Paint ceiling a light color to augment light reflection and diffusion.

Install new lighting system with light directed to counters and display cases.

GENERAL LIGHTING

Increase service cable.

Rewire with copper sufficient to take double contemplated connected load.

Put all wiring in metal conduit.

Fuse all circuits with circuit breakers.

Location marker—illuminated sign.

SHOW WINDOW LIGHTING

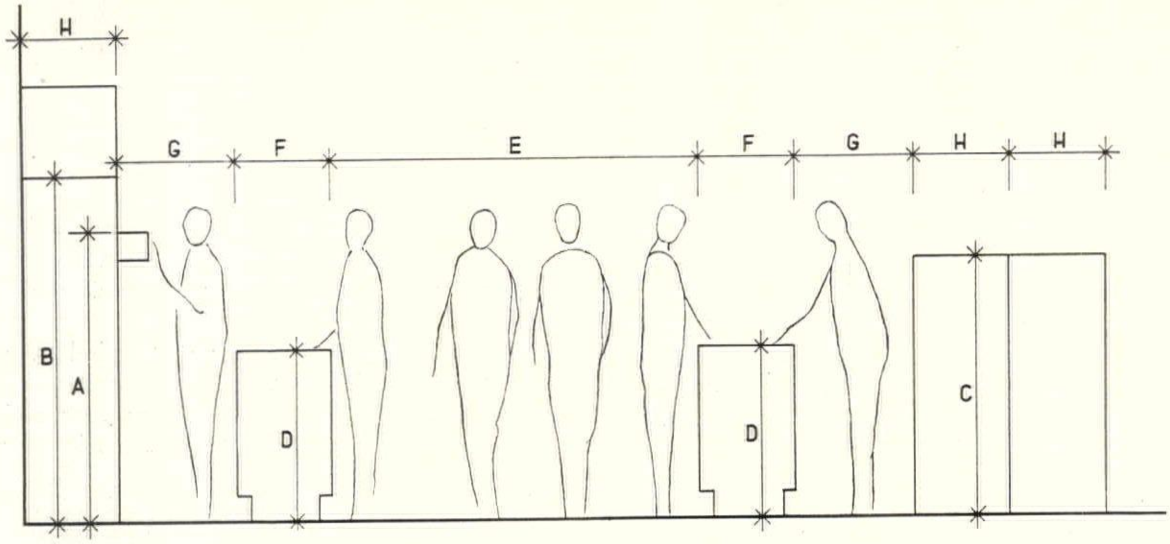
Allow one circuit to each six feet of lineal window. Wire lamps alternately.

Allow two additional circuits to each window for accessories.

Wire lamps alternately.

Allow one circuit also for each 20 lineal feet of windows for footlights if contemplated.

Overhead lights 12 inches apart, preferably flushed in.



STORE FIXTURE DIMENSIONS

HEIGHTS:

A. MAXIMUM PRACTICAL HEIGHT TO TOP OF DRAWERS . . . . 5'–4"

B. MAXIMUM PRACTICAL HEIGHT TO TOP OF SHELF . . . . 6'–4"
Spacing of shelves and overall height dependent on (1) architectural effect and proportion to height of room (2) whether display is placed overhead.

C. MAXIMUM OVERALL HEIGHT OF CENTER STOCK FIXTURE TO SECURE GOOD VISIBILITY OVER . . 4'–9"
Trend today with decrease in stocks to make even lower 4'-0" to 4'-6" to further increase visibility of whole floor.

D. SHOW CASE HEIGHT FOR STANDING SELLING . . . . 3'–2"
This is slightly lower than generally used in past.

D. SHOW CASE OR COUNTER HEIGHT FOR SEATING CUSTOMERS . . . 2'–10"

PLAN DIMENSIONS:

E. WIDTHS OF CUSTOMERS AISLES. MAIN AISLE MINIMUM WIDTH TO PERMIT TWO CUSTOMERS TO PASS WHEN CUSTOMERS ARE STANDING AT COUNTER . . . . 7'–0"

PLAN DIMENSIONS:

Important, main-heavy traffic aisles should be wider—11' to 12'.
Minimum secondary—low traffic aisles 4'6" to 5'-0".

F. COUNTER DEPTHS TO ACCOMMODATE GREAT MAJORITY OF MERCHANDISE . . . . 1'–10"
Show cases in the past generally made 2'-0" *but improved construction and standardization of folds in many lines has permitted this decrease, giving additional space to aisles.*

G. CLERK'S AISLES. DEPENDENT ON POSSIBILITY OF TAKING OUT DRAWERS IN STOCK FIXTURES FOR CLEANING . . . . 2'–2" to 2'–3"
The above also permits clerks to pass. If latter is not necessary and drawers not used it can be a minimum of 1'-6". Wide clerk's aisles have tendency to expose lower part of stock fixture and floor, often littered, to customer's view.

H. STOCK FIXTURES TO ACCOMMODATE MOST MERCHANDISE TODAY, ESPECIALLY SMALL WARES, ARE IN DEPTH . . . . 1'–10"
This dimension must be carefully checked, however, with the merchandise to be carried.

If overhead lights are exposed, use pipe or patented wireway for wires.

If flushed in, use flexible metal covered cable.

Convenience outlets in ceiling every six lineal feet of window.

Convenience outlets in baseboard every five feet.

Two floor receptacles in each window.

Provide valance.

Provide curtain.

Provide glare shields on overhead exposed, open mouth equipment when used in backless, glassbacked or island windows.

Use translucent window reflectors if upper part of window is to be used as a sign.

Light, neutral matte finish for window interior.

STORE INTERIOR LIGHTING

One circuit for every 200 square feet of floor area on an average for overhead lighting.

Built-in flush lighting constructions or totally enclosed functional luminaires.

Self lighting in show cases.

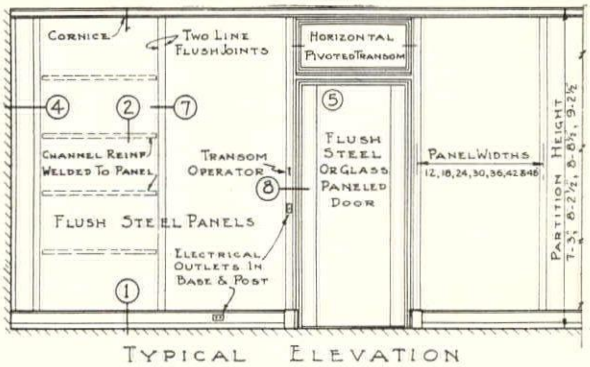
Counter lights for color discrimination where required.

Individual switches for each lighted show case and each lighting source 200 watts or over.

Wire overhead lights alternately when not switched individually.

Counter convenience outlets (duplex) every six feet.

Light values to automatically maintain lighting level where daylight provides all or part of the illumination, part of the day.



FLUSH TYPE STEEL PARTITION SUITABLE TO STORE INTERIOR ALTERATION (Courtesy E. F. Hauserman Co.)

Illuminated location and direction signs.

Light, matte interior surface finishes when semi-indirect or indirect lighting is to be used.

All equipment to take standard lamps of as few sizes as possible to avoid errors in relamping and simplify maintenance.

SHOW WINDOWS

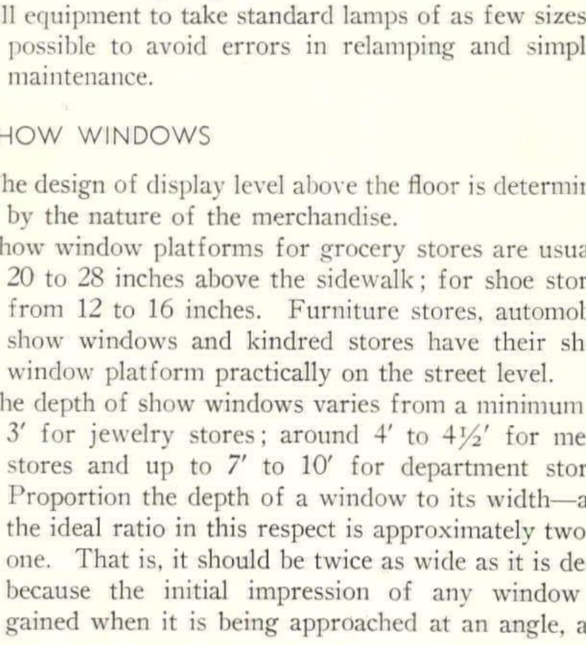
The design of display level above the floor is determined by the nature of the merchandise.

Show window platforms for grocery stores are usually 20 to 28 inches above the sidewalk; for shoe stores, from 12 to 16 inches. Furniture stores, automobile show windows and kindred stores have their show window platform practically on the street level.

The depth of show windows varies from a minimum of 3′ for jewelry stores; around 4′ to 4½′ for men's stores and up to 7′ to 10′ for department stores. Proportion the depth of a window to its width—and the ideal ratio in this respect is approximately two to one. That is, it should be twice as wide as it is deep, because the initial impression of any window is gained when it is being approached at an angle, and if it is too deep for its width it is difficult to trim without hiding the merchandise. Department store windows can vary in widths and depths due to the fact that they carry lines of so many different sizes, but for furniture the windows should be, if possible, 10′ in depth, and with a width accordingly.

Window height is governed by display requirements and by the architectural effect on the exterior. It is evident that men's furnishing windows can be lower than the department store window displaying rugs and home furnishings or even ready-to-wear. Jewelry windows and shoe store windows can, of course, be much lower.

Bulkhead heights vary for ready-to-wear and today they are kept around 18″ to 20″. In jewelry stores and other types they are raised up so that the floor is from 3′ to 3′ 6″ above the sidewalk. This can be done by the actual bulkhead over the plateau on the interior, but again the architectural effect in proportion should largely govern this, it being a general rule that small merchandise, such as jewelry, shoes, etc., is better raised up nearer the customer's eyes; whereas furniture and ready-to-wear on full forms should be placed down to give the customer more of a normal viewpoint.



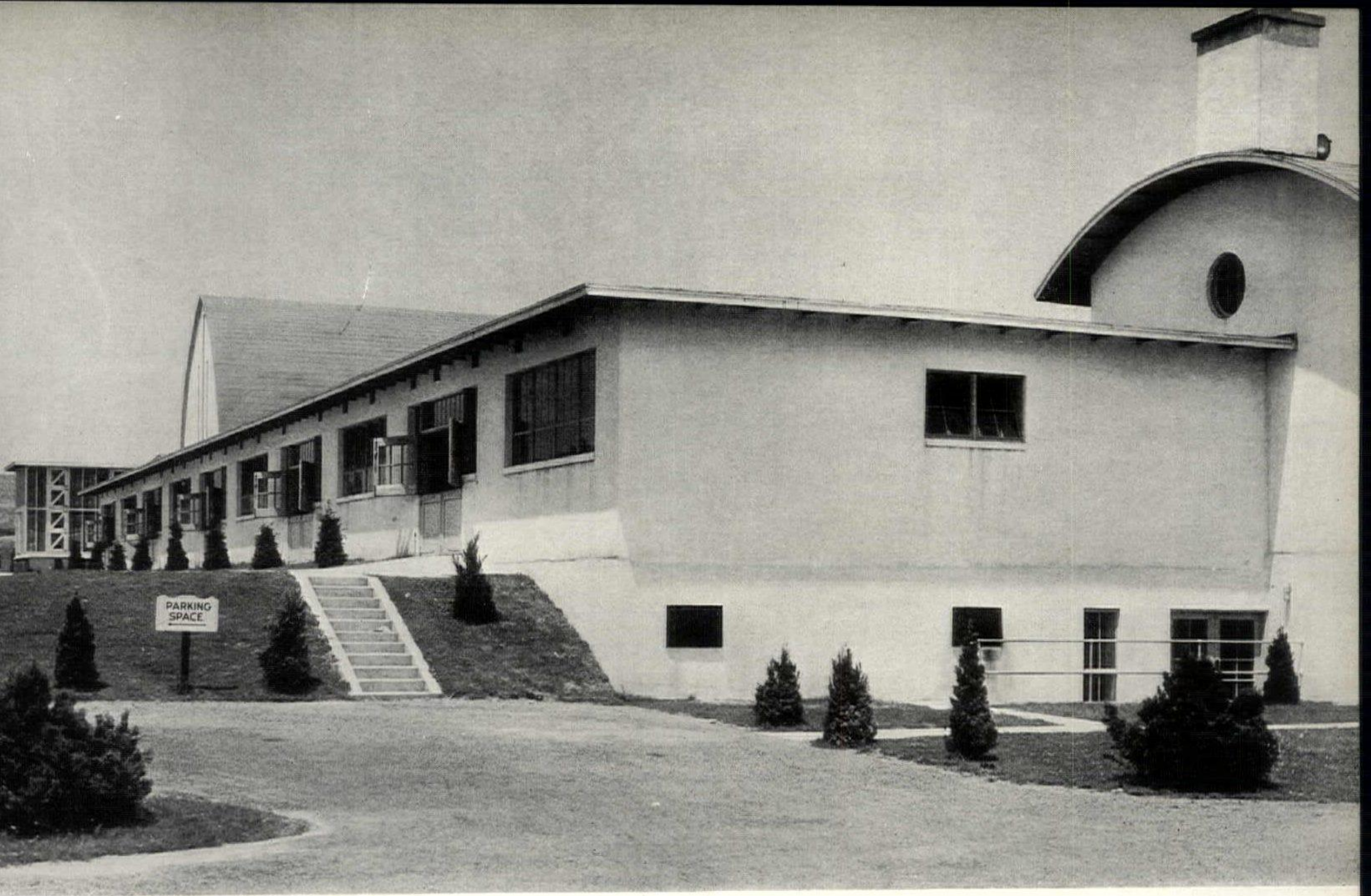
DETAIL FOR OBTAINING FLAT CEILING WHERE PARTITION WAS REMOVED. THE PACK-WOLIN SHOP, DETROIT. LANCELOT SUKERT, ARCHITECT.

ESTIMATED SPACE REQUIREMENTS FOR STORES OF VARIOUS TYPES*

Type of Store	Dimensions	Area (Sq. Ft.)	Authority
Grocery	40′ x 60′	2,400	Safeway Stores, California.
	35′ x 60′	2,100	Average chain store doing $3,000 weekly business.
	30′ x 40′	1,200	Lönberg-Holm, architect.
	20′ x 45′	900	Carl Dipman, editor of *The Progressive Grocer*.
	20′ x 35′	700	Average chain store doing $1,200 weekly business.
	28′ frontage		W. F. Williamson for store doing $100,000 business annually.
	16′-18′ front		W. J. Baxter, Chain Store Research Bureau.
Grocery and Meat	100′ x 100′	10,000	Ralph Morgan, president of Chain Store Research Bureau.
	60′ x 100′	6,000	Average store.
	35′-50′ front		W. J. Baxter.
Drug Store	20′ x 80′	1,600	Ralph Morgan.
Variety (5 and 10c)	40′ x 150′	6,000	Kresge and Woolworth.
Specialty—Hardware, etc.	20′ x 80′	1,600	Ralph Morgan.
	20′ x 36′	720	Ideal electrical contractor's, National Lamp Works.
Chain Department	50′ x 120′	6,000	J. C. Penney average.
Shoes	20′ x 100′	2,000	Wise Shoe ideal.
	20′ x 80′	1,600	Walkover ideal.
	15′ x 75′	1,125	Beck Hazzard ideal.
	18′ frontage		W. J. Baxter.
Candy	7′ x 40′	280	Mary Lee shops.
	or 9′ x 30′	270	
	18′ frontage		W. J. Baxter.

All store examples and estimates from Baxter, William J., *Chain Store Distribution and Management*, 1932; Williamson, W. F., *The Retail Grocer's Problems;* U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce.

*From *Store Buildings and Neighborhood Shopping Centers*, by Clarence S. Stein and Catherine Bauer, THE ARCHITECTURAL RECORD, February, 1934, p. 182.



Robert W. Tebbs

COW STALLS WITH BARN IN DISTANCE

LAUXMONT DAIRY

AT WRIGHTSVILLE, PENNSYLVANIA
DELANO AND ALDRICH, ARCHITECTS

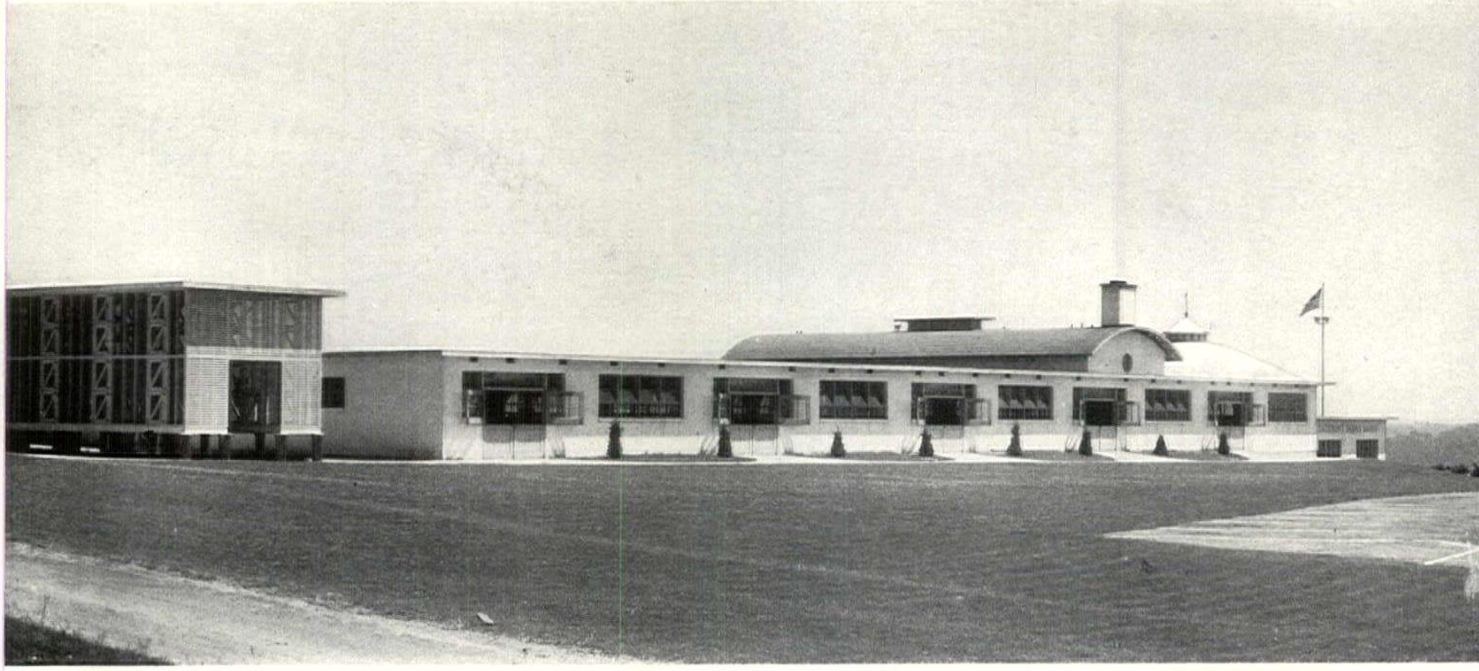
As has become the practice on many of the best dairy farms within the past five years, the cows are milked in a special room, known as the "milking parlor," instead of in the barns in which they live. But, in addition, at Lauxmont, they are kept loose in pens instead of being fastened by the neck in stalls; this is an innovation.

By referring to the plan of the dairy, it will be seen that there are two cow barns connected by the building that contains the milking parlor. At milking time, the cows are allowed to come from their "loafing pens" to the milking parlor through the alleys along the outer walls of the barns, passing first through a room in which the udder and adjacent parts are washed with a spray of warm water and dried with a towel.

In the milking parlor, the cows enter stalls which hold them so that they cannot move about but are comfortable. They are given water to drink, in a fountain fixed to each stall, to keep them quiet during the milking. The milking machines are applied and the milk is drawn off under vacuum into sealed glass jars that hang from scales, one for each cow, so that the weight of milk produced can be noted. From these jars the milk passes through pipes to a pair of cylindrical glass tanks. These tanks release the vacuum and the milk flows by gravity from this point to the cooling tank, in a nearby room, and from there to the bottling machine.

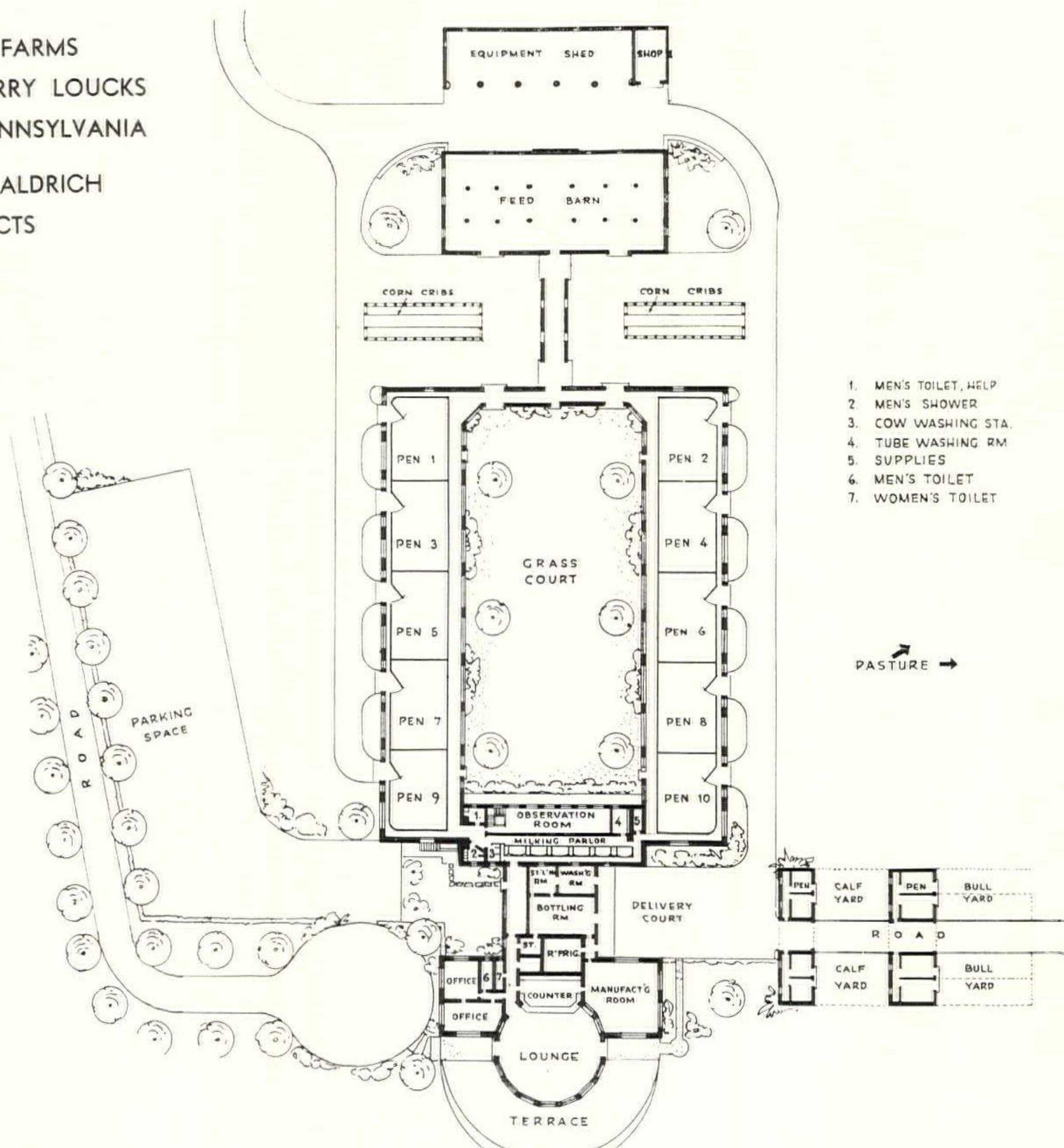
From the time the milk is drawn from the cow into the milking machine until it is sealed in the bottles it is inclosed for protection from contamination. This method, which was perfected at the United States Department of Agriculture Experimental Dairy Farm at Beltsville, Maryland, in July, 1928, has already been widely adopted by large commercial producers of milk. It is known as the combine milking system.

The milking machines are operated by vacuum and



LAUXMONT FARMS
ESTATE OF S. FORRY LOUCKS
WRIGHTSVILLE, PENNSYLVANIA

DELANO AND ALDRICH
ARCHITECTS



graphs by Robert W. Tebbs

CORN CRIBS AND BARN

their pulsations, under magnetic control, are timed to induce the maximum flow of milk. One man can operate several milking units, usually from three to five. At Lauxmont, there are six milking units, one for each of the six milking stalls, which are arranged in tandem.

Between the milking of one cow and the next the parts of the milking machine that come in contact with the cow can be cleansed very quickly by insertion in a funnel-shaped sterilizer attached to each stall.

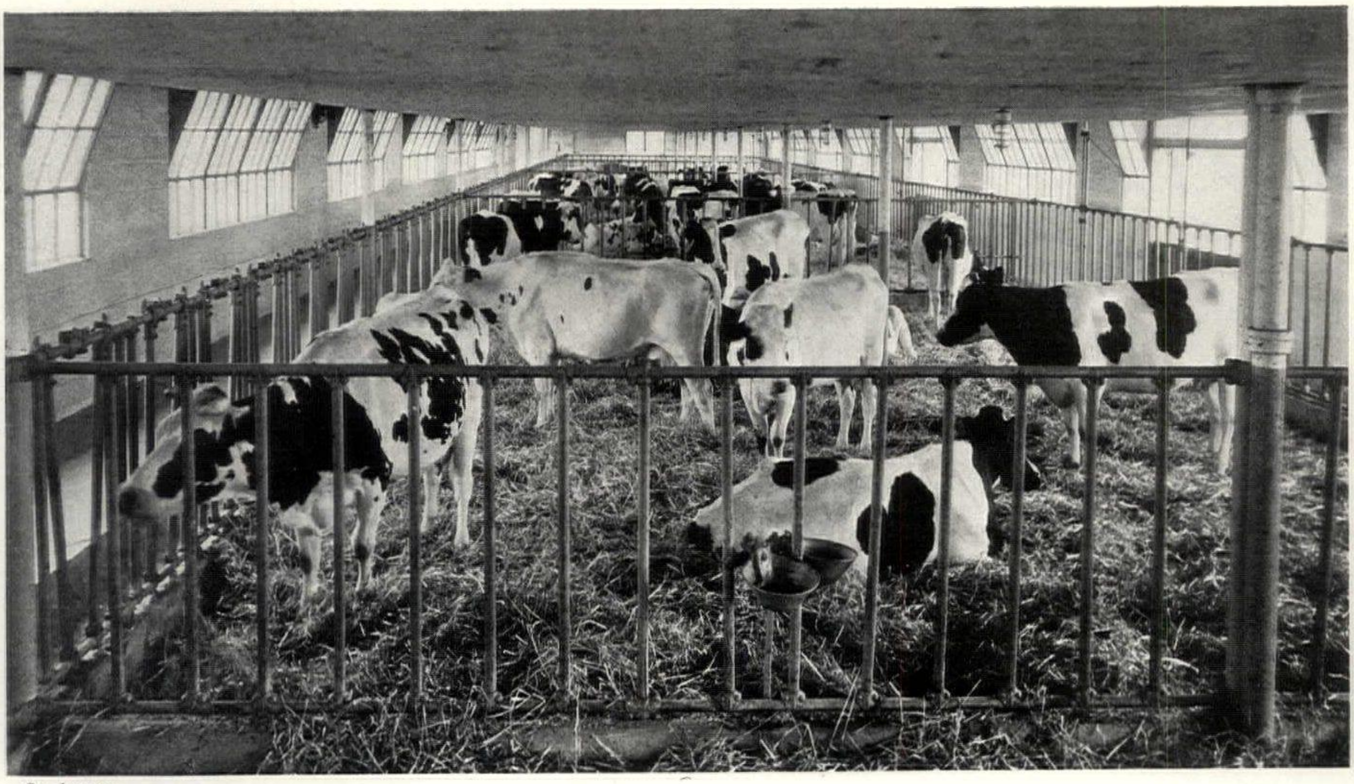
After each cow is milked, she is returned to her pen. It has been found that cows learn the routine very readily. This makes for efficiency, for the work comes to the worker. It makes for cleanliness, not only because the milk is constantly inclosed, but because the operation is conducted in a room that can be kept scrupulously clean and the operator can keep himself clean also. It is not possible to approach this degree of cleanliness in barns in which the cows live.

The milking parlor does away with the hard task of attempting to keep the barns clean enough for milking and there is, consequently, no need to keep the cows in stanchions. The cows are allowed to run in pens with deep bedding all over the floor, which is renewed at intervals. This is more comfortable for the cows and it saves labor. At Lauxmont each "loafing pen" is ample to accommodate 20 cows and, as there are ten pens, the barns can comfortably house a herd of 200 cows. The combine milking system is applicable to herds of from 25 cows upward.

Visitors can watch the milking from easy chairs in the observation room, which is provided with large plate glass windows overlooking the milking parlor. The observation room is an important feature of a dairy where this system of milking is employed, for visitors like to see the operation and are impressed with the cleanliness

Robert W

THE BARN, LAUXMONT FARMS
DELANO AND ALDRICH, ARCHITECTS



Strohmeyer

"LOAFING PENS" IN ONE OF THE BARNS
LAUXMONT FARMS — WRIGHTSVILLE, PA.

of the method; this has advertising value for the dairy.

There is a circular lounge in which there is a milk bar. Here ice cream also is sold. Along the passage between the lounge and the observation room, plate glass windows give visitors a view of the bottling machine in operation.

A large parking space for automobiles is provided.

The buildings have been placed on a sloping site, which permitted advantageous planning in different levels. The feed barn, with the implement shed beyond it, is at the high end of the group. The slope of the ground makes it possible to drive into the feed barn at the upper level, on the side away from the cow barn, and to bring the prepared feed out at the lower level, along the road between the corn cribs, to the cow barns. Four silos are in process of construction and their place is indicated on the plan in connection with the feed distribution system.

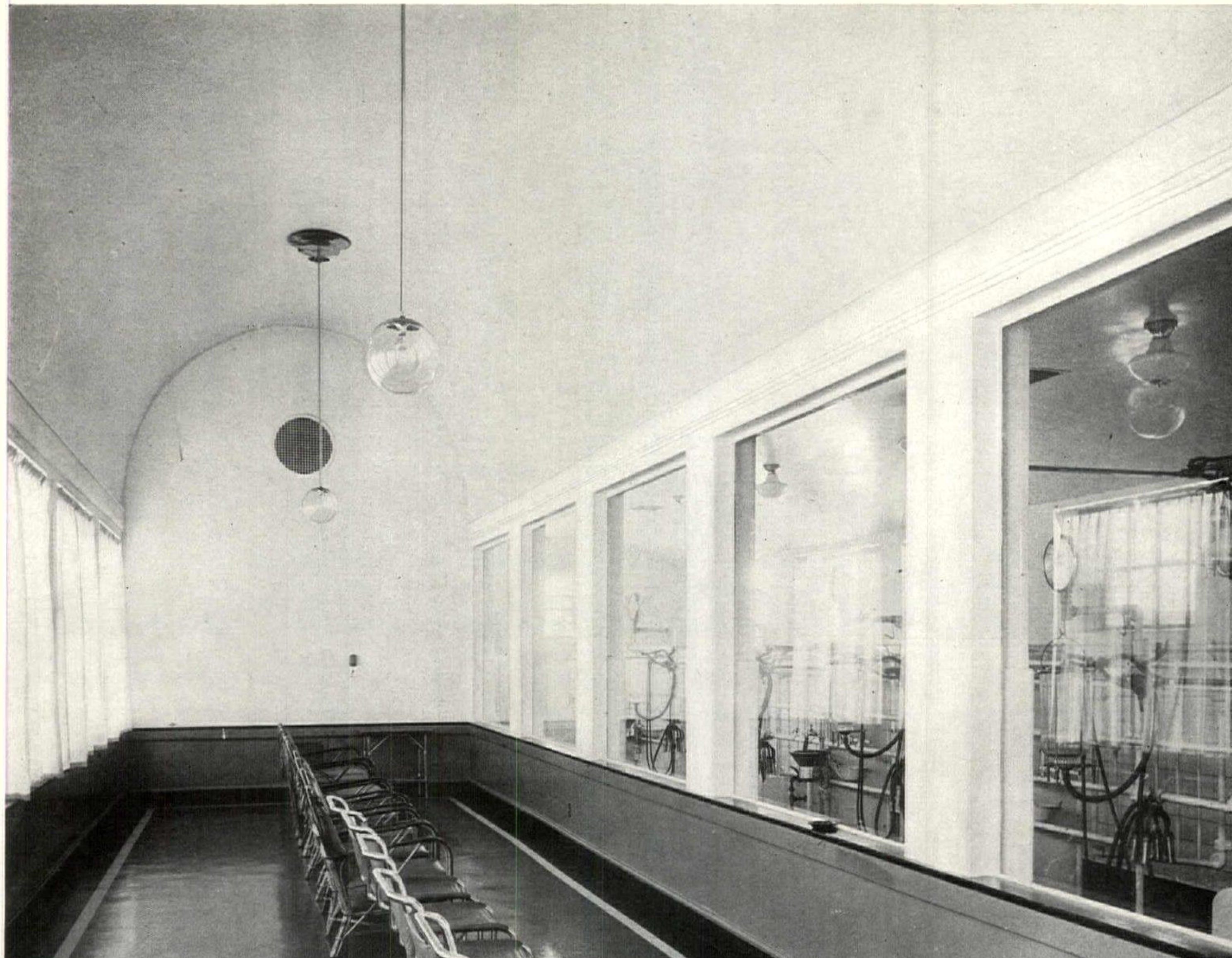
Inside the cow barns, the feed is distributed in the mangers from small trucks which men trundle along the feeding alleys. These alleys are elevated, at the level of the tops of the mangers, to prevent the loss of feed, for more or less is always tossed out of the manger by the cows. In order to insure cleanliness in handling the feed, the men are dressed in white and wear white rubber boots. There are stanchions along the mangers, so that the cows can be fastened at feeding times, to prevent interference with one another and to insure even feeding.

The slope of the ground has been utilized also in planning the milking parlor, observation room, lounge, bottling room, cooling room and ice cream room with their connecting passages, and compactness is a feature. The cooling tank is elevated so that the milk flows naturally down to the bottling room and to the ice cream room. The whole system is arranged with a minimum of short length pipes which are taken down and sterilized after every milking. The passage is depressed so that visitors pass beneath the milking parlor and reach the observation room by ascending stairs. A belt conveyor carries the bottles from the sterilizing room around the bottling machine and into the refrigerator. The calf pens and bull pens, with their yards, are placed at one side not far from the lounge building, where they serve as an attraction to visitors.

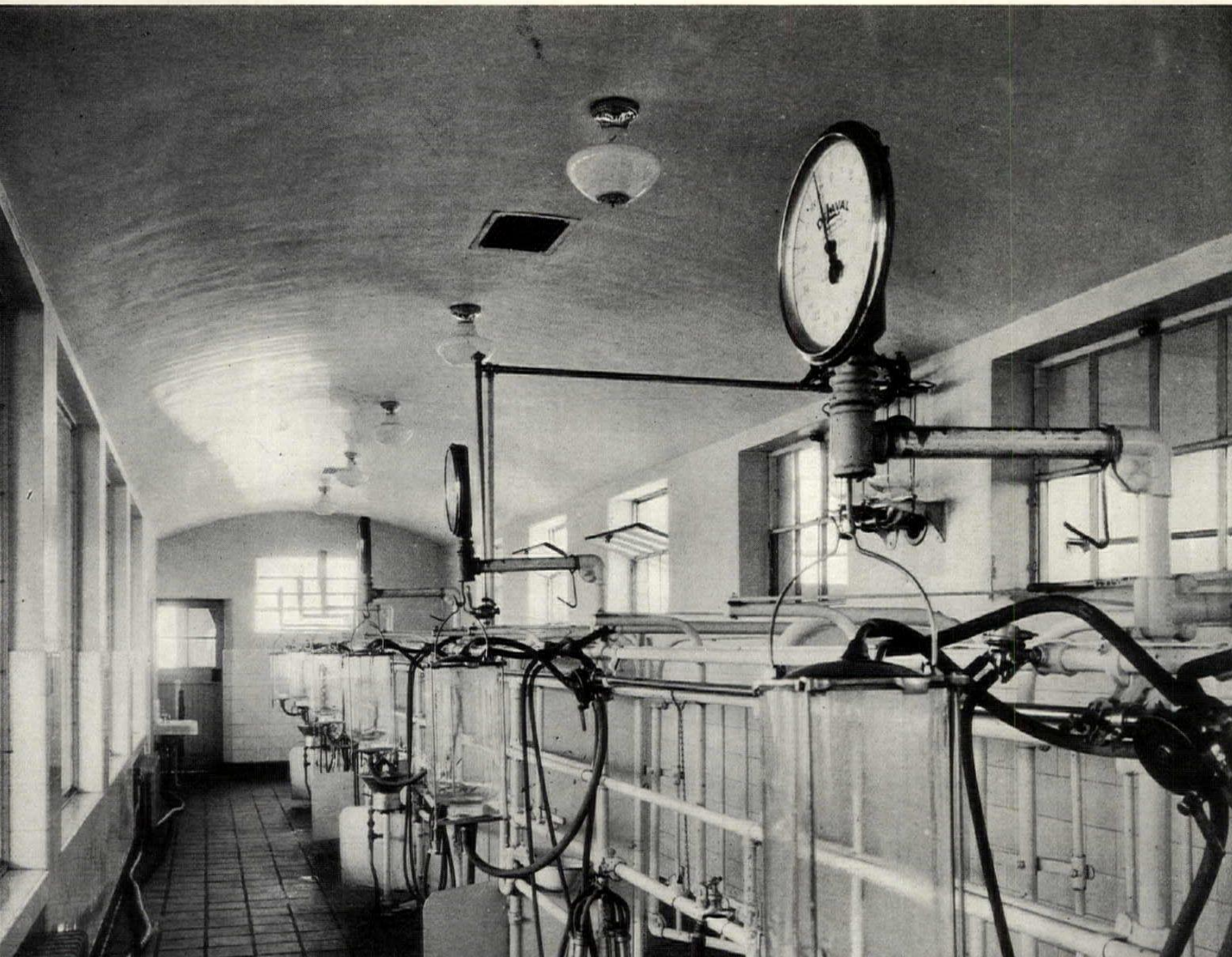
The barns are plain and simple, built with stuccoed cement block walls and slag roofs, on wooden timbers, that slope slightly towards the court. Wide projecting eaves on the sides of the flat-roofed corn cribs shelter the corn from rain, while the open construction of the sides of these buildings permits it to dry. The corn cribs are supported on glazed tile pipes filled with concrete, making the building rat proof, for the smooth, hard surface of the tile does not afford any foothold for the rodents.

Though this dairy is operated as a business it is on the estate of S. Forry Loucks, and is therefore a hobby of the owner.

EUGENE CLUTE.



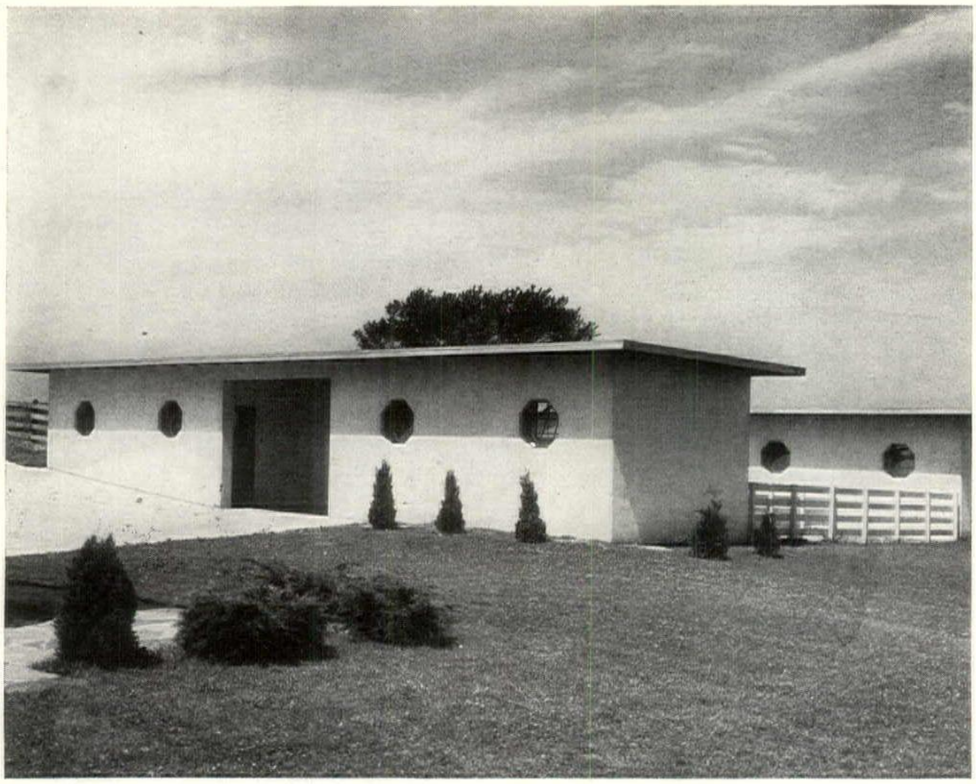
OBSERVATION ROOM WHERE VISITORS CAN WATCH THE MILKING
LAUXMONT FARMS—WRIGHTSVILLE, PA.



otographs by Robert W. Tebbs

THE MILKING ROOM
DELANO AND ALDRICH, ARCHITECTS

DELANO AND ALDRICH
ARCHITECTS



CALF AND
BULL PENS

Photos by Robert W. Tebbs

ENTRANCE TO OFFICES
AND VISITORS' GALLERY

Terminal wholesale produce markets are an important development in the distribution of perishable products like vegetables and fruits. So far these markets have been built or controlled by organizations which have usually sought their own ends in the arrangement and construction. Presumably, as the author suggests, the evolution which is in progress in this field is not yet complete, but indications point to the general desirability of a single concentration area for the wholesale and jobbing business of a city which will be accessible to rail and trucking facilities.

In studying conditions in their own communities, architects may find suggestive evidence in the case of the Northern Ohio Food Terminal, Inc., in Cleveland. This project was developed on a tract of 43 acres cleared in the dense slum area of the city. More than 300 buildings were razed and several streets eliminated to provide space for trackage, cold storage, a farmer's market with more than 300 shed stands, and facilities for several wholesale grocery firms, poultry and meat dealers, and dealers in dairy products. Similar results may possibly be obtained elsewhere by architects or architectural groups who are undertaking the promotion of slum clearance and low-cost housing projects.

By WELLS A. SHERMAN
Specialist in Charge of Fruit and Vegetable Division, United States Bureau of Agricultural Economics

THE WHOLESALE PRODUCE MARKET

THE wholesale produce market has a number of variations. If reference is to a structure in a large city the enterprise is likely to be one financed largely, or owned outright, by one or more railroad companies. It may be organized as a terminal company in which private money as well as railroad capital is invested; if the railroad interests are dominant, its plan will almost inevitably seek the direct and easy transfer of fresh fruits and vegetables from railroad cars to shed space suitable for the display and sale of the produce, or to stores or sales rooms of individual receivers.

Trackage must be depressed or structures so elevated that receiving platforms are at car door level. Deliveries, usually from the opposite side of the shed or the opposite end of the store, should be at truck floor levels.

The buildings must facilitate the unloading and release of railroad cars and must, therefore, be relatively long in proportion to width with trackage usually along their entire length. Whether or not the trackage should be inclosed in the building may depend largely upon the climate. If outside temperatures preclude unloading perishables for long periods, a structure covering both delivery tracks and receiving space may be justified. In deciding these important details expense may be offset by added convenience.

Obviously, however, the decision may rest upon the rental obtainable from dealers who are to use space in the terminal for the display or sale of their receipts. The probable number of patrons and the rentals they will pay must be predetermined in any case.

Most of the recent heavy investments in railroad fruit and vegetable terminals have been predicated on agreement by many or most of the carlot receivers in the town to move to the proposed location and to occupy definite space at definite rates. Naturally, the railroads have not cared to aid the business of their competitors—the trucks. Therefore few, if any, of the new railroad terminals contemplate the receipt and resale of goods arriving over the highways.

This situation is almost sure to result in the near future in a cheaper type of building or space arrangement elsewhere in the city for the special accommodation of the wholesale trade in other than rail receipts. If a building is provided for this purpose it is likely to represent some expenditure of public funds and charges are likely to be based on daily occupancy. Relatively little space can be assigned to permanent occupants who can pay fixed rentals.

The products offered in such markets arrive by truck or by farm vehicle without special protection from prevailing temperatures. It follows that most of the business must be done at seasons of the year when the danger of freezing is not great. The total volume may vary tremendously, shrinking to negligible amounts when fresh local produce is out of season. Such a market may be so seasonal in operation that it is closed for several winter months. On the other hand, in sections of the country where local production is possible during the winter, or where products can safely be moved over the highways and exposed for sale in unheated space, the operation of a farmers' and truckers' market may be continuous and perhaps patronized by haulers from great distances if city ordinances or market rules permit.

If the expenditure of public funds is involved there is likely to be a demand that the terminal market provide accommodations for such of the local jobbing trade as may wish to do business therein, and there may be a demand for a retail section. Unless the market is to be purely seasonal the portion which is intended for retail sales must be inclosed and adequately lighted and warmed. Retail business can seldom be confined to the hours required for wholesale transactions. The wholesaler begins his day's work long before consumers are ready to begin their daily marketing. The wholesaler also may have finished his business for the day long before the retailer can close without serious loss of patronage. The introduction of a retail department or section of the terminal immediately complicates the problems both of construction and of operation or administration.

There is always a tendency to permit, if not to encourage, retail selling at any market which has been provided for farmers either wholly or partly at the public expense. Jobbers are frequently not averse to operating in the immediate vicinity of a large retail market center, partly because of the convenience with which their customers (the retailers) can be served and partly because of the added business they derive from consumer buyers of full packages, such as bushels, sacks and barrels.

Possibly the size of the city or the population to be served will usually determine the feasibility of a wholesale produce terminal which excludes all retail business. Location, however, is another factor, for it seems to be demonstrated that no large number of consumers can be persuaded to patronize a marketing center located on the outskirts of the city where land is obtainable at prices which will permit the development of a large produce terminal accommodating, as such terminals must eventually do, every type of wholesale traffic in perishable farm products, whether the transportation has been over rails or highways.

WITHIN the relatively recent past there has been an enormous aggregate expenditure by the railroads of the country in wholesale produce terminals. Such construction has sometimes been cooperative but often highly and disastrously competitive. There are now "split markets" at rival railroad terminals in Washington, Philadelphia, Buffalo, Detroit, and Los Angeles. In some other cities perishables have been wholesaled from different competing points for much longer periods.

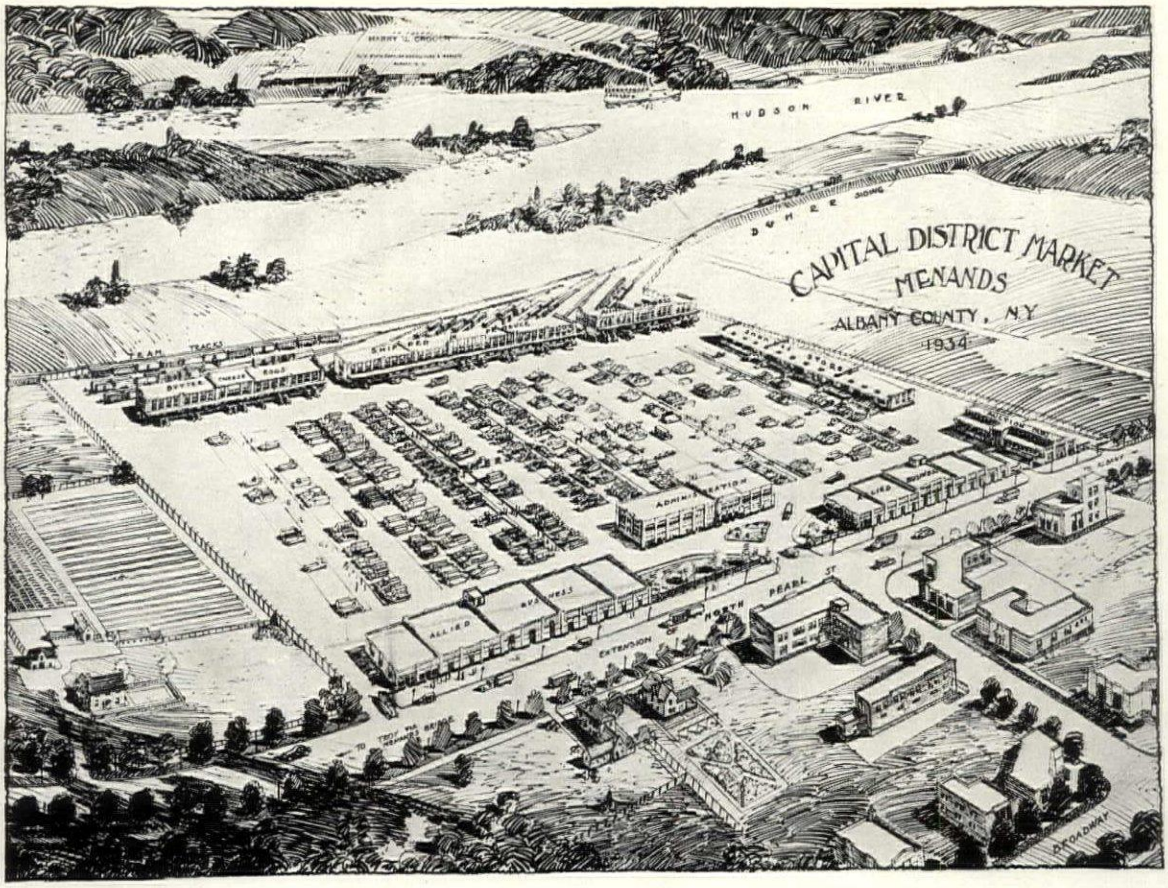
The Northern Ohio Food Terminal is an example of cooperation on the part of most of the carriers serving the town and there is no seriously competing wholesale terminal in the municipality. However, the arrangement of the Cleveland terminal virtually ignores the existence of the motor truck as a conveyor of wholesale supplies to the city, and this is also largely true of both of the rival railway terminals in Detroit.

This general disposition on the part of the railroads to ignore the truck and to make no provision for busi-

Left: South Water Market in Chicago, built by jobbers against competition of the chain stores. Nearly all supplies must be hauled from relatively distant railroad sidings but truck deliveries can be made with relative ease.

Right: Northern Ohio Food Terminal in Cleveland. This project occupies 45 acres in what was recently a dense slum area, and provides trackage, cold storages, a farmer's market, and facilities for wholesale dealers.

Courtesy, Northern Ohio Food Terminal, Inc.



A new type of market, the second of a series of six regional markets recommended by the State Department of Agriculture and Markets, and the Cornell Agricultural College for up-State New York. Like the Buffalo Market, the first to be established, this is a private development. It is being built at Menands (between Troy and Albany) by the Capitol District Cooperative, Inc., an organization of 615 growers, as a wholesale food handling center for all the cities in the district, comprising a population of 650,000 persons. The site has an area of 25 acres, with rail connections and a possible water connection.

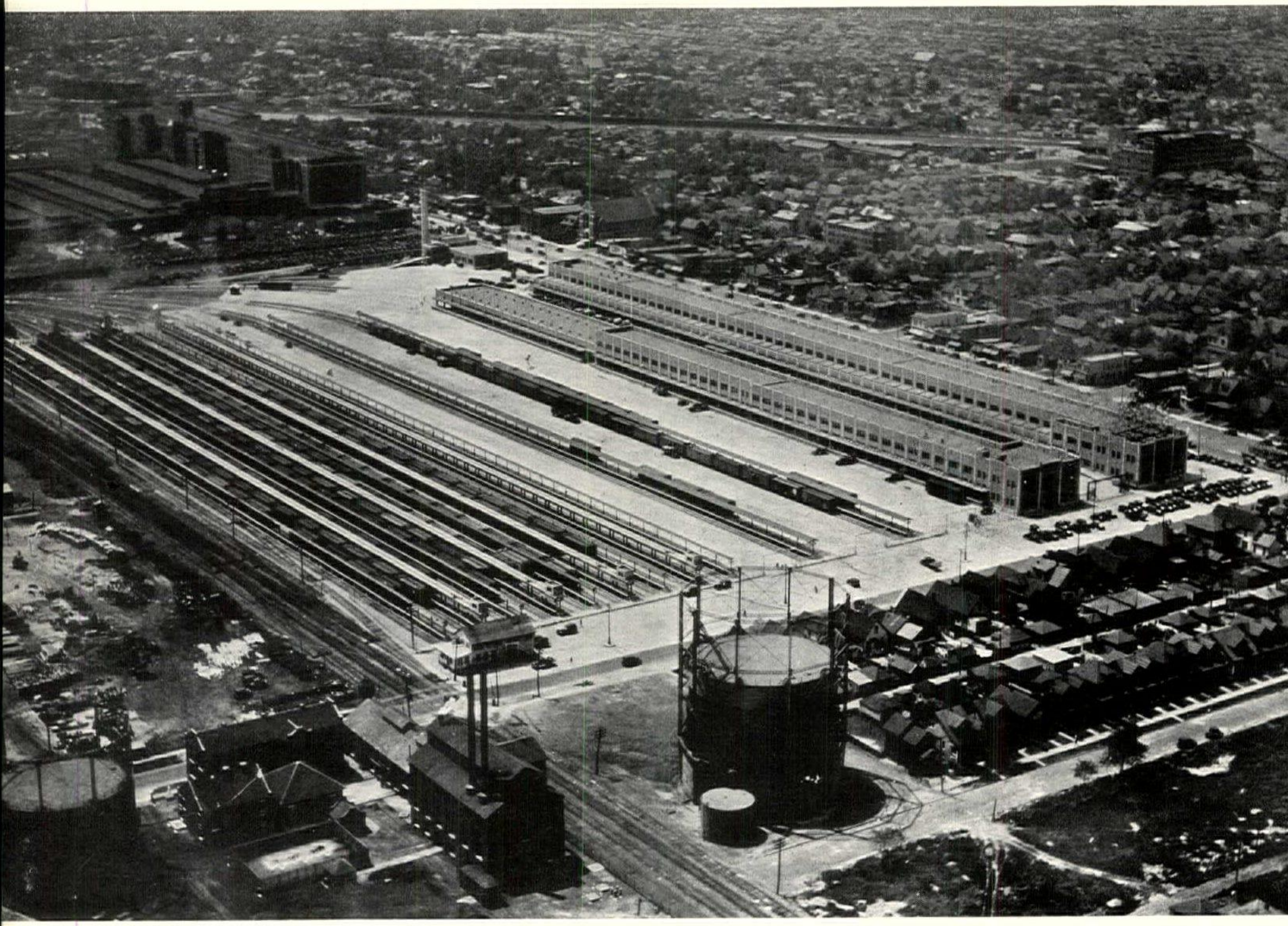
ness in their terminals in products other than those which they deliver justifies a question as to the sufficiency and permanence of these railroad wholesale terminals as exclusive centers for the distribution of city supplies.

In many cases the chain stores have established their warehouses on private sidings, sometimes quite remote from the railroad produce terminals, thus depriving these terminals of any revenue from the products handled by these chains. This situation also encourages, and in the absence of other wholesale terminal facilities absolutely necessitates, direct store door delivery from trucks selling at wholesale.

In most of our large cities the trucks now bring in such a large proportion of the total fruit and vegetable receipts that it seems inevitable that there must be better provision than has heretofore generally been made for the accommodation of this traffic, and for the sale of trucked-in supplies under more openly competitive conditions. The physical requirements of a market for the accommodation of products coming in and going out on motor vehicles obviously have little in common with those of a typical railway wholesale produce terminal as developed in recent years. It might almost be argued that the railroads have made these enormous investments partly as a gesture of defiance. They appear to have proceeded on assumption that local and trucked-in supplies can never be accumulated at any one spot in sufficient volume to interfere with the wholesale trade in products delivered by rail. Whether this gesture will result in ultimate loss to the carriers is perhaps not yet fully determined.

IF the multimillion-dollar railroad produce terminal is a gesture of defiance toward the truck such an investment as that in the new South Water Market of Chicago must be considered as a gesture of defiance by the old line carlot and jobbing trade against the competition of the chain store group.

This enormous jobbing market, consisting of long solid blocks of concrete cut into wholesale unit stores to which nearly all supplies must be hauled from relatively distant railroad sidings but to which deliveries by trucks from country producing points can be made with relative ease, was financed upon the theory that jobbers could pay for their space on the amortization plan and eventually own their stores, which were planned to meet the specific needs of jobbers and commission men selling the year around from fixed points. It was known from the start that little, if any, chain store business would or could be done at or through



U. S. Dept. of Agriculture

Detroit Union Produce Terminal. The site occupies 38 acres. Ten miles of trackage serve the terminal. The two main buildings are 70 feet wide and 1,100 feet long, giving a display space of more than 100,000 square feet.

these stores. The larger chains are acquiring most of their fruits and vegetables through their own buying organization operating to a large extent at shipping points. The goods are owned by the chains when the cars arrive and economy demands their direct transfer from the car to the retail unit in the simplest possible way. This involves unloading the car at a point controlled exclusively by the chain store organization and arranged to expedite redistribution in mixed truck loads to many unit stores.

There has been little criticism of the physical features of the new South Water Market, which seems to have been well designed for its intended purpose. The decreasing volume of jobbing business, however, has made it impossible for many tenants to continue their amortization contracts. Space in the market is reputedly worth less than when first built. Aside from any question of physical fitness it may be assumed that no trade group will in this generation attempt to finance another such structure. Neither is space likely to be taken at such high rates in any wholesale market which is not also a railroad delivery point.

In the smaller cities, including those having up to at least 250,000 population, the railroad obviously cannot afford produce terminals of the Detroit and Cleveland type. The number of carload deliveries is far too small. Still, such cities, and even groups of cities of smaller size, need every type of wholesale, jobbing, and retail distribution to be found in New York or Chicago. Here the tendency must be toward a distribution center where all kinds of wholesale trade can be conducted with satisfactory provision for the efficient functioning of each. Here we shall have need not for a building usually but for a group of buildings and paved spaces probably with a large percentage of the total area under shed roofs in recognition of the seasonal character of much of the business.

The proportionate investments in inclosed and heated buildings, in paved trading space, and in open sheds may be determined by the interests promoting most vigorously or subscribing most liberally. Even if public money is to be used exclusively, which will be opposed by many, it is hardly to be expected that equal provision will be made for the vociferous and the less articulate groups which are destined to do business in the market.

EFFORTS extending over several years to develop so-called "regional markets" in New York State where wholesale assembling and distribution could be centered have progressed slowly toward realization. The scheme contemplates ample space set aside for farmers' use with suitable and probably separate provision for the receipt and display of arrivals by rail and truck—all with a view to expediting sale and delivery to independent truckers or to the delivery trucks of storekeepers.

The Capitol District Regional Market was actually opened July 16, although incomplete. It is officially described as a development of 125 acres with options held on additional land for expansion. When opened the administration building had not been erected and the rail connections and wholesale houses were incomplete. The jobbers' stores were all finished and occupied. Enough of the farmers' section had been paved to accommodate eight hundred trucks. Another paved section was provided for trucker-buyers.

The last Legislature created a Regional Market Authority each for Syracuse and for Newburgh in the Lower Hudson Valley. Plans for each of these trading centers have been drawn but thus far neither Authority has been able to secure the financing of its enterprise.

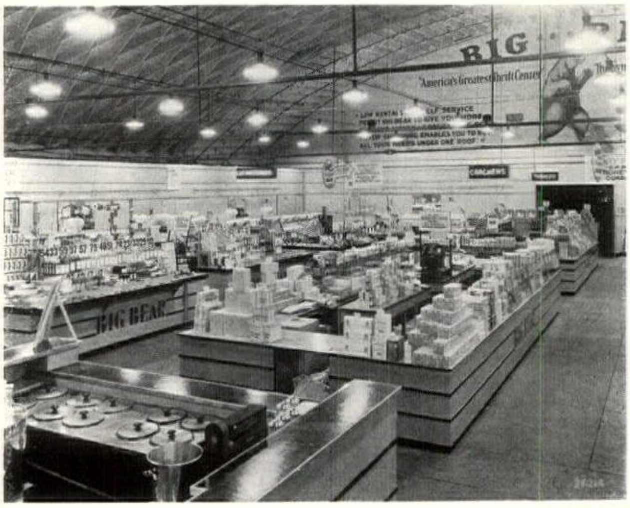
We have noted that experience has shown that city housewives cannot be attracted in large numbers to retail market centers remote from the shopping district. In other words, food buying except at the corner store or at the roadside stand must be a part of a general shopping trip. Whether the wholesale trade in fruits and vegetables can be divorced from other commercial activities and centered where the competing rail and truck carriers are provided with equal facilities remains to be proved. These State-promoted regional markets in New York may furnish the answer. If it is affirmative we may be able to evolve a standard physical development to be varied in detail with latitude, population to be served, proportions of rail and truck receipts, and quantities of local products to be handled.

RAYMOND MATHEWSON HOOD

Raymond Hood, nationally known architect, died at his home, Southfield Point, Stamford, Connecticut, August 14, 1934. He was regarded as one of America's most successful architects. He was born in Pawtucket, Rhode Island, March 29, 1881, attended Brown University and was graduated from Massachusetts Institute of Technology in 1903. He later studied in Paris, receiving his diploma from the Ecole des Beaux-Arts in 1911. His first job was with Henry Hornbostel in Pittsburgh. In 1914 he came to New York and set up his office on a floor of a brownstone walkup in 42nd Street. Between scant commissions he hired out his services as a draftsman until his first notable success in winning the international competition for the design of the Tribune Tower, Chicago, 1922. The award was made to Mr. Hood as an associate with John Mead Howells. He designed and built the American Radiator Building and established his enlarged office in its tower. His later work includes the Daily News Building, the McGraw-Hill Building and he was one of the three collaborating architects for Rockefeller Center.

DAIRY AND MEAT DEPARTMENTS — Workroom and refrigerators incorporated into the departments on sales floor; aisle increased to 10 feet so as to accommodate week-end crowds.

1



2

DELICATESSEN DEPARTMENT — Counters and lower back wall are faced with green enamel plates with black trim.

SUPER-MARKET MOVEMENT — The Big Bear Market at Paterson, New Jersey, is one of three recently opened great food centers in New Jersey. The first of the Big Bear group opened in Jersey City, December 8, 1932. By 7 o'clock in the morning of the opening day there were 2,000 customers waiting at the doors. Over half a million dollars had been taken in within the opening six weeks. It is reported that about 50 per cent of the shoppers are men, many unemployed, who drive many miles for their food supplies. It is estimated that the average per person sale is between $1.50 and $2.00. The super-markets are operated on the principle of selling a percentage of goods below cost which accounts for such prices, at the time of opening, as the following: pork and beans, 3c a can; corn flakes, 5c a package; salmon, tall can, 5c; rolled oats, large package, 3c; onions and sweet potatoes were advertised at 1c a pound. (See, also, article on Jersey City Super-Market by B. Sumner Gruzen, Architect, in The Architectural Record, July, 1934, pages 43-48.)

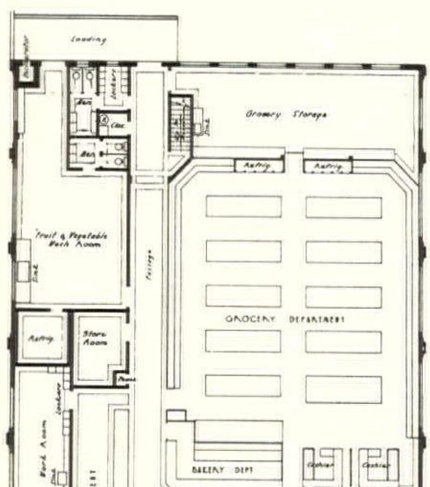
1. Showing refreshment, cracker, cosmetic, novelties and tobacco departments. Aisles are 6 feet transversely, 8 feet longitudinally. Note entrance at right leading to auto supplies and shoe departments.

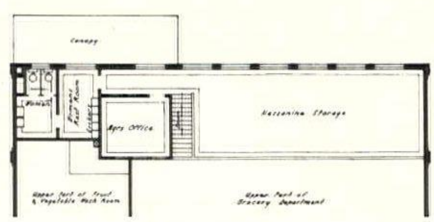
2. Grocery Departments—Shelves are used at perimeter of department, a practice not adopted if space permits half counters. (See Jersey City Shopping Center, The Architectural Record, July, 1934, page 45.) Customers show a slight resistance to taking things from a neatly arranged shelf and to reaching up for merchandise. Aisles are 8 feet longitudinally, 6 feet transversely. The lighting, with 15-17½ ft. candles by reflectors every 10 feet, is very satisfactory.

BIG BEAR SHOPPING CENTER — A SUPER-MARKET . . . . PATERSON, NEW JERSEY
B. SUMNER GRUZEN, ARCHITECT

Associated Photographers, Inc.

INTERIOR OF THRIFTY MART





MEZZANINE FLOOR PLAN

This food market is a new type with floor plan to accommodate both counter- and self-service. It is reported that the day of the "drive-in" market is passing in Los Angeles. Markets are now built up to the street line and are of the "super-market" type. With this latter type, space to park automobiles is generally provided at the side of the store. The location of departments has become an exact science. In almost all cases the entire width of the store is free of column supports. There are also no interior supports to obstruct the floor plan.

THRIFTY MART, LOS ANGELES, CALIFORNIA
MORGAN, WALLS AND CLEMENTS, ARCHITECTS

THE LIGHTING OF SMALL STORES

By HENRY L. LOGAN
CONSULTING ELECTRICAL ENGINEER

THE function of small stores is to sell merchandise. This function is best exercised if all the elements of the store contribute to it. Nothing should be permitted to compete with the merchandise for the buyer's attention. Fittings, surroundings and decorations, chosen for the sake of their own beauty, and without reference to the primary purpose of the store, will inevitably compete with the merchandise and weaken its appeal.

Stating this principle more directly, the merchandise should be the paramount feature in the field of view. To achieve this, the light should fall on the merchandise *first* and then be reflected into the traffic areas and the store generally. This lighting principle is simply the extension to the store interior of the same lighting methods that have long proved successful when used in show windows, but with such modifications as common sense dictates.

BRIGHTNESS SCALE

Scientific lighting of small stores (interiors and windows) implies an ascending scale of brightness in the field of vision presented by the store or window, with the merchandise occupying the peak of the scale. Much present-day store and window lighting brings about the reverse condition with either the lighting equipment itself, or the upper part of the store or window, at the top of the brightness scale and the merchandise somewhere near the bottom.

In the case of store interiors, light sent to the ceiling first becomes the brightest feature. It is the first to attract the customer's eyes. It "optically" depresses the merchandise and leads to an unnecessary increase in wattage in the show cases if effort is made to counterbalance the brightness.

If general lighting is used from ceiling or suspended fixtures, the lighting units are highest in the scale of brightness and attract attention, usurping the place of the goods in the customer's field of view. Further, this common method treats the goods as part of the general background, lighted no more favorably than the walls, the aisles and the ceiling, with the result that even the most skillful arrangement of merchandise takes on some of the characteristics of a confusion pattern.

Controlled direct lighting is the most effective method by which the merchandise can be given optical dominance. Fortunately it is also the least costly way to transfer a given amount of light from the source to the field of view.

WINDOW LIGHTING

All standard makes of show window lighting equipment are the "controlled direct lighting" type. All manufacturers provide complete installation details, and as the physical dimensions of the various kinds of units available are much the same the architect finds that the principal factor he has to determine is the connected load so he can make proper electrical provision.

LIGHT INTENSITY

The connected load depends upon the number of foot-candles of light the merchant needs to secure the maximum sales return from the windows. The eye operates fairly efficiently at levels about equal to indoor daylight (20 to 100 foot-candles). For effective vision *only*, illumination on light goods displays should therefore be above 30 foot-candles, and on dark colored displays above 100 foot-candles (allowing for absorption).

However, competition of neighboring windows is usually the governing factor. Figure 1 shows the increase in percentage of passers-by stopped, with various increases in window lighting intensities above the lighting of neighboring shops when the lighting has been tripled over competition. A conservative rule is to provide for double the lighting intensities of competition.

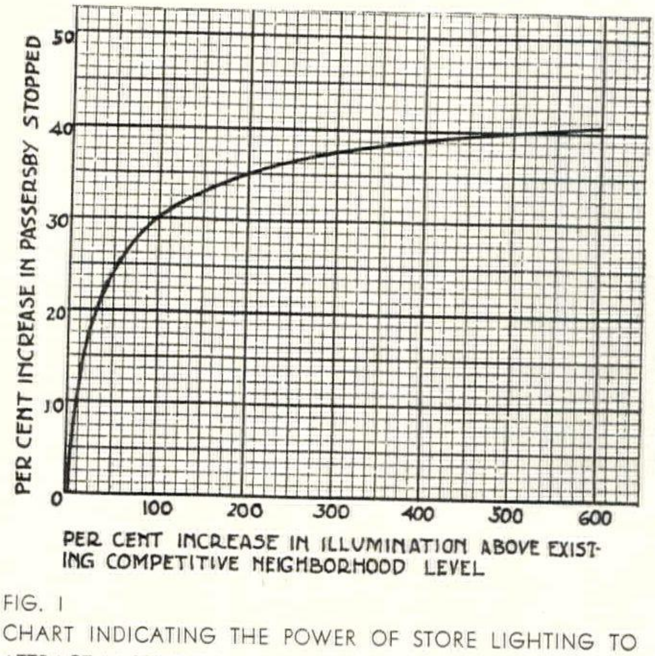


FIG. 1
CHART INDICATING THE POWER OF STORE LIGHTING TO ATTRACT PASSERS-BY.

TECHNICAL NEWS AND RESEARCH

LIGHTING OF SMALL STORES

BY

HENRY L. LOGAN

Where a motor trade is an important source of business and neighboring competition is absent or negligible, the illumination must be sufficient to permit the window to tell its story in six seconds, the maximum time it will be within view of the passengers of the car when the approach and retreat views are unobstructed. This requires a minimum of 100 foot-candles which can be secured with 150- to 300-watt lamps per running foot of window, depending upon the efficiency of the equipment selected, and the size of the window. (In general, shallow windows, 100 watt; medium windows, 200 watt; deep windows, 300 watt.)

Street lights should be taken into consideration since often the windows can be so arranged that obscuring reflections are minimized if this item is taken care of in the planning stage.

SUNLIGHT

The sun often effectively "boards up" windows by causing such bright reflections of opposite windows, traffic and passers-by that for hours during the daytime the windows are nearly useless. This can only be fully overcome by measuring the brightness of the reflections and putting *more light* in the window. Sometimes this calls for fantastic levels of light and is simply out of the question. Actual experiments have shown, however, that most daylight interference can be overcome by the use of 500 watts per running foot of show window in efficient equipment.

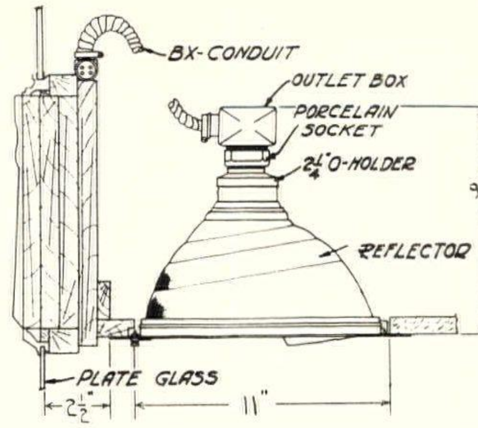
The new double filament lamp, now available, makes this feasible. It has a 200-watt and a 300-watt filament. Either filament can be burnt separately or they can both be lighted simultaneously. During the hours of high daylight both filaments can be switched on and at night only the one that gives the proper lighting level for night conditions.

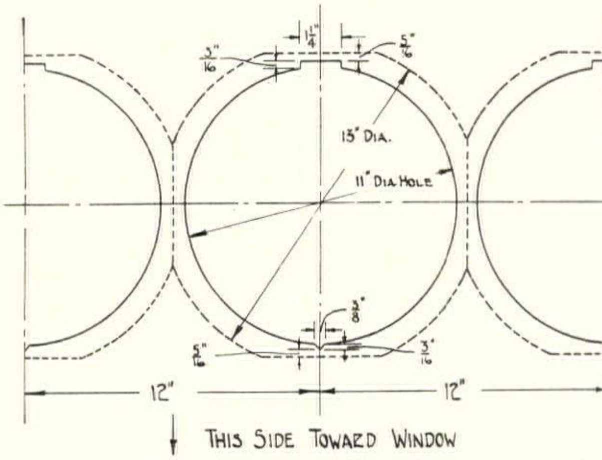
SPACING OF OVERHEAD EQUIPMENT

Reflectors should not be more than 18 inches apart and 12 inches where possible. In general it is preferable to use many reflectors and smaller lamps than vice versa. Diffusion is better and the "quality" of the lighting higher when produced by many light sources. In addition, numerous light sources permit the use of step wiring with its great flexibility.

FOOTLIGHTS

These are a helpful adjunct to the overhead lighting. When used the wattage per running foot of window should be not more than one-third, and preferably one-quarter that of the overhead lighting.





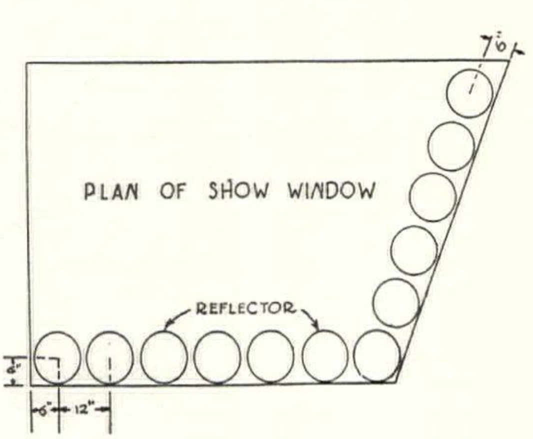
DETAILS OF TYPICAL SHOW WINDOW REFLECTORS.

SIDE LIGHTING

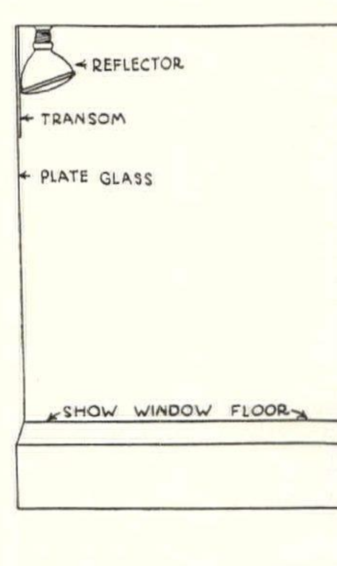
Side lighting is now coming into use. This puts the lighting equipment up the sides of the windows instead of overhead. It has the advantage of putting the maximum illumination on the display at an angle normal to vision. It prevents the use of a long continuous window (which may be a gain), and forces its breakup into a number of completely separated windows, with wide vertical valances to hide the equipment.

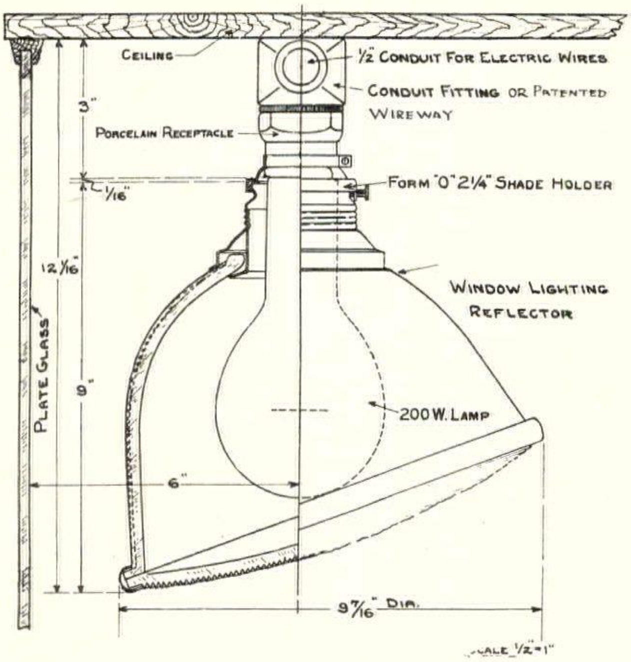
BACKGROUND LIGHTING

Separate lighting of the background from its foot has an attention-arresting value and has been used on occasion, but it has not become popular because of its tendency to subordinate the display to the background. It has no proved sales value.



IN SHOW WINDOW LIGHTING THE ARCHITECT MUST DETERMINE THE REQUIRED CONNECTED LOAD FOR DESIRED DISPLAY ILLUMINATION.





STANDARD WINDOW REFLECTOR OF CLOSED TYPE.

COLORED LIGHTING

Colored lighting has a sales advantage on festival occasions and on special displays. As a steady diet it invariably develops into a sales handicap. If extra outlets are provided on separate circuits in each window, as previously recommended, sufficient provision will have been made.

AUXILIARY EQUIPMENT

Each window should be provided with at least two full circuits to take care of spotlights, animated displays and festival lighting, unless they are of the "cabinet" type popular with jewelers and some specialty stores.

A time switch will make it possible to run the lights during the most effective window display hours when the store is closed.

SIGNS

Forty per cent of all small stores have illuminated signs. Confectionery stores, drug stores and restaurants are invariably equipped with illuminated signs. Their value as a sales aid has been thoroughly demonstrated. Sign designing is a special field with its own experts. The research departments of the lamp companies publish monographs carefully treating every phase of the subject in detail, which the architect would be well advised to consult.

Where the upper part of the window is used for a sign, window reflectors that will transmit some light directly to the sign should be selected.

WINDOW BACKS

The national survey of small stores conducted by members of the Illuminating Engineering Society each ten years reveals that at present (1932 survey) 60 per cent of all small stores have window backs, of which one-half are of the "boxed-in" or solid type. The survey brings out the fact that backless windows are customary in grocery, clothing repair stores and barber shops. Bakeries, confectionaries, delicatessen stores, meat markets, eating places, drug and jewelry stores showed a preponderance of transparent, glass backs that gave some view of the store interior from the window.

In both backless and glass-backed windows the lighting equipment should be protected by glare shields, otherwise it will be an intolerable nuisance to the workers in the store and an annoyance to the customers.

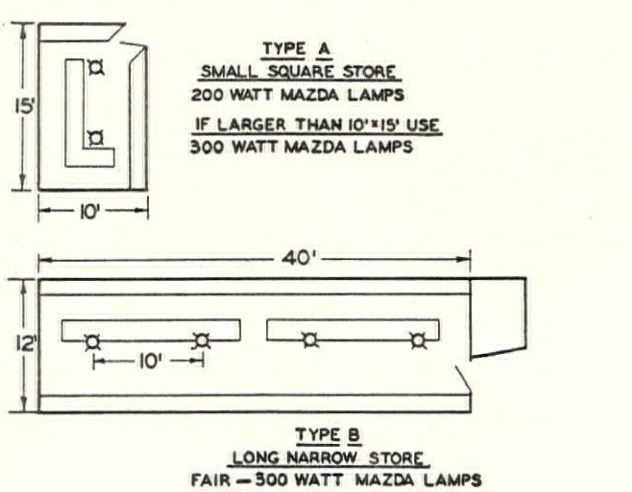
BACKGROUNDS

It is the considered opinion of leading display managers that light colored backgrounds of neutral tone and matte finish give the greatest flexibility, and are the easiest to dress against. Diffusion from them will also help to tone down confusion shadows.

VALANCE

Where exposed overhead equipment is used a valance is desirable to prevent the bright and unsightly mechanisms from detracting from the display. It is also best to hide flush equipment with a valance because the "spill" light from the equipment tends to compete with the display. Where the equipment is located be-

"THE AMOUNT OF LIGHT IN THE STORE DEPENDS UPON THE WINDOW LIGHTING. IF A PROPER BALANCE IS NOT ARRANGED BETWEEN THESE TWO, THE BEST WINDOW LIGHTING MAY FAIL ITS PURPOSE. THERE ARE TESTS ON RECORD PROVING THAT WHEN THE WINDOW LIGHTING HAS BEEN RAISED TO A LEVEL DETERMINED TO STIMULATE PASSERS-BY TO ENTER THE STORE, THE PASSERS-BY HAVE FAILED TO ENTER DUE TO THE DIMNESS OF THE STORE INTERIOR."



COURTESY, ILLUMINATING ENGINEERING SOCIETY.

SUGGESTED LIGHTING ARRANGEMENT TO PROVIDE RECOMMENDED LEVELS OF ILLUMINATION IN TYPICAL SMALL STORES.

HIGH VISIBILITY. CONTROLLED LIGHT DIRECTED AT THE MERCHANDISE IN A MODEL FOOD STORE, NEW YORK CITY

hind an opaque feature of the window that sufficiently hides it, such as a deep transom bar, an additional valance is unnecessary.

WINDOW CURTAINS

Where window curtains are used, minimum space should be taken up by them. If space is not conserved at this point in order to permit the lighting to be as near the glass as possible, the equipment will be behind a portion of the display when the window is dressed close to the glass. This will reverse the shadows on the front objects and render them indistinct.

ISLAND WINDOWS

Island windows are difficult to dress and to light. When used they must be dressed and lighted from all sides. Anti-glare shields on the lighting equipment are necessary to prevent the lights on the far side of the island from obscuring vision on the near side. They also require valances of about twice the normal depth, unless they are unusually high with the lighting units at such an angle to the observer's direction of view that they cannot be included in it.

VENTILATION

All show windows should be ventilated. This avoids softening of wax figures because of accumulating heat from the lamps in the confined space, and other damage to the display. Ventilation makes working conditions for the display men more tolerable (an important factor in the larger stores where there is much window space to dress), and it controls steaming and frosting of the windows in winter.

IDEAL DEPTH OF WINDOWS

The ideal depth of windows from a lighting standpoint is not less than one-third, nor more than two-thirds the height to the lighting equipment. This also covers the range of effective visual inspection considering that as much of the window as possible should be visible on the approach.

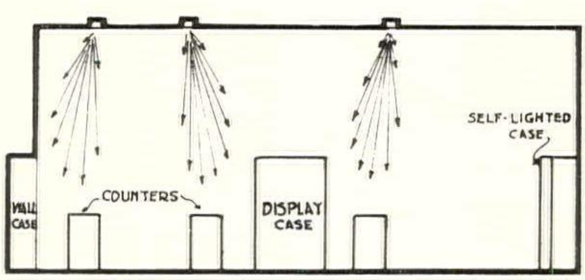
STORE INTERIORS

MINIMUM DESIRABLE LIGHTING LEVELS FOR STORE INTERIORS

Type of Space	Foot-Candles on Display (or Work)	Foot-Candles in Self-Lighted Show Cases	Foot-Candles in Aisles and Traffic Areas
Automobile Showrooms...	40	..	40
Barber Shops............	20	40	5
Book Stores	15	30	5
Candy Stores	20	40	10
Clothing Stores	30	60	10
Drug Stores	20	40	10
Electric Shops	40	80	10
Floor Coverings	50	100	15
Florist Shops	20	40	5
Food Stores	20	40	5
Furniture Stores	10	20	5
Gift Shops	40	80	10
Hairdressers Shops	20	40	5
Hardware Stores	15	30	5
Hat Stores	30	60	10
Jewelry Stores	40	80	10
Liquor Stores	10	20	5
Millinery Stores	20	40	10
Music Stores	15	30	5
Shoe Stores	30	60	10
Specialty Shops..........	(depends upon particular case)		
Tobacco Stores	20	40	5
Wall Coverings	30	60	10

CONNECTED LOAD

The connected lighting load can be determined by multiplying the watts per square foot by the floor area. (The watts per square foot, for the intensities recommended in the preceding table, are given in the table following.) To this should be added the wattage in the self-illuminated show cases, the wattage of inside signs and all other miscellaneous illuminating equipment.



WATTS PER SQUARE FOOT OF FLOOR AREA

Intensity in Foot-Candles	*Controlled* Direct Lighting*	*Semi-Ind.** Lighting*	*Indirect*** Lighting*
10	1.7	2	3
15	2.5	3	4.5
20	3.4	4	6
30	4.3	5.5	7.5
40	5.7	7.3	10
50	7.0	9.2	12.5

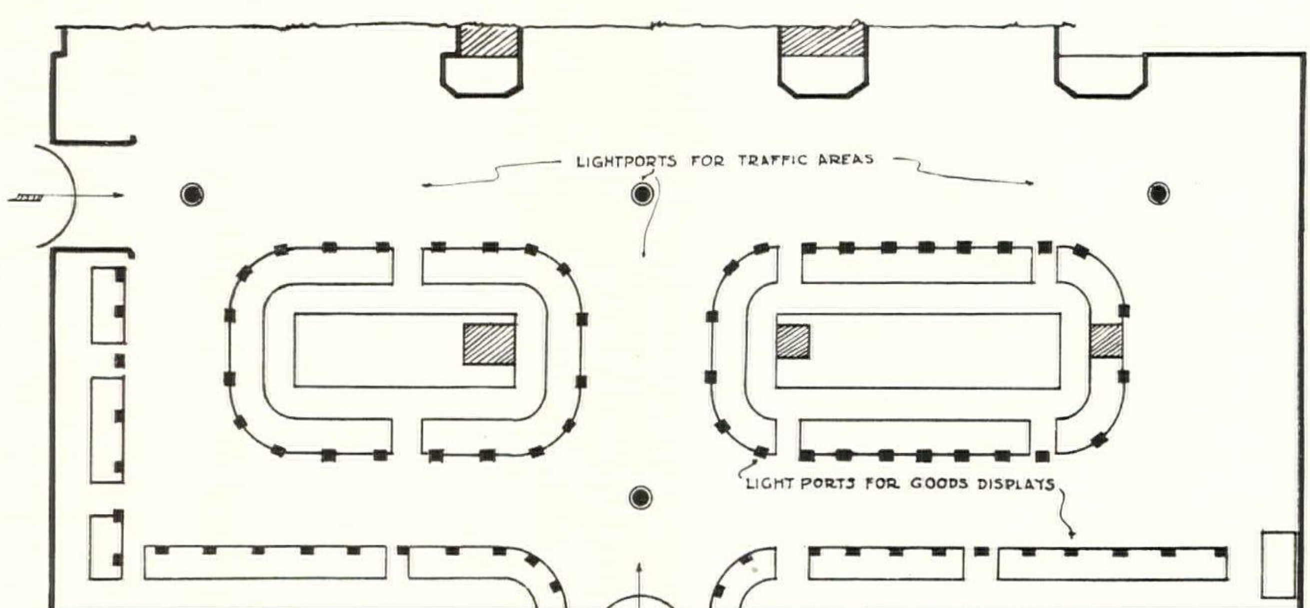
*This form of lighting is independent of surroundings.
**Figures based on light surroundings, use of higher wattage, higher efficiency lamps for the higher intensities and functional fixtures.
***Ditto. If coves are used the above figures may be increased by four "times."

CIRCUITS

The maximum connected load permitted on ordinary branch lighting circuits is 1,320 watts. The number of circuits will depend upon the size of lamps used. The lighting fixtures should be wired alternately on the circuits so that in case of a circuit going dead only half the lamps in that part of the store go out. Separate circuits should be provided to the show cases. In addition each six feet of counter should be provided with a convenience outlet for the operation of animated counter displays, display lamps and other electrical purposes.

SWITCHING

All lamps of 500 watts or more should be switched individually. When possible it is desirable to switch all lamps of 200 watts or more individually. Wall switches are recommended. Pull chains are unsightly, get out of order easily and require considerable maintenance. Switches should be in a place quickly accessible but concealed from the public. In small stores one light should have a separate switch apart from the rest for cleanup purposes. In larger stores one light for every 800 square feet should be tied together on a separate circuit or circuits for cleanup purposes with separate switches specially located.



PLAN AND SECTION ILLUSTRATING RELATION OF LIGHT PORTS TO SALES COUNTERS, CASES AND AISLES. WALLACH'S STORE, NEW YORK CITY. SEE STORE INTERIOR ON OPPOSITE PAGE.

CEILING LIGHTS LOCATED FOR GOODS DISPLAY, SEE PLAN, PAGE 212.

WALLACH'S STORE, EMPIRE STATE BUILDING, NEW YORK

STARRETT AND VAN VLECK, ARCHITECTS

LIGHTING OUTLETS

The number of lighting outlets will vary with the type of system selected, controlled direct lighting requiring the most and indirect lighting with functional fixtures needing the least. Individual stores vary so widely, no exact guide can be given.

However, controlled direct lighting sources ("light ports") should be located at the ceiling, directly over the customer's edge of the counter and be spaced one-quarter of the mounting height above the counter apart, or 30 inches, whichever is the largest. The lamp size will vary from 100 watts per light port for 15 foot-candles (average ceiling heights), to 300 watts for 50 foot-candles.

Arrangement of outlets for standard direct and semi-indirect systems is given on page 210, the lamp sizes being for direct lighting.

For indirect lighting, Type A store would take one outlet only in the center of the ceiling, Type B three outlets in place of the four shown, and Type C two to three outlets in one row, depending on the size of lamp used and the ceiling height. Low ceilings force the use of smaller units with smaller lamps and more of them.

METHOD OF LIGHTING

The application of controlled direct lighting to store interiors is best illustrated by a few examples. The recent installation in the Wallach's store, Empire State Building, New York City, is of the "controlled direct" type. It is shown on page 213, with a simplified plan and an explanatory lighting diagram on page 212. The "light ports" are located flush in the ceiling and reflect the plan of the fittings. They are of the lens type and bend the light towards the merchandise on the shelves and counters. At all angles of possible observation by customers they are of low brightness, the light going to the field of view instead of into the observer's eyes.

Page 215 shows the same principle applied to the

LIGHT IN THIS ROADSIDE STAND IS DIRECTED DOWNWARD FROM FLUSH CEILING PARTS ON TO THE SERVICE AND TABLE AREAS.

INTERIOR OF "DUTCHLAND FARMS" ROADSIDE STAND

lighting of the typical country chain food store. In this case the equipment follows tradition in that it is suspended from the ceiling, but it is simplified in form and so designed that it emits light only in the direction of the merchandise. It replaced standard equipment that used one-third more current and delivered only half as much light on the merchandise. Page 211 is a close-up of similar equipment in another food store showing the manner in which this method of lighting makes the display stand out. Page 215 illustrates similar lighting of an independent food store just opened in Elmira, New York. Special attention is called to the lighting of the flat central displays where a variant of the side lighting units is used, directing all the light downward. A plan and section of a typical store showing the relation of such light control units to its physical features is given on page 214.

Page 214 shows the interior of a typical "Dutchland Farms" roadside stand, illuminated by "light ports."

Page 215 shows "light ports" in the ceiling of a jewelry store pouring down directed light with scientific precision on a show case in which diamonds and other jewels are displayed. The ceiling of the show case to the right is a continuous "light port" emphasizing the silverware on exhibition.

Controlled direct lighting is best suited to all types of small stores that display and sell packaged merchandise or stack their merchandise vertically. The following are included in this class:

Book stores.	Hardware stores.
Candy stores.	Hat stores.
Clothing stores.	Liquor stores.
Drug stores.	Music stores.
Food stores.	Shoe stores.
Gift shops.	Tobacco stores.

Such lighting is best for jewelry stores because diamonds and gems depend upon their color and sparkle for their appeal, which is at a maximum under brilliant direct lighting.

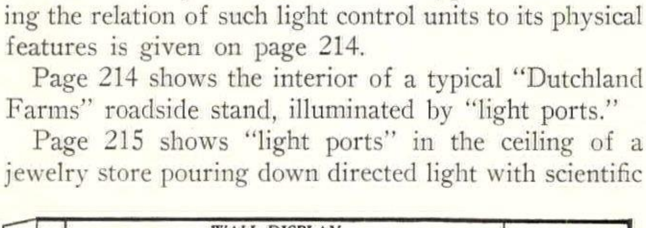
Applied in the form of show case lighting it is a desirable auxiliary to semi-indirect or indirect general lighting in the following types:

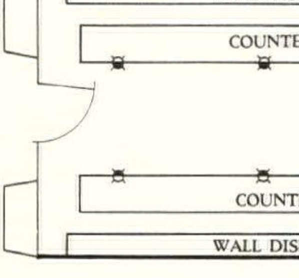
Electric Shops.	Millinery shops.
Florists.	Specialty shops.
Hairdressers.	

It is the most effective way of lighting merchandise displayed in large vertical planes, such as floor and wall coverings.

Semi-indirect lighting is best suited to stores having large objects on floor display, such as automobile showrooms, electric shops; to some specialty shops, such as stores selling large musical instruments and notions stores displaying all articles on flat counters.

Indirect lighting fits the service stores (in the public area, the work area being an industrial lighting problem). Such are barber shops, tailors, furriers, cleaning and dyeing establishments, opticians' and many specialty shops. It is also best in those shops (for example, millinery), where the merchandise is not on general display, but is brought out, one item at a time, and





Typical store plan with section showing direct illumination of counters and small display tried on under strong local lighting provided at the spot where the merchandise is inspected.

An optician's shop, lighted by a simple form of functional indirect luminaire is shown on page 215. Here most of the customer's time is spent sitting down, waiting for service. The only critical use he has to make of his eyes is when he selects the type of eyeglass fittings he prefers, which is done leisurely and not under the time pressure that accompanies purchases of most goods.

MAINTENANCE OF LIGHTING SYSTEM

Since the cost (average for the country) of a 300-watt lamp, per annum, in the average store is $240 per year it is easy to realize the value of proper maintenance of lighting fixtures. A comparatively slight accumulation of dirt will cut the light in half and therefore double its cost. A store burning ten 300-watt lamps can easily find itself paying $1,200 a year for the privilege of keeping a film of dirt on its lighting equipment, not to speak of the sales loss as a result of the fall from a productive lighting level to a mere comfort level.

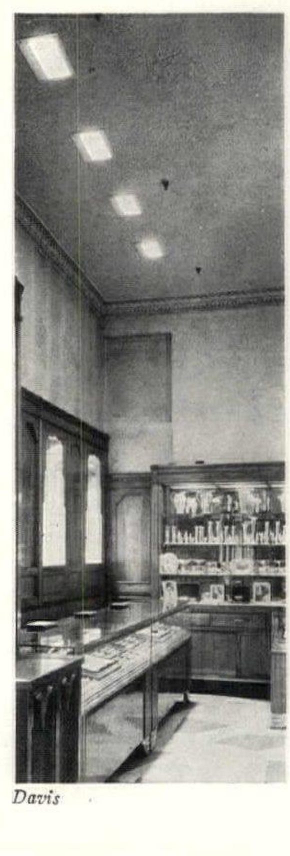
The architect can help minimize losses of this kind by avoiding open lighting equipment which, if of the indirect or semi-indirect type, accumulate dirt in the bowl and on the neck of the lamp. (This dirt tends to bake on because of the heat of the lamp and is always so distributed on the reflecting and transmitting surfaces that much of the light has to pass through it twice before it reaches an outside surface); by locating the equipment so that it is easily accessible for cleaning; by choosing equipment that gives easy access to the lamp and does not require excessive labor for cleaning; by selecting equipment that is ruggedly built and will not require replacement of parts from time to time because of failure; and by giving the interior of the store durable light reflecting finishes where the surrounding are a cooperative feature of the system selected.

LIGHTING OF A TYPICAL COUNTRY CHAIN FOOD STORE. IN THIS CASE THE EQUIPMENT FOLLOWS TRADITION, IN IN THAT IT IS SUSPENDED FROM THE CEILING, BUT IT IS SIMPLIFIED IN FORM AND LIGHT IS EMITTED ONLY IN THE DIRECTION OF THE MERCHANDISE.

SPECIAL INDIRECT AND DIFFUSED LIGHTING IS REQUIRED FOR THE OPTICAL STORE. A SIMPLE FORM OF INDIRECT LUMINAIRE IS SHOWN HERE.

DIRECT ILLUMINATION OF MARK TWAIN FOOD MARKET INTERIOR, ELMIRA, NEW YORK, HASKELL AND CONSIDINE, ARCHITECTS. ATTENTION IS CALLED TO THE LIGHTING OF THE FLAT CENTRAL DISPLAYS.

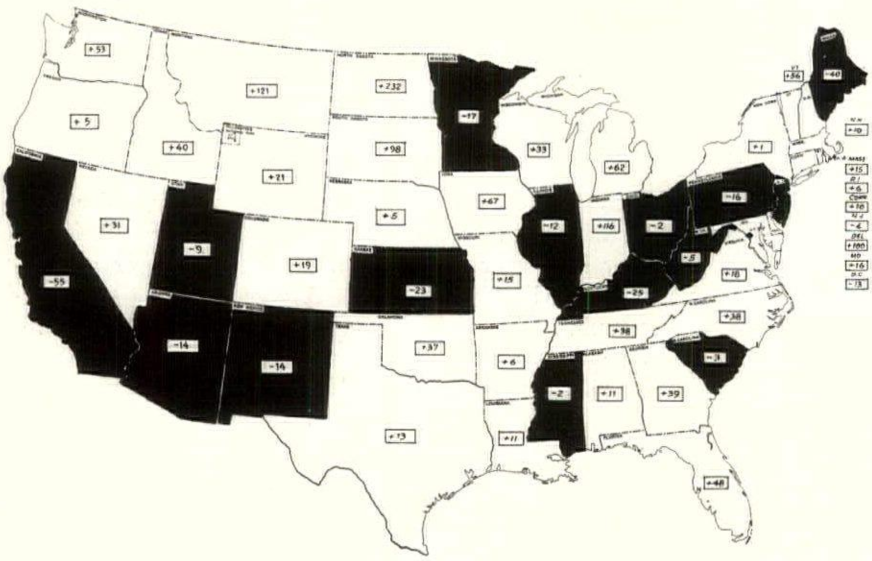
JEWELRY STORE WITH "LIGHT PORTS" AT CEILING. THESE DIRECT LIGHT ON A SHOW CASE IN WHICH DIAMONDS AND OTHER JEWELS ARE DISPLAYED. THE CEILING OF THE SHOW CASE TO THE RIGHT IS A CONTINUOUS "LIGHT PORT" EMPHASIZING THE SILVERWARE ON EXHIBITION.



Davis

BUILDING TRENDS AND OUTLOOK

BY L. SETH SCHNITMAN
CHIEF STATISTICIAN
F. W. DODGE CORPORATION



BUILDING DURING 12 MONTHS — August, 1933 - July, 1934, INCLUSIVE. Corresponding twelve months ended June, 1933, taken as base. SHADED AREA: BELOW BASE. UNSHADED AREA: ABOVE BASE. Figures denote percentage change from base. Floor space for new building contracts, 37 states east of the Rocky Mountains. Permit valuations for Rocky Mountain and Pacific coast states. Map, copyright American Map Co., N. Y. Authorized reproduction No. 5025.

RESIDENTIAL BUILDING LOSES GROUND

Construction awards through July continued above the corresponding monthly totals of last year. The July volume of $119,696,800 for the 37 eastern states contrasts with $82,554,400 for July, 1933, and $127,076,700 for June of this year.

For the elapsed months of 1934 construction awards amounted to $973,820,000 for the 37 eastern states as against $514,667,800 for the corresponding seven months of 1933. The cumulative gain over 1933, amounting to about 90 per cent, was almost entirely due to the rise in publicly-financed construction projects growing out of the PWA program. This class of work alone totaled $624,263,200, while for the corresponding 7 months of last year publicly-financed contracts amounted to only $181,549,500.

Residential building contracts let during July fell below the respective totals for either the preceding month or July, 1933. For the year to date, however, residential awards are still above the total for the corresponding seven months of 1933; the gain amounts to about 11 per cent.

Non-residential building awards totaled $60,751,400 for July against $43,104,900 for June and $39,983,200 for July of last year. The cumulative total for this class of construction amounted to $339,151,800 as against $224,376,800 for the corresponding seven months of 1933.

Public works contracts during July fell below the volume of June, but were more than twice as large as the volume reported in July of last year. For the year to date contracts for public works amounted to $406,060,000 as against only $121,094,300 for the corresponding seven months of 1933.

Public utilities awards in July were smaller than in June, but were almost twice as large as in July, 1933. For the year to date contracts for this class of construction amounting to $76,982,800, were more than twice as great as in the like seven-month period of 1933.

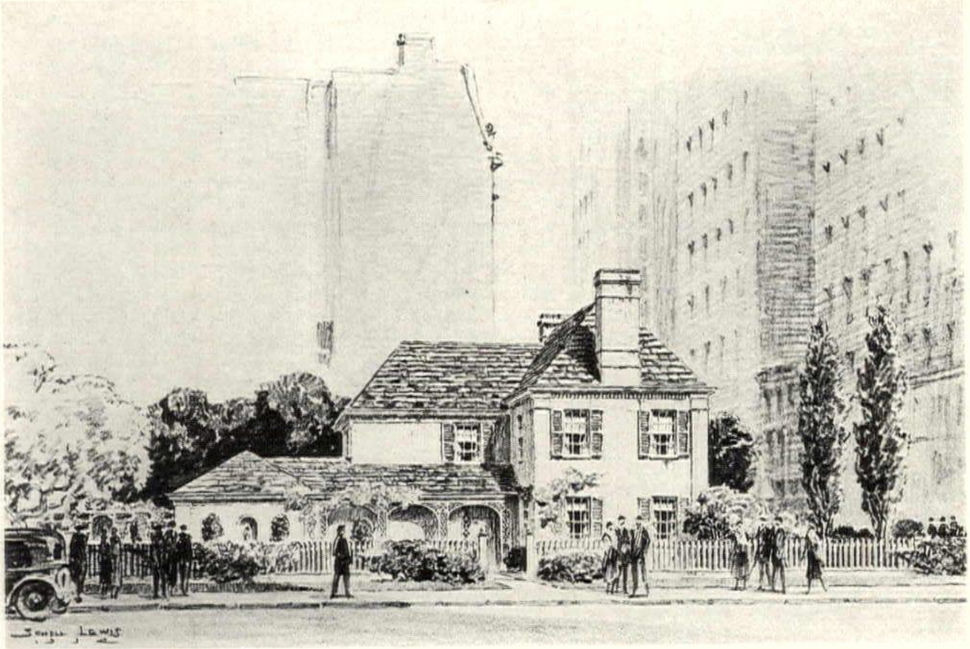
Contemplated construction reported during July totaled $243,675,500 as against $313,882,300 for June and $447,678,300 for July of last year. Losses in proposed new construction from last year's totals were pronounced in each of the four major classes of work, but the reported decline in residential planning was the most discouraging.

MATERIAL PRICE MEASURING ROD

F. W. DODGE CORPORATION
COMPOSITE PRICES

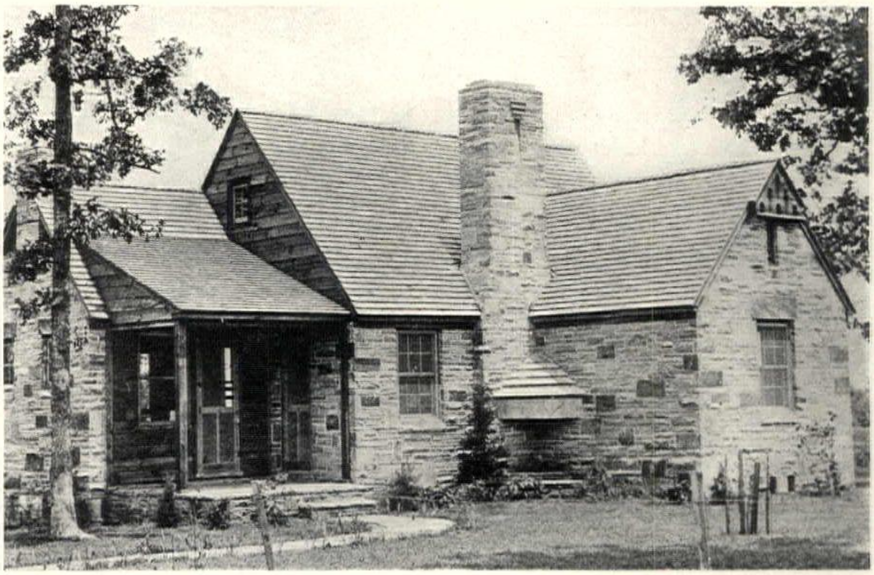
MATERIAL	This Month	Month Ago	Year Ago
Portland Cement	$2.25	$2.25	$2.10
Common Brick	14.83	14.84	11.85
Structural Steel	1.65	1.65	1.60
Lumber	16.35	16.40	15.65

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 should be read carefully. 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. *Revised.



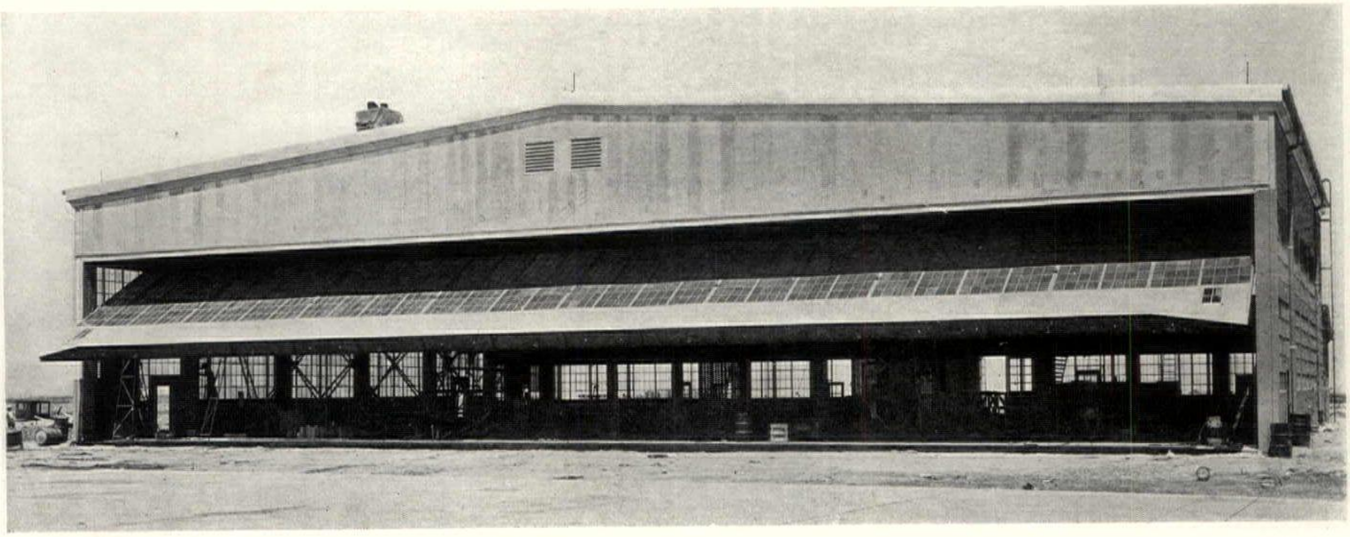
SMALL HOUSE BEING BUILT ON $1,000,000 SITE: This Georgian-type dwelling is now being constructed at the northeast corner of Park Avenue and Thirty-ninth Street, New York City, by Better Houses in America to demonstrate what the dollar will buy in the construction field. Roger H. Bullard and Clifford C. Wendehack are the architects.

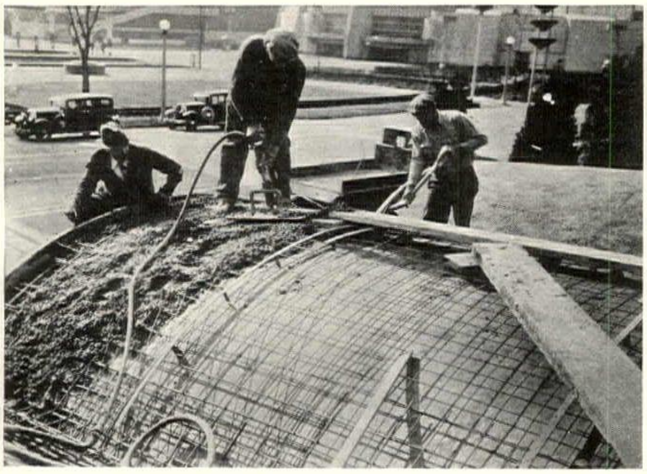
$2,000 HOMESTEAD (right): Houses like this are being constructed at Cumberland Homesteads, Crossville, Tennessee, one of the projects being developed by the Subsistence Homesteads Division of the Department of the Interior.



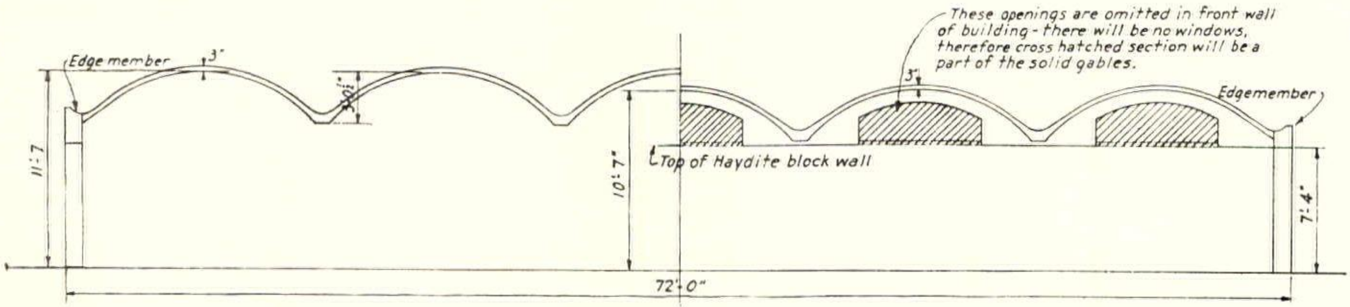
Wide World

WORLD'S LARGEST DOOR (below): In the August issue (page 71) there appeared a photograph of a door measuring 9 by 35 feet and captioned as the "world's largest." A. T. Hugg of the Detroit Steel Products Company sends The Record another claimant for this honor—the hangar door in the Denver Airport which measures 150 feet wide by 22 feet high and weighs approximately 16½ tons "as compared with the 10-ton midget which you show."





For the first time in this country the Zeiss-Dywidag System of shell roof construction is used on a farm building. Brook Hill Farm of Genesee Depot, Wisconsin, in cooperation with Starline, Inc., of Harvard, Ill., used this roof construction on the stable portion of the $75,000 exhibition building at Chicago World's Fair. The system originated in Germany and is practical for roofing structures where a large area of unobstructed floor space is required. The barn has an over-all dimension of 36 by 72 feet. Walls are made of 8" x 12" x 16" Haydite concrete masonry units. Its roof consists of five double-curved barrels, each 14 by 34 feet. Stiffening diaphragms in the gables and edge beams transfer the roof load from the shell to the supporting walls. Steel reinforcement consisting of 1/4", 3/8" and 1/2" bars, was placed, 3 layers at ends and 2 in the center in accordance with stress requirements. Concrete was placed to a thickness of 3 inches. One day after placing, the concrete was sealed with a waterproofing material, and after curing for 4 days the forms were removed and the curved reinforced slab became self supporting. A coat of aluminum paint completed the roof. The underside was painted but may be left natural. Roberts and Schaefer, engineers, in cooperation with Starline, Inc., designed the barn section; Richard Philipp was the architect.



DEVICE TO STUDY POROUS MATERIALS HELPS AIR CONDITIONING

Small quantities of air, on the order of the amount that passes through the walls of a cigarette while it is being smoked, can now be measured with great accuracy, according to a Science Service report. Of particular use in air conditioning of houses, a small machine has been invented that can determine in a very short time if a sheathing paper meets requirements as to the amount of air that can leak in or out through it.

S. T. Carson of the National Bureau of Standards, who developed the instrument, has found that it has a range about a thousand times greater than most similar devices for measuring permeability. It can be used on leather and insulating materials as well as such thin membranes as a cigarette paper.

Paper sheathing, air-tight food wrappers, grease absorbers, and the insulation for electric cables can all be studied and their true value found. Since air permeability is related to liquid absorption the efficiency of roofing materials and the rate of drying of ink on printing paper can also be measured accurately.

HISTORIC BUILDINGS SURVEY BECOMES A PERMANENT BODY

The Historic American Buildings Survey has been reorganized as a permanent institution functioning through the National Park Service, the Library of Congress, and the American Institute of Architects. An agreement to coordinate all future work of recording historic structures has just been concluded by these three organizations, according to an announcement by the Institute's Committee on Public Information.

The drawings already made by the Survey are now being transferred from the Park Service to the Library of Congress, which will soon have copies ready for public distribution, Dr. Leicester B. Holland, Chief of the Library's Division of Fine Arts, said. Many requests have been received for prints from libraries, historical and other organizations. Sometimes the prints wanted are those of a single building, but more often a whole district is desired.

Of 2,315 projects indexed, 888 have been completed and 196 are partially finished. The number of drawings aggregates 5,739, and of photographs 3,474. About 700 historic notes have been made.

It is the purpose of the Survey to study, measure, and draw up the plans, elevations, and details of the important antique buildings of the United States.

SCRANTON AIR POLLUTION SURVEY

The consideration of mixtures of solid fuels, as another means of easily and economically reducing black smoke from rail, utility, industrial and domestic sources, is expected to follow in the wake of a report of a survey made at Scranton, Pa., by H. B. Meller and L. B. Sisson, air pollution specialists of Mellon Institute of Industrial Research. The findings in the Scranton report appear to be applicable wherever low-priced, small sizes of anthracite are available for mixture with the higher volatile (potentially smoke-making) bituminous coal. This availability is said to obtain over practically all of the Eastern seaboard and much of the Great Lakes areas.

In reporting on observations made on one major railroad system, where mixtures of small-size anthracite and bituminous coal had been employed inexactly for some years, it was found that satisfactory performance had been secured only recently, and then only where the mixing process was complete—mechanically done.

In the case of one large fuel consumer reported on, where the mixing process is most skillfully looked after, the saving in fuel cost averaged about $33,000 a month.

In applying the suggested mixture of coals to a community, it would be necessary first to ascertain the volatile contents of the various logically available fuels and then to use them in such proportions as would bring the volatile content of the composition down to about 20 per cent, or less.

The Mellon Institute report is considered valuable to the Federal Housing Administration and to other Housing Authorities in that it points to another economical and ready method of reducing smoke in some eastern areas—especially so-called slum or blighted city areas—where objectionable air pollution would seriously affect the life and maintenance of constructional materials, damage vegetation, and injure human health, thereby prejudicing buyers or tenants against a district as a commercial or residential site.

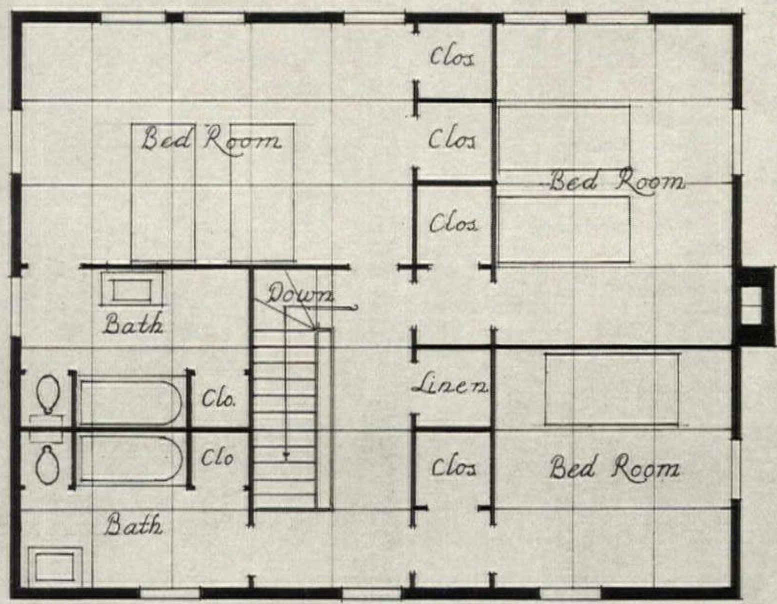
A.I.A. ADVOCATES COORDINATION OF SIZES OF BUILDING MATERIALS

Economies in the construction of buildings erected by tax-supported agencies can be effected by coordinating the sizes of building materials, the American Institute of Architects declares in endorsing the movement for uniform sizes fostered by the National Bureau of Standards.

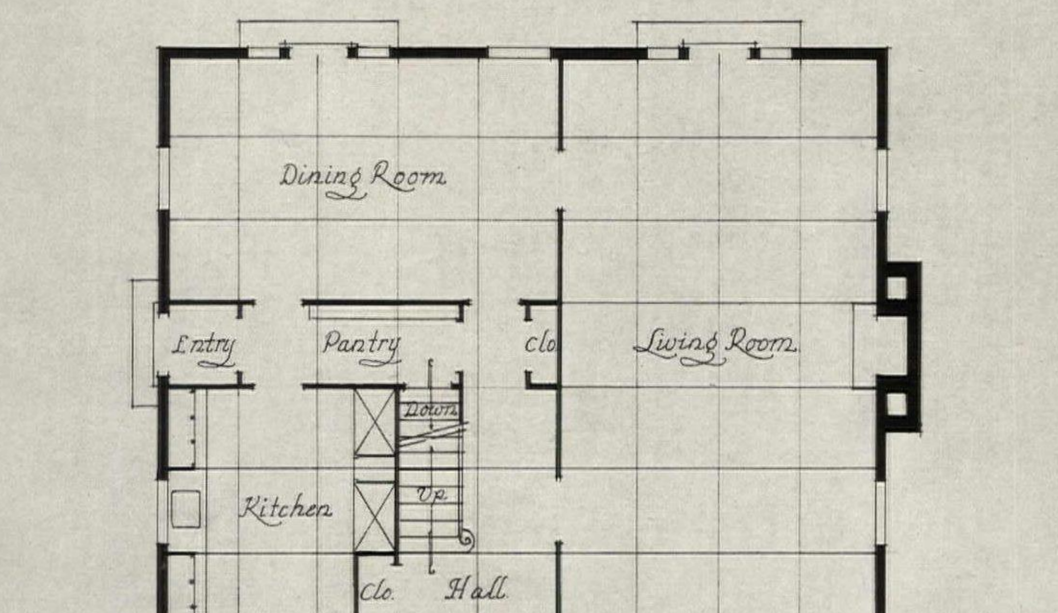
The Institute points out that the development of such standards should not exclude or discourage the manufacture of odd sized brick for special purposes or aesthetic reasons.

"It is the intention of the coordination movement to confine activities to units for use in structures where economy in materials and labor are deciding factors, such as Federal, State, and local government buildings, commercial structures, industrial buildings, mass production projects, and low-cost housing," it is explained.

"For these reasons there is nothing in the proposed project that should be objectionable to architects on the basis of being contrary to their desires for freedom in design. The minor adjustments in sizes of units will be negligible and should have the desirable effect of simplifying matters for the designer."

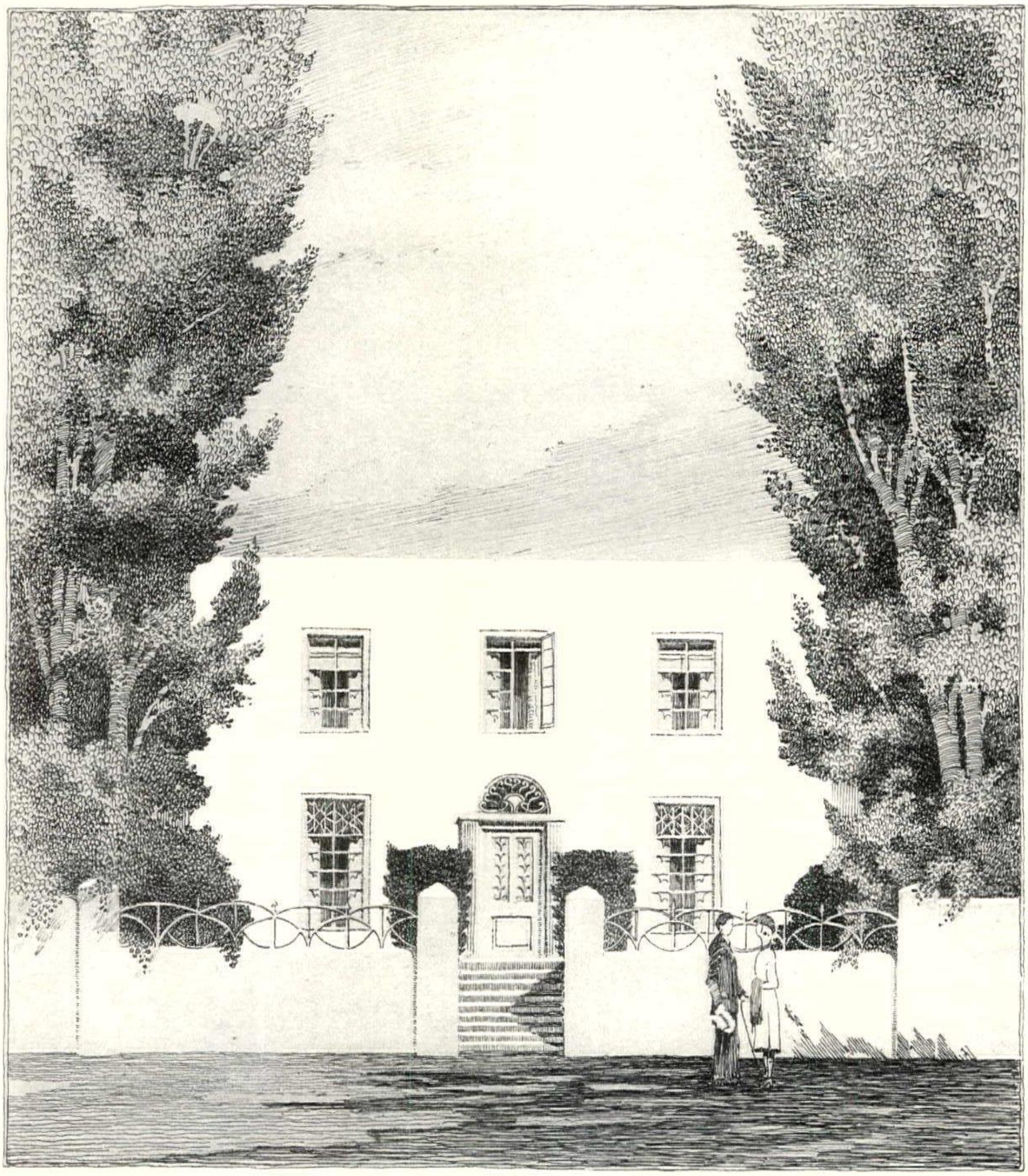


· SECOND FLOOR PLAN ·



· FIRST FLOOR PLAN ·

~ H. T. Lindeberg - Architect ~



~ A SUBURBAN HOUSE ~

H. T. Lindeberg - Architect

Daniel Neilinger Del.

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O C T O B E R

THE ARCHITECTURAL RECORD

There is now in the making one of the largest housing shortages in our history. Building figures for the last four years, compared with population increases and with property losses by fire and depreciation, permit of no doubt on that score. Revival of private house building was conditioned on (1) arresting the decline in private house values and (2) liquefying the assets of the lending institutions which invest in home mortgages. These conditions have now been met by the Home Owners' Loan Corporation and the Federal Home Loan Bank System. The fear that home values would be governed by foreclosure prices rather than by normal economic factors has been removed and private capital is available for private house construction. In Mr. Fahey's words: "I have no doubt that the ring of the hammer and the saw throughout the land will be heard more loudly by the early part of 1935 than at any time in the past six years."

THE RESUMPTION OF HOME BUILDING

By JOHN H. FAHEY, Chairman, Federal Home Loan Bank Board

THE failure of the home-building industry to function properly, whether through overactivity or underactivity, is always disastrous. Overbuilding in the middle years of the last decade paved the way for deflation and depression. Inactivity in building now hampers complete economic recovery. The public has turned to the Federal Government as the only agency capable of reviving activity in the industry. However, more is demanded of Governmental leadership than immediate resumption of construction. It must seek ways to make these periodic failures impossible. Its task is one of careful reform as well as recovery and its achievements, if they are to be permanent, must develop slowly.

As credit is the throttle of the home-building industry, the Government's program centers around the organization of the nation's home-financing system and home-mortgage market. In the Spring months of 1933 the home-financing system was drifting toward complete collapse. With mortgage foreclosures attaining nearly 26,000 in June, 1933, the highest of any month on record and to be compared to a monthly normal of approximately 6,000, the pressure on the credit structure and on home-financing institutions was terrific. The value of real estate underlying mortgages was being steadily undermined. Demand had practically disappeared. The Government's first responsibility, there-

JOHN H. FAHEY was born in Manchester, New Hampshire in 1873. Soon after graduation from high school he became a reporter on the Manchester Mirror which he later purchased, becoming its editor and publisher. Subsequently he took up press association activities and became New England superintendent of the Associated Press. From 1903 to 1910 he was publisher and principal owner of the Boston Traveler. During this time he also acted as chairman of the national committee which revised the by-laws of the Associated Press, and recommended various reorganization plans. After disposing of the Boston Traveler he devoted his attention for the next 15 years to the firm of John H. Fahey and Co., engaged in the investment securities business, with headquarters in Boston. During this period he was interested in various business and financial enterprises, purchasing the Worcester (Mass.) Evening Post in 1914 and the Manchester (N. H.) Mirror in 1922. He was president of the St. John's River Shipyard Co., in Jacksonville, Fla., 1917-1920, publisher of the New York Evening Post in 1923, and president of the Clarke Press in Manchester, N. H., in which he has continued his interest. He is president and principal owner of the Worcester Evening Post. He was appointed a member of the Board of the Federal Home Loan Bank by President Roosevelt in June, 1933, and is also a member of the Board of Directors of the Federal Home Owners' Loan Corporation. Mr. Fahey has been keenly interested in civic and public affairs, serving in many capacities in connection with the work of business organizations of the country.

Keystone View

fore, was to end the downward spiral and forestall disaster to our entire credit structure.

It undertook to do this by setting up the Home Owners' Loan Corporation to refinance mortgages and relieve distressed mortgagees. By September 1, 1934, the Corporation had refinanced 492,648 home mortgages, aggregating $1,476,900,000 and had in excess of 500,000 additional in process of refinancing. The action of the Corporation in thus protecting the market from being flooded with these distressed properties has arrested the downward spiral and saved existing home values. It has taken the pressure off home-financing institutions. Over $200,000,000 of the Corporation's funds have gone directly to closed institutions to release their frozen assets. More than 90 per cent of the vast sum already disbursed by the Corporation has been distributed to home-financing institutions. In these ways the Corporation has helped to preserve the home-financing structure. Its success was vital to the resumption of home building. Without it, institutions would have had no funds with which to finance new construction. Until it arrested the fall in values there could be no new building, for no one is going to put money in a new home if it is sure to be worth less than the cost of construction or if he can buy the neighboring property for half what the new home would cost him.

The permanent organization of the home-financing system has gone forward steadily while the Home Owners' Loan Corporation was halting the deflation. That organization began with the passage of the Federal Home Loan Bank Act in July, 1932. The Federal Home Loan Banks constitute a reserve system for the nation's principal home-financing institutions, namely, building and loan associations, savings banks, and life insurance companies. The estimated total urban home-mortgage debt in 1932 (the latest year for which figures exist) was $21,000,000,000. Of this amount the three classes of institutions eligible to membership in the Federal Home Loan Bank System held approximately $12,000,000,000. The System seeks to pool the resources of these institutions into a national reservoir against which member institutions can draw to meet any emergency.

By September of this year the System had 2,805 members with assets of $3,109,000,000. These member institutions had a potential line of credit with the Federal Home Loan Banks of $237,600,000, of which they were using at the end of July, only $85,587,000. It is evident, therefore, that the System has provided some 3,000 home-financing institutions with a substantial reserve which protects them against fear of emergency pressure and from which they may borrow to make new loans should their own resources be inadequate to meet the demand. The number of institutions eligible for membership in the Federal Home Loan Bank System is probably double the number already in. Undoubtedly there are many which cannot qualify but for the protection of savers and investors every institution which can should be a member of the System.

The Federal Home Loan Bank System constitutes one form of protection to existing home-financing institutions; the Federal Savings and Loan Insurance Corporation constitutes another. This Corporation, which the National Housing Act of June 27, 1934, authorized the Federal Home Loan Bank Board to set up, *must* insure accounts of Federal Savings and Loan Associations and *may* insure those of eligible building and loan associations, to the extent of $5,000 for each shareholder. The primary purpose of this insurance is to prevent the withdrawal of savings from thrift home-financing institutions and to increase the flow of funds to them for home financing.

The framing of rules and regulations was completed in August and the examination and insurance of Federal Savings and Loan Associations got under way in September. Applications for insurance from building and loan associations are now being handled. The flow of savings to banks since the establishment of the Federal Deposit Insurance Corporation makes it certain that the Federal Savings and Loan Insurance Corporation will greatly increase the loanable funds of thrift home-financing institutions.

However the Government's program stimulates by even more direct means the increase of credit for home financing. This is accomplished by the establishment of Federal Savings and Loan Associations, which are local, mutual, thrift home-financing institutions modeled on the best features of mutual savings banks and building and loan associations. They are privately managed under Federal charter and subject to regular Federal examination. They may be new institutions or existing building and loan associations converted from state-chartered institutions. To encourage their organization, the Federal Treasury is permitted to subscribe up to 75 per cent of the total paid-in capital of any Association. Congress appropriated $100,000,000 to be used for this purpose. Through these Associations the Government is able to make its own credit available for home financing and home construction with the maximum of safety to itself. The Government has sought to establish them in every community where credit for home financing is either lacking, frozen, or inadequate. Up to September 1 charters had been issued to 406 new associations and to 92 associations converted from state institutions. At that time charters were pending for 220 new associations and for 173 converting associations. The resources of the 498 chartered associations totalled $75,321,616; the resources of the 393 for which charters were pending totaled $212,944,400.

The $100,000,000 of Federal investment in these thrift home-financing institutions seems likely to constitute but a fraction of the increased funds which they will make available for home-financing. A Kentucky building and loan association operating under State charter some months ago converted into a Federal Association. The institution has assets of approximately $6,000,000. After it became a Federal Association, its receipts from investments in its shares increased nearly $100,000 a month over the previous rate.

The remainder of the Government's program for the permanent organization of the home-financing system is being carried out by the National Housing Administration. However, the sections of the program listed above and already in part accomplished have been sufficient to make funds available for home financing in many, if not all, sections of the country. The Federal Home Loan Bank Board knows from the reports of its regional banks and from other sources that home-financing institutions have money to lend or have credit with the Federal Home Loan Banks to obtain money for lending should they wish to do so. It is evident, however, that in many sections of the country mortgage money is not being offered as liberally as the situation warrants. To make credit available for home financing is one problem; to insure its use seems to be quite another.

THE nation needs new housing. There is now in the making one of the largest housing shortages in our history. Building figures for the last four years compared with population increases and with property losses by fire and depreciation permit of no doubt on that score. If credit is available and homes are needed, why are not more of them being built? Lack of public confidence is undoubtedly one factor. Confidence will increase as employment increases and credit is liberalized. That is why the success of the present home reconditioning effort of the National Housing Administration is so important. As it puts men to work, this effort will increase the number of those financially able to invest in new or better homes and spread great confidence among those who, though financially able to buy or build, are now hesitant.

Another principal obstacle to the resumption of home financing and consequently of home building is unquestionably the difficulty of adjustment to the general withdrawal of second-mortgage financing. The depression put the second-mortgage structure practically out of business and the Government hopes to prevent its return. It was a costly, inefficient and dangerous incubus on home ownership. The Government seeks to eliminate the need for the second mortgage by encouraging the making of first mortgages up to 75 and 80 per cent of the soundly appraised value of the property. To the extent that this succeeds, it means also the elimination of the short-term straight mortgage and the use of the long-term amortized mortgage, which is repaid over a period of seven to twenty years by monthly installments of principal and interest.

The long-term amortized mortgage is the cornerstone of the Government's program for organizing the home-financing system. Hitherto it has been made almost exclusively by the building and loan associations, and their total home-mortgage holdings of $6,500,000,000 (in 1932) constitute approximately the total of the country's long-term amortized mortgages that are privately held. To this must be added the nearly $3,000,000,000 of fifteen-year amortized mortgages eventually to be held by the Home Owners' Loan Corporation.

The fact that they made long-term amortized mortgages does not mean that building and loan associations habitually or even frequently loaned up to as much as 75 per cent of the appraised value of the property on a first mortgage. In some States they were prohibited by law from lending more than 66 per cent, and generally they were influenced by the prevailing practice of restricting first mortgages to 50 or at the most 60 per cent of property value. To induce building and loan associations to make larger first mortgages so that the need for the second mortgage can be largely eliminated will require time and education.

Federal Savings and Loan Associations are authorized to lend up to 75 per cent on a first mortgage, and it is believed that they can be encouraged to make such loans extensively. A major purpose of the Mutual Mortgage Insurance Fund, which is being set up by the National Housing Administration, is to give protection to and thus encourage investments in 80 per cent long-term amortized first mortgages.

Reform takes time and the transfer of most home financing from the old basis of short-term, straight-maturity first mortgages, representing only 50 or 60 per cent of property value, to the sounder basis of long-term amortized first mortgages up to 70 or 80 per cent of value, constitutes a major reform in home financing. While it is in process, thousands of homes will be built under the older methods of financing. In any event, private capital is available for the purpose. Today it is lying idle, unproductive and unprofitable. As confidence continues to return and loaning policies become more liberal, that credit will move eagerly to work in one form of home-loan finance or another. I have no doubt that the ring of the hammer and the saw throughout the land will be heard more loudly by the early part of 1935 than at any time in the past six years.

ADMINISTRATORS of the BETTER HOUSING PROGRAM

Announcement was made on August 13 of the appointment of Regional, State and District Directors for the Better Housing Division of the National Emergency Council, which is to be the immediate field agency of the Federal Housing Administration. Appointments were made by Donald R. Richberg, Executive Director of the National Emergency Council. Concurrence in the appointments was given by James A. Moffett, Federal Housing Administrator.

In order to expedite the organization of a field personnel able to direct and energize the modernization part of the Better Housing program under Title I of the National Housing Act the Federal Housing Administration elected to use the facilities of the National Emergency Council. Insofar as possible the Better Housing Division is headed by the present State Directors of the National Emergency Council. In States where this particular plan was not feasible special personnel has been added to the National Emergency Council offices temporarily to concentrate their efforts on the Better Housing Program. In all cases the heads of the movement will be known as Directors, either Regional, State or District, of the Better Housing Division of the National Emergency Council.

For purposes of administration the country is divided into 10 regions. In 42 States the administration of the program is placed in the hands of State Directors. In 6 States, because of unusual conditions, it was necessary to organize District offices.

REGION ONE: New York.

REGIONAL DIRECTOR: Julian Gerard, New York City.

Director for Albany District: Roy S. Smith.

Director for Buffalo District: Raymond E. Winfield, Buffalo.

Director for New York City District: Gates Ferguson.

REGION TWO: Connecticut, Maine, Massachusetts, Rhode Island, New Hampshire and Vermont.

REGIONAL DIRECTOR: Charles Birmingham, Boston.

State Director for Connecticut: William Meany, Greenwich, Conn.

State Director for Maine: George M. Williamson.

State Director for Massachusetts: John F. Malley, Boston.

State Director for Rhode Island: LeRoy King, Newport.

State Director for New Hampshire: Eugene E. Reed, Concord.

State Director for Vermont: Dr. J. Holmes Jackson, Burlington.

REGION THREE: Delaware, Maryland, New Jersey and Pennsylvania.

REGIONAL DIRECTOR: Charles Edison, West Orange.

State Director for Delaware: Willard Springer, Jr., Wilmington.

State Director for Maryland: Arthur E. Hungerford, Baltimore.

State Director for New Jersey: Charles Edison, West Orange.

State Director for Pennsylvania: Edward N. Jones, Pittsburgh.

Western District Director for Pennsylvania: Edward Brown Lee.

Eastern District Director for Pennsylvania: Edward Paul Simon.

REGION FOUR: Florida, Georgia, North Carolina, South Carolina and Virginia.

REGIONAL DIRECTOR: John W. Millsaps, Atlanta.

State Director for Florida: Fons A. Hathaway, Jacksonville.

State Director for Georgia: William A. Sirmon, Atlanta.

State Director for North Carolina: Theodore B. Sumner, Asheville.

State Director for South Carolina: Lawrence M. Pinckney, Charleston.

State Director for Virginia: D. R. Hunt, Roanoke.

REGION FIVE: Alabama, Arkansas, Louisiana, Mississippi and Tennessee.

REGIONAL DIRECTOR: Hugh Humphreys, Memphis.

State Director for Alabama: Robert Jemison, Jr., Birmingham.

State Director for Arkansas: J. J. Harrison, Little Rock.

State Director for Louisiana: C. M. Dickson, Shreveport.

State Director for Mississippi: W. P. Bridges, Jackson.

State Director for Tennessee: Roy H. McKay, Memphis.

REGION SIX: Ohio, Michigan and West Virginia.

REGIONAL DIRECTOR: Benedict Crowell, Cleveland.

Northern District Director for Ohio: E. H. Blair, Cleveland.

Southern District Director for Ohio: Albert L. Guckert, Granville.

State Director for Michigan: George J. Burke, Ann Arbor.

State Director for West Virginia: F. Witcher McCullough, Huntington.

REGION SEVEN: Indiana, Illinois, Kentucky and Wisconsin.

REGIONAL DIRECTOR: Percy Wilson, Chicago.

Northern District Director for Illinois: Carroll Sudler, Chicago.

Southern District Director for Illinois: C. E. Hamilton, Carbondale.

State Director for Indiana: Fred Hoke, Indianapolis.

State Director for Wisconsin: A. Matt Werner, Sheboygan.

State Director for Kentucky: Judge J. R. Layman, Elizabethtown.

REGION EIGHT: Colorado, Kansas, Missouri, New Mexico, Oklahoma, Texas and Wyoming.

REGIONAL DIRECTOR: Walter Dearing Cline, Wichita Falls.

State Director for Colorado: Thomas A. Duke, Pueblo.

State Director for Kansas: Homer Bastian, Atwood.

State Director for Missouri: Paul Kendall, Kansas City.

State Director for New Mexico: J. J. Dempsey, Santa Fe.

State Director for Oklahoma: Frank Buttram, Oklahoma City.

Eastern District Director for Texas: Mabry Seay, Dallas.

Southern District Director for Texas: H. P. Drought, San Antonio.

Western District Director for Texas: Robert Stuart, Fort Worth.

State Director for Wyoming: Nels A. Pearson, Sheridan.

REGION NINE: Minnesota, Montana, North Dakota, South Dakota, Nebraska, Iowa.

REGIONAL DIRECTOR: Guy H. Harvey, Yankton.

State Director for Minnesota: Mrs. Anna Dickie Olesen, Minneapolis.

Associate Director for Minnesota: Fred Schilplin, St. Cloud.

State Director for Montana: Miles Romney, Hamilton.

State Director for North Dakota: Robert B. Cummins, Mandan.

State Director for South Dakota: Mr. Goss.

State Director for Nebraska: Richard L. Metcalfe, Omaha.

State Director for Iowa: John J. Hughes, Des Moines.

REGION TEN: Arizona, Cailfornia, Idaho, Nevada, Oregon, Utah and Washington.

REGIONAL DIRECTOR: Allen B. Swinerton, San Francisco.

State Director for Arizona: Steve A. Spear, Prescott.

Northern District Director for California: Califford C. Anglin, Richmond.

Southern District Director for California: Fred W. Marlow, Los Angeles.

State Director for Idaho: Harry Whittier, Boise.

State Director for Nevada: Frank Ingram, Reno.

State Director for Oregon: Edgar Freed, Portland.

State Director for Utah: Allen T. Sanford, Salt Lake City.

State Director for Washington: J. E. Bradford, Seattle.

Keystone Views

JAMES A. MOFFETT, Federal Housing Administrator, former vice-president of Standard Oil Company of New Jersey.

APPOINTMENT by the American Bankers Association, and by various groups of manufacturers, of liaison officers in every state and region to cooperate with the Federal Housing Administration in its Better Housing Program has been followed by additional similar appointments of volunteer assistants in all parts of the country. The work of these volunteers will be to cooperate with the State and Regional Directors of the Better Housing Program, already named by the National Emergency Council. They will assist the directors in supplying to all private financial and business agencies in their territories complete information regarding the Better Housing Program.

BECAUSE of the large number of property owners whose mortgage or tax payments to some extent are not up to date but who still are able to maintain their properties, the Federal Housing Administration has announced a major modification of its regulations permitting such owners to apply for modernization credits. Under the revised rules, any financial institution may use its own judgment as to whether the status of taxes should affect the approval of a loan. Also, any institution which does not itself hold the mortgage may use its own discretion as to whether or not it will make a loan even though the mortgage may not be completely "in good standing." In making this announcement, James A. Moffett, Federal Housing Administrator, stated that banks in many states had reported that they were willing to make loans because they were certain property owners would repay out of their incomes in spite of the fact that some delinquencies had not yet been made up in connection with the principal or interest payments on mortgages.

BUILDERS' "FLOOR COSTS" REDUCED TO AID HOUSING

A DROP averaging 7 per cent in overhead sales and delivery cost on less-than-carload shipments of builders' supply materials has been authorized through an administrative order by the National Recovery Administrator. The order was requested by the Code Authority for the trade to aid the home-building and home-modernization program, according to an announcement in the September 4 issue of *The Blue Eagle*.

This drop in costs was brought about by application of the Code Authority to modify former administration approved figures and percentages which constituted the minimum overhead cost of selling and delivering builders' supplies in less-than-carload quantities. This was done by eliminating items of interest and lost accounts (excepting a reserve for lost accounts of 1 per cent), and establishing specific modal percentage charges.

Materials affected by the order are the following:

Brick mortars, casement and steel sash, cement and cement products, cement pipe, ceramic tile, clay roof tile, common brick, cut stone, dampers and fireplace accessories, drain tile, face brick, fire brick and clay, glazed structural tile, gypsum products, hollow tile, lime and lime products, mesh reinforcement, metal lath and kindred products, mineral aggregates, mortar and cement colors, molding plasters, roof and flooring slates, sewer pipe, flue lining and other clay products, structural terra cotta and waterproofing compounds.

MODERNIZATION CREDIT PLAN: BULLETIN NO. 2

THE Modernization Credit Plan of the Federal Housing Administration was opened August 31 to active participation on the part of savings banks; savings, building and loan associations; insurance companies and similar institutions required by law to loan only against mortgage security. Thus, mortgage institutions particularly accustomed to extend credit in the real estate and building field are invited to participate, along with national and state banks, industrial banks and finance companies, in a plan described by the Federal Housing Administration as "unique in the mortgage field."

James A. Moffett, Federal Housing Administrator, announced that Modernization Credit notes may be extended up to as long as three years and in exceptional cases, in the discretion of the mortgage institution, as long as five years. This discretionary authority to extend the term beyond three years was granted, he explained, primarily to make possible full participation by the mortgage type of institution. Some of these, it was stated, could not operate effectively on the shorter term basis. Institutions making unsecured loans likewise were given the option of taking five-year notes, although the opinion was expressed that this extension would not be largely availed of in such cases. This does not mean, however, that every property owner needs the maximum time permitted. It is to his advantage, and to the advantage of the financial institution, that the loan should be paid off as rapidly as possible, giving due consideration to the amount he can comfortably pay each month.

It further was stated that all financial institutions might take mortgage security in view of the opening of the plan to so-called mortgage institutions, although it is intended that credit shall be extended by all institutions as nearly on an unsecured basis as state laws make possible.

"The mortgage is relegated from its place as principal security," according to the outline of the plan in Bulletin No. 2, "to one of security in legal form only, so as to permit mortgage institutions to proceed as if these loans were unsecured, and yet meet the requirements of the laws in their states.

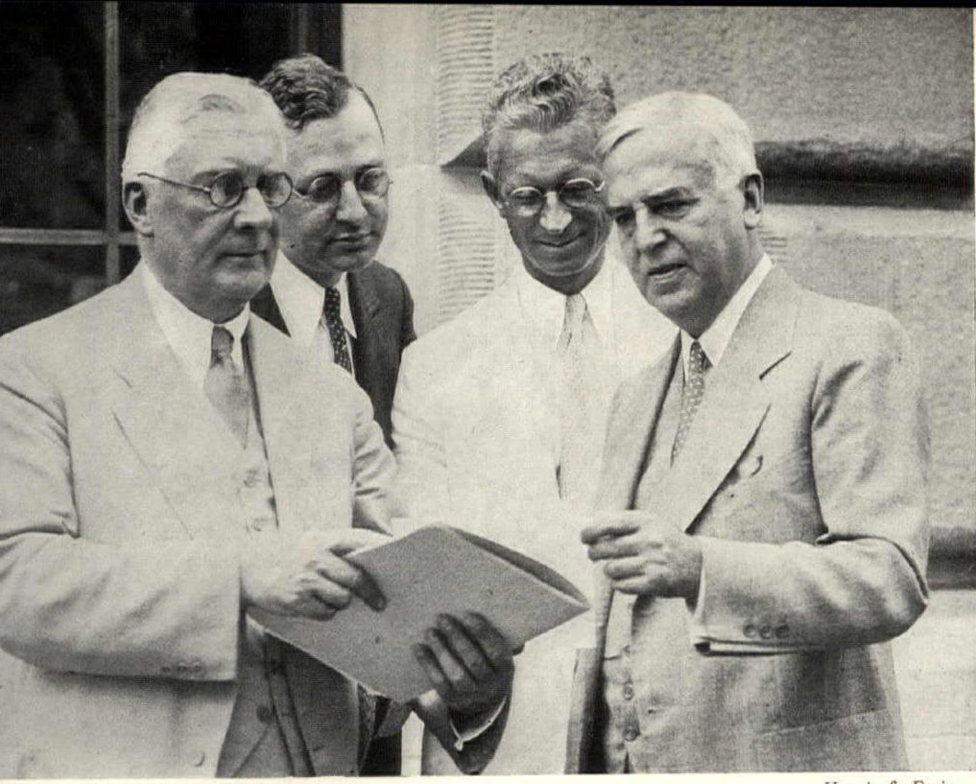
"The mortgage institutions," the statement continued, "would be more interested, under this plan, in the property-owner's income than in his property."

This Bulletin outlines such modifications of the plan described in Bulletin No. 1 (issued primarily for commercial and industrial banks, finance companies and similar financial institutions) as are necessary to enable institutions required by law to loan only against mortgage security ("mortgage institutions") to extend credit under the Modernization Credit Plan in a manner as nearly as possible in conformity with their accustomed practices.

The Modernization Credit Plan relies primarily on personal character and earning power to release credit so that property-owners may enjoy housing improvements now and pay for them in small monthly installments.

Reasonable costs, easily met requirements, and favorable terms for the financing, all are obtained under the plan described in Bulletin No. 1. The modification herewith of the basic idea enables mortgage institutions to extend credit in a manner as nearly as possible like that provided for financial institutions permitted by law to make unsecured loans.

The Modernization Credit Plan invites an adjustment of customary practice on the part of both types of institutions. Commercial banks generally have dealt in thirty to ninety-day self-liquidating loans; they are now assisting property owners with longer term credit. Mortgage institutions generally have been accustomed to obligations running for many years; but they also are logical institutions to provide credit on less extended terms to property owners with whose interests they are so closely identified.



Harris & Ewing

AT WORK ON FEDERAL HOUSING ADMINISTRATION PROGRAM:

Here are four important persons who have been meeting in Washington, D. C., to work out a credit program for inducing the general public to buy materials and to modernize their homes.

From the left: W. K. Payne, Auburn, N. Y.; Albert L. Deane, Deputy Administrator, Federal Housing Administration; Roger Steffan, Director, Division of Modernization Credits, FHA; and H. E. Otte of Moline, Ill.

THERE are 65 ways and reasons for the home owner to repair or improve his property, according to the *Home Owners' Manual* issued by the Federal Housing Administration and distributed to every city and town in the country as a part of its campaign to show the public how to take full advantage of the better housing movements. The 23-page booklet is entitled "How Owners of Homes and Business Property Can Secure the Benefit of the National Housing Act." It is being sent to bankers, State, District and Regional Directors of the Federal Housing Administration, to builders, contractors and private citizens.

FHA FINANCING RATES

From the radio address by Albert L. Deane, Deputy Federal Housing Administrator, broadcast over a coast to coast network of the National Broadcasting Company on August 29:

The Federal Housing Administration has set a maximum financing charge beyond which no financial institution can go if the loan is to be insured. This charge not only covers interest for the use of the bank's money, but also the extra cost of handling loans that are paid off in monthly installments. . . . The maximum charge set by the Federal Housing Administration, covering all interest and other fees is $5 for each $100 of a one year installment loan—$9.19 for each $100 if it is repaid in two years—$13.03 for each $100 if it is repaid in three years.

Do not confuse this finance charge with straight interest on a bank loan. On a straight interest basis, the bank will receive under this plan a return on the money it loans you, at a rate slightly less than 9¾% per annum. This is a much lower charge on this type of loan than financial institutions have been able to grant heretofore. They are able to loan money at this low charge now, only because of the government's cooperation.

A bank that ordinarily loans money to its depositors for sixty or ninety days at, say 6% interest, will receive a much lower return on these installment loans, because of the extra cost of handling the large number of additional payments.

I have tried to make this matter clear because it has been reported to us that some property owners have confused the matter of the annual interest return to the bank with the maximum financing charge the property owner must pay. When they have been told that the maximum return to the bank was 9¾% they have thought that they had to pay $9.75 to get a $100 loan for one year, when actually the most they can pay is $5 on such a loan.

PWA HOUSING DIVISION REPORTS PROGRESS

The PWA Housing Division has undergone a complete reorganization since June 13 when Robert D. Kohn resigned as Director after Administrator Harold L. Ickes, dissatisfied with the management of initial stages of the program, ordered a thorough investigation into all phases of Housing Division activities. The Division is now under the direction of Col. Horatio B. Hackett. Weaknesses in organization and procedure have been overcome and the program now is being pushed vigorously.

One limited dividend housing corporation project at Alta Vista, Va., has been completed, providing 50 modern homes for the small mill town.

Five other limited dividend projects, including the $5,060,000 Hillside project and the $3,450,000 Boulevard Gardens project, both of New York, are under construction. Another limited dividend project is ready to start construction, bringing this phase of the program up to seven projects, all in construction stages. The total cost of the seven projects will be $11,471,600.

The Federal program, which will place Government-financed housing projects in many cities, is now in the most complicated, and of necessity the longest, stage —that of acquiring sites. Anywhere from four to 10 months is required to obtain title to the hundreds of land parcels going into a single low-cost housing site, if it is to be obtained at a reasonable cost.

$127,564,500 is available for Federal housing projects. Projects for 74 cities are under examination. Sites for two projects in Atlanta have been purchased; bids for the demolition of existing slum buildings were received August 15; the two projects will cost $4,800,000. Options have been taken and Federal condemnation proceedings have been filed on the site of a $3,000,000 Cleveland project. Appraisals, title examinations, surveys, and options are well advanced on 10 additional sites in seven different cities.

Sites have been selected, preliminary social and economic surveys have been completed and the various steps of land acquisition started on 4 sites in four other cities. Initiation of projects has been started in 61 other cities.

A group of European experts in housing and municipal planning began a six weeks' tour of the country on August 20, under the auspices of the National Association of Housing officials, to study housing in the United States. The photograph shows the group examining an apartment house in New York. They are, from left to right: Henry Wright, New York architect; Sir Raymond Unwin of England, former president of the Royal Academy of Architects and England's foremost authority on city planning; Miss A. J. Samuel of the British Society of Women Housing Estate Managers; Dr. Ernst Kahn of Germany, former manager of the municipal housing program in Frankfort, Germany; and Ernest J. Bohn of Cleveland, president of the National Association of Housing Officials and author of Ohio's current housing laws.

Keystone View

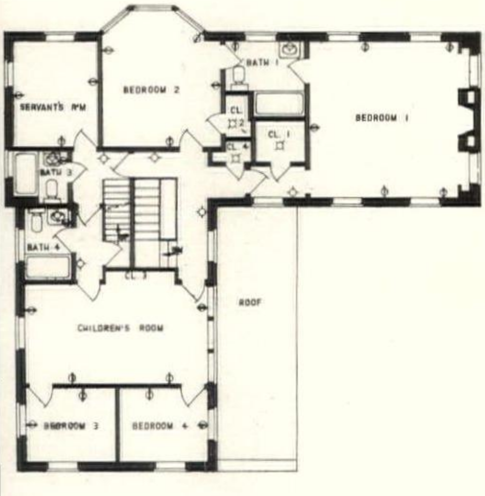
tographs by Roger Sturtevant

Kitchen floor has linoleum on wood in working portion and quarry tile for fireplace and alcove. All other floors are pine, stained a dark brown.

WILLIAM WILSON WURSTER
ARCHITECT

Photographs by George H. Van Anda

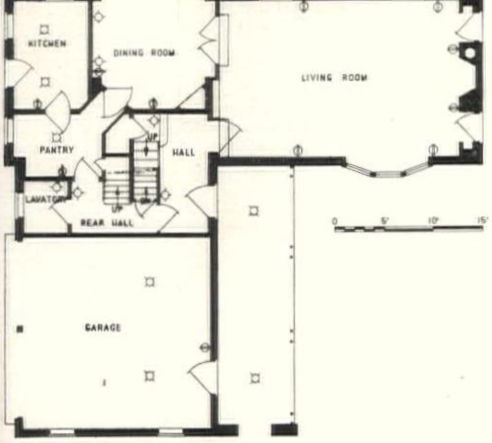
HOUSE AT WILTON, CONNECTICUT
EVANS, MOORE AND WOODBRIDGE, ARCHITECTS



Construction: exterior walls of cinder concrete with reinforced concrete slab on first floor. Plaster ceilings. Rock lath and plaster interior walls. Plank pine floors. White pine trim. Second floor ceiling insulated with rock wool.

Color scheme: exterior walls finished with white cement wash. Dark gray asbestos shingle roof. Interior walls largely papered, woodwork stained.

Cost: $13,000.



HOUSE OF THOMAS N. ST. HILL
PASADENA, CALIFORNIA
DONALD D. McMURRAY, ARCHITECT

Construction consists of concrete foundations, wood studs and floor joists. Shingle roof. Color scheme: oyster white walls with gray stained roof.

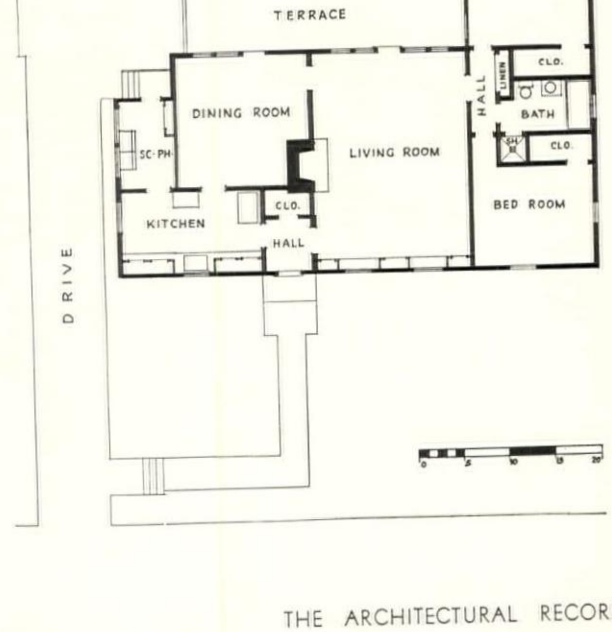
ographs by George D. Haight

HOUSE OF CHARLES B. VORHIS
CALIFORNIA
DONALD D. McMURRAY, ARCHITECT

Exterior walls of stucco with metal sash. Wood trim interior and exterior and wood floors. Plastered walls and ceilings. Color scheme: light green exterior with red tile roof.

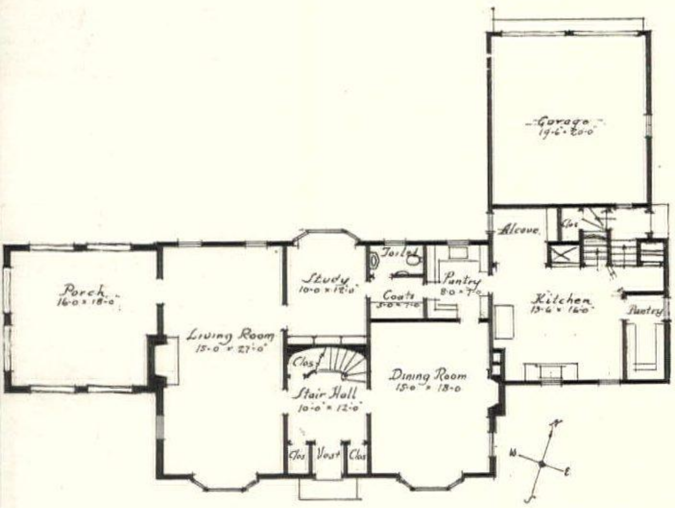
George D. Haight

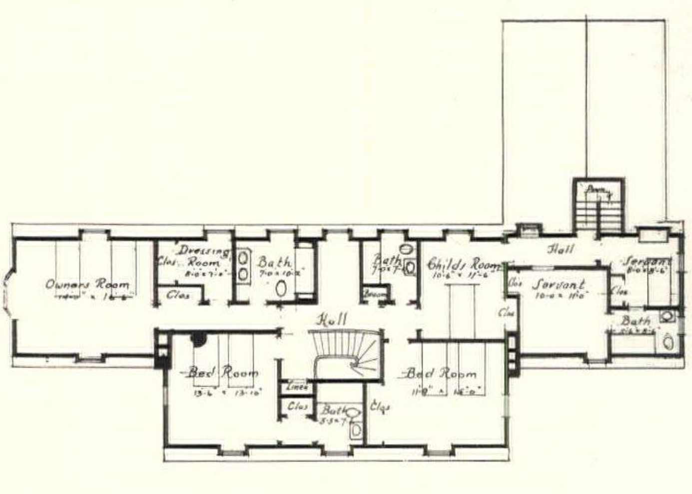
Construction consists of concrete foundations, wood studs and floor joists. Exterior walls of stucco with metal sash. Wood trim, interior and exterior. Wood floors. Plastered walls and ceilings. Color scheme: light green exterior walls with red tile roof. Heating: gas unit furnace individually controlled in all major rooms, with master switch located in living room and master bedroom. Cost: $4 a square foot.



HOUSE OF CLARENCE E. GUSE
GLENDALE, CALIFORNIA
DONALD D. McMURRAY, ARCHITECT

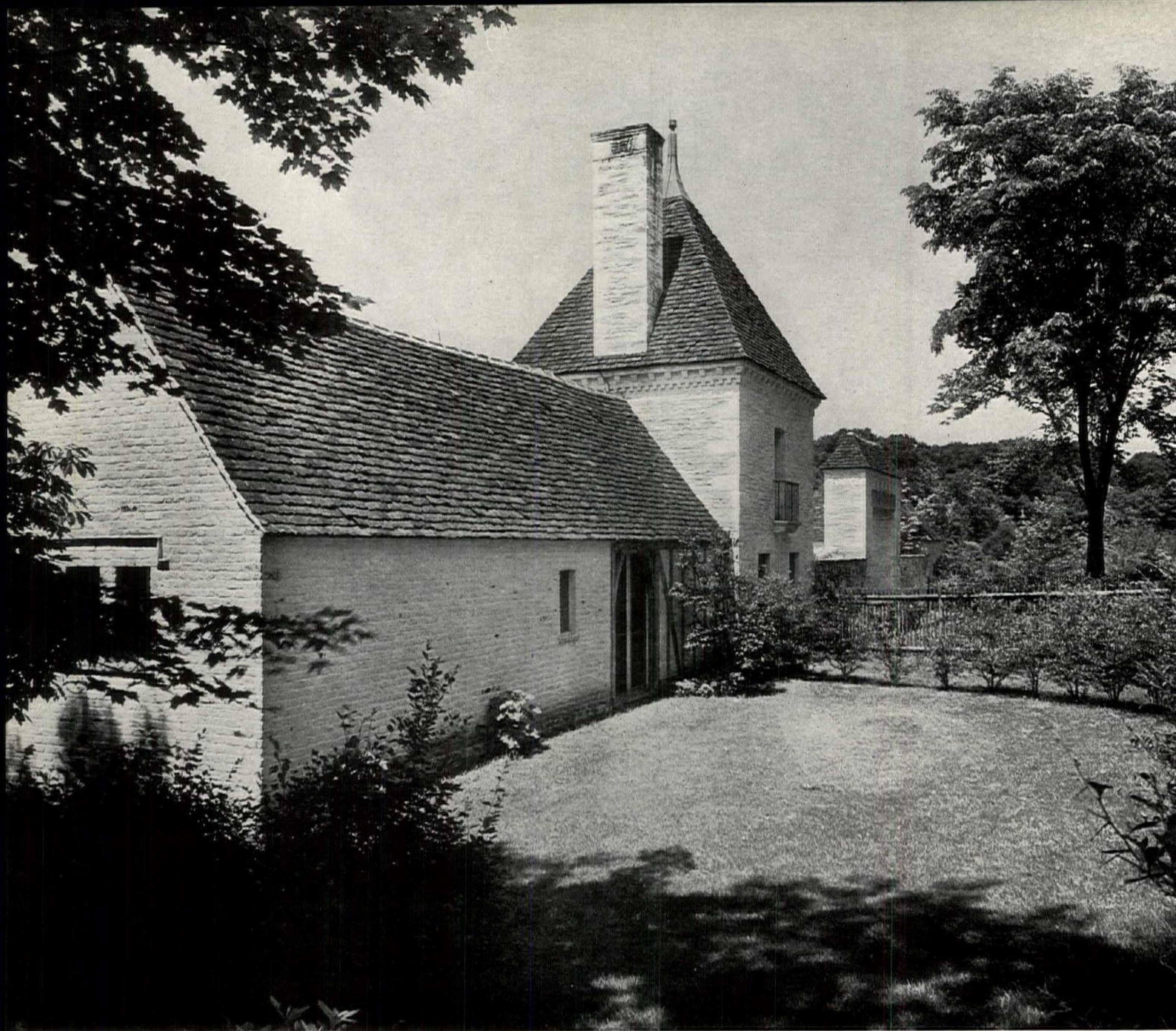
George H. Van Anda





The site is a knoll about 300 feet back from the street. The house has clapboard frame walls with brick ends. Colors are white with maroon exterior doors and shutters. The roof has stained shingles, carefully insulated. Heating is vapor with cast-iron boiler and oil burner. House has 55,700 square feet and cost $27,500.

HOUSE OF C. K. SKINNER
SOUTHPORT, CONNECTICUT
CAMERON CLARK, ARCHITECT



Photographs by Robert Maclean Glasgow

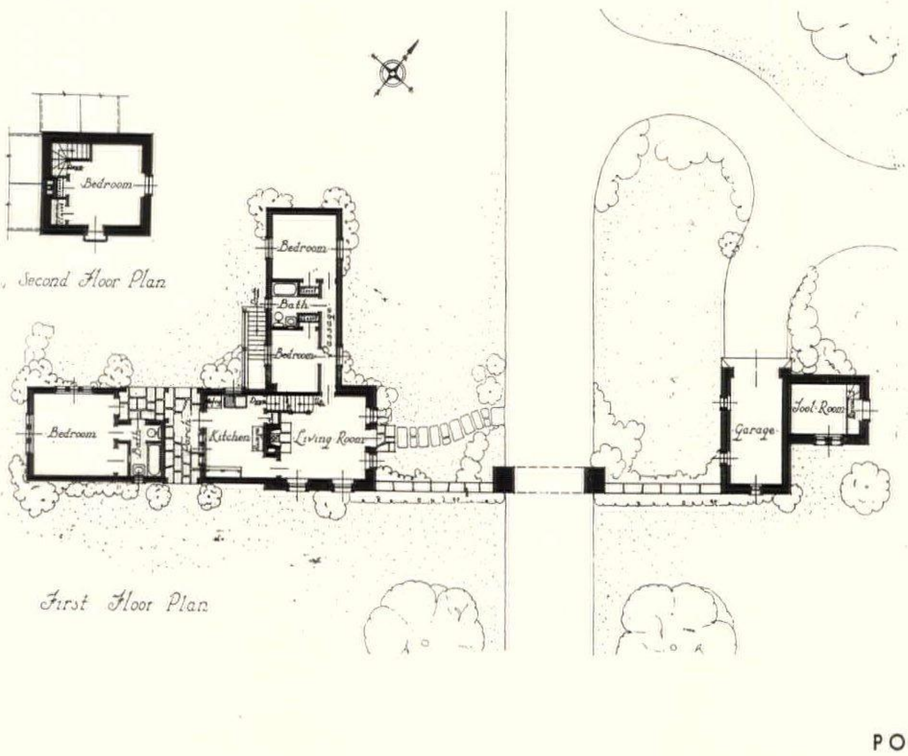
The house, inspired from the architecture of provincial France, is situated on a level lawn overlooking a small lake and sloping hills. All exterior walls are built of random field stone with the exception of the two wings leading off the central tower unit which are of common brick. All walls and chimneys are whitewashed. Large stones were used at all corners, also at all window and door openings. The cornice of the square tower is in courses of cut limestone and brick dentils.

Quarry tiles in shades of red and burgundy were used on all roofs. All exterior woodwork is oak, stained a weathered finish. The interior walls and woodwork are painted with simple cottage decorations.

GUEST HOUSE ON ESTATE OF J. M. KAPLAN

CROTON-ON-HUDSON, NEW YORK

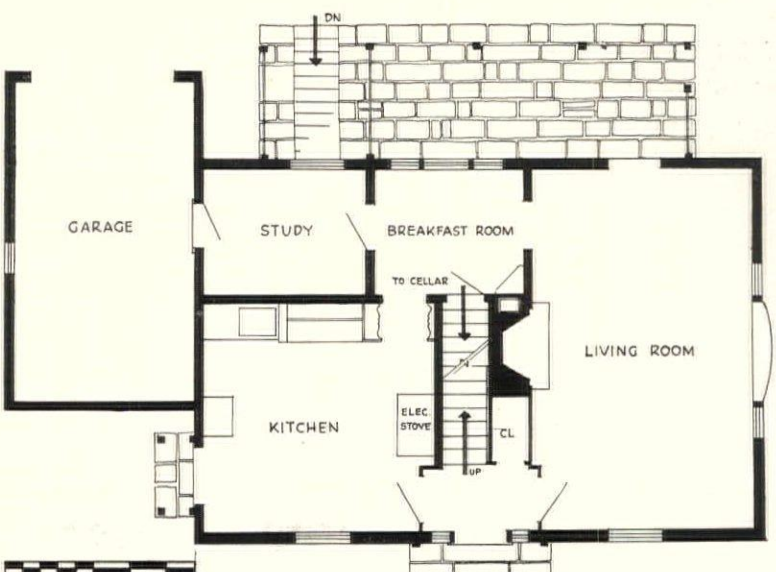
FRANK J. FORSTER AND R. A. GALLIMORE, ARCHITECTS


Bedroom
Second Floor Plan
Bedroom
Bath
Bedroom
Passage
Bedroom
Bath
Kitchen
Living Room
Garage
Tool Room
First Floor Plan

Photographs by George H. Van Anda

HOUSE OF CHARLES K. MOSER AT KENT, CONNECTICUT
ALLAN McDOWELL, DESIGNER

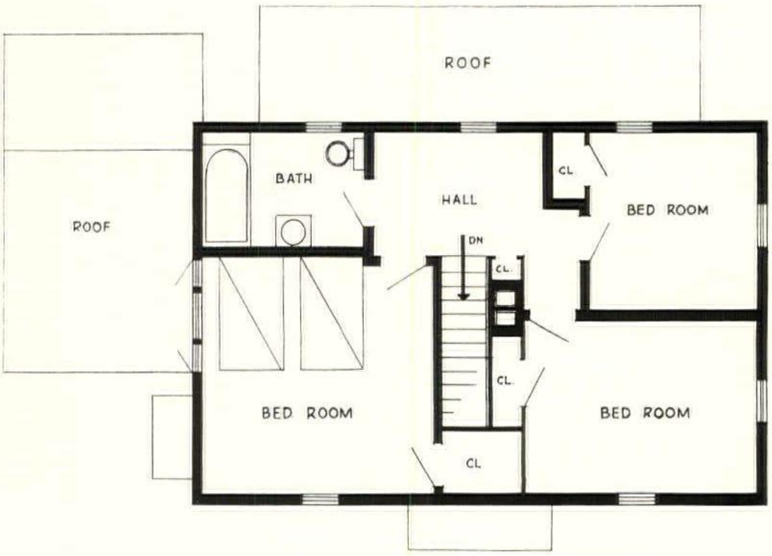
Exterior side walls are shingles laid $8\frac{1}{2}''$ to weather on first story. Second story gable ends are wide redwood laid vertically with molded edges; front and back are flush pine board laid horizontally. Roof: wood shingles 5" to weather. Interior walls are plaster and paper with exception of kitchen and bath (painted). Living room is plastered, except for fireplace wall of vertical redwood boards with molded edges. Equipment: electric range, refrigerator and water pump. Water heated with small coal stove. No furnace as yet, although provision has been made for future installation. Hand-made wrought hardware.



George H. Van Anda

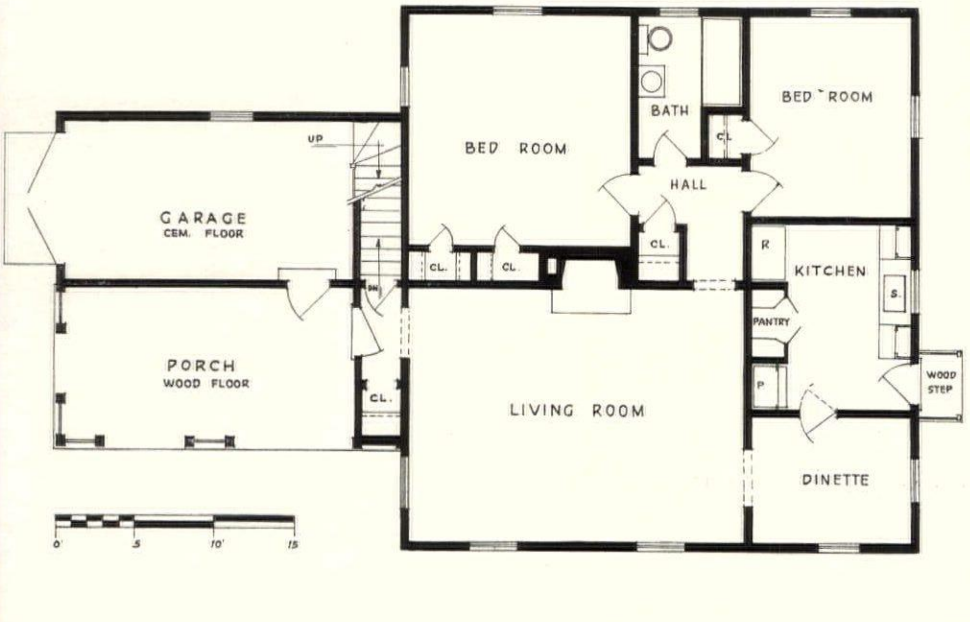
Color scheme: stained gray roof, white chimney, white shingles with second story board just off white (oyster shell), dark blue blinds and porch ceilings. All interior trim is bone white. Panel wall of living room is natural redwood with ceiling painted dark blue. Cost of house (completed this year): $4,500.

HOUSE OF CHARLES K. MOSER
KENT, CONNECTICUT
ALLAN McDOWELL, DESIGNER

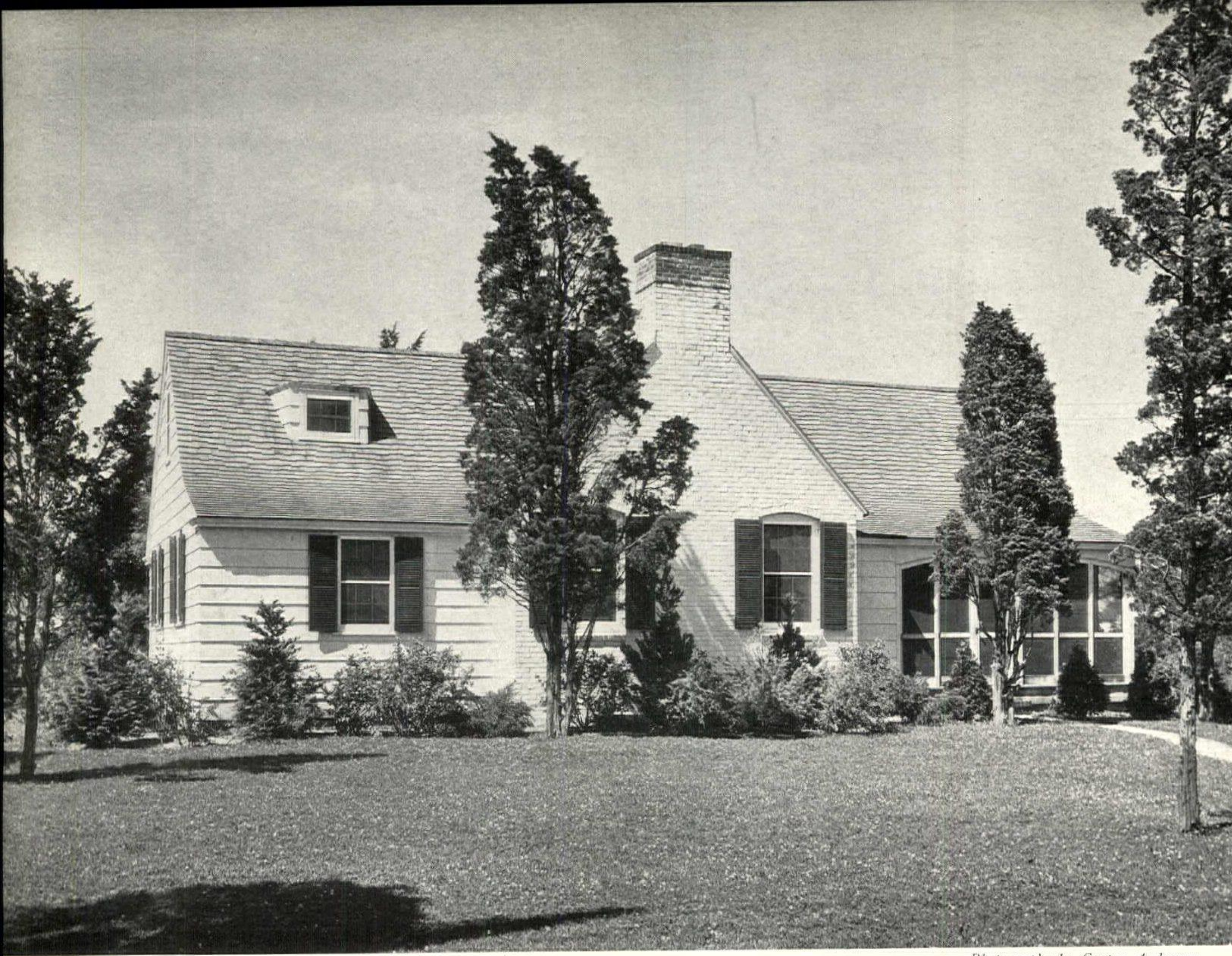


Gustav Anderson

HOUSE OF MRS. HELEN WADE AT HARBOUR GREEN, LONG ISLAND
HARMON REALTY CORPORATION — RANDOLPH EVANS, ARCHITECT

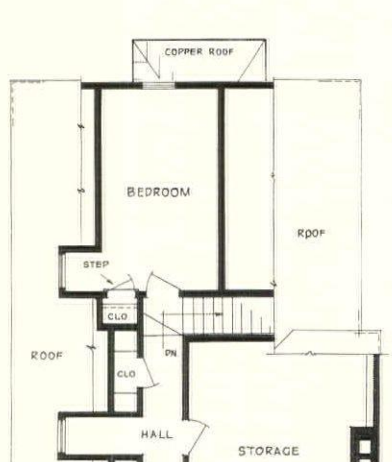


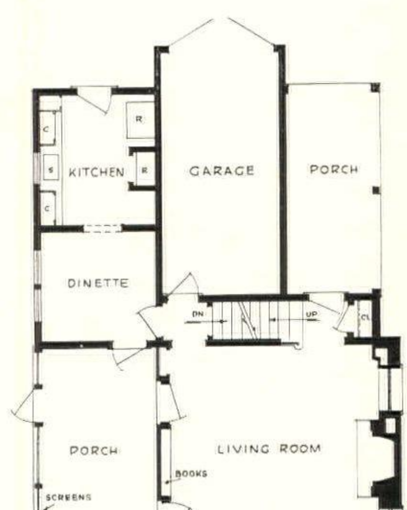
Construction: clapboard walls with roof of cedar shingles. Oak floors. Oil burner supplies steam heat. Color scheme: white walls and green roof. Cost (completed in 1934): $4,200.



Photographs by Gustav Anderson

Construction: walls and roof of wood shingles. Oak floors. Steam heating. Color scheme: white walls and green roof. Cost (house completed in 1933): $6,100.

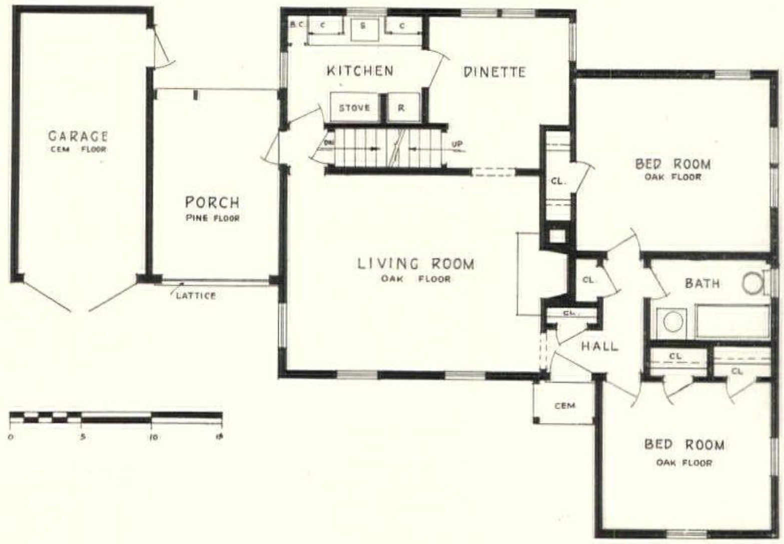




HOUSE OF MRS. LUCILLE D. BOYLE
HARBOR GREEN, LONG ISLAND
RANDOLPH EVANS, ARCHITECT

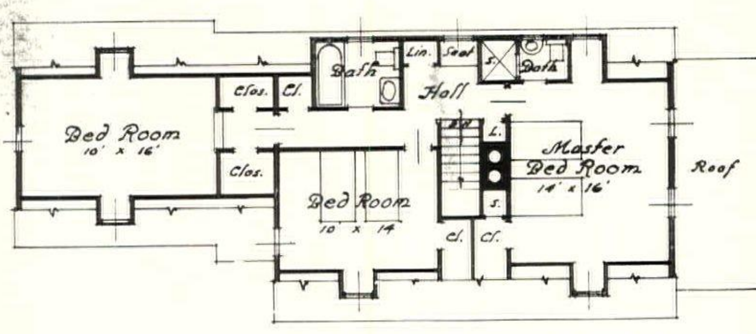
HOUSE OF SANFORD WARD AT HARBOR GREEN, LONG ISLAND
RANDOLPH EVANS, ARCHITECT

Construction: clapboard siding. Wood shingle roof. Oak floors. Steam heating. Color scheme: white walls and green roof. Cost (house completed this year): $4,600.

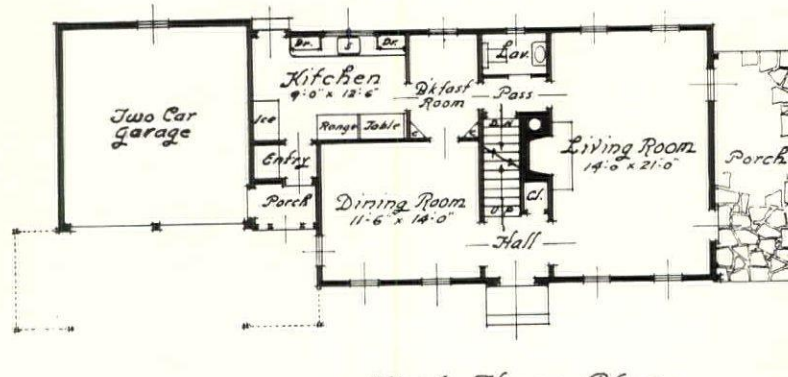


Photograph by Gustav Anders...

Materials: hand-rived cypress shingles for exterior walls with white pine trim. Roof of cedar shingles. Interior trim of white pine except in recreation room which is of pecky cypress. White pine wainscot in living room. Red oak floors throughout. Linoleum floors in kitchen and breakfast room. Walls: paper over white finished plaster. Color scheme: pure white walls and dark green stained roof. Blinds are painted black green. Interior woodwork is cream white. Equipment: concealed radiation with two-pipe steam heating plant and oil burner. Cost (house completed last year): $8,500 complete, including landscaping.



- Second Floor Plan -

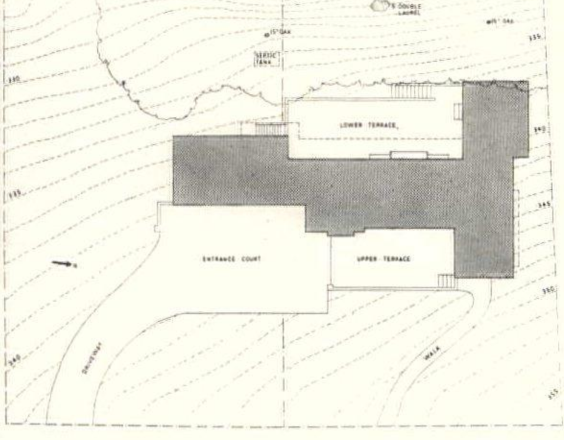


- First Floor Plan -

HOUSE AT ROCKVILLE CENTRE, L. I.
MAXMILLIAN R. JOHNKE, ARCHITECT

PORTFOLIO of NEW HOUSES

Photograph by Roger Sturtevant



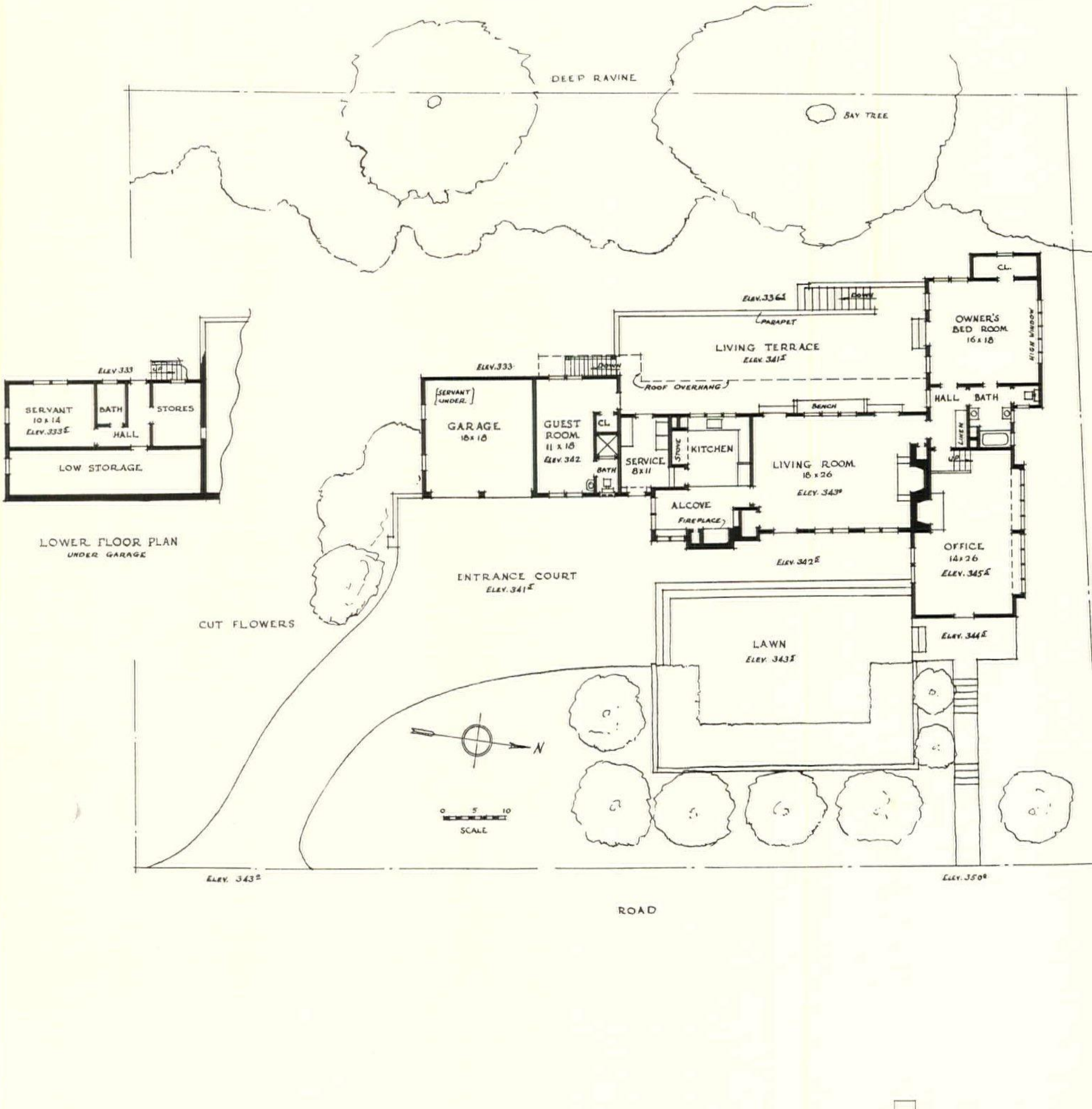
HOUSE OF THOMAS D. CHURCH

PASATIEMPO ESTATES
SANTA CRUZ, CALIFORNIA

WILLIAM WILSON WURSTER, ARCHITECT

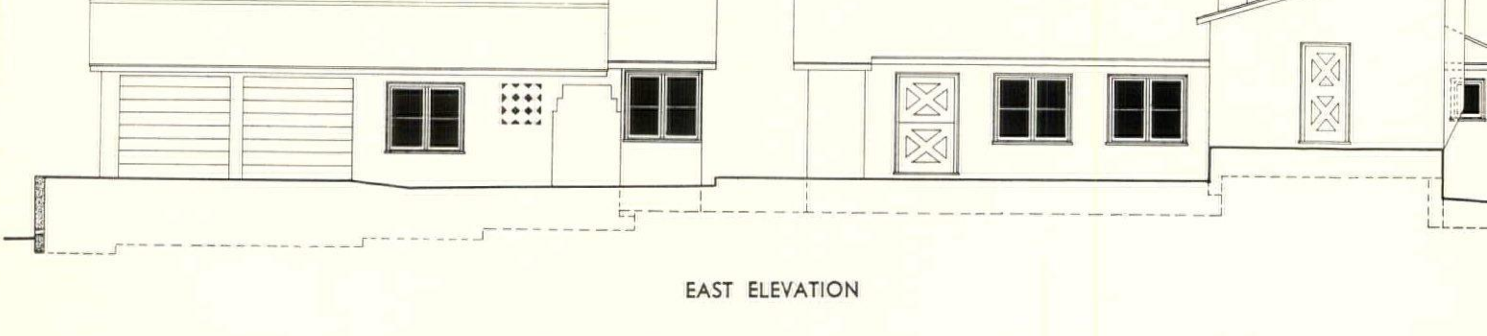
HOUSE OF THOMAS D. CHURCH
SANTA CRUZ, CALIFORNIA
WILLIAM WILSON WURSTER, ARCHITECT

This house is also used by Mr. Church as an office for the practice of his profession as a landscape architect. Contours and shape of lot made desirable the planning of the house in a north and south direction. Halls and dining room were eliminated for simple country living. Cost: $8,500.



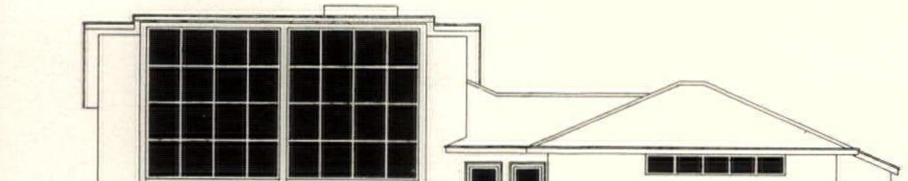
LOWER FLOOR PLAN
UNDER GARAGE

ROAD



EAST ELEVATION

Roger Sturtevant



NORTH ELEVATION

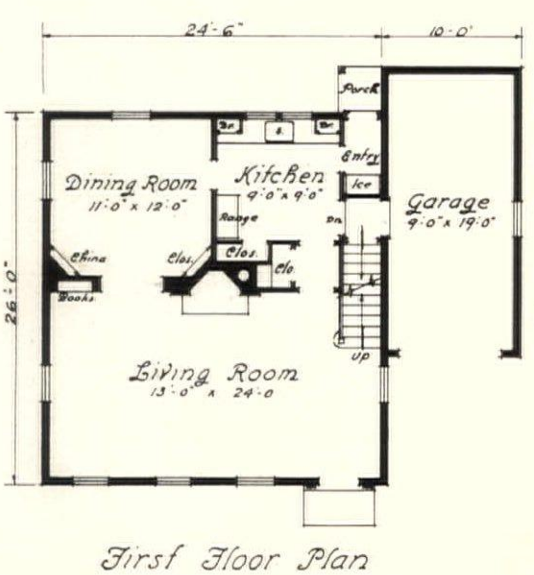
Outside walls: resawed redwood, ship lap with flush joints, whitewashed.

Roof: split redwood shakes, $\frac{1}{2}''$ to $\frac{3}{4}''$ thick, laid 10" to the weather and left untreated to be weathered a dark brown.

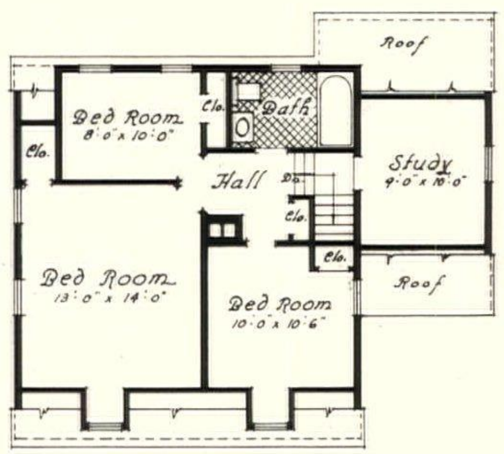
All outside trim, doors and windows painted white.

All walls and ceilings are of redwood boarding (in some rooms resawed), painted with white cold water paint to give the appearance of whitewash.

HOUSE OF THOMAS D. CHURCH
SANTA CRUZ, CALIFORNIA



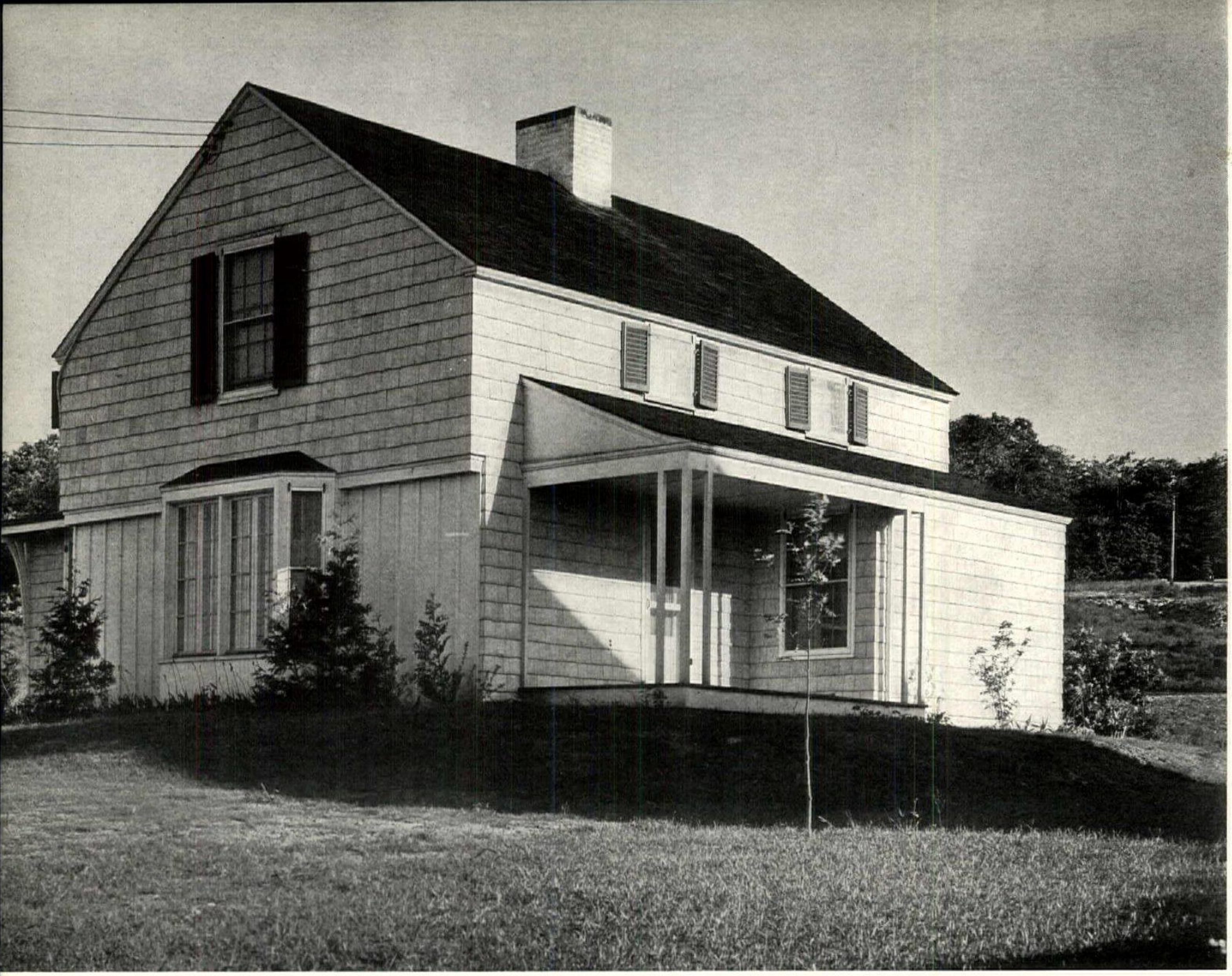
First Floor Plan

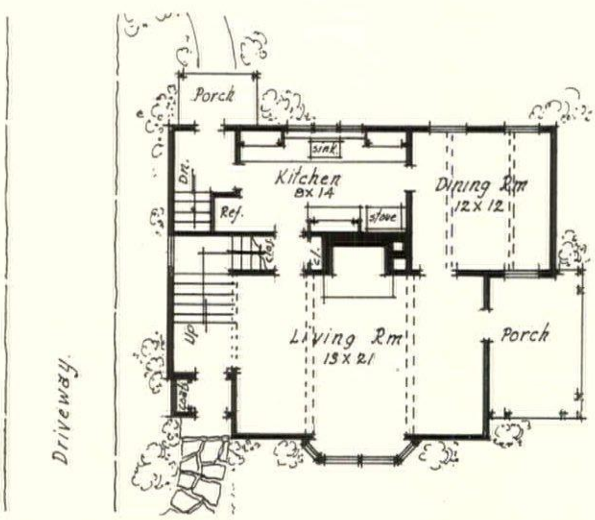


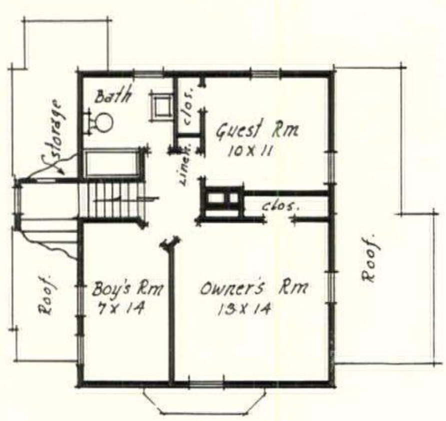
Second Floor Plan

Materials: cedar shingles 8" to weather. White pine trim. Interior finish of knotty pine on first floor and white pine on second floor and in kitchen. Random width oak floor and red oak strip floors. Warm air heating. Color scheme: white walls and trim with dark green stained roof and blinds. Cost (house completed last year): $3,215.

CAPE COD COTTAGE AT HEMPSTEAD, L. I.
MAXMILLIAN R. JOHNKE, ARCHITECT





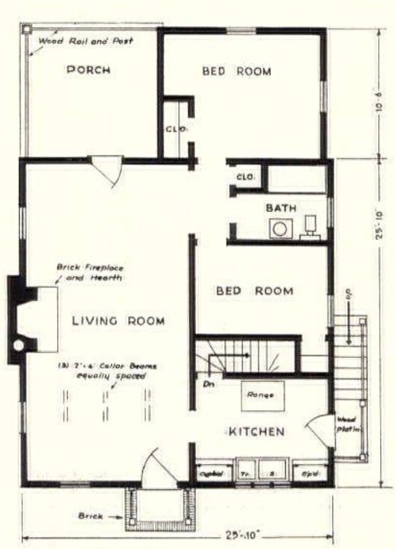


Frame construction insulated with rock wool. Exterior walls of stained white shingle and white pine boards with battens. Stained black shingle roof. Heating: hot air furnace. Cost: $7,500.

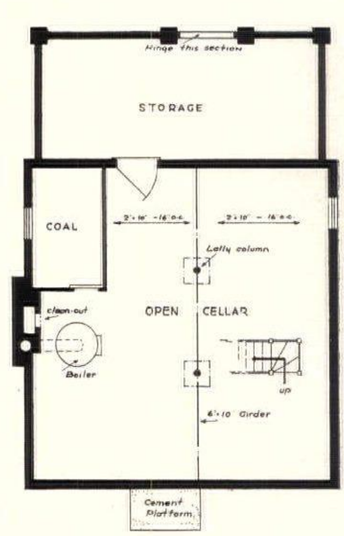
HOUSE OF KENNETH STODDARD
SYRACUSE, NEW YORK
CHARLES H. UMBRECHT, ARCHITECT

HOMELAND CO. HOUSE IN YONKERS, NEW YORK
WILLIAM CAIN, ARCHITECT

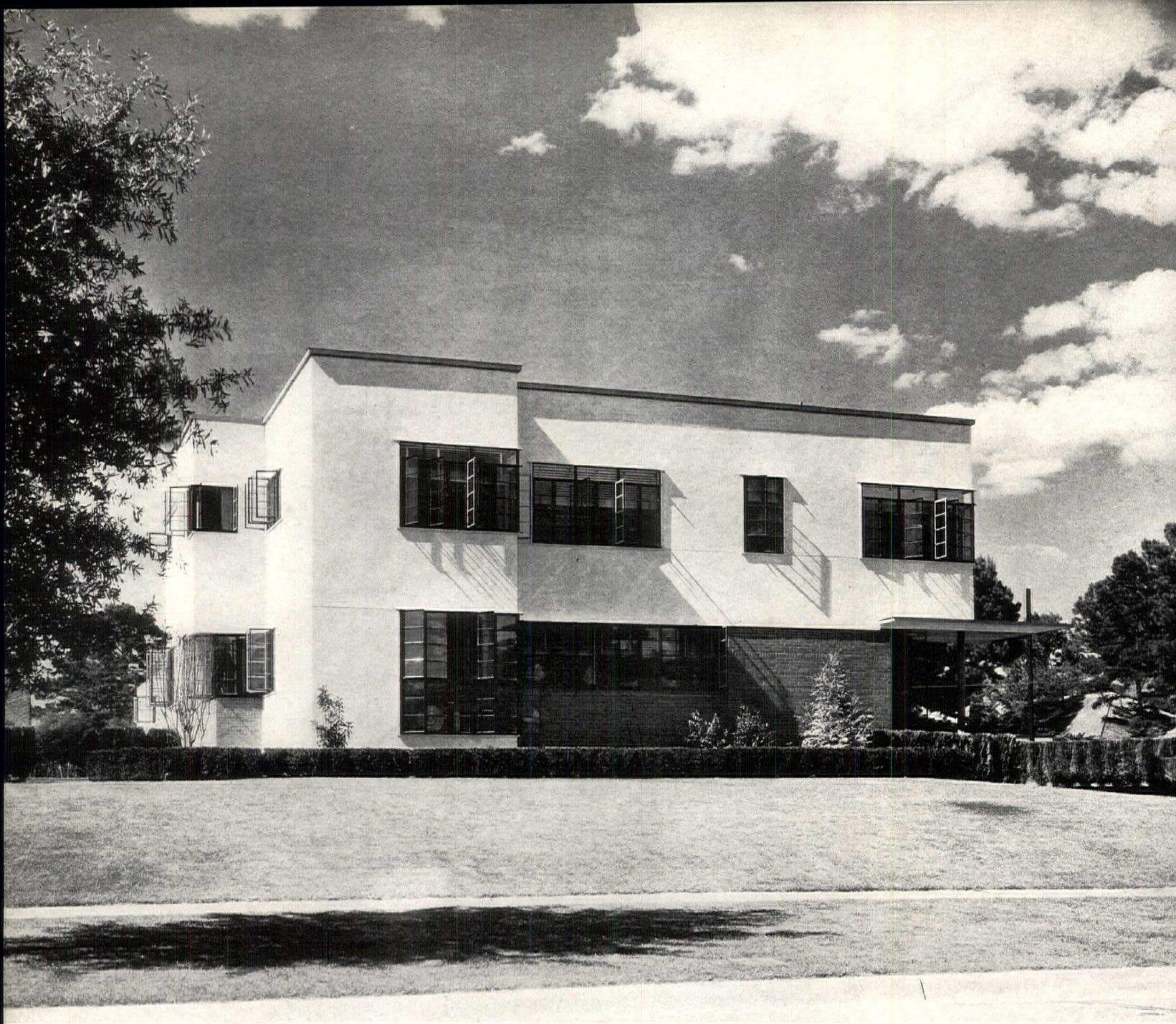
Outline specifications: concrete block foundations. Cement floor cellar. All interior walls of pine sheathing on studs. All exterior walls have Celotex on outside of studs and pine sheathing on inside. Celotex is also placed on tops of roof rafters which are left exposed. Exterior walls finished with clapboards. Wood shingled roof. Oak floors. Stained woodwork. Steam heating. Cost: $3,000.



FIRST FLOOR PLAN



CELLAR PLAN



Walls are of wood stud construction with wood sheathing, building paper, air space, and stucco on metal lath. To prevent checking, horizontal and vertical strips of sheet metal divide the stucco into comparatively small panels; these strips are secured to the sheathing and form expansion joints.

The roof is conventional flat composition type laid on sheathing supported by rafters that are trussed with ceiling joists. A feature is the absence of parapet and gutters. The cornice flashing forms a gravel guard around the edge of the roof and the two downspouts are carried to the concrete driveway which serves as a surface drain.

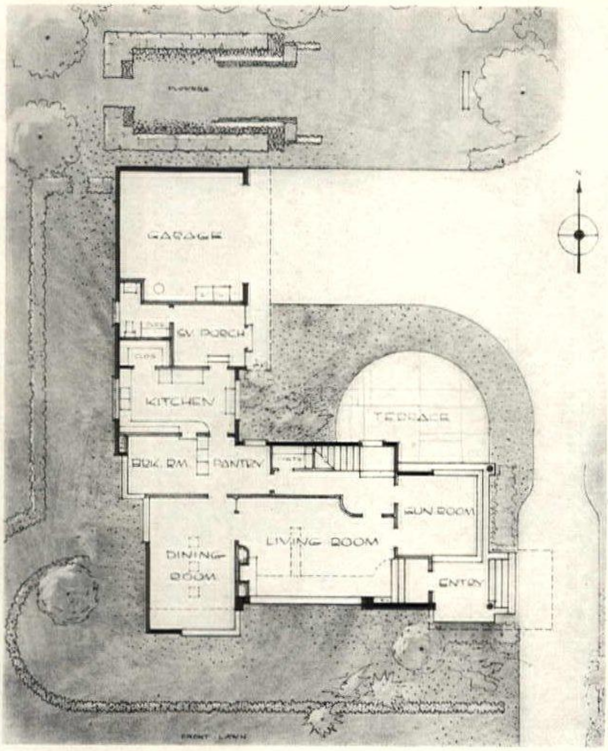
In general the floors are of wood construction and covered with rubber sheet linoleum. Windows are stock steel casements with vertical muntin bar removed. They are set in a wood frame that allows the windows to project beyond the exterior stucco surface, giving a more waterproof construction.

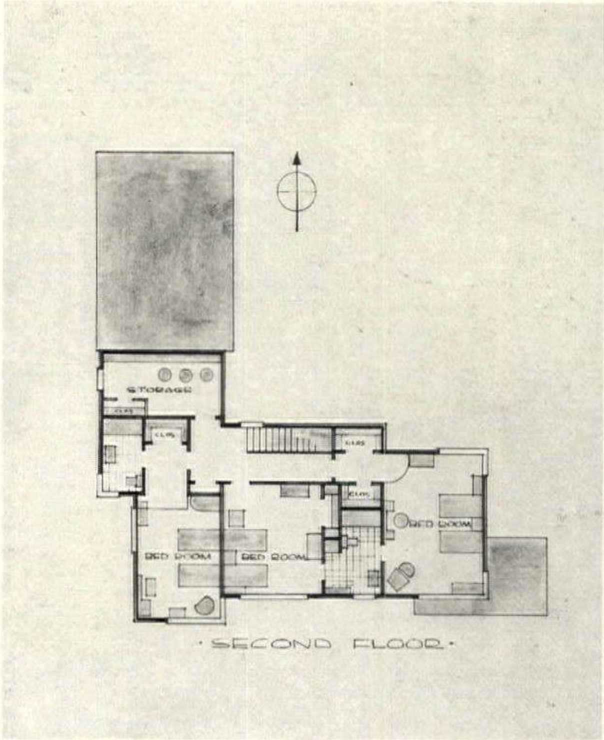
The house is heated by gas steam radiators and wall heaters. There is no basement.

Color scheme: exterior walls are of white stucco and dark red brick; sash is painted black, cornice bright red. Walls and ceilings are treated in three colors, the ceiling being the color of one of the walls. The living room and dining room are painted in two shades of neutralized orange and white. The carpet is olive green.

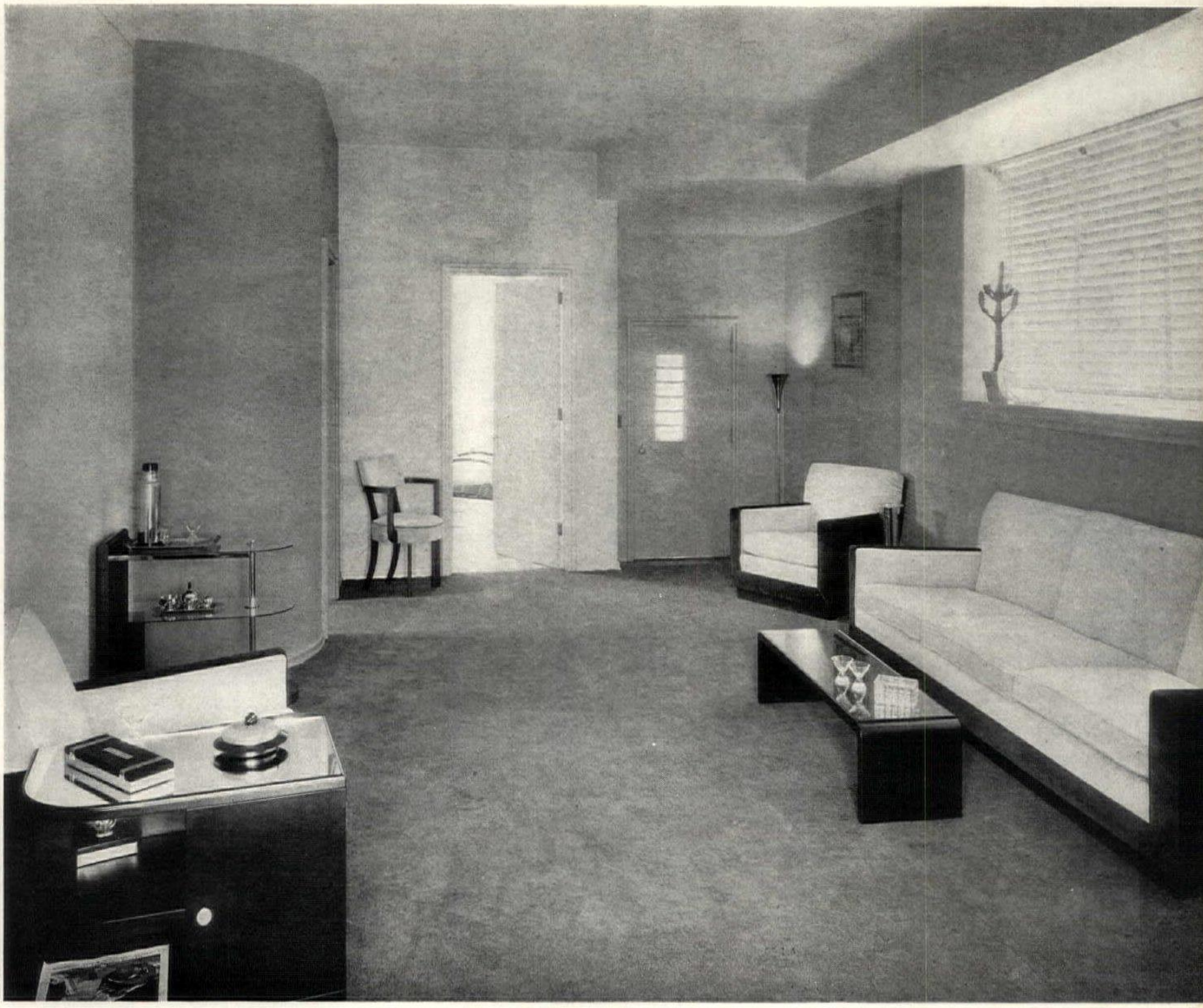
HOUSE OF I. E. WILE IN SHREVEPORT, LOUISIANA

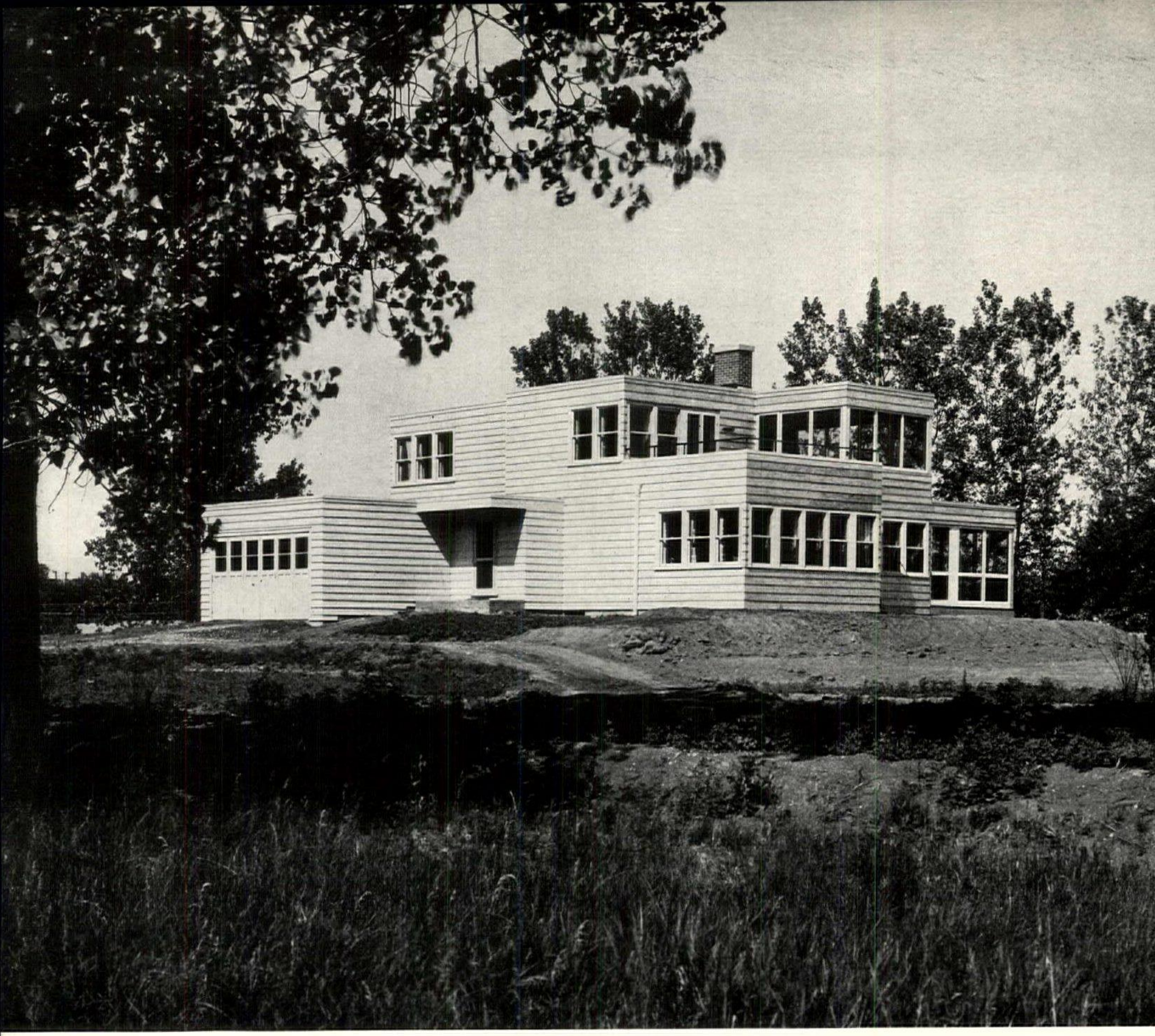
JONES, ROESSLE, OLSCHNER AND WIENER, ARCHITECTS



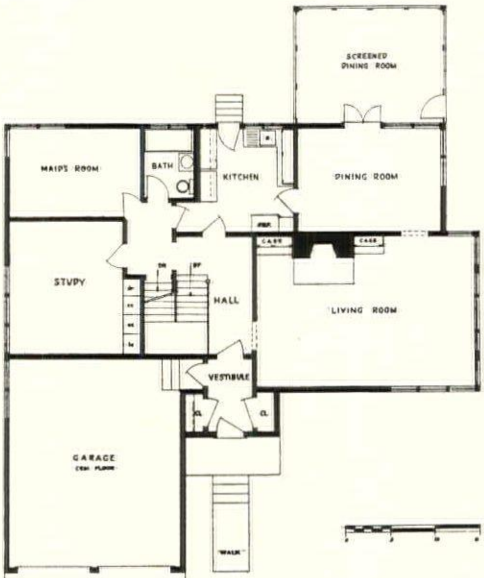


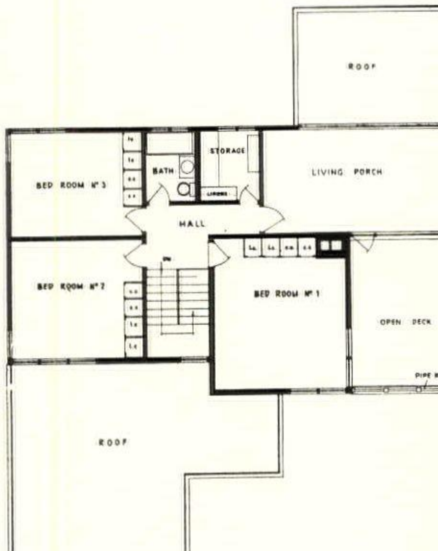
LIVING ROOM LOOKING TOWARD SUN PARLOR





Regular frame construction, using lumber of a special pre-shrunk variety.

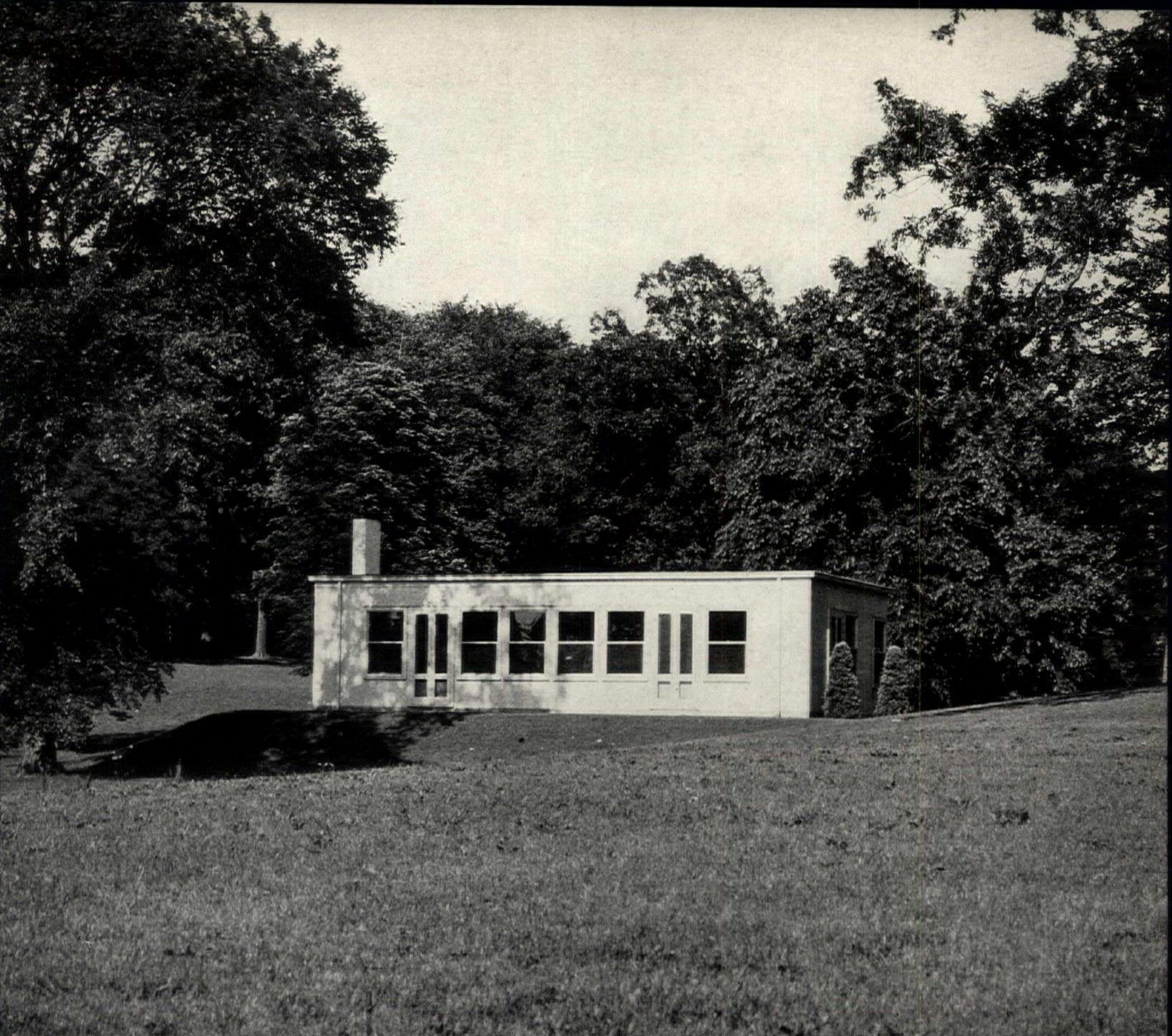


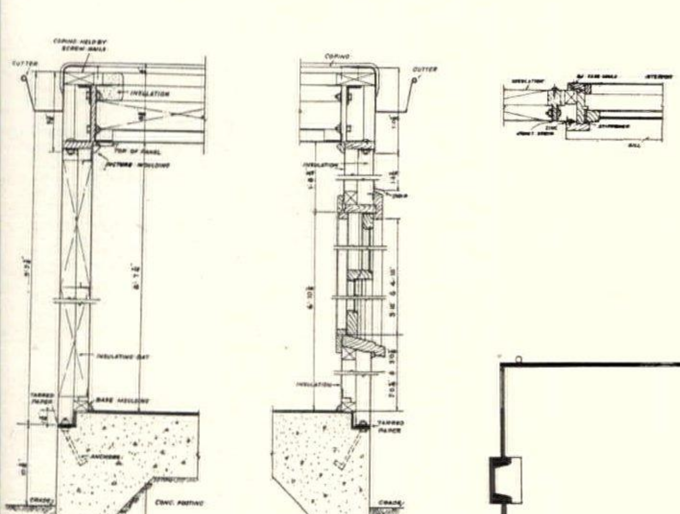


HOUSE OF S. R. LOGAN
WILLOW ROAD
NORTHBROOK, ILLINOIS

GENERAL HOUSES, INC.
HOWARD T. FISHER, ARCHT.

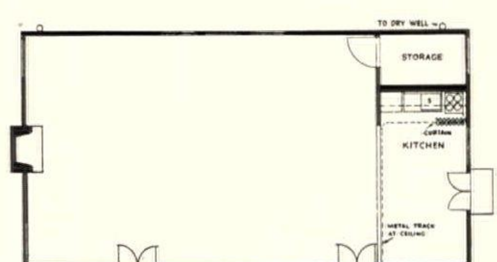
ALBERT S. BIGELOW AND
PHILIP WILL, JR., ASSOCIATES





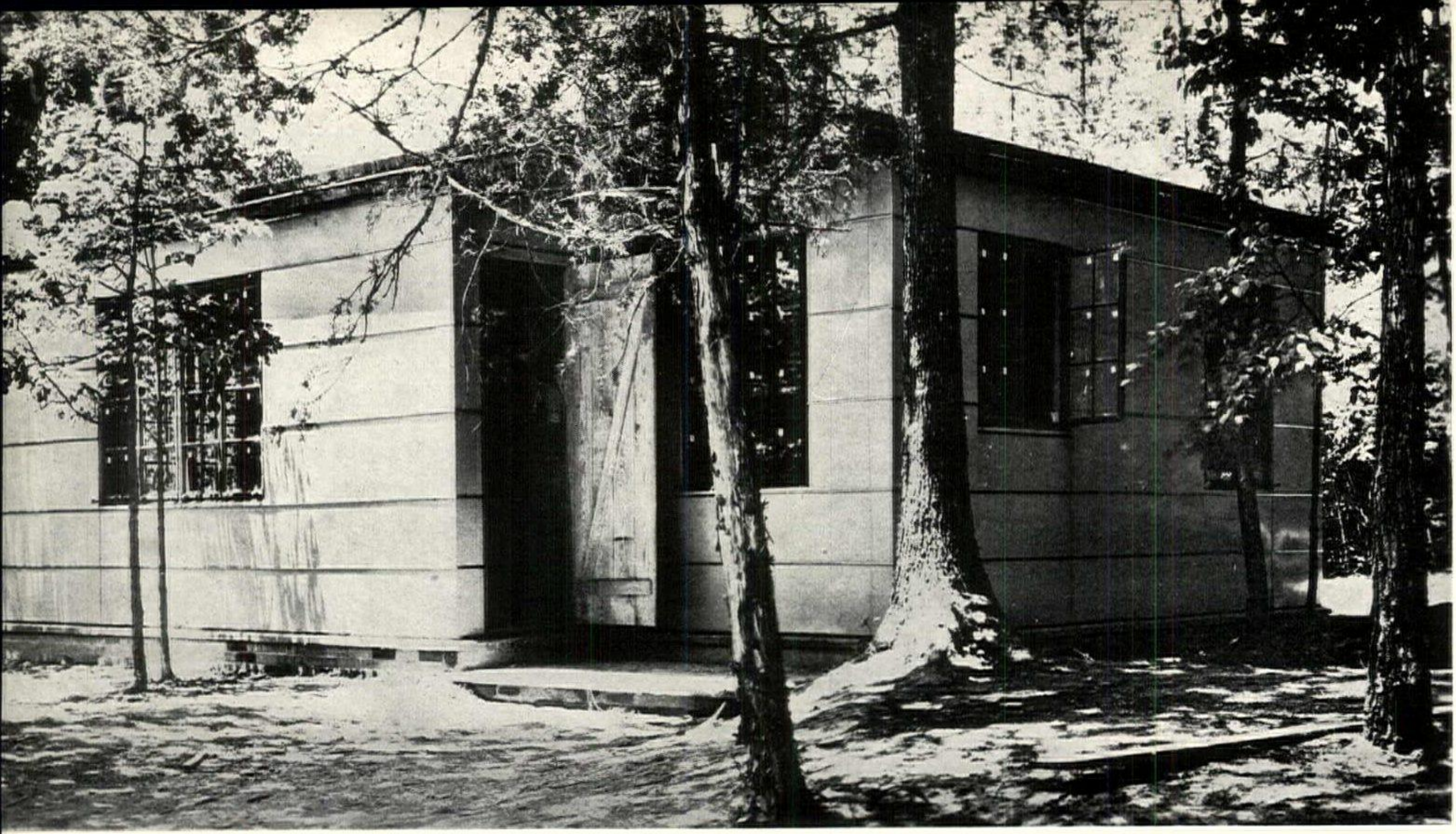
WALL CONSTRUCTION DETAILS

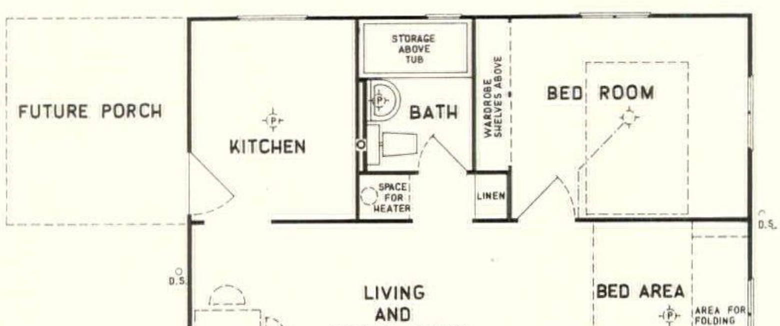
The main house on the Swift Estate is occupied by three generations. The recreation house has been erected to provide additional living room space, a place where parties could be held without disturbing other members of the family. A small kitchenette is provided for cooking and cocktail mixing. When not in use, the kitchenette is concealed behind a curtain suspended from a ceiling track. A storage closet is used for games, card tables, and the like. The prefabricated fireplace burns wood. Linoleum is laid directly over the concrete sub-floor.



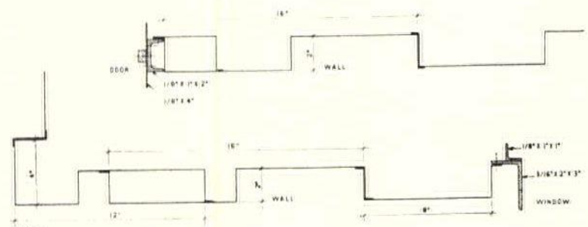
RECREATION HOUSE
FOR HUNTINGTON B. HENRY
SWIFT ESTATE
LAKE FOREST, ILLINOIS

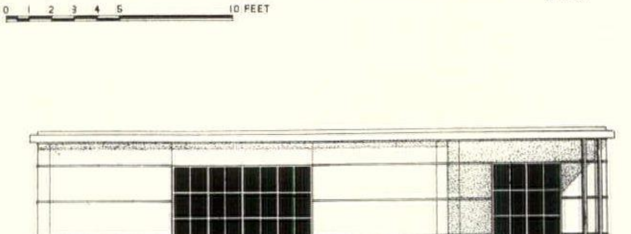
GENERAL HOUSES, INC.
HOWARD T. FISHER, ARCHITECT

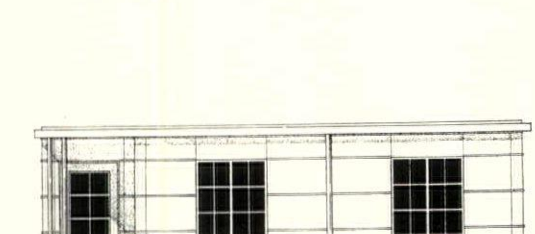




The porcelain enamel siding is practically maintenance free. It will never require painting, and can easily be cleaned with a damp cloth. The enameled iron is attached to the side of the house with a newly-invented clip-strip of stainless steel.
The house will cost $2,100. Unit electric heaters will supply heat.







ALL-STEEL HOUSE FOR TENNESSEE VALLEY AUTHORITY

NORRIS, TENNESSEE—ROBERT SMITH, JR., ARCHITECT—PAUL FREDRIC ROBSON, ASSOCIATE

BUILT BY AMERICAN ROLLING MILL CO.

CHECK LIST FOR NEW CONSTRUCTION AND MODERNIZATION OF HOUSES

INCLUDING

DIMENSIONS OF ESSENTIAL EQUIPMENT AND FURNITURE FOR THE HOUSE

PREPARED BY A. LAWRENCE KOCHER AND ALBERT FREY

GENERAL

MAKE SURE HOUSE IS STRUCTURALLY SOUND.

EXAMINE CONDITION OF FOOTINGS, FOUNDATIONS, WALLS AND HOUSE CONSTRUCTION AND DETERMINE EXTENT OF ESSENTIAL REPAIRS REQUIRED.

Houses should be securely anchored to foundations.

IS IT NECESSARY TO REPLACE SUPPORTS AND WALLS FOR STABILITY AND CONVENIENCE OF ARRANGEMENT?

ARE BASEMENT WALLS DAMP?

Remedy: grade exterior, or remove earth at outer wall face, apply asphalt paint to exterior of masonry, fill trench against wall with stone, apply cement coating with a mixture of asphalt or use R. I. W. or other approved waterproofing compound.

THE LOT SHOULD BE GRADED OR DRAINED SO THAT THERE WILL BE NO STANDING WATER.

STUDY ALL UNUSED SPACE.

RE-ORIENT ROOMS OF HOUSE.

Improve arrangement and provide more desirable exposure.

THERE SHOULD BE DIRECT SUNSHINE AT SOME TIME OF DAY IN EACH ROOM THROUGHOUT THE YEAR.

No room should have only a north exposure.

NORTH ROOMS SHOULD HAVE ADDITIONAL WINDOWS TO EITHER THE EAST OR WEST.

The north rooms would therefore be corner rooms.

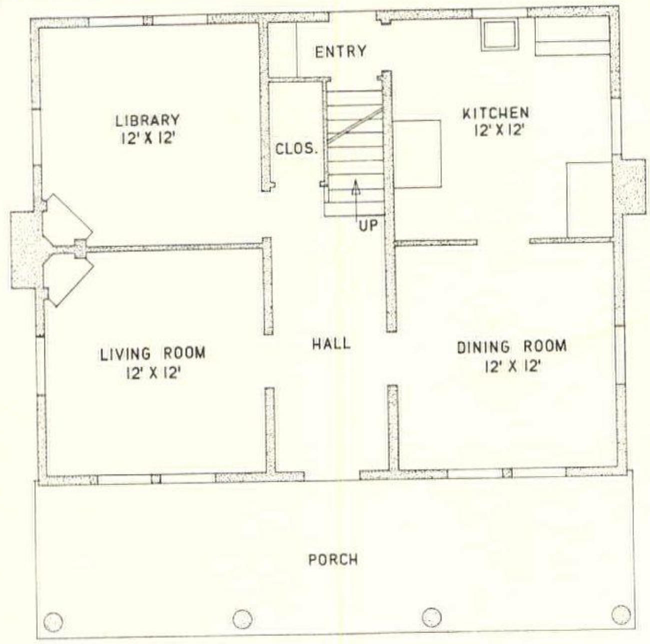
COVERED PORCHES SHOULD NOT BE SO PLACED AS TO REDUCE UNDULY THE NATURAL LIGHTING OF ROOMS.

No room should receive its sole natural light from windows opening upon covered or glassed-in porches.

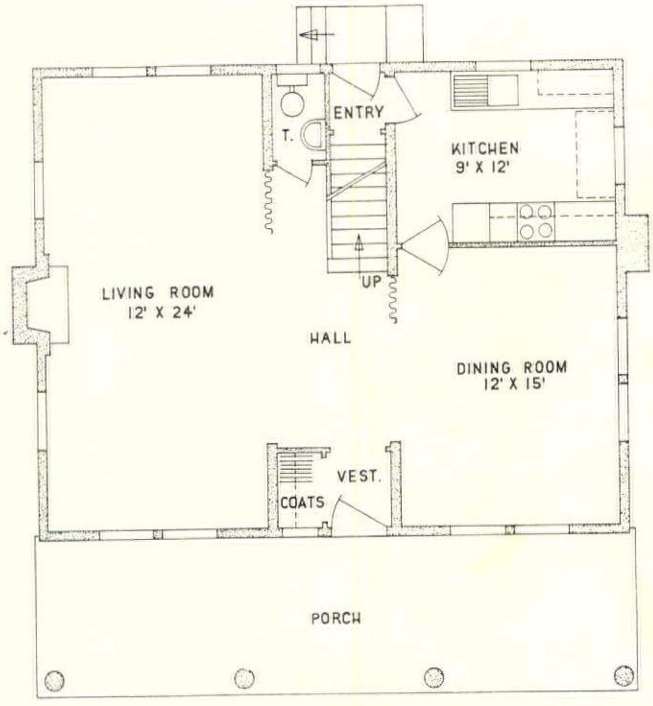
STUDY EVERY FLOOR LEVEL, AND APPROACHES.

THE ROOM ARRANGEMENT IN THE HOUSE PLAN SHOULD BE SUCH AS TO MAKE IT POSSIBLE TO AVOID WASTE MOTION.

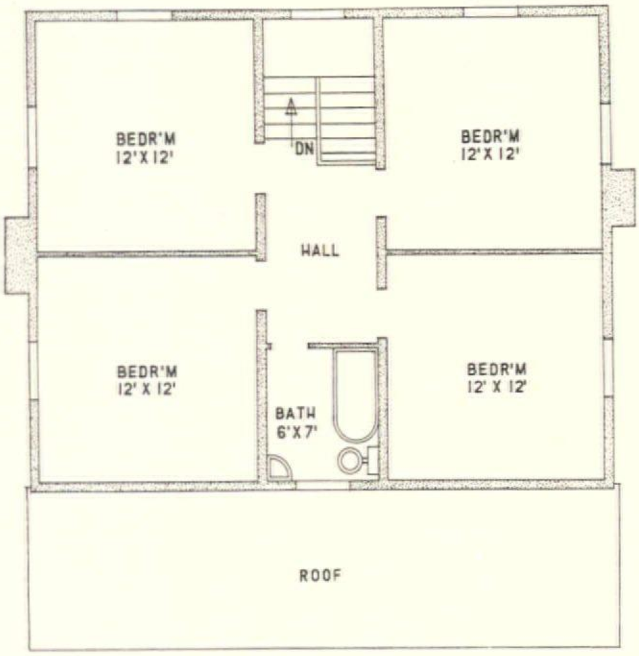
Save unnecessary steps and facilitate housework by improved arrangement. There should be relatively easy access from room to room but it should be possible also to close each room off from the others when it is desired.



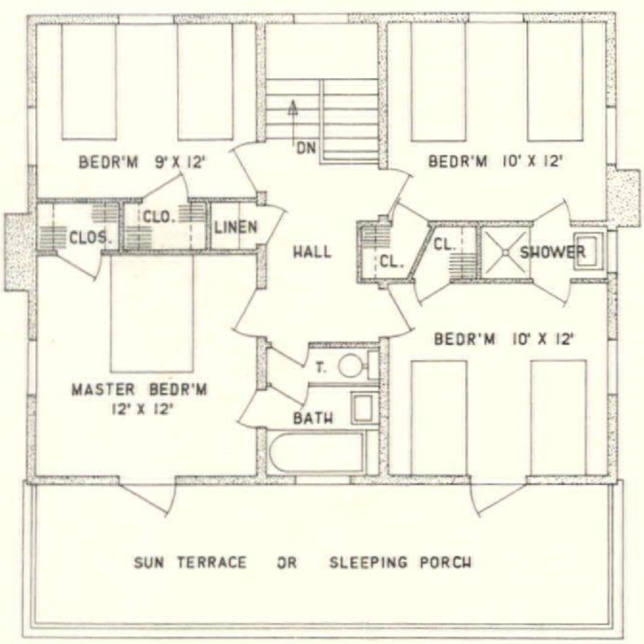
A. TYPICAL GROUND FLOOR PLAN (BEFORE ALTERATION). ROOMS TOO SMALL AND BOX-LIKE; WASTE SPACE IN KITCHEN AND HALL. THERE IS A DEPRESSING AND CONFINED CHARACTER WITH A SUCCESSION OF SMALL ROOMS. PLAN LACKING IN CONVENIENCES.



B. SUGGESTED ALTERATION OF GROUND FLOOR PLAN SO AS TO OBTAIN OPENNESS OF PLAN; GREATER USE OF ENTIRE FLOOR AREA; POSSIBILITIES FOR CONTROLLED PRIVACY; ADDITION OF VENTILATED TOILET AND CONVENIENT COAT CLOSET; KITCHEN ARRANGED SO AS TO SAVE STEPS; SMALL SHELTER OVER REAR DOOR; PASSAGE FROM KITCHEN TO DINING ROOM DOES NOT INTERFERE WITH WORK AREA AND OFFERS SUITABLE SPACE FOR SERVING TABLE; MORE PRACTICAL LOCATION OF FIREPLACE.



TYPICAL 2D FLOOR PLAN (BEFORE ALTERATION). NO DISTINCTION IN ROOM SIZES FOR DIFFERENT USES; NO BUILT-IN CLOSETS; INADEQUATE BATHROOM FACILITIES; THERE IS NO CROSS VENTILATION IN FRONT BEDROOMS; OBSOLETE PLUMBING FIXTURES.



SUGGESTED ALTERATION OF 2D FLOOR PLAN. ALL BEDROOMS HAVE ADEQUATE BUILT-IN CLOSETS; BEDROOMS ARE SUITED IN SIZE TO VARIED USE; CROSS VENTILATION ADDED FOR ALL ROOMS; BATHROOM REARRANGED WITH NEW FIXTURES AND INCLOSED TOILET FOR USE DURING OCCUPANCY OF BATH; ADDITIONAL SHOWER AND WASH BASIN BETWEEN TWO BEDROOMS; ROOF OVER PORCH ALTERED TO SUN TERRACE OR SLEEPING PORCH; LINEN CLOSET ACCESSIBLE FROM HALL; ROOM LAYOUT SUITED TO FURNITURE.

PROVIDE FOR PROPER DAYLIGHTING OF EVERY ROOM.

"Each room should have at least one window, but preferably two or more, opening directly on a permanent open space sufficient in size to admit adequate light and sunlight. The total window space should not be less than fifteen square feet in area. The tops of windows should be as near the ceiling as is consistent with good architectural design. Windows should be so constructed that they can be opened either throughout all of their area or at both top and bottom."*

ENLARGE EXISTING ROOMS.

COMBINE TWO ROOMS AS ONE.

ADD NEW ROOMS.

CONSIDER DESIRABILITY OF AN OFFICE.

ADD UNNEEDED HALL SPACE TO ROOMS OR CLOSETS.

CONVERT EXISTING ROOMS TO NEW USES.

STUDY PLAN FOR IMPROVED OR ADDED ENTRANCES.

PROVIDE TERRACE ACCESSIBLE FROM LIVING ROOM.

INCLOSE PORCH TO SERVE AS ADDITION TO LIVING ROOM.

MAKE ROOF ACCESSIBLE FOR OUTDOOR LIVING PORCH.

ADD SUN PORCH.

INSTALL WASHROOM AND TOILET ON FIRST FLOOR.

Preferably enclosed and ventilated.

COMBINE HOUSE AND GARAGE WITH SHELTERED PASSAGE TO HOUSE.

DETERMINE POSSIBILITIES FOR MAKING BASEMENT AND ATTIC MORE USEFUL.

ELIMINATE ARRANGEMENTS WHICH MAY CAUSE ACCIDENTS.

Steep or dark stairways, low ceilings, low window sills, door steps, steps without railing.

SIMPLIFY ROOF CONTOUR.

Eliminate unnecessary gables and dormers.

REMOVE DECAYED AND OBSOLETE ORNAMENTAL TRIMMINGS FROM HOUSE AND PORCHES.

*The Home and The Child. The Century Co., N. Y.

KITCHEN

REARRANGE EQUIPMENT TO CONCENTRATE WORKING AREA.
In the placing of equipment consider the preparation of food, service to dining table and rear entry.

SEPARATE PASSAGE FROM REAR ENTRANCE TO DINING ROOM FROM WORK SPACE.

PROVIDE CROSS VENTILATION.

REDUCE ROOM DIMENSIONS TO SAVE STEPS.

ADD EXTRA SPACE TO DINING ROOM.

INSTALL DOUBLE-ACTING DOORS TO DINING ROOM.

ARRANGE FOR DIRECT DAYLIGHT ON ALL EQUIPMENT AND WORK SURFACES.

BUILD IN BREAKFAST NOOK.

ADD CABINETS, SHELVES AND WORK COUNTERS.
Use local or standard cabinet units. Linoleum, stainless steel or enameled steel for work surfaces.

PROVIDE NEW PANTRY SHELVES.

INSTALL DROP TABLE.

COVER DRAIN-BOARDS AND SINK COVER
with linoleum or other sanitary material.

INSTALL BROOM, MOP AND CLEANER CLOSET.
Use local or standard cabinet.

IMPROVE UTILIZATION OF STORAGE SPACES
with adjustable shelving and hooks for orderly hanging of cooking utensils.

BUILD AN OUTSIDE VENTILATED CUPBOARD FOR KEEPING VEGETABLES.
Ventilation through wall at top and bottom shelves, screened. Shelves with holes for air circulation, or of wire mesh.

BUILD IN IRONING BOARD.
Recessed cabinet, 48″ to 56″ high, 12″ to 16″ wide.

BUILD IN ELECTRIC FAN,
particularly if kitchen is not provided with cross ventilation. Fan should be near stove in upper part of window or built in wall cabinet. 14″ square, 12″ propeller is recommended.

INSTALL MILK AND PACKAGE RECEIVER.
Steel body, two doors, outer door insulated, burglar-proof lock, wall opening 14″ wide, 12″ high.

PROVIDE SANITARY GARBAGE DISPOSAL EQUIPMENT.
Garbage receiver with foot lever.

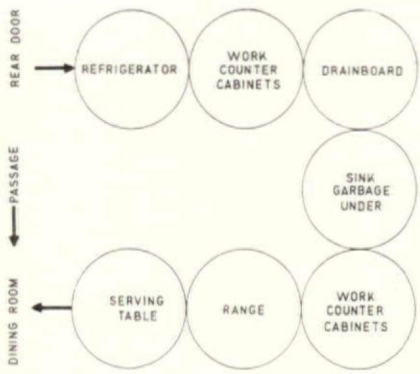
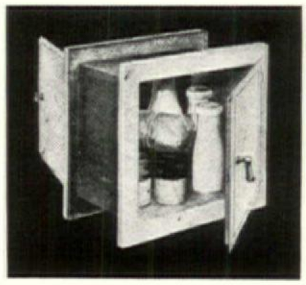
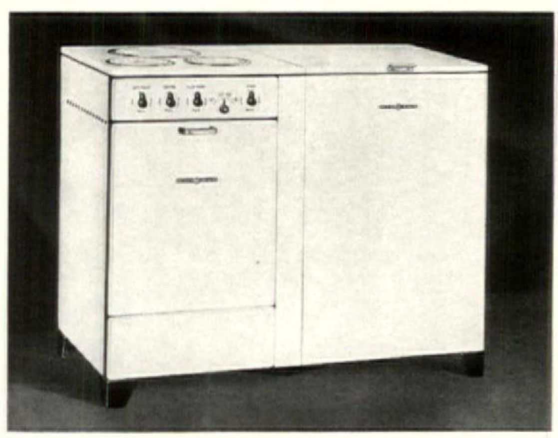


DIAGRAM OF KITCHEN, SHOWING LOCATION OF EQUIPMENT WITH RELATION TO SEQUENCE OF WORK IN FOOD PREPARATION AND SERVICE.



A MILK AND PACKAGE RECEIVER; STEEL BODY, TWO DOORS, OUTER DOOR INSULATED, BURGLAR-PROOF LOCK, WALL OPENING 14″ WIDE, 12″ HIGH.

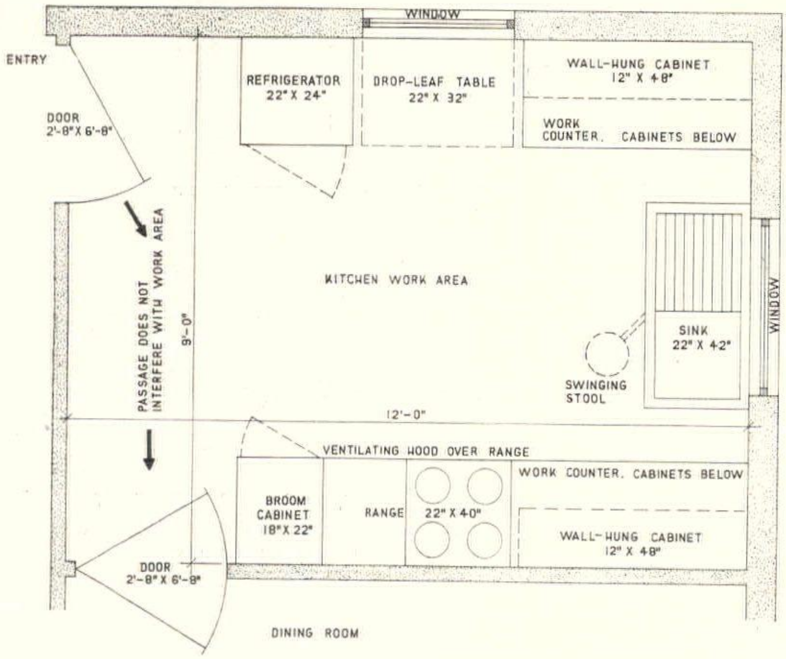
***NEW TYPE ELECTRIC FLUSH TOP RANGE,** 18″ WIDE, 24″ DEEP, 36″ HIGH. COOKING UNITS: TWO 6½″ DIAMETER, 1,000 WATTS; ONE 8½″ DIAMETER, 2,000 WATTS. OVEN UNIT: 14″ WIDE, 18″ DEEP, 18″ HIGH, 3,000 WATTS. PRICE AT THE FACTORY, $72.



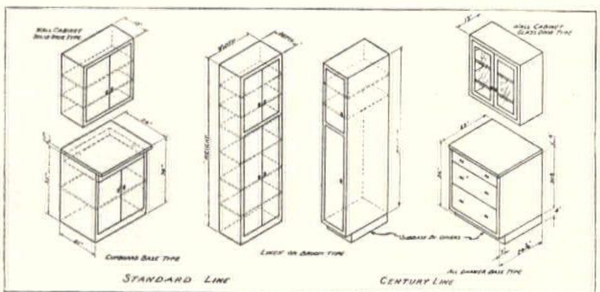
***RANGE AND REFRIGERATOR COMBINED,** 42⅛″ WIDE, 24″ DEEP, 36″ HIGH. PRICE AT THE FACTORY, $139.50.

***NEW TYPE ELECTRIC LIFT-TOP REFRIGERATOR,** 21″ WIDE, 23⅞″ DEEP, 36″ HIGH. COOLING SPACE: 16″ WIDE, 16″ DEEP, 13¼″ HIGH. TWO FREEZING TRAYS OF 10 CUBES EACH, 2 LB. OF ICE TOTAL. CURRENT CONSUMPTION, 20 TO 25 KW. PER MONTH. OPERATING TIME, 18 TO 22 PER CENT OF THE TIME WITH AVERAGE FOOD LOAD AND AVERAGE OPERATING CONDITIONS. PRICE AT THE FACTORY, $74.50.

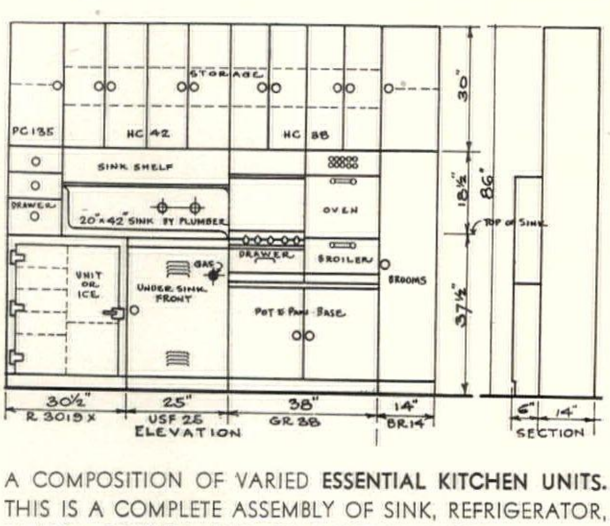
*Developed for TVA, and suitable for kitchens in any locality.



PRACTICAL KITCHEN LAYOUT ACCORDING TO SEQUENCE OF WORK IN FOOD PREPARATION AND SERVICE; KITCHEN ARRANGED SO AS TO SAVE STEPS. PASSAGE FROM KITCHEN TO DINING ROOM DOES NOT INTERFERE WITH WORK AREA. WORK COUNTERS WITH WALL-HUNG CABINETS PROVIDE MAXIMUM SURFACE FOR FOOD PREPARATION AND STORAGE SPACE.



STANDARDIZED KITCHEN CABINET UNITS. THESE UNITS MAY BE COMBINED WITH RANGE, SINK AND REFRIGERATOR AND SUIT KITCHENS OF VARIED SIZES AND ARRANGEMENTS.



A COMPOSITION OF VARIED **ESSENTIAL KITCHEN UNITS.** THIS IS A COMPLETE ASSEMBLY OF SINK, REFRIGERATOR, RANGE, BROILER AND STORAGE CABINETS IN MOST COMPACT FORM.

INSTALL PANTRY SINK FOR WASHING DISHES.

REPLACE OLD RANGE WITH NEW ONE.
Gas or electric. May be combined with cabinets or refrigerator unit.

PROVIDE ILLUMINATION OVER RANGE AND SINK.

ADD A CABINET NEAR THE RANGE
for kettles, pans and other cooking utensils.

CONSIDER NEW LOCATION FOR REFRIGERATOR.

INSTALL AN AUTOMATIC REFRIGERATOR.
Electric or gas; may be combined with cabinets.

ARRANGE THE SINK WITH DRAIN-BOARD TO THE LEFT AND FLAT SURFACE TO THE RIGHT.

PROVIDE A DUMB-WAITER.
Sanitary metal or wood cabinet and doors, hand-operated.

ADD A SERVING TABLE OR WHEEL TABLE.

INSTALL OUTSIDE ICE-DELIVERY DOOR.

PROVIDE DISH STORAGE
accessible from kitchen and dining room to save steps.

LAY A WATERPROOF AND RESILIENT FLOOR.
Linoleum; rubber.

APPLY LIGHT, WASHABLE FINISH TO WALLS.
Tile; washable fabric; enamel paint.

PROVIDE A MARBLE SLAB FOR PASTRY MAKING
Recessed in work surface or table.

CHECK SAFETY LOCK FOR REAR DOOR.

BUILD IN ELECTRIC CLOCK.

BUILD IN CAN AND BOTTLE OPENERS.

PROVIDE ATTACHMENT FOR MEAT CHOPPER.

DINING ROOM

ALTER SIZE OF ROOM TO NEEDS.
Consider number of persons at table, furniture and space to circulate.

CHECK ON DESIRABILITY OF EXPOSURE AND VIEWS.
Relocate or group windows. East or west exposure is preferable for dining.

PLACE DINING TABLE SO AS TO RECEIVE AMPLE WINDOW LIGHT.
Tentative standards of the International Congress on Illumination, held at Lake Saranac in 1928, suggest that at least some of the sky should be visible from table height over a considerable part of the room's area and that sunlight should be able to penetrate to at least half of the depth of the room.

REPLACE IMPRACTICAL FURNITURE.
Use practical furniture having smooth surfaces, of moderate bulk and of light weight.

IMPROVE RELATION TO KITCHEN.
Shortest traveling distance. Double swinging doors.

ARRANGE CHINA CABINETS NEAR KITCHEN DOOR.
Wall-hung types are convenient.

PROVIDE CONVENIENT ACCESS TO LIVING ROOM.
Increase width of entrance.

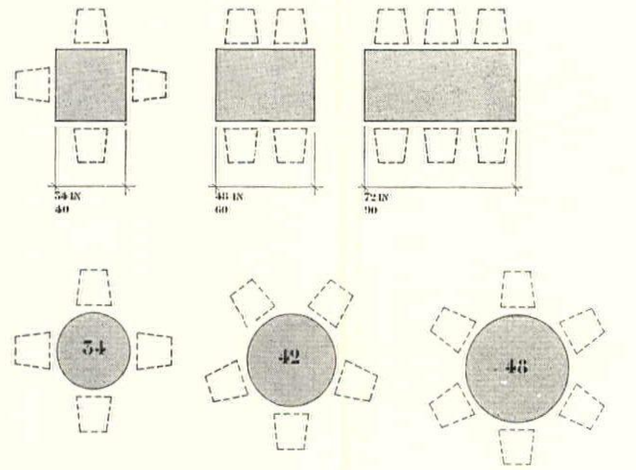
ADD A DINING PORCH ACCESSIBLE FROM KITCHEN.
Glass at side as protection from winds or completely inclosed with removable windows to increase number of days porch can be used.

LAY A LINOLEUM FLOOR.
Tan or gray shades that do not show steps; plain. Use felt under linoleum.

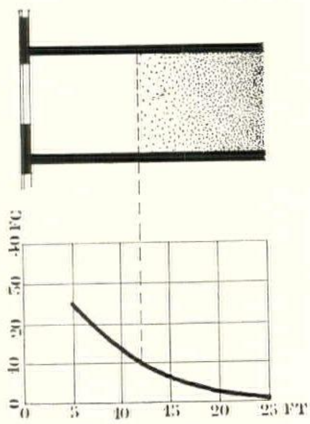
REPLACE WOOD FLOOR OR SCRAPE EXISTING FLOOR.
Maple, oak, birch.

APPLY PRACTICAL FINISH TO WALLS IN CHEERFUL COLORS.
Washable; dust shedding. Paint or fabric in light shades of tan, green, blue or rose. Light colored wood.

MAKE CEILING SMOOTH AND LIGHT IN COLOR TO IMPROVE ILLUMINATION.
Remove plaster ornaments, refinish white or cream.



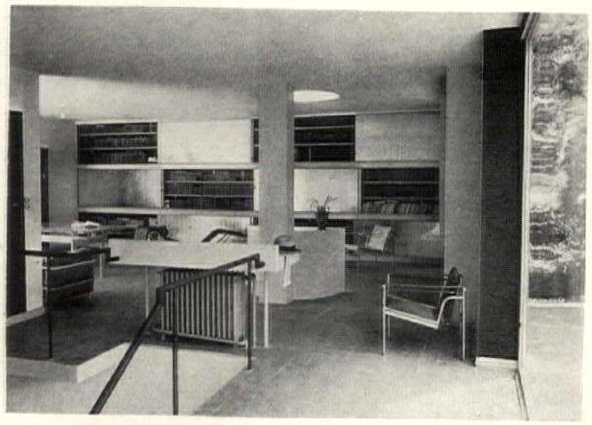
DINING TABLES OF STOCK SIZES, SHOWING SEATING POSSIBILITIES. THE TABLE DIMENSIONS, FURNITURE AND SPACE FOR SERVICE DETERMINE THE DINING ROOM SIZE.



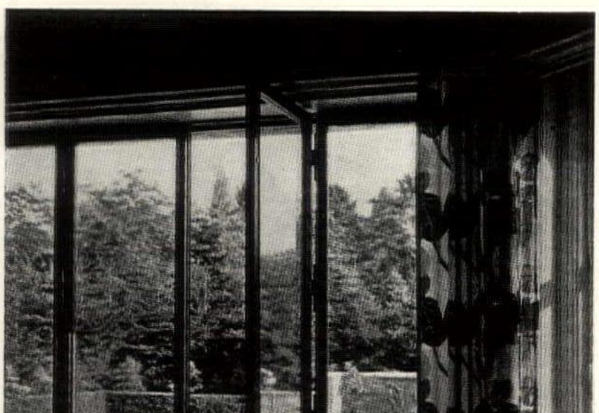
A DIAGRAM SHOWING **HOW MUCH LIGHT IS ADMITTED BY WINDOW,** AN AID FOR DETERMINING WINDOW HEIGHT. A WINDOW ADMITS SATISFACTORY DAYLIGHT IN ROOM INTERIORS APPROXIMATELY TWICE THE WINDOW HEIGHT.

A COMBINED LIVING AND DINING ROOM. LIGHT IS CONTROLLED BY VENETIAN BLINDS. WINDOWS ARE STEEL CASEMENTS OF FIXED AND OPENING TYPES. FLOOR LAID WITH CORK IN 18" x 24" PIECES, NO BORDERS.

SECTIONAL FURNITURE (BOOK SHELVING WITH DESK), DRAWERS, CABINETS; EASY TO KEEP CLEAN AND TRANSPORT; CAPABLE OF VARIED ARRANGEMENTS.



A REMODELED GUEST HOUSE. A GARDEN HOUSE WAS CONVERTED TO RESIDENCE USE; WALL AND CEILING LIGHT ADDED; WALLS SEVERELY PLAIN; BOOKCASES WITH DOORS, SLIDING IN PAIRS, OF SHEET ALUMINUM.



LIVING ROOM THAT OPENS BY GLAZED DOORS DIRECTLY TO GARDEN.

LIVING ROOM

MAKE POSSIBLE COMBINATION OF LIVING AND DINING ROOMS FOR ENTERTAINING.

Separate with curtain, folding or sliding partition. "The downstairs common rooms include the living room, dining room and also the parlor and music room. When these are provided, they may be designed to open into one another so as to facilitate the entertainment of guests. Also, however, it should be possible to close off each room so that any member of the family may entertain personal guests in privacy."*

ELIMINATE UNNECESSARY DOORS.

Combine rooms for living with hall.

GROUP WINDOWS FOR OUTLOOK AND UNBROKEN WALL-SPACE.

Use folding type, or type presenting little obstruction of frames. Sunset view desirable. Consider possibilities for screening and cleaning.

REARRANGE FURNITURE FOR CONVENIENCE AND EASE.

Eliminate unnecessary pieces. Consider daylighting, lines of traffic and free space for entertaining.

BUILD IN NEW FURNITURE.

REPLACE OLD CUMBERSOME FURNITURE WITH LIGHT, FOLDING TYPES.

ADD BUILT-IN BOOKCASES.

Build from floor to ceiling or recess in wall at convenient height. Provide adjustable shelving.

BUILD A PORCH RELATING TO THE LIVING ROOM.

Southern exposure, facing flower garden or view. Avoid darkening of living room by building porch on side where most windows are located.

LAY A NEW FLOOR OR CARPET.

Linoleum, carpet or hardwood. Plain.

INSTALL LIGHT COLORED, FLUSH WOOD PANELING.

White pine, birch, gum, of plywood or flexwood.

IMPROVE ACOUSTICS OF CEILING.

Acoustic felt; tile or insulation board.

PROVIDE STORAGE OF WOOD CONVENIENT TO FIREPLACE.

Dimension box to log sizes of 16", 24", 30" and 48".

MODERNIZE TRIM AND DOORS, ELIMINATING DUST-CATCHING CORNERS.

Use flush type steel or wood moldings.

REPLACE OLD, UNHANDY HARDWARE.

Use smooth, simple kind, chromium-plated.

MAKE NEW SHADES HARMONIZE WITH COLOR SCHEME.

Washable, non-fading material preferred.

IMPROVE DAYLIGHTING BY ELIMINATION OF EXCESSIVE AND DARK CURTAINS.

Use light pastel color for curtains that harmonize with walls.

INSTALL OUTSIDE AWNINGS FOR COOLNESS.

Spring roller type for easy operation and neat appearance. Install 2"–3" off wall to permit escape of heated air. Bright red, blue or green add cheerful note to house.

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*White House Child Conference Recommendations. See The Home and The Child. The Century Company, New York.

BATHROOM

BUILD ADDITIONAL BATHROOM OR SHOWER BETWEEN BEDROOMS.
Minimal sizes of: shower with lavatory, 2′-9″ x 6′-10″; room with tub, lavatory, toilet, 5′-0″ x 5′-0″.

SEPARATE BATHROOM FROM TOILET FOR CONVENIENCE.
6′-0″ high partition between toilet and other fixtures.

REPLACE OLD FIXTURES WITH MODERN BUILT-IN TYPES.
Built-in bathtub, shower; colored fixtures; chromium fittings.

PROVIDE SANITARY TOILET SEAT.
Seamless sheet covering.

INSTALL SHOWER STALL OR CURTAIN IN TUB.
Shower sizes, 32″ x 32″, 34″ x 34″, 36″ x 36″. Curtain—water repellent, mildew resisting, crack-proof, shrinkproof.

LAY WATERPROOF FLOORING.
Tile, terrazzo, linoleum, rubber, cork.

PROVIDE BATHROOM STOOL WITH CORK SEAT.
Height, 13½″.

CHECK FOR PIPE LEAKS, CLEAN-OUT FACILITIES, DRAINS AND TRAPS.

ADD SHUT-OFF COCKS OR VALVES.
For control of water in bathroom. Brass or copper, automatic pressure relief.

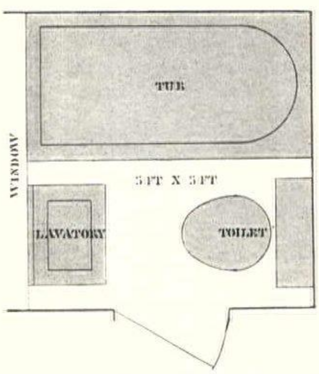
PROVIDE DRESSING ROOM FACILITIES.

PROVIDE TOWEL RACK.
Chromium, accessible from wash basin.

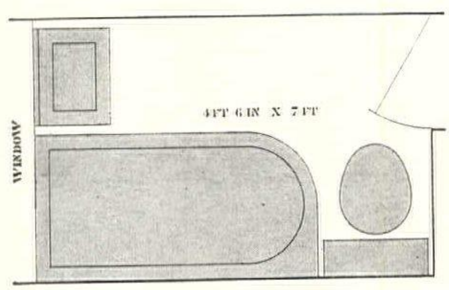
INSTALL SANITARY WINDOW SILL.
Glass or vitreous slab.

PROVIDE CABINET FOR BATHTUB AND SHOWER VALVES.
Access door with space for repair.

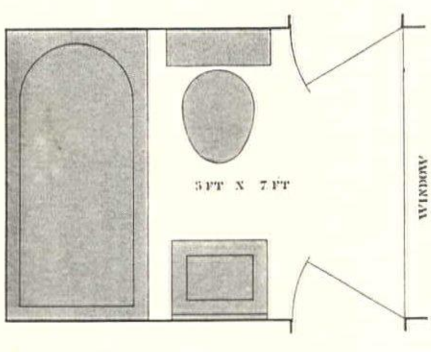
REPLACE NOISY TOILET FLUSH SYSTEM WITH NEW SILENT TYPE.



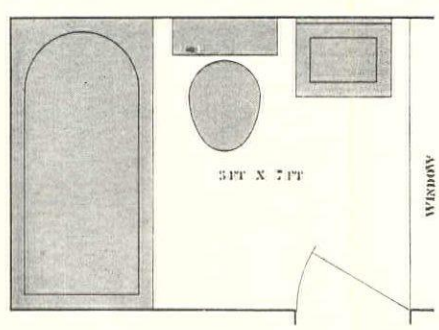
SMALLEST POSSIBLE BATH ROOM. SINGLE DOOR ENTRY (25 SQUARE FEET).



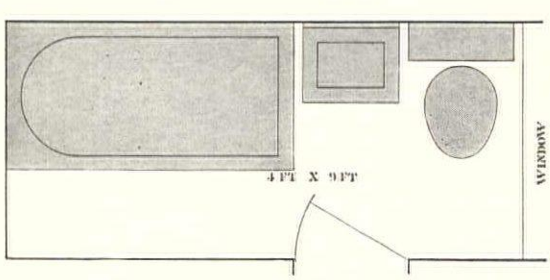
BATHROOM OF NARROW ARRANGEMENT SUITED TO ACCESS FROM HALL (31½ SQUARE FEET).



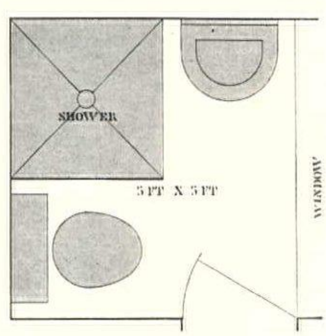
BATHROOM OF MINIMUM SIZE BETWEEN TWO ROOMS (35 SQUARE FEET).



SPACIOUS ARRANGEMENT. SINGLE DOOR ENTRY (35 SQUARE FEET).

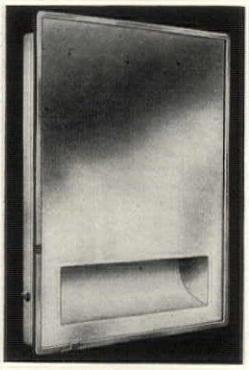


NARROWEST PRACTICABLE ARRANGEMENT TO PARALLEL DEEP ROOMS. FIXTURES ARE IN ROW FOR ECONOMY. (36 SQUARE FEET.)

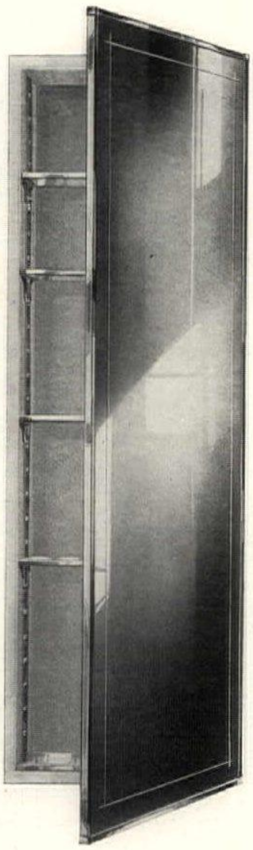


ARRANGEMENT OF MINIMUM SIZE WITH SHOWER (25 SQUARE FEET).

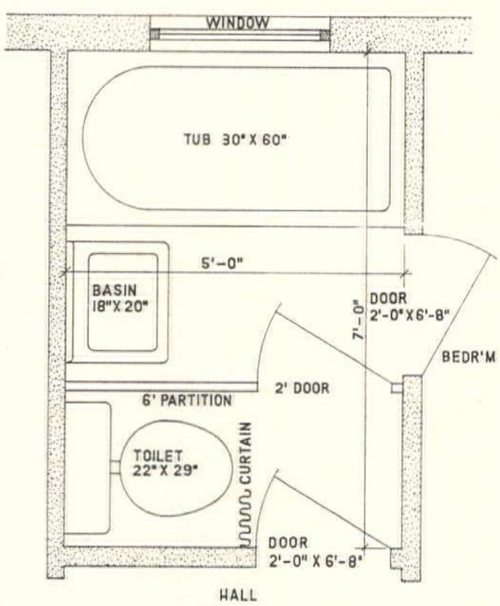
TYPICAL PLAN ARRANGEMENTS FOR THE BATHROOM.



MEDICINE CABINET WITH BUILT-IN INDIRECT LIGHT FROM BELOW. MIRROR DOOR, NARROW CHROMIUM-PLATED FRAME.



LINEN CABINET OF BUILT-IN TYPE. FULL SIZE MIRROR IN DOOR FRAME. ADJUSTABLE SHELVES. SIZES, 16″ TO 18″ WIDE, 60″ HIGH, 4″ TO 12″ DEEP.



IMPROVED BATHROOM LAYOUT. SEPARATION OF TOILET FROM BATHROOM INCREASING CONVENIENT ENTRY TO TOILET; SIDE WINDOW WOULD BE PREFERRED TO OVER-TUB LOCATION WHERE POSSIBLE; THIS BATHROOM IS ACCESSIBLE FROM HALL AND ADJOINING BEDROOM.

REFINISH WALLS WITH TILE OR OTHER SANITARY MATERIAL.
Washable fabric, vitreous slabs, phenolic resin fibre sheets.

INSTALL RECESSED MEDICINE CABINET WITH MIRROR AND LIGHT.
Built-in or adjustable lights at sides or bottom. Sizes, 16″ to 20″ wide, 20″ to 30″ high, 3″ to 4″ deep.

PROVIDE BUILT-IN SHELVING.

BUILD IN LINEN CABINET WITH MIRROR DOOR.
Sizes, 16″ to 18″ wide, 60″ high, 4″ to 12″ deep.

ADD WARDROBE OR HOOKS.
Porcelain enamel, or chromium-plated.

INSTALL TRANSLUCENT GLASS IN WINDOW.
Ribbed, squared, etched, smooth-rough. Complete diffusion.

RECESS SOAP HOLDERS.
Vitreous china, matched with tiles.

INSTALL LIQUID SOAP SUPPLY.

PROVIDE A TUB HAND SUPPORT.
Porcelain enamel; chromium-plated; cork covered for insulation.

REPLACE HANDLES AND OUTLETS WITH SMOOTH, STAINLESS TYPES.
Chromium-plated.

ADD WASHROOM WITH TOILET ON FIRST FLOOR.
Minimum size, 3′-0″ x 4′-6″.

INSTALL A CLOTHES CHUTE.
Round, 12″ to 24″ diameter. Inside, glass enameled metal, or aluminum, flush inside.

BUILD IN LAUNDRY HAMPER.

PROVIDE HOT WATER BAG HOOK.

INSTALL RAZOR BLADE DISPOSAL.

BUILD IN SCALE.
Flush with floor, dial on wall.

INSTALL SHOWER WITH ENTRANCE FROM HALL TO SUPPLEMENT BATHROOM.
Of a group of 637 urban families which discussed bathroom satisfactions and dissatisfactions, 245, or 45 per cent, want a second bathroom.

PROVIDE ELECTRIC HEATER (BUILT-IN).
Chromium-plated reflector, adjustable heating units 9″ x 9″ and 13″ x 13″, 4″ deep.

INSTALL EQUIPMENT FOR INSTANTANEOUS HOT WATER SUPPLY.
Gas or electric; copper boiler.

PROVIDE SHOCK-PROOF ELECTRIC FIXTURES.

ADD TOWEL RODS.
Porcelain enamel; glass; chromium-plated.

REPLACE SHOWER HEAD
with type adjustable for different flows and of self-cleaning construction. Finished in chromium plate.

PLUMBING

INSTALL AUTOMATIC WATER PUMP.
Quiet, automatic operation; quick suction pick-up; electric or gasoline, automatic lubrication.

REPLACE CORRODED PIPING WITH MODERN, DURABLE TYPE.
"With galvanized pipe, it is quite likely that after a period of, say, 15 years the area may be decreased as much as 25 per cent; if the water contains lime, it is possible that 50 per cent of the area may be lost."
Noiseless installation; copper or brass pipe; flexible tubing.

INSULATE WATER PIPES AGAINST FREEZING.
Moulded cork coverings; fibre felt; asbestos-cement; hair felt.

PROVIDE WATER-SOFTENING SYSTEM.
Simplified, quick regeneration, corrosion-proof tank.

REPLACE RUSTY TANK WITH STAINLESS TYPE.
Copper; stainless steel.

PROVIDE LAUNDRY TUBS.
Porcelain; porcelain enamel; slate; concrete.

INSTALL REFRIGERATOR DRAIN.
Non-clog, odorless type with safety trap.

BUILD PERMANENT DRAINBOARD AT KITCHEN SINK OR REPLACE WITH COMBINATION.
Stainless metal drainboard.

ADD NEW MIXING FAUCETS.
Chromium-plated, with soap holder.

BUILD IN ELECTRIC DISHWASHER.
Combined with kitchen sink.

REPLACE WASHERS IN LEAKY FAUCETS.

REPAIR DEFECTIVE VALVES IN WATER CLOSETS.

INSTALL VENT PIPES.

BUILD IN NEW BATHTUB.
30" to 36" wide, 54" to 72" long.

MATCH NEW FIXTURES WITH COLOR SCHEMES.
White, black, cream, blue, green, flesh, orchid.

PROVIDE LAVATORIES IN BEDROOMS.
15" x 18" to 20" x 24".

BUILD IN A SHOWER.
Sizes, 32" x 32", 34" x 34", 36" x 36".

CONVERT LARGE CLOSET INTO EXTRA TOILET OR SHOWER ROOM.

CHROMIUM-PLATE OLD NICKEL-PLATED FAUCETS AND FITTINGS WHICH ARE UNSIGHTLY.

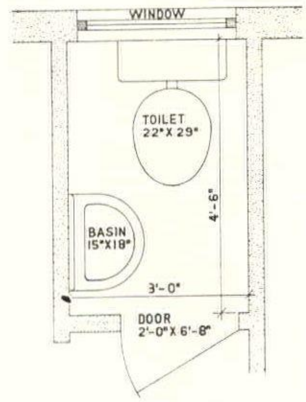
INSTALL ADDITIONAL SILL COCKS FOR WATERING GARDEN. OR FOR WASHING CAR.
Brass or bronze.

INSTALL LAUNDRY MACHINE.
Electric washer and wringer; centrifugal extractor.

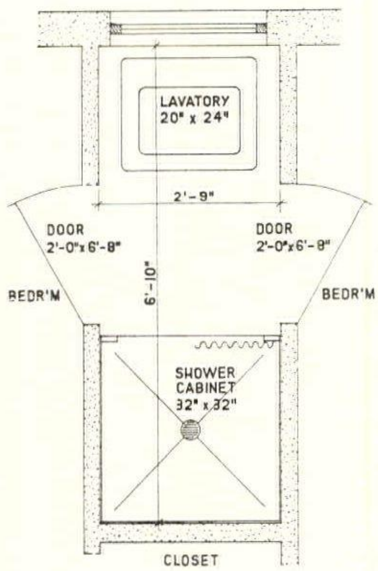
IMPROVE SEWAGE DISPOSAL SYSTEM.
Airtight septic tank of reinforced concrete or corrosion-proof iron. Capacity of at least one day's sewage flow. Facilities for cleaning.

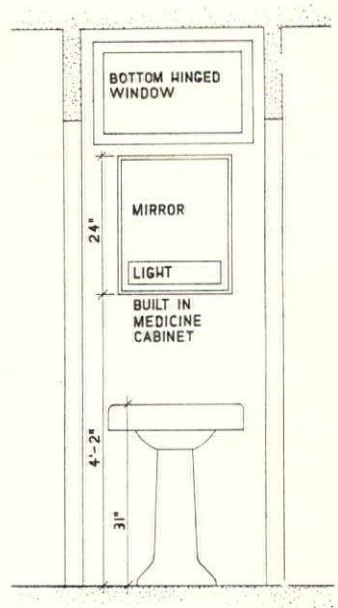
PROVIDE AUTOMATIC SHOWER MIXER.

ADD LAVATORY IN HALLWAY.



WASHROOM OF SMALL SIZE FOR LOCATION ON GROUND FLOOR OR BASEMENT. THE ADDITION OF A GROUND FLOOR WASHROOM AND TOILET WILL BE A MOST FREQUENT AND DESIRABLE IMPROVEMENT TO THE MODERNIZED HOUSE. SPACE FOR THIS ADDITION CAN OFTEN BE FOUND IN HALLWAYS, UNDER STAIRS OR CONVERTING CLOSET OR PANTRY TO THIS USE.

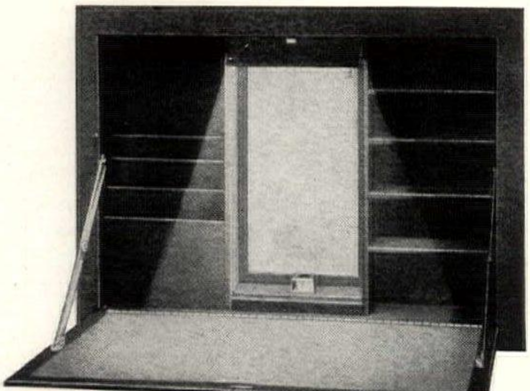




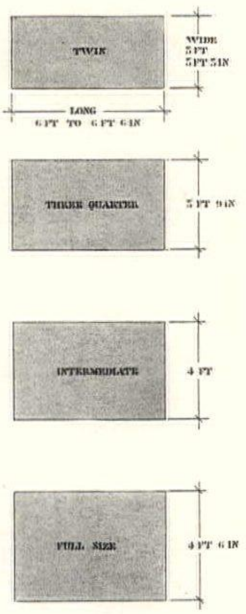
PLAN OF SHOWER AND LAVATORY COMPARTMENT BETWEEN BEDROOMS REQUIRING MODERATE FLOOR SPACE; SUITABLE TO CONVERSION OF EXISTING CLOSET; SHOWER IS A SELF-CONTAINED CABINET OF STANDARD SIZE ON THE MARKET; REQUIRES ONLY 19 SQUARE FEET.

ELEVATION OF LAVATORY COMPARTMENT SHOWN IN PLAN AT LEFT; CORRECT LOCATION OF FIXTURES AND WINDOW; PRACTICAL HEIGHTS FOR FIXTURES: LIGHTING OF PERSON FACING MIRROR IS EITHER BY WINDOW ABOVE OR BY ELECTRIC REFLECTOR AT BASE OF MIRROR.

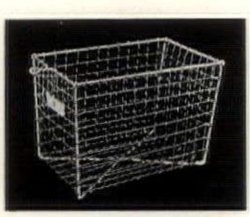
FLEXIBLE COPPER TUBING CAN BE READILY INSTALLED IN OLD PARTITIONS; NO FITTINGS REQUIRED; ECONOMICAL. DIAMETER UP TO 1¼"; UP TO 60 FEET IN LENGTH; ORDINARILY SUPPLIED IN 20-FOOT LENGTHS.



BUILT-IN WALL DESK. 32″ WIDE, 24″ HIGH, 5″ DEEP.



RANGE OF **TYPICAL BED SIZES.** LENGTHS AND WIDTHS OF BEDS ARE STANDARDIZED AS SHOWN HERE, BUT THE HEIGHT OF BEDS VARIES ACCORDING TO USE AND STYLE.



BASKET OF WOVEN WIRE FOR GARMENT STORAGE THAT IN SOME CASES MAY REPLACE DRAWERS. CONTENTS ARE VISIBLE. THE BASKET IS EASILY TRANSPORTABLE BECAUSE OF ITS LIGHT WEIGHT.

TELESCOPIC HANGER THAT OCCUPIES LITTLE SPACE WHEN COMPRESSED AND WHICH PERMITS EXTENSION AND BRINGS CLOTHES INTO PLAIN SIGHT.

BEDROOMS

MAKE SHAPE OF ROOMS AND LOCATION OF WINDOWS AND DOORS SUIT PLACING OF BEDS.
Rectangular rooms are easier furnished than oddly shaped rooms.

IMPROVE EXPOSURE OF ROOMS.
East exposure preferable. West not suited for children's bedrooms. Setting sun keeps them awake longer. South preferable to north.

PROVIDE CROSS VENTILATION.
Windows or doors on opposite walls or diagonal. Where windows are inconvenient, louvers should be installed. Louvered doors to hall.

GIVE EVERY BEDROOM DIRECT ACCESS FROM HALL.

PROVIDE A CLOTHES CLOSET IN EVERY ROOM.
Minimal floor area required for one person, 24″ x 36″. Provide two closets in rooms occupied by two persons.

INSTALL EFFICIENT STORAGE EQUIPMENT IN CLOSETS.
Hanging rod, drawers, hat shelf, shoe rack, tie rack, hat stands, coat hooks, shoe-shining drawer.

LINE CLOSETS WITH MOTHPROOF MATERIAL OR CEDAR.
Construction reference. Plastic moth-repellent coating; aromatic plaster; cedar paint.

PROVIDE FULL LENGTH MIRROR ON WALL OR CLOSET DOOR.
Mirror size, 18″ to 20″ x 60″.

MAKE POSSIBLE COMBINATION OF CHILDREN'S BEDROOMS FOR LARGER PLAY AREA.
With folding partitions, wood or fabric, horizontally sliding or double doors.

PROVIDE EXTRA BEDROOM BY SUBDIVIDING LARGE ROOM.
Consider dimensions of beds and space to get around.

INSTALL IN-A-DOOR BED FOR EMERGENCY.
Single bed closet, 30″ x 42″. Double bed, 30″ x 60″.

ADD SLEEPING PORCH OR SUN TERRACE.
Southern exposure preferred. Floor covered with painted canvas. Terrace on roof level cool in summer and free from insects.

PARTITION-OFF DRESSING ROOM OR CLOSET.

INSTALL BUILT-IN WALL DESK.
32″ wide, 24″ high, 5″ deep.

RE-CARPET THE FLOOR IN ACCORDANCE WITH GENERAL LAYOUT.
Plain shades of light tan, gray or green.

REFINISH WALLS AND CEILING IN PLAIN, QUIET COLORS.
Flat paint; cold water paint; washable fabric. Use pastel shades of blue, green, rose, tan.

BUILD IN SMALL WALL-SAFE IN MASTER BEDROOM.
Small size, 7″ high, 12″ wide, 8″ deep; medium size, 12″ high, 12″ wide, 8″ deep; large size, 20″ high, 20″ wide, 15″ deep, and up.

BEDROOMS (Continued)

AROMATIC RED CEDAR CLOSET LINING.

Closets lined with red cedar heartwood of correct thickness and construction are a very satisfactory protection against clothes moths, provided the articles to be stored are first thoroughly brushed or otherwise treated to remove the older clothes moth larvae. The volatile oil in the pure heartwood of red cedar gives off an aroma that kills the newly hatched or young larvae or worms of clothes moths. The cedar lining for walls, floors and ceiling must be approximately airtight, 3/4" or more in thickness. Veneering of cedar is not effective. Cedar closets cannot be depended upon to kill the moths, their eggs or worms after they are one-half to full grown or after they are 3 or 4 months old.* It is therefore essential that clothing hung or stored in cedar closets or chests be free from the older larvae or moth worms.

CONSTRUCTION OF RED CEDAR CLOSETS

The U. S. Department of Commerce recommends the following construction: "The entire surface of the closet should be covered, including the inside of the door, with 3/8" cedar lining. It is preferable to use 13/16" cedar flooring for covering the floors, but 3/8" may be substituted if desired. The door should be tight fitting, and, if necessary, it should be weatherstripped.

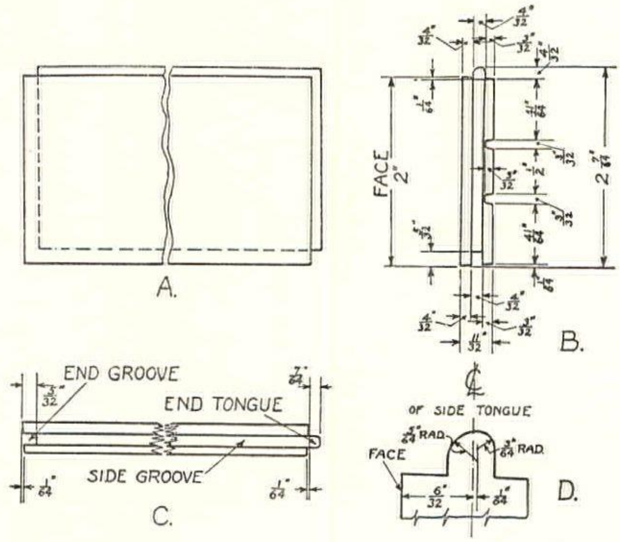
"In lining a closet already built and plastered, the lining may be placed directly on the plaster if care is exercised to nail on the studding. Face nailing is recommended, but blind nailing may be used if preferred. It is not necessary that the end joints come directly over the studding as the end matching will hold any short pieces in perfect position that may be placed between studding.

"Red cedar shelving is recommended. This adds to the general appearance of the closet or storage room and also increases its efficiency. It is also recommended that all corners be fitted with cedar quarter-round moulding, since the more cedar that checks destruction by moths, and the greater the quantity of cedar, the greater the amount of aroma.

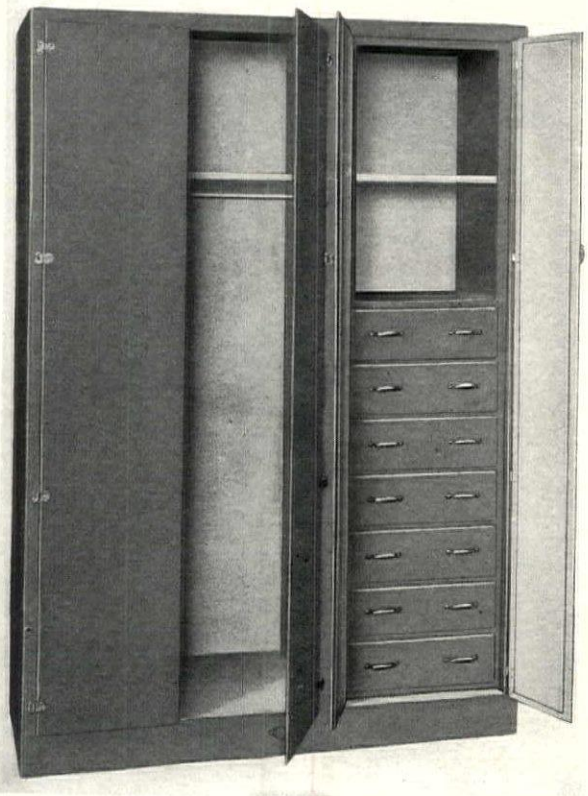
CEDAR CLOSETS IN NEW HOMES.

"Where installation is being made in new homes, it is recommended that the closet be lined with wallboard, deadening felt, or other insulating material free from offensive odors, or else plastered, but it may be nailed directly on the studding. In this event it is best to close all spaces between studding at the floor and at the ceiling in order to prevent the escape of aroma betwen the studs. Another method of preventing this loss of aroma from the back side of the lining is to coat it with a suitable material which will effectively seal the wood. Such protective coatings as shellac, paraffine, or lacquer, which are quick drying, have been found effective for this purpose.

"Positively no paint, varnish, or other finish should be used on the interior of the closet, since this would seal the wood and prevent the volatilization of the cedar oil which is the effective agent in protecting stored materials from ravages by clothes moths. Furthermore, painted or varnished surfaces within the closet may soften or become tacky and in this condition may damage garments coming in contact with them."

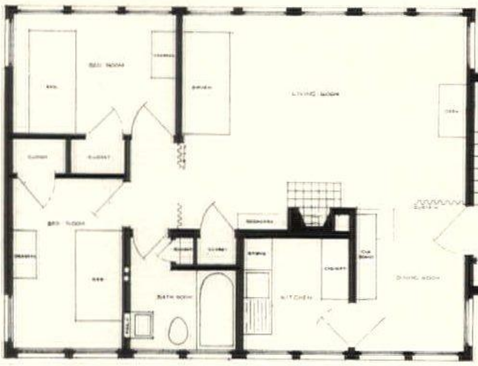


CEDAR LINING DETAIL WITH DIMENSIONS AND APPROVED PROFILE FOR JOINTING. THE CEDAR LINING FOR WALLS SHOULD BE AT LEAST 3/8" THICK. THE FLOORING OF CEDAR IS PREFERABLY 13/16" IN THICKNESS AS A MINIMUM AND MAY SLOPE TOWARD DOOR OR MAY BE RAISED APPROXIMATELY 2" ABOVE LEVEL OF OUTSIDE ROOM FLOOR.



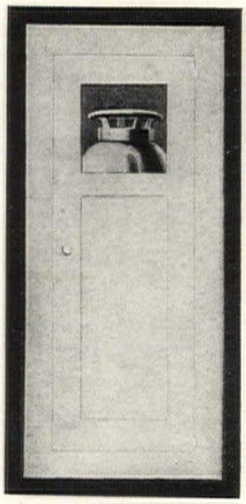
CLOTHES CLOSET OF HEAVY STEEL, WELDED AND MADE WITH TWO COMPARTMENTS. DRAWERS ARE OF DUST-PROOF CONSTRUCTION.

* Clothes Moths and Their Control, U. S. Department of Agriculture, Farmers' Bulletin No. 1353, p. 36.

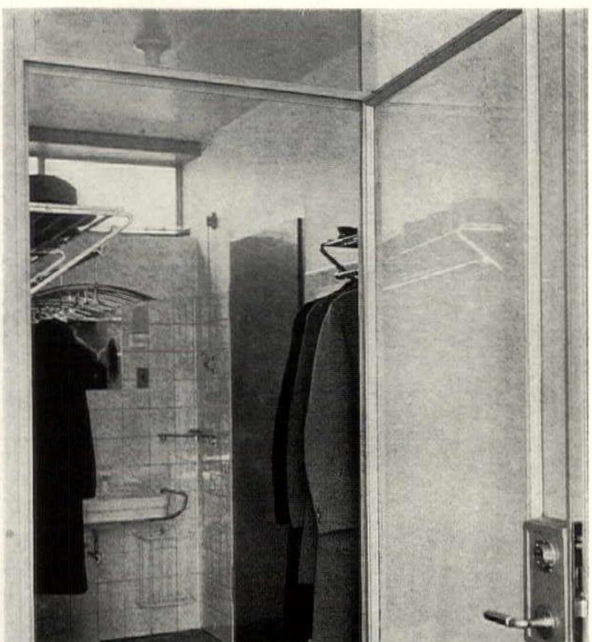


FIRST FLOOR

EXAMPLE OF COMPACT ARRANGEMENT OF ROOMS; COMBINED LIVING AND DINING SPACE; WINDOWS ON OPPOSITE SIDES BECAUSE OF VIEWS AND FOR CROSS VENTILATION; GROUPED PLUMBING; SIX BUILT-IN CLOSETS; COMPACT STAIRWAY DOES NOT INTERRUPT MAIN FLOOR FRAMING.



RECESSED CABINET FOR FIRE EXTINGUISHER. 2½ GALLON CAPACITY, STEEL CABINET, 12" WIDE, 30" HIGH, 8" DEEP.



VIEW OF **COAT CLOSET** ACCESSIBLE FROM ENTRANCE HALL. LAVATORY FACILITIES ARE PROVIDED. WALLS AND DOORS HAVE SANITARY WASHABLE FINISHES OF GLAZED TILE AND ENAMEL.

GENERAL INTERIOR WORK AND EQUIPMENT

PROVIDE SAFE HEAD ROOM UNDER STAIRS.
7'-0" minimum. "Triangular turns on stairs are unsafe and undesirable. Handrails or balustrades within the reach of young children should be provided on all stairs, including those leading to the cellar and attic. All stairs should be adequately lighted and where there are young children it is often advisable to place gates at the tops of stairs."

REPLACE WORN-OUT STAIR TREADS.

COVER TREADS WITH LINOLEUM, RUBBER OR CARPET.

CHECK SAFETY OF HANDRAILS.

TRANSFORM CLOSED STAIRWAY INTO OPEN ONE, ADDING SPACE TO HALL OR ROOMS.

MAKE ALL WINDOWS AND DOORS WORK PROPERLY.
New pulleys; mouldings; cords.

WEATHERSTRIP WINDOWS AND DOORS WHERE NEEDED.
Zinc, copper, bronze, brass, felt, sponge rubber.

REFIT WITH NEW AND SAFE HARDWARE.
Use friction door hinges; exterior doors with safety locks in knob.

REPAIR DEFECTIVE BLINDS AND SHUTTERS.

REPLACE WOOD PANELS IN DOORS WITH GLASS FOR LIGHT OR VISION.

INSTALL WINDOW ADJUSTERS AND DOOR CHECKS.
Window operators eliminating removal of screens, door checks, exposed at head or concealed in floor.

RE-PUTTY DEFECTIVE WINDOW PANES.

REPLACE OLD GLAZING WITH ULTRA-VIOLET RAY GLASS IN SUN ROOM OR CHILDREN'S PLAYROOM.

CAULK JOINTS BETWEEN WOOD TRIM AND MASONRY.

INSTALL STORM SASH.
Interchangeable with screens.

CONSIDER ROLLSCREENS WHERE PREFERABLE.

REPAIR OR REPLACE SCREENS.
"Screening of aluminum wire or chromium alloys does not stain building. Screening excludes light. Select mesh according to purpose: 14 mesh—flies; 16 mesh—mosquitoes; 18 mesh—gnats."*

BUILD A COAT CLOSET NEAR THE ENTRANCE.
20" to 24" deep, 36" to 48" wide. "There should be a closet for outdoor wraps on the entrance floor near the outside door, which can be reached through any of the rooms. There should be a separate closet for children's outdoor wraps or else special provision should be made for them in this closet through low hooks and rods and low shelves or other special equipment for overshoes."*

INSTALL MIRROR IN HALLWAY.

BUILD SEAT OR CHEST IN HALL.

* The Home and The Child. The Century Co., N. Y.

GENERAL INTERIOR WORK AND EQUIPMENT (Continued)

PLAN STORAGE SPACE FOR PAPER, STRING, BAGS, SEWING MACHINE, GOLF BAGS, TENNIS RACKETS, CHILDREN'S TOYS.
"All closets should have doors, and knobs on the inside so that they can be opened by children. Low drawers and cupboards or other special provision should be made for children's playthings."*

EQUIP CLOSET ON EACH FLOOR FOR BROOMS AND CLEANING SUPPLIES.
Size, 12″ to 20″ deep, 16″ to 24″ wide.

BUILD IN AN IRONING BOARD IN BATHROOM OR SEWING ROOM.
Recessed cabinet, 48″ to 56″ high, 12″ to 16″ wide.

RE-NAIL WOOD FLOORS TO ELIMINATE CREAKING.

ADJUST OR RENEW BASEBOARDS.

APPLY INSULATION TO FLOORS, WALLS AND ROOFS.
Insulation board; rock wool; rock felt; sprayed flake insulation; quilt insulation; cork; shredded wood-cement boards; aluminum foil.

BUILT-IN MAIL BOX.
Size, 4″ wide, 16″ high, 4″ deep.

INSTALL RECESSED TELEPHONE CABINET.
Size, 12″ x 12″, 4″ deep.

PROVIDE BUILT-IN CABINET FOR FIRE EXTINGUISHER.
Size, 12″ wide, 30″ high, 8″ deep.

REPLACE OLD CURTAINS AND DEFECTIVE RODS WITH BETTER TYPES.
Curtain rails with inside rollers. Venetian blinds to improve control of light.

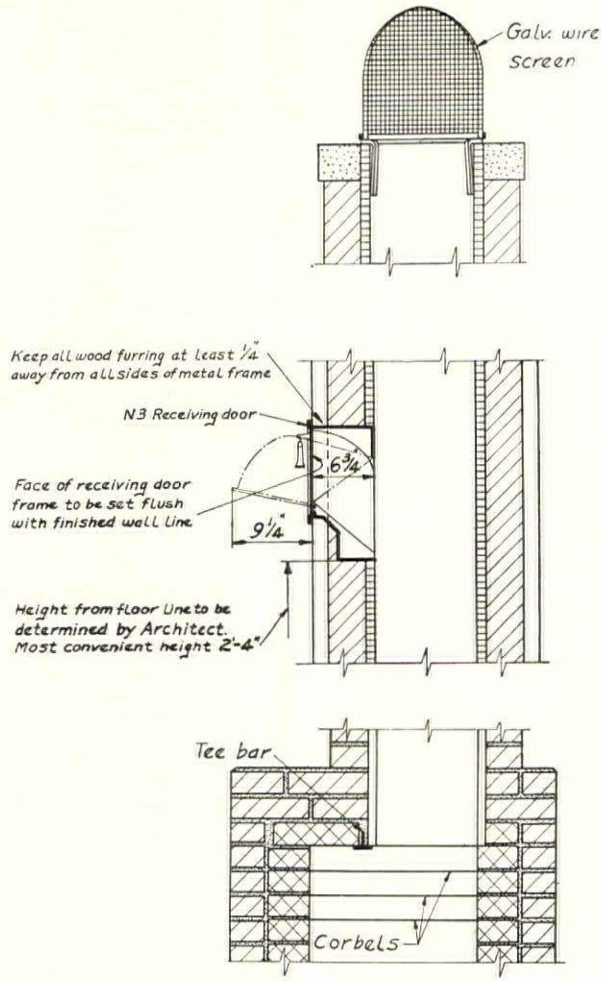
INSULATION

Adding insulation to walls and floors will decrease the cost of heating or offset the loss of efficiency caused by air leakage due to shrinkage and deterioration of materials. The comfort of living will be improved since poorly insulated outside walls admit cold into rooms creating a chilling effect. In order to heat such rooms, the air temperature has to be higher than is comfortable for living.

Insulation should be provided in the outer half of a wall. Since the inner facing is of higher conductivity and low heat capacity, the inner facing of an exposed wall should be an efficient insulating membrane, (plaster on metal lath, sheet rock, plywood). This arrangement permits a rapid adjustment of room and inner wall-surface temperature, for heating or cooling.

Money spent for reducing the heat loss of a house (insulation) should be applied in the following order:

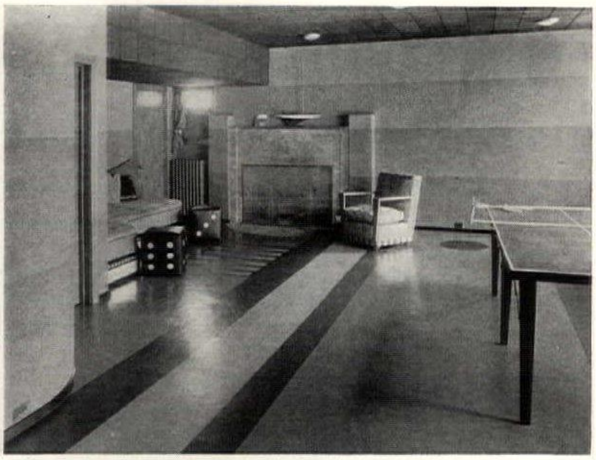
a. Weatherstripping.
b. Insulate roof or ceiling.
c. Insulate walls.
d. Double windows.



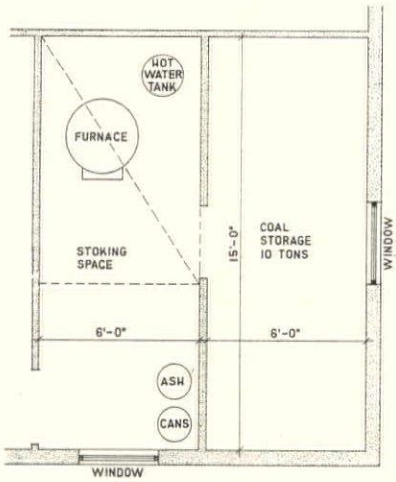
SECTION OF **INCINERATOR CHIMNEY** SHOWING SAFETY SCREEN OVER TOP, INSTALLATION OF RECEIVING DOOR AND METHOD FOR LAYING BRICKS OVER COMBUSTION CHAMBER.

VIEW SHOWING APPLICATION OF **LARGE SHEET OF PLYWOOD** OR INSULATION BOARD. WITH BOARDS REACHING FROM FLOOR TO CEILING, SMOOTH FLUSH SURFACES ARE OBTAINED WITH A MINIMUM OF JOINTS. COMMON WIDTH IS 4 FEET, LENGTHS FROM 8 TO 12 FEET.

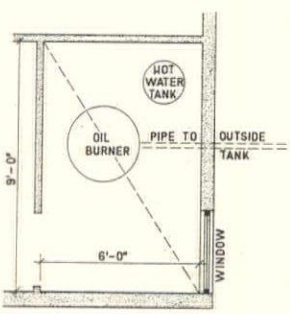
*The Home and The Child. The Century Co., N. Y.



EXAMPLE OF **BASEMENT ALTERED FOR PLAYROOM USE.**



CONVENTIONAL FURNACE ROOM WITH COAL BIN.



FURNACE SPACE REQUIRED FOR OIL OR GAS FURNACE.

180 SQUARE FEET OF FLOOR AREA REQUIRED FOR CONVENTIONAL SOLID FUEL FURNACE ROOM WITH COAL BIN. **54 SQUARE FEET OF FLOOR AREA** REQUIRED FOR HEATER ROOM WITH OIL OR GAS FURNACE.

TERRACE SHELTERED IN LEAST EXPENSIVE METHOD (PIPE FRAME AND AWNING). THE AWNING IS REMOVABLE FOR AUTUMN AND WINTER MONTHS SO AS TO ADMIT SUNLIGHT INTO LIVING ROOM.

BASEMENT

PROVIDE A CEILING CLEARANCE OF AT LEAST 7 FEET.

ADD WINDOWS FOR ADEQUATE DAYLIGHT AND VENTILATION.
Window area not less than 1/10 of floor area. Openings 1/2 of window area.

IMPROVE STAIRS WITH HAND RAILING OR EASIER TREADS.
Risers 7½". Treads 9½". A cellar stairway should have broad treads and comfortable rise because of use of this stairway for moving ash cans, boxes and other heavy objects.

PAINT STAIRWAY TO PREVENT STUMBLING IN THE DARK.
Light, bright colors.

ADD OUTSIDE ENTRANCE AND STAIRS.
Risers 7", treads 10½".

APPLY WATERPROOFING TO WALLS.
Cement coating with admixture; asphalt compounds; mastic; waterproof felt or fabric. Special paint. Plastic joint filler. Metallic or integral waterproofing admixtures.

INSTALL DRAIN TILE AROUND OUTSIDE OF FOOTINGS.
Pipe should be below basement floor level.

PROVIDE FIRESTOPS AT SILLS AND AROUND PIPE HOLES.
Plaster on metal lath; mineral wool; asbestos fiber.

ADD BRIDGING TO STIFFEN SAGGING JOISTS.
Pressed steel bridging; wood bridging.

COVER BASEMENT CEILING WITH FIREPROOF MATERIAL.
Plaster on metal lath; sheet metal; asbestos cement boards; sheet rock.

PATCH FLOOR CRACKS.
If concrete floor is in bad condition, it is frequently necessary to remove damaged concrete, and then relay the concrete to within ½-inch of the finished surface. The following day, wet the concrete thoroughly and surface the area with a stiff cement mix composed of 1 part portland cement, 3 parts sand. If a crack is repaired, chisel out the joint to a deep wedge-shaped groove, and clean thoroughly. This can then be filled with a stiff cement mix, forcing cement into the groove by hammering in place with a flatboard.

DUSTPROOF CONCRETE FLOORS.
2-3 coats of floor paint, staining and waxing, 2-3 coats of cement hardener.

INSTALL FLOOR DRAINS.
Galvanized cast iron removable brass strainer, with trap for sewer connection.

INSULATE CEILING.
Insulation board; rock wool; aluminum foil.

CAULK AROUND WINDOWS.

APPLY SMOOTH FINISH TO WALLS.
Cement plaster, plastic paint.

BASEMENT (Continued)

BRIGHTEN ROOMS WITH LIGHT COLORS ON WALLS AND CEILING.
Calcimine; cold water paint in pastel shades; cement paint; flat wall paint.

INCLOSE FUEL STORAGE SPACE.
With fireproof material such as concrete, brick, gypsum planks, stucco on metal lath, sheet metal, asbestos cement board.

INSTALL A COAL CHUTE FROM THE OUTSIDE.
Of copper-bearing steel, glass panel optional, automatic lock, operated with chain from inside. Wall chutes 17″ x 24″ and 22″ x 33″. Grade line chutes (door opening) 20″ x 24″ and 24″ x 30″.

PARTITION-OFF VENTILATED SPACE FOR FRUIT AND VEGETABLE STORAGE.
Wood frame with insulation board, gypsum planks, hollow tile, cinder concrete tile.

INSTALL A TOILET WITH WASH BASIN.
Minimum room size 3′-0″ x 4′-6″.

MAKE A RECREATION AND PLAYROOM WITH WALLCASES FOR PLAYTHINGS.
Use cheerful colors (red, blue, green, yellow). Water- and dampproof floor and walls. "The floor area should allow at least eighty-four square feet for each child. Artificial lighting should be high and indirect. If side lights are used they should be out of the child's reach and the light source shielded. Since most of the child's play is on the floor, hardwood floors or floors overlaid with battleship linoleum or cork are recommended."* Minimum room size for ping pong, 10′ x 16′.

BUILD A WELL-LIGHTED WORKSHOP WITH BENCH AND SHELVES.
Enlarge windows; use standard size wood or steel sash; utility steel sash. Provide for lumber storage. Adjustable steel shelving: 2″ work bench (maple, oak, pine); covered box for refuse; electric bell from first floor to save steps for wife.

PROVIDE DRY AND VENTILATED CLOSET FOR STORAGE OF TRUNKS.
Steamer trunks are: Wardrobe type, 15″ x 20″ x 40″; Packing type, 13″ x 22″ x 36″.

PROVIDE ORGANIZED RACK FOR GARDEN TOOLS.

BUILD SCREEN AND STORM-SASH RACKS.

INSTALL ASH HOIST.

CHECK SAFETY OF WINDOW AND DOOR LOCKS.

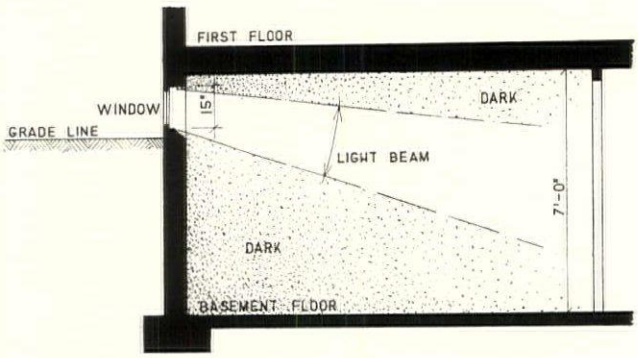
INSTALL DARK ROOM FOR PHOTOGRAPHY.
Provide sink; electric wiring; ventilation.

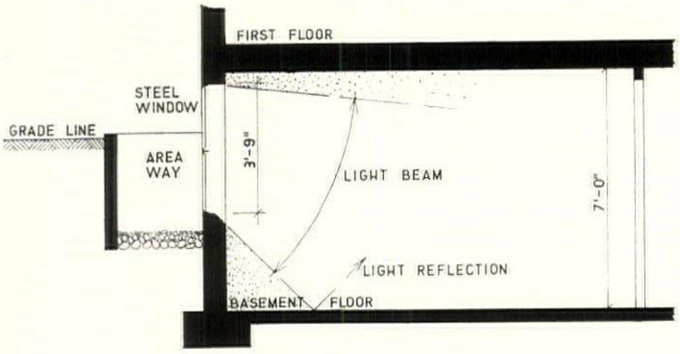
CONSIDER DESIRABILITY OF A TAP ROOM, LABORATORY, GYMNASIUM.

PROVIDE ADEQUATE VENTILATION FOR BOILER ROOM.

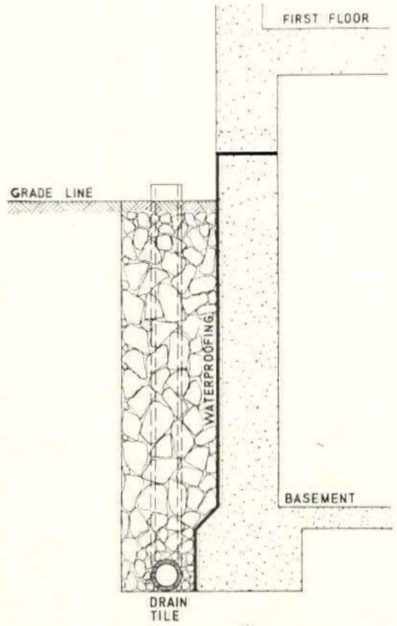
ADD DIRECT OUTSIDE EXIT FOR BOILER ROOM.

*The Home and The Child. The Century Co., N. Y.





INSTALL LARGER WINDOWS IN BASEMENT. A COMPARISON OF EFFECTIVE DAYLIGHTING BY USE OF SMALL OR LARGE WINDOWS IN BASEMENT. NOT ONLY IS BASEMENT BETTER LIGHTED BY LARGE WINDOWS BUT THE LARGER OPENING PERMITS BETTER VENTILATION AND A DRIER CELLAR. THE STANDARD SASH OF LARGE SIZE COSTS BUT LITTLE MORE THAN THE SMALLER WINDOW.
FOR A PLAYROOM IN BASEMENT THE ENLARGEMENT OF WINDOWS IS PARTICULARLY ESSENTIAL.



A METHOD FOR WATERPROOFING A BASEMENT WALL. CRUSHED STONE FILL BETWEEN WALL AND EARTH FACILITATES DRAINAGE AWAY FROM WALL TO DRAIN PIPE. THIS PIPE (COMMON DRAIN TILE, 4″) SHOULD BE BELOW FLOOR LEVEL. A DRAIN TILE PLACED VERTICALLY AND CONNECTED WITH HORIZONTAL DRAIN WILL PERMIT FLUSHING A CLOGGED DRAIN. WATERPROOF OUTER SURFACE OF WALL WITH ASPHALT COMPOUND, R. I. W. OR OTHER PREPARATION FOR WATERPROOFING.

Van Anda

ATTIC SPACE USED FOR BEDROOM. INSULATION SHOULD BE APPLIED TO WALLS AND CEILING. CROSS VENTILATION IS PROVIDED BY WINDOWS ON OPPOSITE WALLS.

ATTIC

APPLY FIRESTOPPING BETWEEN STUDS AT FLOOR LINE.
Plaster on metal lath; apply mineral wool; asbestos fiber.

LAY FINISHED FLOORING.
Pine; hardwood; linoleum; canvas.

APPLY FINISH TO WALLS AND CEILING.
Wallboard; plaster; paint.

INSTALL DISAPPEARING STAIRWAY IN PLACE OF TRAPDOOR.
Floor opening 24″ to 30″ wide, 48″ to 72″ long, depending on height of stair.

INSULATE UNDER ROOF.
Insulation board; rock wool; rock felt; sprayed flake insulation; quilt insulation; cork; shredded wood or cement boards; aluminum foil.

FILL CRACKS AROUND CHIMNEYS.
See protection recommended by National Board of Fire Underwriters.

PARTITION-OFF EXTRA BEDROOM.
Plaster on metal lath; or use wallboard; gypsum plank.

ADD WINDOWS AND LOUVERS.
Adjustable type. Window area not less than 1/10 of floor area. Openings 1/2 of window area.

PROVIDE CROSS VENTILATION FOR SUMMER COOLING.

PROVIDE HEATING FACILITIES.
Connect with central plant, or install gas or electric heaters.

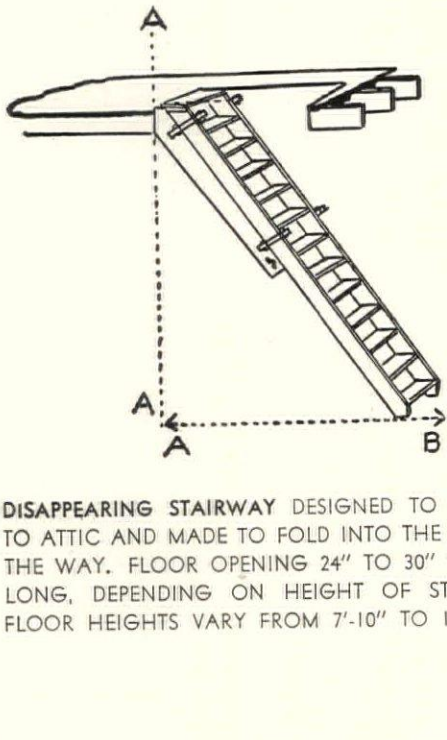
BUILD A PLAYROOM FOR CHILDREN.
Sound-insulate walls and ceiling; build shelves for playthings; lay resilient flooring; paint in gay colors.

SUBDIVIDE STORAGE SPACES TO INCREASE USE.
Adjustable shelving.

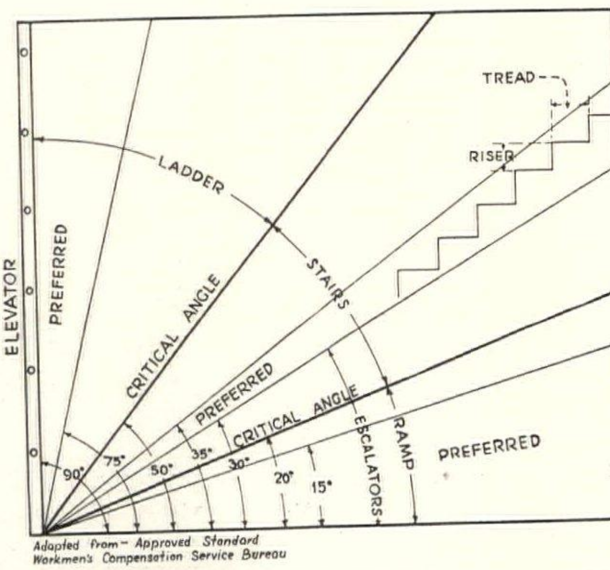
PARTITION-OFF A MAID'S ROOM.

FIX UP A STUDY.

CONSIDER DESIRABILITY OF SLEEPING BUNKS.



DISAPPEARING STAIRWAY DESIGNED TO PROVIDE ACCESS TO ATTIC AND MADE TO FOLD INTO THE CEILING, OUT OF THE WAY. FLOOR OPENING 24″ TO 30″ WIDE; 48″ TO 72″ LONG, DEPENDING ON HEIGHT OF STAIRS. FLOOR-TO-FLOOR HEIGHTS VARY FROM 7′-10″ TO 10′-0″.



Adapted from — Approved Standard Workmen's Compensation Service Bureau

TABLE OF RISERS AND TREADS FOR STAIRS
TREAD + RISER = 17½″

ANGLE WITH HORIZONTAL	RISER IN INCHES	TREAD INCHES	
22°-00′	5	12½	
23°-14′	5¼	12¼	
24°-38′	5½	12	
26°-00′	5¾	11¾	
27°-33′	6	11½	
29°-03′	6¼	11¼	
30°-35′	6½	11	P'F'D
32°-08′	6¾	10¾	P'F'D
33°-41′	7	10½	P'F'D
35°-16′	7¼	10¼	P'F'D
36°-52′	7½	10	
38°-29′	7¾	9¾	
40°-08′	8	9½	
41°-44′	8¼	9¼	
43°-22′	8½	9	
45°-00′	8¾	8¾	
46°-38′	9	8½	
48°-16′	9¼	8¼	
49°-54′	9½	8	

Supplied by — American Abrasive Metals Co.

TABLE TO SERVE AS GUIDE IN DETERMINING SAFE AND **DESIRABLE SLOPE FOR STAIRS, RAMPS, LADDERS:** STAIRS, 6½″ RISER WITH 11″ TREAD; 6¾″ RISER WITH 10¾″ TREAD; 7″ RISER WITH 10½″ TREAD, AND 7¼″ RISER WITH 10¼″ TREAD ARE **PREFERRED.**

HEATING AND VENTILATION

REPAIR OR REPLACE BOILER WITH MORE EFFICIENT TYPE.
New features are: flush, enameled casing; automatic damper; fuel economy; well insulated jacket; fuel capacity; convenient clean-out.

INSULATE BOILER
with asbestos-cement coats; magnesia blocks; asbestos felt.

REPAIR INSULATION OF HEATING PIPES.
Corrugated asbestos paper; magnesia blocks; asbestos felt.

FIREPROOF WALLS AND CEILING OF HEATER ROOM.
Asbestos cement board; sheet steel; stucco on metal lath.

CHECK JOINTS AND DRAFT CONTROLS OF SMOKE PIPE.
Automatic damper. Insulate smoke pipe with magnesia blocks.

INSTALL AUTOMATIC DRAFT CONTROL, LOW WATER ALARMS, STEAM PRESSURE METERS.

ADD NEW RADIATORS OR REARRANGE OLD ONES.
Estimate separately the amount of radiation for each room with consideration of exposure, wall insulation, window area.

REPLACE DEFECTIVE VALVES.
Automatic and adjustable.

RE-PACK STEAM VALVES AND INJECTORS.

INSTALL THERMOSTATIC CONTROL.
Thermostatic traps; electric control; clock thermostat; centralized or individual radiator control.

INSTALL AUTOMATIC FEED SYSTEM OR OIL BURNER.
High capacity of feed system, reliable. Silent oil burner; perfect combustion; gas or electric ignition.

INCREASE EFFICIENCY OF RADIATORS BY PROPER PAINTING.
Thin coats; dark shades; flat finishes.

CONVERT RADIATING HEATING INTO CONVECTION SYSTEM WITH BUILT-IN CABINETS.

INSTALL HOT WATER HEATING SYSTEM, COAL, GAS OR ELECTRIC.
Silent, automatic type. Rustproof tank.

ATTACH INDIRECT HEATER TO STEAM BOILER FOR HOT WATER SUPPLY.

INSULATE HOT WATER TANK.
Asbestos felt, with canvas jacket.

PROVIDE BUILT-IN ELECTRIC HEATER IN BATHROOM.
Chromium-plated reflector, adjustable heating units 9″ x 9″, and 13″ x 13″, 4″ deep.

HEAT THE GARAGE.
Unit heater; gas or steam radiator.

ADD FORCED CIRCULATION TO AN OLD WARM AIR SYSTEM.
Silent electric blower.

PROVIDE COOLING.

INSTALL INDEPENDENT OR CENTRAL AIR CONDITIONING.

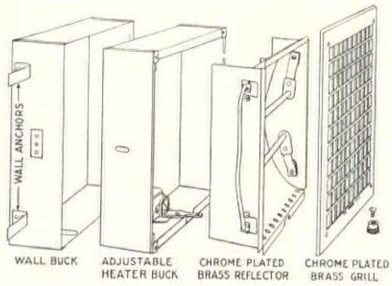
BUILD IN ASH DUMPS IN FIREPLACES.
One lid or two lid types 5″ x 8″, 6″ x 9″, 6″ x 15″, 5″ x 7″, 7″ x 10″.

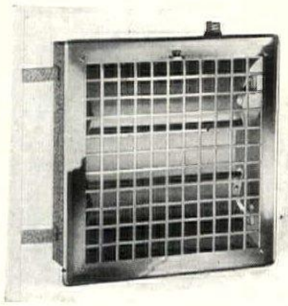
IMPROVE OLD TYPE FIREPLACES WITH DRAFT CONTROLS OR READY-BUILT LINING.
Steel damper with easy control. Length, 24″ to 48″; width, 10″ to 14″. Complete copper bearing steel lining, joints welded, including draft controls, firebox and smoke chamber.

OVERHAUL VACUUM SYSTEM.

ELIMINATE TRAPS IN STEAM LINES.

INSTALL AUTOMATIC SPRINKLER SYSTEM FOR BASEMENT AND STOREROOMS.





RECESSED ELECTRIC BATHROOM HEATER WITH CHROMIUM-PLATED REFLECTOR AND ADJUSTABLE HEATING UNITS. SIZES, 9″ x 9″ AND 13″ x 13″, 4″ DEEP.

■

RULES FOR SAFE CHIMNEY CONSTRUCTION.
Where the wall forming a smoke flue is made up of less than 8 in. thickness of brick, concrete or stone, a burnt clay flue tile lining should be used. Cement mortar should be used for the entire chimney. No plaster lining should be permitted.

Chimneys should extend at least 3 feet above flat roofs and 2 feet above the ridges of peak roofs. The chimney should be properly capped with terra cotta, concrete, cast iron or other approved material; but no such cap shall decrease the flue area.

There shall be but one connection to the flue to which the boiler or furnace smoke pipe is attached. The boiler or furnace pipe shall be thoroughly grouted into the chimney and shall not project beyond the inner surface of the flue lining. Be sure that clean-out door below pipe entrance is airtight.

A chimney should be at least 35 ft. in height for satisfactory operation. For chimneys not less than 35 ft. in height above grade line, the net internal dimensions of lining should be at least 7 x 11½ in. See local heating engineer for correct flue size for specific heating requirements. (From recommendations of National Board of Fire Underwriters.)

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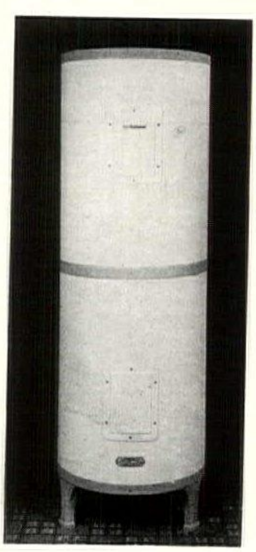
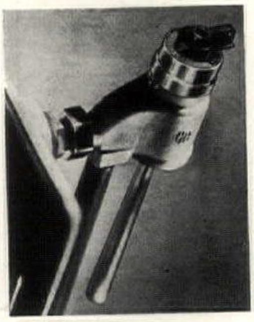


ELECTRIC HOT WATER HEATER WITH AUTOMATIC TEMPERATURE REGULATION. THE TANK IS INSULATED AND COVERED WITH AN OUTER CASING FINISHED IN ENAMEL.



AUTOMATIC VALVE FOR STEAM RADIATORS. PROVIDES INDIVIDUAL ROOM TEMPERATURE CONTROL BY SELF-CONTAINED THERMOSTATIC UNIT MODULATING THE FLOW OF STEAM.

KEEPING HEATER IN CONDITION.

Care of the boiler is often neglected and it should receive special attention at a time when the house is modernized. The following recommendations are from the American Society of Heating and Ventilating Engineers Guide, 1934, pp. 345, 346:

"Heating boilers are often seriously damaged during summer months due chiefly to corrosion resulting from the combination of sulphur from the fuel with the moisture in the cellar air. At the end of the heating season the following precautions should be taken:

1. All heating surfaces should be cleaned thoroughly of soot, ash and residue, and the heating surfaces of steel boilers should be given a coating of lubricating oil on the fire side.
2. All machined surfaces should be coated with oil or grease.
3. Connections to the chimney should be cleaned and in case of small boilers the pipe should be placed in a dry location after cleaning.
4. If there is much moisture in the boiler room, it is desirable to drain the boiler to prevent atmospheric condensation on the heating surfaces of the boiler when they are below the dew-point temperature. Due to the hazard of some one inadvertently building a fire in a dry boiler, however, it is safer to keep the boiler filled with water. A hot water system usually is left filled to the expansion tank.
5. The grates and ashpit should be cleaned.
6. Clean and repack the gage glass if necessary.
7. Remove any rust or other deposit from exposed surfaces by scraping with a wire brush or sandpaper. After boiler is thoroughly cleaned apply a coat of preservative paint where required to external parts normally painted.
8. Inspect all accessories of the boiler carefully to see that they are in good working order. In this connection, oil all door hinges, damper bearings and regulator parts."*

INSPECT ALL HEATING PIPES TO REDUCE HEAT LOSS TO AN ECONOMICAL MINIMUM.

Pipe insulation is also used to reduce the absorption of heat by cold pipes as well as to prevent condensation on the outer surfaces.

"Very often, even where pipes are thoroughly insulated, flanges and fittings are left bare due to the belief that the losses from these parts are not large. However, the fact that a pair of 9 in. standard flanges having an area of 3.00 sq. ft. would lose, at 110 lb. steam pressure, an amount of heat equivalent to more than a ton of coal per year shows the necessity for insulating such surfaces."*

PROVIDE HUMIDIFICATION.

Just what the optimum range of humidity is, is a matter of conjecture. There seems to exist a general opinion, supported by some experimental data, that warm, dry air is less pleasant than air of a moderate humidity, and that it dries up the mucous membranes in such a way as to increase susceptibility to colds and other respiratory disorders.*

CONSIDER USE OF GAS FOR HEATING.

The increased use of gas for house heating purposes has stimulated production of a large number of different types of gas-heating systems and appliances, including the following:

Steam, hot water and vapor boilers.
Warm air furnaces.
Warm air floor furnaces.
Garage heaters.
Space heaters.

INSTALL OIL BURNER IN OLD COAL-BURNING FURNACE.

The oil burner may be installed as a heating unit in a boiler designed for coal fuel. Increased efficiencies, however, of 5 per cent to 15 per cent are often obtainable with boilers designed especially for liquid fuel.*

CHECK AIR SUPPLY FOR OIL BURNER.

"It is essential that the basement, or at least that portion used as a boiler room, be open to the outside air, in order that sufficient air be available for combustion. Frequently a case of poor (oil burner) operation will be found where a test with the draft gage made by inserting the tube through the keyhole of the outer door will show that there is a partial vacuum in the basement when the burner is running, all of the combustion air coming through the keyhole and minute cracks."

A simple remedy is to cut an inch from the bottom of the outer door.

USE WINDOWS FOR VENTILATION.

Windows offer an advantage of transmitting light, as well as providing ventilating area when open. Air movement can be greatly accelerated by the supplementary use of a fan.

In the design of windows ventilating a house, where the direction of the wind is quite constant and dependable, the orientation of the dwelling together with the amount and grouping of such windows can be readily arranged to take full advantage of the force of the wind. Where wind is quite variable then windows for ventilation should be arranged on side walls so that there will be approximately equal areas on all sides. In general glass heat loss is 4 to 5 times that of an ordinary wall.

DOUBLE GLAZED WINDOWS TO CUT DOWN HEAT LOSS.

Double glazing reduces heat loss to about half.

PROVIDE AWNINGS FOR WINDOWS WITH SOUTH AND WEST EXPOSURE.

Some recent tests indicated that sunshine through window glass is the most important factor to contend with in keeping a room cool in summer. If a house is provided with awnings so that the window glass is shielded from sunshine, the amount of cooling required will be greatly reduced.

PLASTER OR PAINT WALLS TO REDUCE AIR LEAKAGE.

Tests by the A. S. H. V. E. indicate that plastering over an 8" brick wall reduces air leakage through wall by about 96 per cent; a heavy coat of cold water paint, 50 per cent; and 3 coats of oil paint carefully applied, 28 per cent.

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*1934 Guide, The American Society of Heating and Ventilating Engineers.

GENERAL EXTERIOR WORK

REPAIR CRACKS AND OPEN JOINTS IN MASONRY WALLS.

CLEAN EFFLORESCENCE OR SCUM ON WALLS WITH ACID OR GIVE SPECIAL TREATMENT.

REMOVE EFFLORESCENCE ON BRICKWORK.
Efflorescence (a whitening of brick surface) can be removed by sponge washing the brick surface with a solution composed of three pounds zinc sulphate to a gallon of water.

DAMPPROOF LEAKY WALLS.
Cement coating with hardener, colorless dampproofing liquid, waterproof paint.

REPLACE WALL SURFACES WITH NEWER OR MORE ATTRACTIVE MATERIALS.

REFLASH WINDOW CAPS OR CAULK JOINTS.

REPAIR OR REPLACE ROOFING WITH MORE DURABLE MATERIALS.
Fireproof shingles; wood shingles; terra cotta tile; slate; copper or other metal.

CHECK SKYLIGHTS FOR REFLASHING, REPAINTING, GLAZING.

APPLY SNOW GUARDS TO PITCHED ROOF SURFACES.
Copper or galvanized steel brackets with rods.

CONNECT DOWNSPOUTS TO DRAINAGE SYSTEM OR TO DRY WELL.

CHECK FOUNDATIONS, FRAME, FLOORING, COLUMNS AND ROOF OF PORCHES.
Need for floor paint or general repainting.

REPAIR OR LENGTHEN CHIMNEY IF NECESSARY.

SCREEN PORCHES.

PROVIDE PORCH AWNINGS.

ADD VENETIAN BLINDS OR BAMBOO SCREENS ON PORCHES.

BUILD SHELTER OVER THE FRONT OR REAR DOOR.

REPAIR AND REPAINT LOOSE OR SHABBY BALCONIES AND RAILINGS.

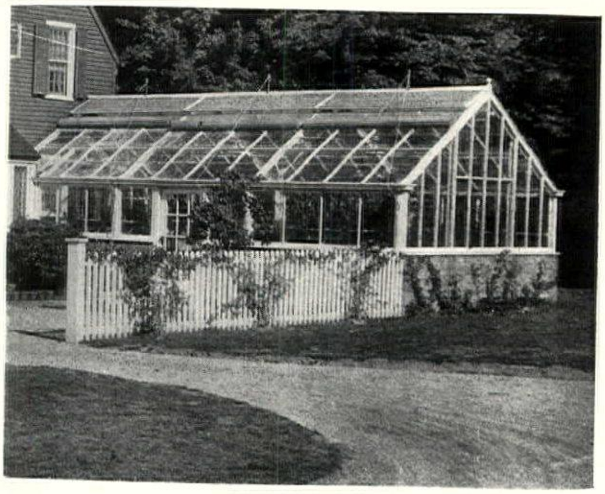
BUILD COVERED WAY TO GARAGE.

IMPROVE GARBAGE DISPOSAL.
"Proper provision should be made for the storing and disposal of garbage, rubbish, ashes, and other household refuse. These should be kept in covered, fireproof, waterproof, rustproof containers of ample capacity, so placed and maintained that they will not interfere with the healthfulness, appearance, or attractiveness of the premises."*
Portable steel or built-in brick incinerator. Gas drier: odorless and complete combustion.

PAINT OLD SCREENS.
Use special screen brush and paint.

REPLACE RUSTED SCREENING WITH NEW ONE.
Wire to be of copper, aluminum, chromium alloys.

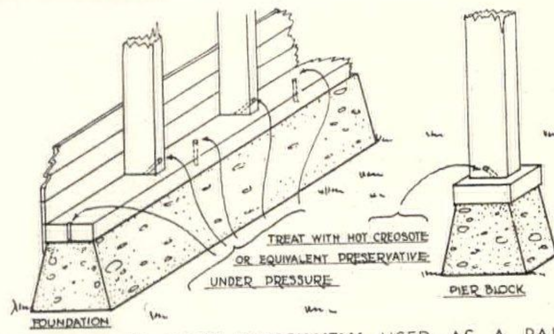
*The Home and The Child. The Century Co., N. Y.



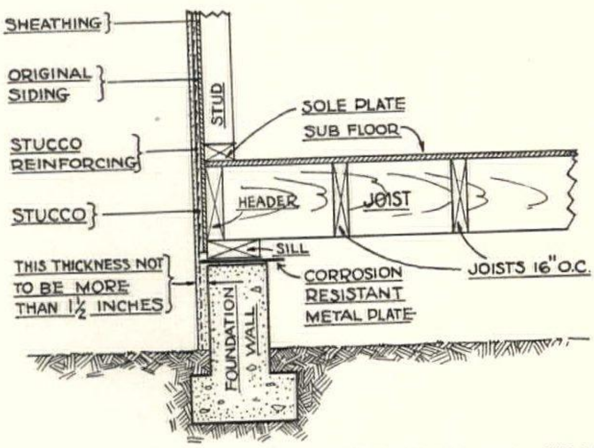
INSTALL GREENHOUSE ATTACHED TO HOUSE AND IN GARDEN LOCATION. PRICES FOR MATERIALS AND INSTALLATION ARE FROM $220 UP.

A GARDEN TERRACE CAN BE GIVEN AN OUTDOOR LIVING ROOM CHARACTER BY CULTIVATING SHADE FROM TREES AND VINES AND WITH USE OF LIGHT GARDEN FURNITURE. THE OPEN BEAMS DO NOT PRODUCE MUCH SHADOW DURING THE WINTER MONTHS WHEN SUNSHINE IS DESIRABLE.

THE APPROACH TO THE HOUSE CAN BE ENHANCED BY THOUGHTFUL PLANTING AND ARRANGEMENT, UTILIZING LOCAL STONE AND PLANT MATERIAL AND AT MODERATE COST.



CREOSOTE IS MOST EFFECTIVELY USED AS A PALLIATIVE AGAINST THE SUBTERRANEAN TERMITE AT THE JOINING SURFACES OF WOOD ON WOOD OR WOOD ON CONCRETE.



METHOD OF PLACING STUCCO OVER SIDING ON AND NEAR FOUNDATION WALL. NOTE CORROSION-RESISTANT METAL PLATE.

INSTALL SHOE SCRAPER.

PROVIDE STORAGE SPACE

for garden furniture, screens, storm windows, baby carriages, bicycles, sleds, garden tools, etc.

INSTALL POLES FOR DRYING CLOTHES.

"If outdoor space for drying clothes is provided, it should be screened so that the neighborhood will not be rendered unattractive. Vine-covered lattices and hedges usually make the most satisfactory screens."*

ADD GARDEN FURNITURE AND EXERCISE EQUIPMENT.

PROVIDE PLAYGROUND SPACE FOR CHILDREN.

"Suitable play space should be provided in the yards to supplement neighborhood resources and should be so located that the play activities of small children can be observed easily by the mother while engaged in her daily routine."*

REARRANGE PLANTING TO GIVE PRIVACY BUT LET THE SUN REACH GROUND AND HOUSE.

"Trees, shrubs, and vines should be planted in such a manner that they provide an attractive setting and furnish shade and privacy."*

INSPECT GROUNDS FOR ELIMINATION OF MOSQUITO BREEDING PLACES.

They breed in stagnant water as found in old tin cans, undrained roof gutters, ponds. Gold and silver fish destroy mosquito larvae in small ponds. Low-grade kerosene or gas-oil is best for treating places that cannot be drained. One ounce of kerosene for 15 square feet of surface.

REPAVE DRIVEWAY AND WALKS.

TERMITES and REPAIR OF TERMITE DAMAGE

REPLACE WOOD TIMBERS DAMAGED BY TERMITES.

APPLY APPROVED METHODS FOR CONTROL OF TERMITES.

The following information is extracted from "Termites and Termite Damage," Circular 318, College of Agriculture, University of California. This bulletin should be consulted for reliable guidance.

"Damage by termites to wood in contact with the ground constitutes a major part of the termite problem. The use of termite-resistant or treated woods in such situations will afford some degree of protection.

"In the case of alteration and repair, remove stumps, roots, scraps, refuse and refuse wood of all description in neighborhood of house. All wooden forms on foundations and chimney bases should be removed.

"In repair work remove all wood in contact with ground that has been attacked by termites. Remove all wood that is structurally unsafe. If subterranean termites are shut off from a source of moisture supply, they will soon die.

"Destroy by fire all removed wood containing termites.

"Provide adequate ventilation under the first floor. At least 2 feet of openings for each 25 lineal feet of exterior foundation wall is recommended. Where there are spaces under floors near the ground they should be excavated so that there will be no soil within 24 inches of the joists. Cross ventilation should be provided.

TREATED LUMBER.

"For timber in contact with the ground the most effective chemical preservative treatments are pressure impregnations with coal-tar creosote. For timber not in contact with the ground pressure impregnation with zinc chloride has proved effective where not subjected to leaching. These latter methods are the treatments recommended by the American Wood-Preservers' Association. Painting surfaces and short time dipping is not effective.

"The use of corrosion-resistant metal plates is recommended as a barrier between foundation walls and wood sills (sixteen-ounce hard copper is recommended).

"Fifteen-gauge zinc has also been recommended. Galvanized iron may be used but will not stand up over a long period.

"Where ground treatment is considered essential, consider U. S. Government Bulletin, Department of Agriculture. It is seldom essential to apply this remedy.

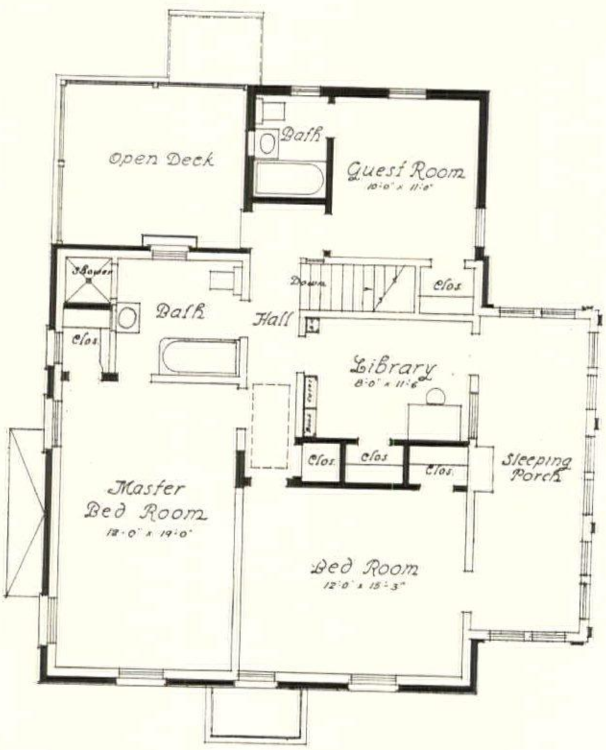
"Subterranean termites often use cracks in brick and masonry foundations as runways. A common method of treatment is to inject a generous amount of hot creosote. This material should be injected between the surfaces of the foundation and the infested sill, and between the surfaces of sill and studding.

*The Home and The Child. The Century Co., N. Y.

A REMODELED HOUSE

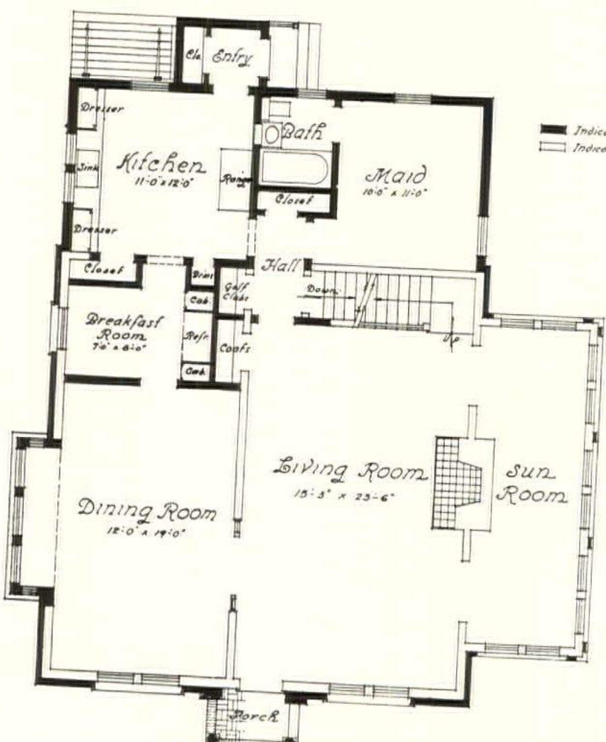
BY M. R. JOHNKE, ARCHITECT

EXTENT OF REMODELING—ADDITION OF WING FOR GUEST ROOM WITH BATH AND MAID'S ROOM WITH BATH. OLD KITCHEN ALTERED INTO BREAKFAST ROOM. NEW AND LARGER KITCHEN ADDED TO REAR. DINING ROOM AND LIVING ROOM WERE ENLARGED; SIZE OF MASTER BEDROOM ENLARGED. RECREATION ROOM PROVIDED IN CELLAR.



←**GROUND FLOOR PLAN** AFTER ALTERATION.

BEFORE ALTERATION.



Indicates new construction
Indicates existing work

SECOND FLOOR PLAN AFTER ALTERATION.

BEFORE ALTERATION.

Gustave Anderson
AFTER ALTERATION.

HOUSE FOR H. P. KOCH, ROCKVILLE CENTRE, LONG ISLAND.
M. R. JOHNKE, ARCHITECT.

OLD PORTION OF BUILDING, BRICK VENEER. PORCH ALTERED—SHINGLES AND NARROW CLAPBOARD; WHITE PINE TRIM; BLACK SLATE ROOF; COPPER LEADERS AND GUTTERS. INTERIOR TRIM OF WHITE PINE, HARD FINISH PLASTER. RECREATION ROOM, PLASTER CEILING AND WALLS. TILED KITCHEN AND BATHS. NEW STRIP FLOORING OF RED OAK SELECTED. NEW CAST IRON BOILER FOR HEATING. ALL OTHER HEATING AND PLUMBING WORK WAS CONNECTED UP WITH PRESENT SYSTEM WHICH DID NOT NEED CHANGING. ALL PIPING, COPPER. NEW RADIATORS WERE OF FREESTANDING TYPE. COLOR SCHEME: GENERALLY CREAM WHITE; BLINDS, DEEP GREEN IN COLOR. GARAGE ALTERED TO MATCH.

HOUSE BEFORE ALTERATION, PHOTOGRAPHED FROM SAME ANGLE AS ABOVE.

GARAGE

BUILD IN A BASEMENT GARAGE.

ATTACH GARAGE TO HOUSE ON GROUND FLOOR.

CONVERT SHED OR BARN INTO GARAGE.

INSULATE OLD GARAGE SHED.

LAY CONCRETE FLOOR.

INSTALL FLOOR DRAIN.
Oil and gas separator.

BUILD GREASING PIT.

PROVIDE NEW DOOR.
Overhead, folding, sliding.

INCREASE DAYLIGHTING.
Additional windows, glass door panels.

INSTALL HEATING EQUIPMENT.

REARRANGE OR REBUILD GARAGE FOR TWO CARS.

APPLY FIRE PROTECTION TO WALLS AND CEILING.

INCREASE ENTRANCE SIZE FOR BETTER ACCESS.

REPLAN ACCESS FOR MORE EASE.

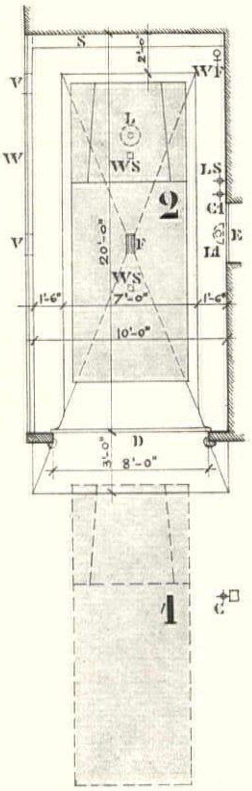
INSTALL ELECTRIC LIGHT.
Over engine.

PROVIDE WATER OUTLET AND BASIN.

BUILD IN STORAGE SHELVES OR CLOSET.

ADD A WORK BENCH.

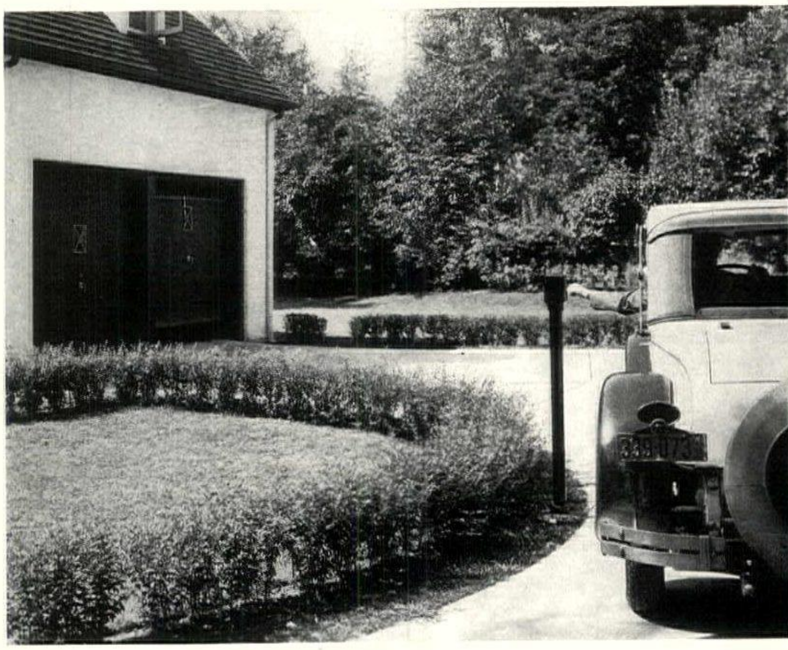
PLAN LOCATION OF GARAGE NEAR STREET FOR SHORT DRIVE REQUIRING MINIMUM PAVING.



TYPICAL GARAGE LAYOUT FOR ONE CAR WITH ESSENTIAL DIMENSIONS AND ACCOMMODATIONS.

KEY TO INDICATION ON PLAN

- 1 Car shown on plan before entering garage in position to operate control switch C.
- 2 Car inside garage.
- C Control switch operated by driver to open, close and lock garage doors without leaving car.
- Cl Control switch for same purpose inside garage.
- D Garage doors (overhead).
- E Entrance door to house (metal clad).
- F Floor drain at center of garage.
- L Ceiling reflector over engine.
- Ll Light at house entrance, directed on running board.
- Ls Light switches.
- S Shelving for storage of supplies.
- V Vents near base of wall.
- W Windows hinged at bottom.
- Ws Sprinkler system for fire protection.



GARAGE DOOR OPENED AND CLOSED ELECTRICALLY BY INSERTION OF KEY IN POST.

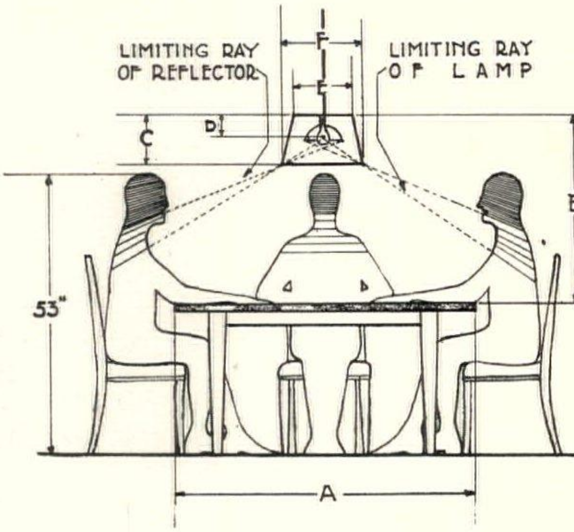
GARAGE DESIGN DATA

MOTOR CAR DIMENSIONS (1934)

MAKE	*(L)	*(W.B.)	*(F)	*(R)	*(W)	*(H)	*(C)	*(T)	*(T.D.)
Willys (77) . . .	13'– 0"	100"	22½"	33½"	5'– 0"	5'– 4"	10½"	. . . .	36'–0"
Ford (V-8) . . .	14'–10"	112"	25"	41"	5'– 7"	5'– 8"	11"	4'– 8½"	46'–0"
Chevrolet	14'–10¼"	112"	25¾"	40½"	5'– 9½"	5'– 7½"	11¼"	4'– 9½"	43'–0"
Plymouth	15'– 1½"	114"	27½"	46"	5'– 7½"	5'– 8¼"	11"	4'– 8½"	. . . .
Pontiac	15'– 7¼"	117¼"	27"	43"	5'–10"	5'– 8½"	13"	4'– 8½"	45'–4"
Oldsmobile (6) .	15'– 9½"	114"	28¼"	47¼"	5'–10¼"	5'– 7¼"	11"	4'–10"	38'–0"
Dodge	15'–10"	117"	25½"	47½"	5'– 7½"	5'– 8½"	11½"	4'– 8½"	. . . .
Chrysler (6) . .	16'– 0¾"	117"	27¾"	48"	5'– 7½"	5'– 8½"	11¼"	4'– 9"	. . . .
Studebaker (6) . .	16'– 3½"	114"	28"	53½"	6'– 2"	5'– 8"	9¾"	5'– 0"	42'-0"
De Soto (AF) . .	16'– 4"	115½"	34¼"	46¼"	5'–10¼"	5'– 8"	11"	4'– 9"	. . . .
Buick	16'– 4¼"	119"	28¼"	49"	6'– 3"	5'– 9½"	12"	5'– 0½"	44'–0"
Nash	16'– 7"	116¼"	29"	53¾"	5'–11"	5'– 7½"	9½"	5'– 0"	46'–0"
Packard	16'–10½"	129¼"	28¼"	45"	5'–11¼"	5'–10½"	9¼"	4'–11½"	41'-6"

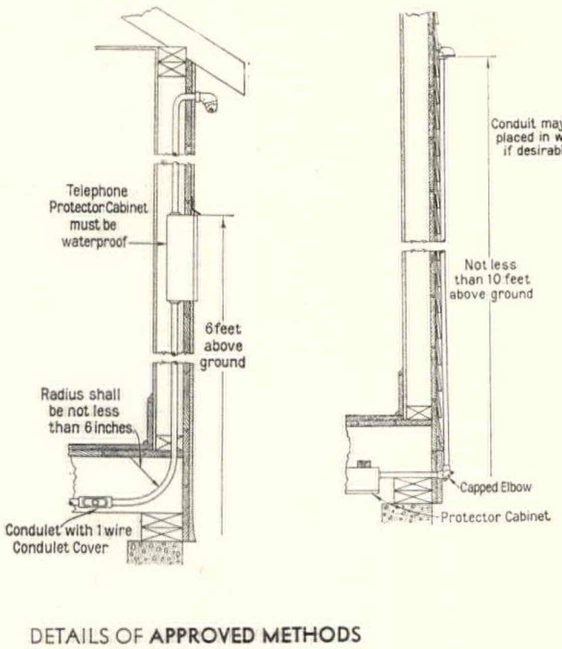
Courtesy: Ramp Buildings Corporation, New York City.

*NOTE: Information supplied by Automobile Manufacturers. (L) length; (W.B.) wheel base; (F) distance from center of front hub cap to front extremity; (R) distance from center of rear hub cap to rear extremity; (W) width; (H) height; (C) distance from ground to underside of running board; (T) tire tread; (T.D.) turning diameter (diameter of smallest walled-in circle in which the car will make a complete turn).



DIMENSIONAL DATA FOR DINING TABLE LIGHTING, SHOWING HEIGHT OF LIGHTING UNIT AND SHADE DIMENSIONS.

TABLE LENGTH	HEIGHT FROM TABLE TO TOP OF UNIT	SHADE DIMENSIONS			
A	B	C	D	E	F
4'-6"	2'-9"	8"	4¾"	10"	14"
5'-0"	2'-11"	9"	5"	12"	16"
5'-6"	3'-1"	10"	5⅜"	14"	18"
6'-0"	3'-3"	12"	6"	16"	20"
6'-6"	3'-3"	12"	6"	16"	20"



DETAILS OF **APPROVED METHODS FOR INSTALLING CONDUITS** FOR ENTRY OF TELEPHONE WIRES, WITHOUT AND WITH BASEMENT. TELEPHONE SERVICE CONDUIT WITH PROTECTOR CABINET IN BASEMENT. FOR THE AVERAGE RESIDENCE TELEPHONE SERVICE THE FOLLOWING CONDUITS ARE SATISFACTORY: ½" PIPE FOR 2-3 WIRES; ¾" PIPE FOR 4-8 WIRES; 1" PIPE FOR 8-12 WIRES.

LIGHT and POWER

Information supplied by

HENRY L. LOGAN, Consulting Electrical Engineer

REWIRE WITH MODERN SYSTEM TO REDUCE FIRE HAZARD.

Conduit: Use either non-metallic sheathed cable, armored cable or rigid metal pipe.

RECOMMENDED WIRE SIZES.

Branch Circuit Wire Sizes Required to Restrict Voltage Loss to 2 Volts (Two Wire, 115 Volt Circuits).

LENGTH OF CIRCUIT IN FEET	WATTS PER CIRCUIT					
	750	1000	1500	1725	2000	3000
	AMPERES PER CIRCUIT					
	6.1	8.7	13.1	15.0*	17.4	26.1
20	14	14	14	14	14	12
30	14	14	14	12	12	10
50	14	12	10	10	10	8
100	10	10	8	8	6	4
150	10	8	6	6	4	4
200	8	6	4	4	4	2

* Fifteen amperes is the allowable current capacity as set forth in the National Electric Code.

Switches: Standard toggle switches for ordinary locations. Mercury switches for locations requiring silence. Safety switch on lighting panel. Safety switch on power panel. Safety master switch. Weatherproof switches in exposed locations.

Circuits: Separate circuits for convenience outlets, lights and power devices. One circuit for oil burner. One circuit for air conditioning apparatus. Heavy duty appliance circuit for electric range. Separate power circuit for radio. Separate concealed circuit for burglar alarm system.

INSULATE EXPOSED WIRES WHERE REQUIRED.

RENEW APPLIANCE CORDS.

CONVENIENCE OUTLETS—ALL DUPLEX.

PROVIDE SPECIAL OUTLETS FOR

Clocks.

Radio (aerial and ground connection).

Fans.

Ventilators.

PROVIDE PILOT LIGHTS ON SWITCH PLATES

of stationary silent devices and switches of lights not visible from the switch.

REPLACE OLD FIXTURES AND ADD NEW ONES.

Built-in flush ceiling lights for porch, vestibule, pantry, kitchen, laundry, bathroom, hall and game room.

Semi-indirect or indirect for living room, library and bedrooms.

Flush ceiling light or suspended "dome" for dining room.

Refractor bracket lights for service entrance, driveway and garage entrance.

Reflectors for garage and boiler room.

PROVIDE NEW POWER LINE.

Consult local utility company for its requirements.

REPLACE BELL BATTERIES WITH BELL TRANSFORMER.

REPLACE OLD FUSE BOXES WITH CIRCUIT BREAKER PANELS.

"Nofuze" panel installation. Cost, about $4 per circuit.

LIGHT and POWER (Continued)

BUY NEW APPLIANCES. CHECK LIST BELOW.

Bottle warmer for nursery.	Hair drier.
Clocks.	Humidifier.
Cooker.	Ironer.
Curling iron.	Mixer.
Coffee maker.	Sewing machine.
Dishwasher.	Sunlamp.
Electric refrigerator.	Toaster.
Electric towel drier.	Vacuum cleaner.
Egg cooker.	Vent fan.
Electric flat irons.	Waffle iron.
Floor waxer.	Washer.
Grill.	Water pump motor.
Heating pad.	

INSTALL WALL SWITCHES IN PLACE OF DROP CORDS.
Located on lock side of door, 4′ from floor.

PROVIDE WIREWAY FOR TELEPHONE EXTENSIONS TO MASTER'S BEDROOM, KITCHEN AND GARAGE.

INSTALL BURGLAR SYSTEM.
Types:
Visual: Manually operated by flexible extension switch under sleeper's pillow (recommended).
Auditory: Sounds alarm (gong) when circuit is broken by intruder.

EQUIP CLOSETS WITH DOOR SWITCHES.

LIGHT APPROACH TO HOUSE.

INSTALL FIRE ALARM SYSTEM.

INSTALL ILLUMINATED HOUSE NUMBER.

PROVIDE LIGHTNING PROTECTION.
Methods:
1. Plant trees with lightning sheds that will include buildings.
2. If building is lathed with metal, only additional precaution required is grounding of all plumbing and metal lath.
3. Lightning arrestors should meet specification of National Board of Fire Underwriters.

BUILD IN ELECTRIC BATHROOM HEATER.
Chromium-plated reflector, adjustable heating units. Sizes, 9″ x 9″; 13″ x 13″; 4″ deep.

HALL LIGHT AND LIGHTS FOR CELLAR STAIRS.
Should be controlled by three-way switches at top and bottom of stairs.

REPAIR OR REPLACE DOOR BELLS AND BUZZERS.

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BEDROOMS, BATHROOMS, February, 1932, pp. 123-128.
KITCHENS, January, 1932, pp. 49-54.
PLANNING THE HOUSE GARAGE, January, 1931, pp. 52-57.
SEATING HEIGHTS AND SPACING, TABLE SIZES AND HEIGHTS, April, 1932, pp. 261-267.
STAIRWAYS, RAMPS, ESCALATORS, July, 1931, pp. 43-48.
WINDOWS, February, 1931, pp. 126-137.
Article by Frederic Arden Pawley:
PLANNING THE HOUSE. A CHECK LIST OF REQUIREMENTS, November, 1932, pp. 282-294.
Article by Howard T. Fisher:
THE COUNTRY HOUSE, November, 1930, pp. 363-385.

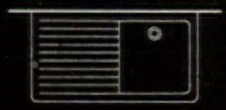
KITCHEN

KITCHEN SINK

21″ to 24″ wide, 22″ to 30″ long. Height of rim, 32″ to 36″ above floor.

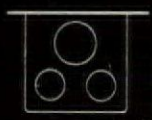
KITCHEN SINK
WITH DRAIN BOARD

21″ to 24″ wide, 41″ to 52″ long. Height of rim, 32″ to 36″ above floor.



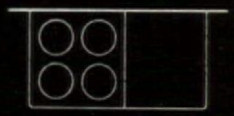
RANGE (OVEN BELOW)

21″ to 27″ wide, 21″ to 30″ long, 34″ to 38″ high.



RANGE (OVEN AT SIDE)

23″ to 27″ wide, 40″ to 48″ long, 40″ to 54″ height over-all.



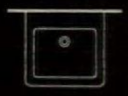
REFRIGERATOR

18″ to 27″ wide, 24″ to 32″ long, 48″ to 60″ high.

BATHROOM

LAVATORY (WALL TYPE)

18″ to 30″ long, 15″ to 24″ wide. Height of rim, 31″ above floor.

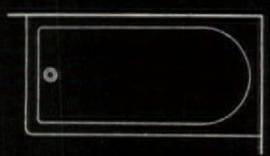


LAVATORY (FREESTANDING, 2″ OFF WALL)

24″ to 36″ long, 20″ to 24″ wide. Height of rim, 31″ above floor.

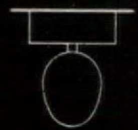
BATHTUB

30″ to 36″ wide, 54″ to 72″ long, 18″ high.



TOILET

Width over-all, 22″ to 24″. Projection from wall, 24″ to 30″.



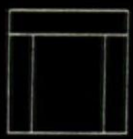
SHOWER CABINET
(METAL)

32″ x 32″ to 42″ x 42″, 72″ to 78″ high.

CHAIRS and TABLES

CHAIR

17″ long, 16″ wide. Height, 32″ to 42″ over-all. Seat, 18″.



EASY CHAIR

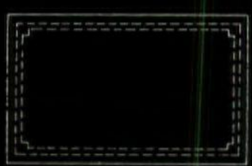
30″ x 30″, 30″ height over-all.

DAVENPORT

Length, 6′ to 7′; width, 30″ to 36″; height, 30″.

BRIDGE TABLE WITH FOLDING LEGS

29″ x 29″, 2″ thick; height, 27″.



TABLE

34″ to 40″ wide, 4′ long for 4 to 6 persons, 6′ long for 6 to 8 persons, 29″ high.

DINING TABLE

3′ diameter, 4 persons; 4′ diameter, 6 persons; 28″ or 29″ high.

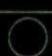
DESKS and PIANOS

DESK (OFFICE TYPE)

4′-6″ to 5′-0″ long, 2′-10″ wide; height, 30″.

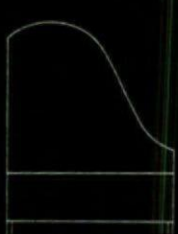
UPRIGHT PIANO

4′-10″ to 5′-4½″ long, 2′-0″ to 2′2″ wide; height, 3′-8″ to 4′-5½″.



PIANO STOOL

14″ diameter; height adjustable, 19″ to 25″.



GRAND PIANO

4′-10″ to 5′-0″ wide, 5′-10″ to 7′-3″ long; height, 3′-4″.

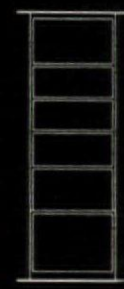
BABY GRAND

4′-7″ to 4′-10″ wide, 4′-11″ to 5′-8″ long; height, 3′-3″ or 3′-2″.

LIVING ROOM and BEDROOM

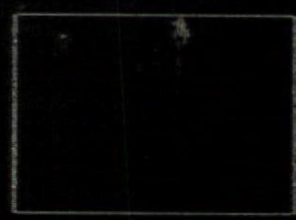
BOOKSHELVES

Highest shelf reached from floor, 6'-6". Length of wood shelves, 2'-6" to 3'-6". Shelf height for common books, 8" to 12". Shelf depth for common books, 7" to 10". Bottom shelf for folios and large books, 20" to 24" high, 16" to 18" deep.



CARPETS AND RUGS
STANDARD SIZES

11'-3" x 15'-0", 11'-3" x 12'-0", 9'-0" x 15'-0", 10'-0" x 12'-0", 9'-0" x 12'-0", 8'-3" x 10'-6", 7'-6" x 9'-0", 6'-0" x 9'-0", 4'-6" x 6'-6". 9, 12, 15, 18, 21 feet are standard loom widths.



SINGLE BED

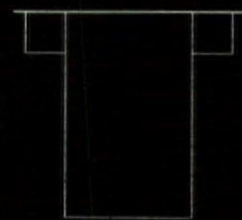
3' to 3'-3" wide, 6' to 6'-6" long.

NIGHT STAND

14" to 17" square. Height, 29" to 30".

DOUBLE BED

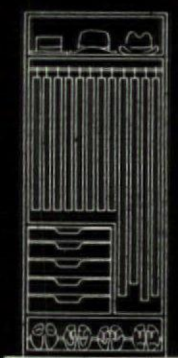
4' to 4'-6" wide, 6' to 6'-6" long.



CLOSETS

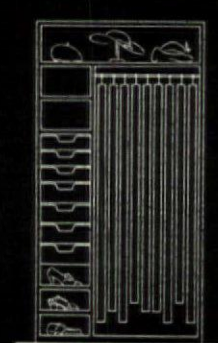
CLOTHES CLOSET
FOR MEN

Hanging space for suits and overcoats. Hanging rod not more than 5'-10" above floor. Drawers for lesser garments, 3" to 4" high. Shelf for shoes, 8" high; shelf for hats, 9" high. Height for suits, 3'-3"; height for overcoats, 5'-0"; width for 8 suits, 22"; width for 4 overcoats, 12". Depth of closets, 20" to 24".



CLOTHES CLOSET
FOR WOMEN

Hanging space for dresses and coats. Hanging rod not more than 5'-6" above floor. Drawers for lesser garments, 3" to 4" high, 12" wide. Shelves for shoes, 5" high; shelf for hats, 12" high. Height of hanging space, 5'-6"; width for 9 dresses, 27"; depth of closet, 20" to 24".



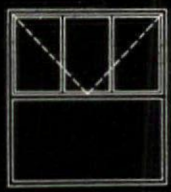
WINDOW (WOOD)
DOUBLE-HUNG

Stock sizes. Width, 1'-4" to 3'-0", every 2" intervals. Height, 3'-0", 3'-6", 4'-0", 4'-6", 5'-2".

WINDOWS and DOORS

"BASEMENT" STEEL WINDOWS (OPENING IN)

Sizes, 2 lights, 1'-11" x 2'-7⅜"; 3 lights, 1'-3" x 2'-9¾", 1'-11" x 2'-9¾", 1'-9" x 3'-3¾". Fits brick or concrete construction.



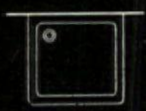
"UTILITY" STEEL WINDOW (for Garages, Basements, Sheds, etc.)

Width, 3'-4½"; height, 3'-7½". Fits concrete blocks. Upper half opening in.

DOOR SIZES (STANDARD STOCK SIZES)

Width, 1'-6" to 3'-0", every 2" intervals. Height, 6'-0", 6'-6"; 6'-8" and 7'-0" (preferred). Thickness, 1⅜", 1¾".

MISCELLANEOUS

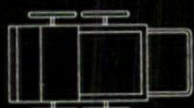


LAUNDRY TRAY

20" to 26" wide, 22" to 30" long. Height of rim, 31" to 36" above floor.

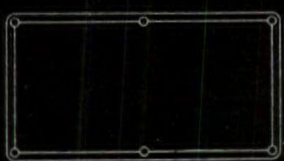
LAUNDRY TRAYS

22" to 27" wide, 40" to 50" long. Height of rim, 31" to 36" above floor.



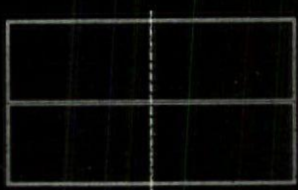
BABY CARRIAGE

2' x 4' over-all. Height, 3' (top down).



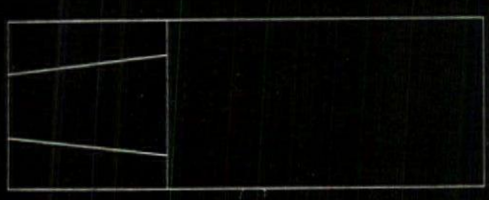
BILLIARD TABLE

Nominal sizes, engl. table, 6' x 12'; standard tables, 5' x 10', 4½' x 9', 4' x 8'; junior tables, 3½' x 7', 3' x 6'. Height, 2'-9½", 2'-10½". Cues, 4'-6" to 4'-10" long.



PING-PONG TABLE (FOLDING IN CENTER, FOLDING LEGS)

5' x 9' (regulation size). Height, 30".



PASSENGER AUTOMOBILE

The following auto sizes for 1934 models are for a few selected cars. For complete listing see table in accompanying check list.

	Wide	Long
Ford	5'-7"	14'-10"
Chevrolet	5'-9½"	14'-10¼"
Plymouth	5'-7½"	15'-1½"

MODERNIZATION

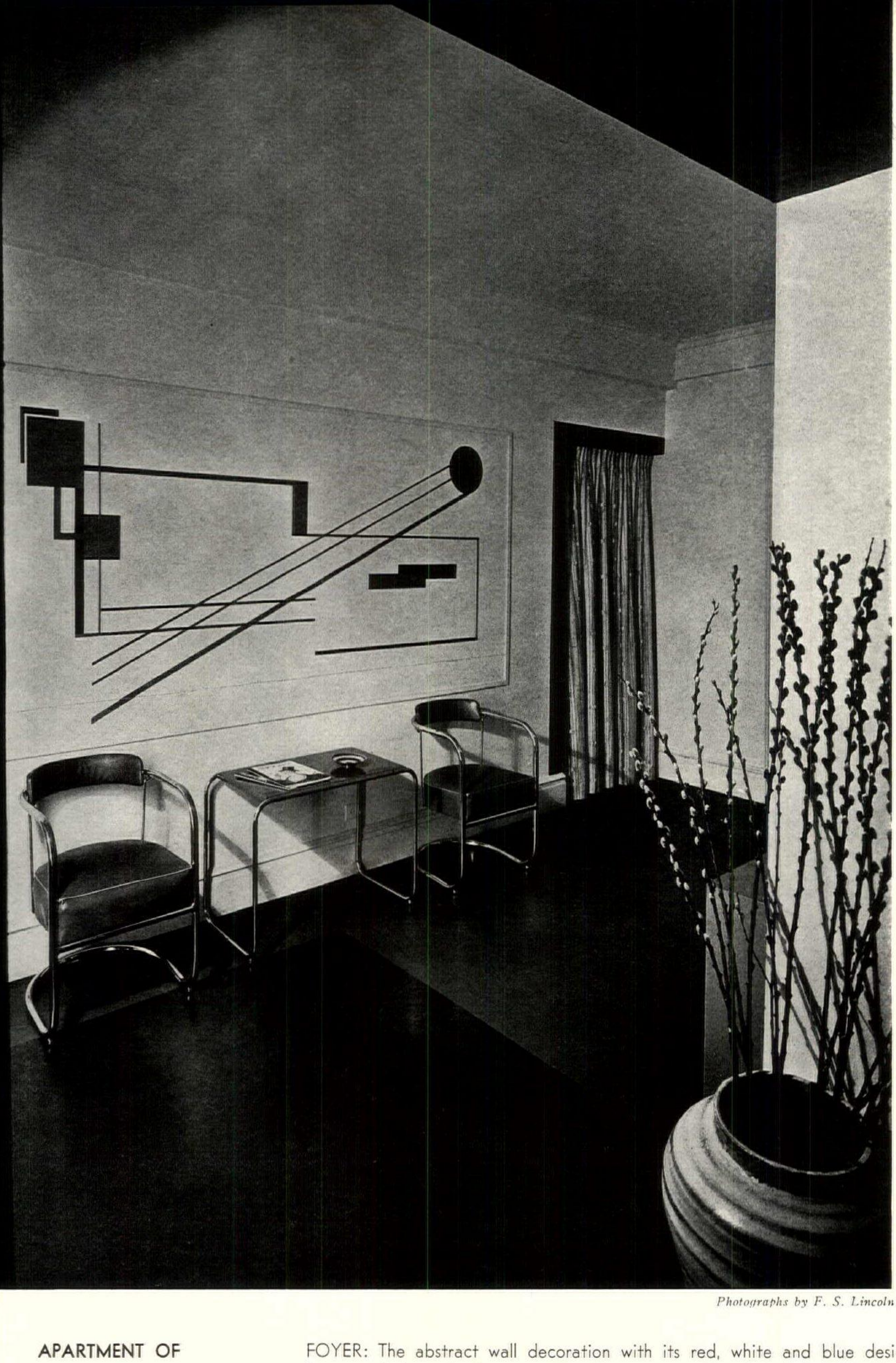
APARTMENT OF DR. FRITZ WITTELS, NEW YORK CITY

DESIGNED BY PAUL LESTER WIENER, DIRECTOR OF CONTEMPORA, INC., ARCHITECTS

Photograph by F. S. Lincoln

This apartment combines consultation office, study and laboratory of Dr. Wittels, a practicing psychoanalyst, with his personal living quarters. The interiors have been designed to provide proper background for the reception and treatment of patients. The colors have been selected for their psychological value in the treatment of patients.

The illustration shows a low end table, one of a pair which flank the sides of a custom-built couch. Designed for the filing of art portfolios and magazines, this table, an adaptation of a Chinese design, also provides space for smoking accessories and the like. It is finished in off-white lacquer. The vase, designed by Vally Wieselthier, is glazed in blue, white and gray. The bronze, "Head of a Woman," is by Sonia Brown.



Photographs by F. S. Lincoln

APARTMENT OF DR. FRITZ WITTELS NEW YORK CITY

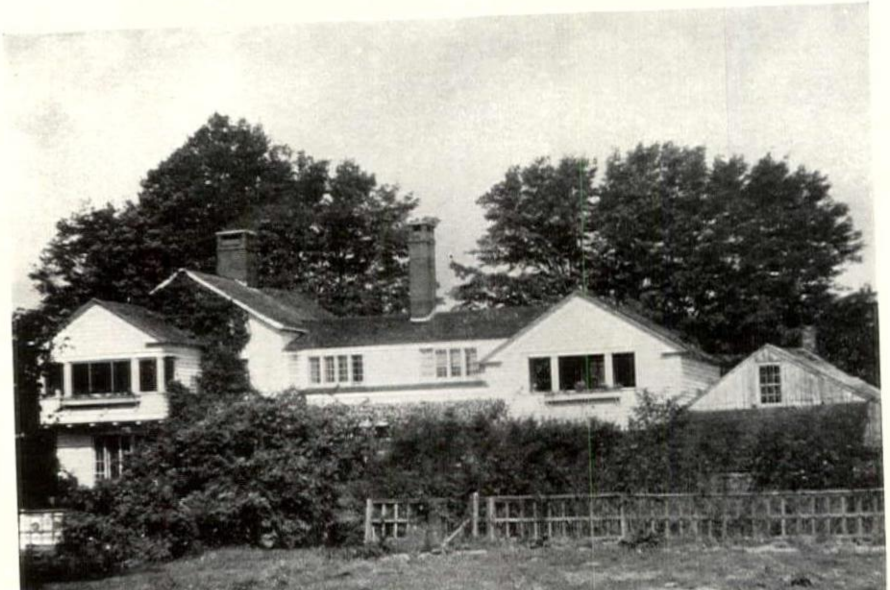
FOYER: The abstract wall decoration with its red, white and blue design, is the keynote of the color harmony. The floor is covered with red and blue linoleum laid in geometric sections. The table is shiny tubular steel and blue bakelite. The steel chairs are upholstered with red leather trimmed in white. A horizontal strip of blue and a vertical strip of red frame the doorway which is curtained with a loosely-woven cotton thread fabric in gray, white, blue and red.

DESIGNED BY
PAUL LESTER WIENER

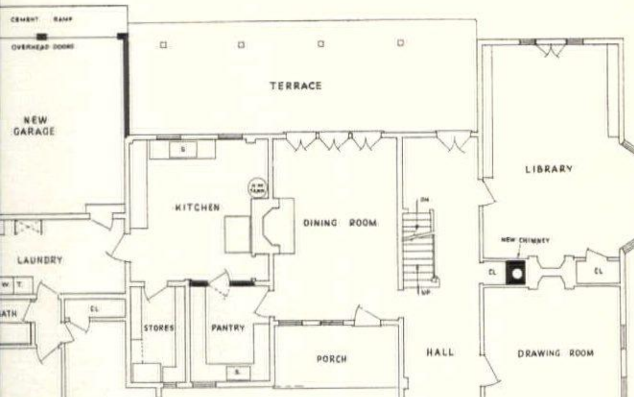
CONSULTATION OFFICE AND STUDY: The circle was used as the basic motif for the architectural design of this room. Two-thirds of the seamless round carpet is white, the other third brick red. The bookshelves are off-white and brick red. The shelves become an integral part of the desk, at the side wall. The chairs and table are also built on circular lines, counterbalanced by the curved frame of the desk, which is set into a frame of cork board. Color accents throughout the room are warm rust red.

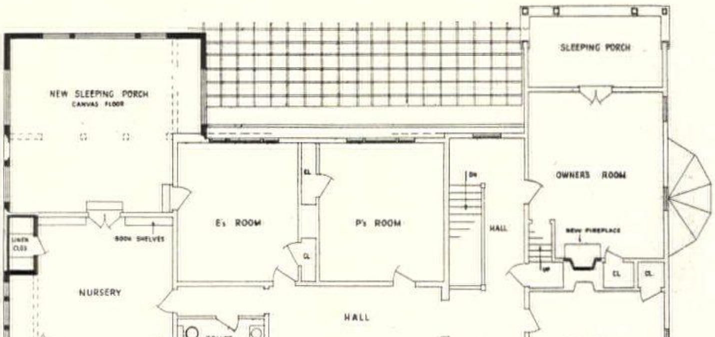
Photographs by George H. Van Anda

REMODELED HOUSE OF EDWARD RAWSON
SKIFF MOUNTAIN, KENT, CONNECTICUT — ROGER H. BULLARD, ARCHIT



House before remodeling.


CEMENT RAMP
OVERHEAD DOORS
NEW GARAGE
TERRACE
LIBRARY
KITCHEN
DINING ROOM
LAUNDRY
NEW CHIMNEY
CL
CL
STORES
PANTRY
PORCH
HALL
DRAWING ROOM
MAIDS RM
PORCH


SLEEPING PORCH
NEW SLEEPING PORCH
CANVAS FLOOR
OWNERS ROOM
E's ROOM
P's ROOM
HALL
NEW FIREPLACE
LINEN CLOS
BOOK SHELVES
CL
CL
CL
NURSERY
HALL
TOILET
GUEST ROOM
CEDAR CLOSET
CLOSET
BATH
BATH

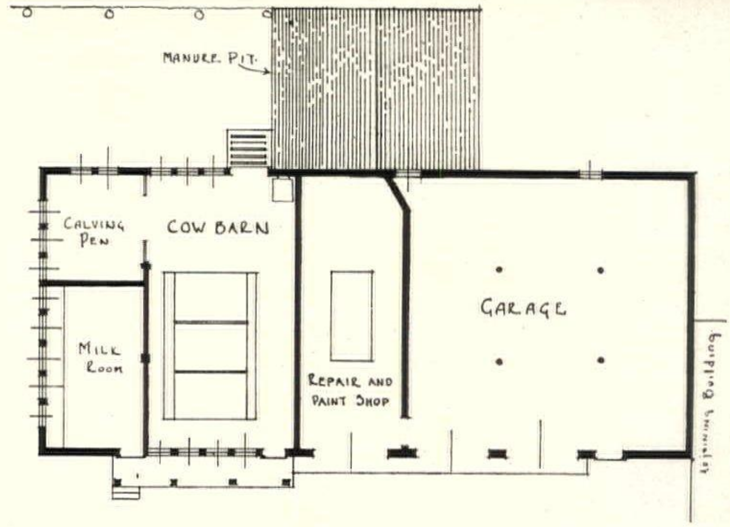
HOUSE ON ESTATE OF HERBERT L. NICHOLS AT GREENWICH, CONN
REMODELED FROM A COWBARN BY EDWARD MAINWARING-JOHNSON

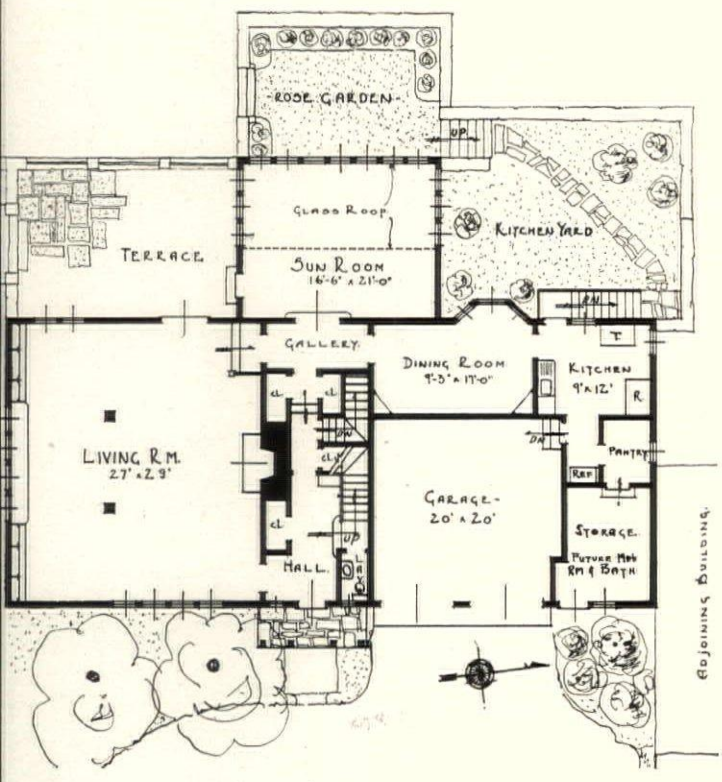
Above: West end before remodeling.

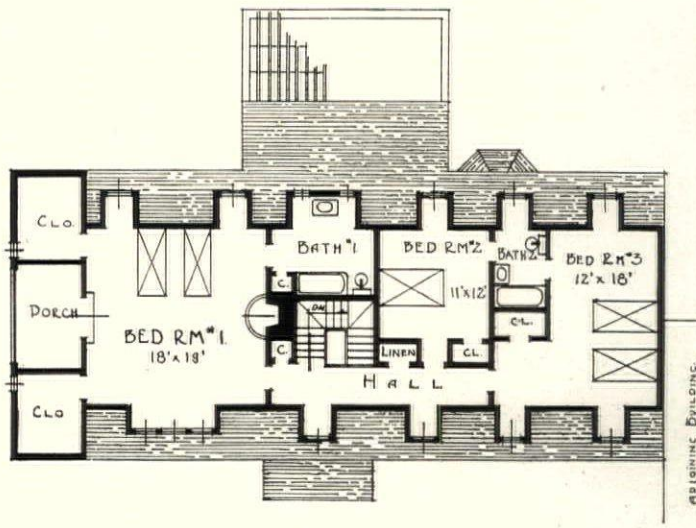
Right: South side after remodeling.

ght: Plan of old cowbarn.

low: Remodeled plan.







General view of living room.

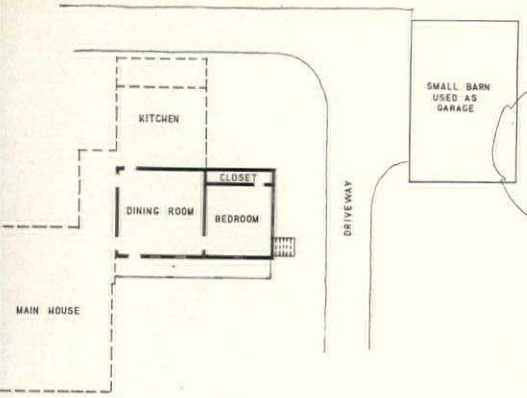
Photographs by George H. Van Ando

REMODELED HOUSE OF DR. RALPH G. STILLMAN
KENT, CONNECTICUT ALLAN McDOWELL, DESIGNER

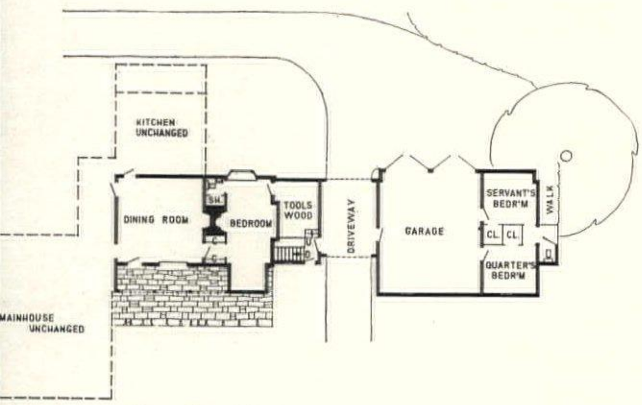
The wing of the old house (illustrated a left) was much too narrow for its heigh Its overhanging roof was eliminated, th tall narrow chimney rebuilt to accommo date three fireplaces, and the fenestra tion changed, and a tool room and ga rage added to improve the south eleva tion and to give the house a greate width.

Materials: White clapboards and gree blinds on main house, and vertical flus boards on garage; wood shingles on roo plaster and wall paper in main house, an exposed studs in garage and servants rooms.

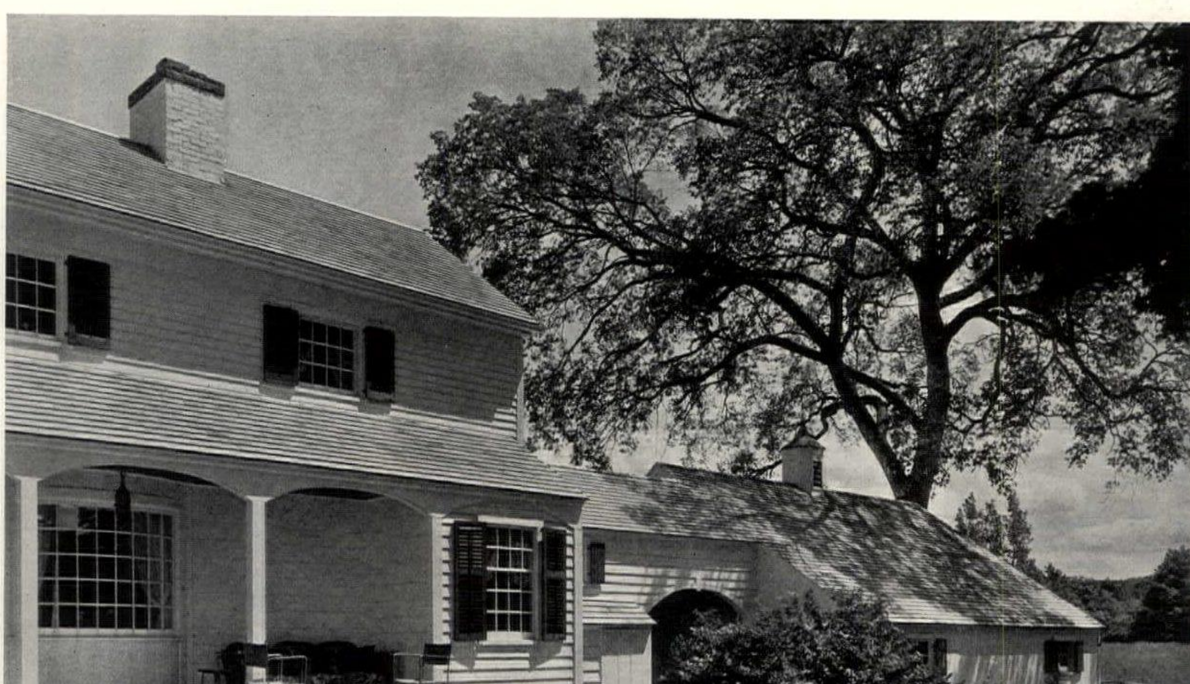
Cost: Roughly $3,500, including repair on outbuildings and fences.

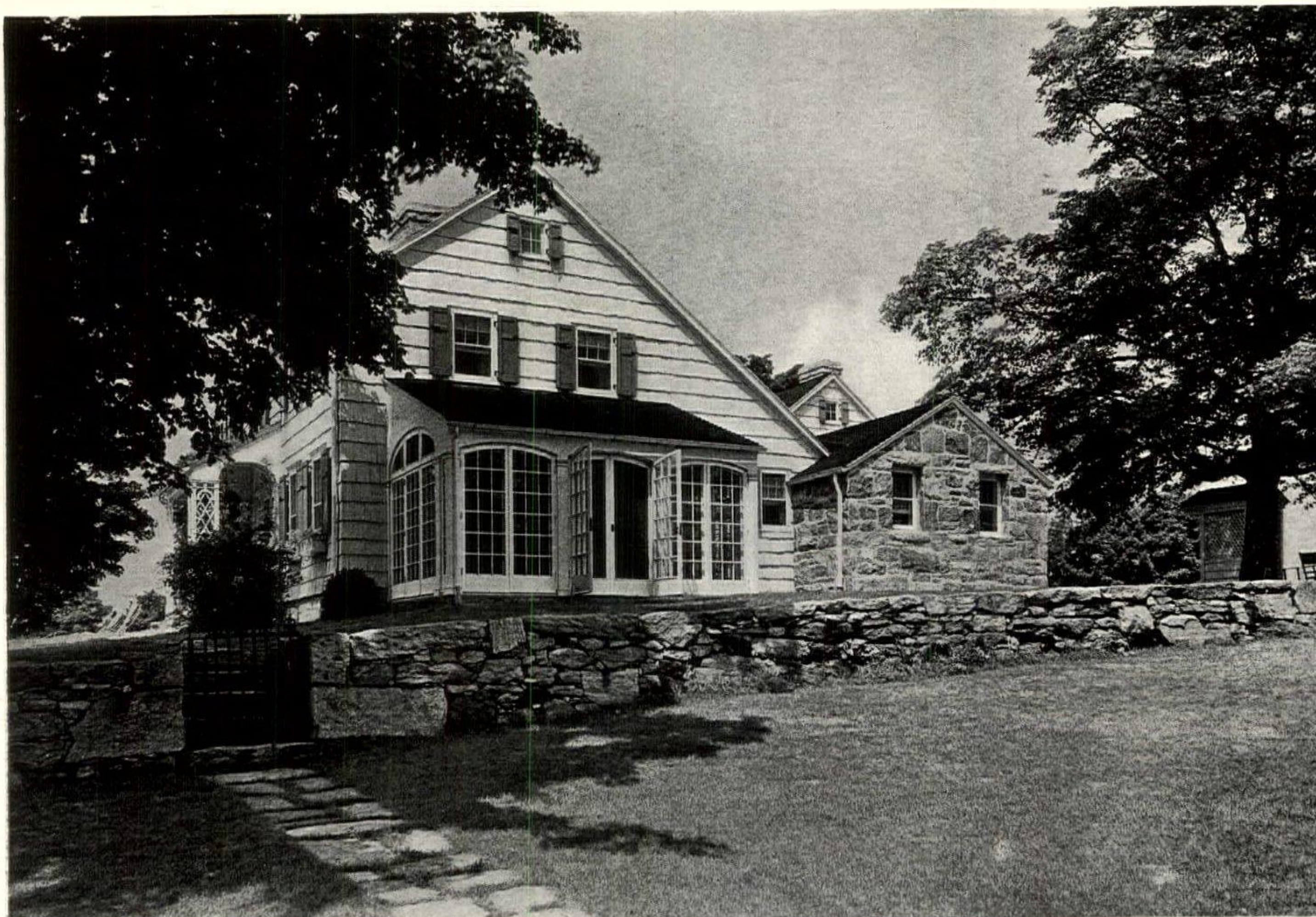


Plan before alteration.



Plan after alteration.





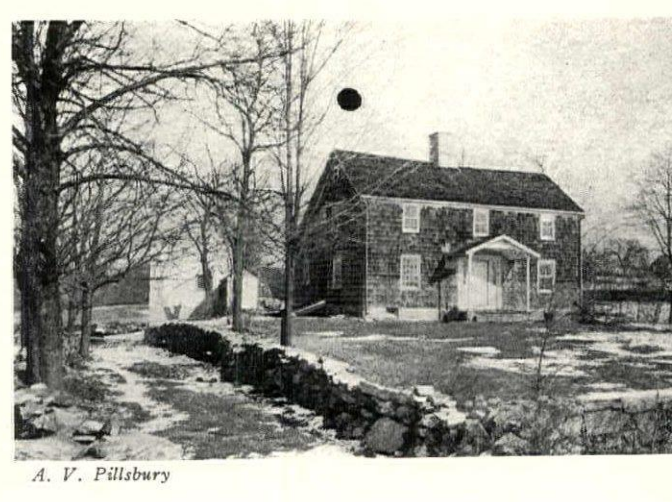
Photographs by Samuel H. Gotts

After remodeling.

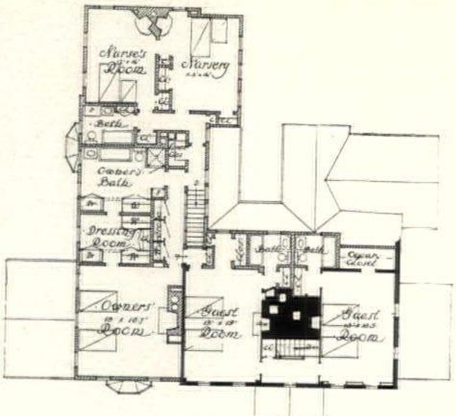
Before remodeling

REMODELED FARMHOUS
IN STAMFORD, CONNECTICU
WILLIAM F. DOMINICK, ARCHITEC

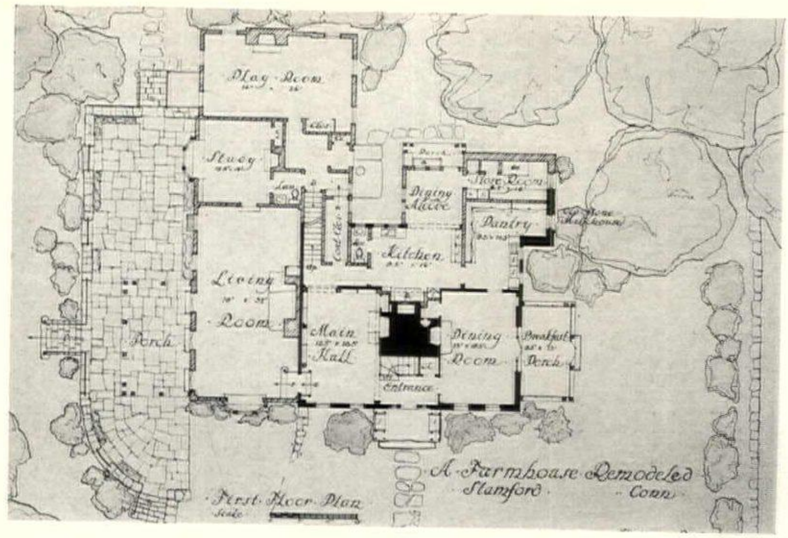
Before remodeling



A. V. Pillsbury



Second Floor Plan



Original size of house was more than doubled in remodeling. Exterior: handsplit cypress shingles, painted white; green blinds. New air conditioning system installed. Cost: approximately $35,000.

After remodeling

REMODELED HOUSE
OF MRS. DOROTHY R. ELLIS
HADDAM, CONNECTICUT

Photographs by Paul J. Weber

ELEANOR RAYMOND
ARCHITECT

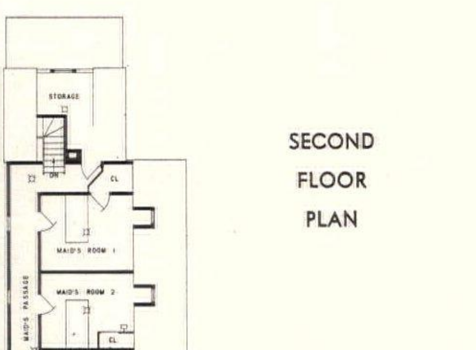
Left: House before alteration.
Upper right: Porch room.
Lower right: Dining room.

Extent of remodeling: Roof of ell raised. New chimneys built. Interiors replastered. Old floors relaid and some new ones installed; woodwork and bookshelves in living room are all new. New inclosed porch added. New heating, plumbing and wiring installed, together with water system and a septic tank.

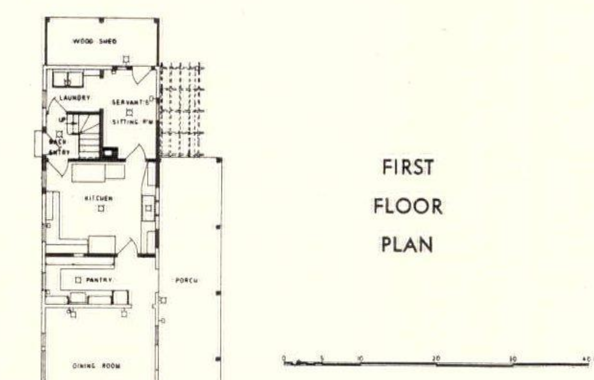
Materials: Clapboards and matched boarding on exterior walls. Wood shingles for roof. Gypsum plaster on rock lath for interiors. Country pine paneling in living room. Linoleum floors in service and baths.

Color scheme: Pale yellow exterior walls with copper-colored blinds. Cream-colored trim and wall papers in most rooms. Stained pine woodwork in living room. Citron yellow painted walls and woodwork in dining room.

Cost: $37,000, including architect's fees.



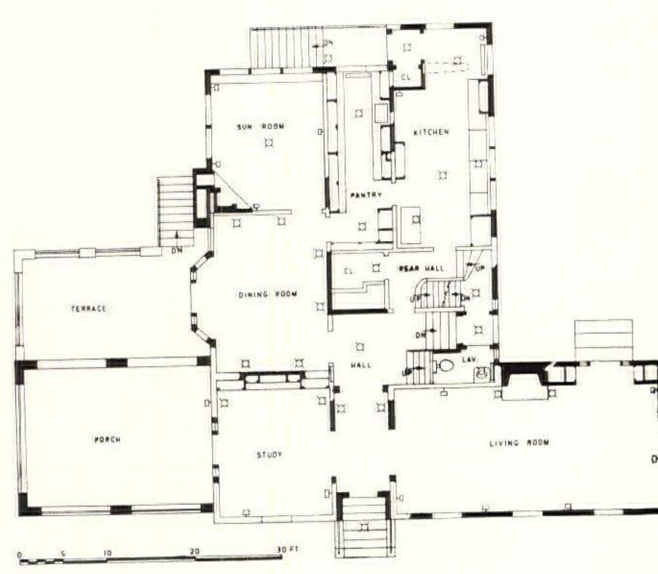
SECOND FLOOR PLAN



FIRST FLOOR PLAN

Photographs by Paul J. Weber

REMODELED HOUSE OF FRANK BARNES
HAVERHILL, MASSACHUSETTS
ELEANOR RAYMOND, ARCHITECT

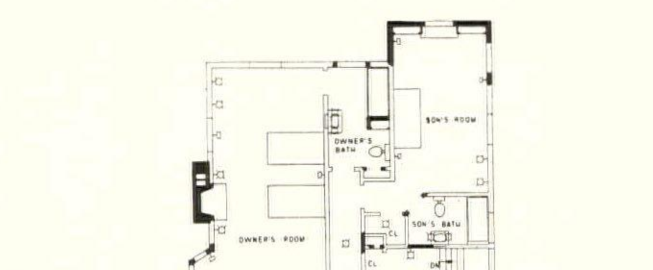


FIRST FLOOR PLAN

House before remodeling

Extent of remodeling: Two-car garage with porch and terrace above added to one side of original house and a living room wing on the opposite side. Exterior shingled walls were furred out, wire lathed and stuccoed. All windows replaced with steel casements. New doorways and two new chimneys built. Kitchen and pantry rebuilt. One new tiled bathroom and lavatory added, old baths tiled and equipped with some new fixtures. New retaining walls and fence built. Cost: $55,000, including architect's fees.

Paul J. Weber



SECOND FLOOR PLAN

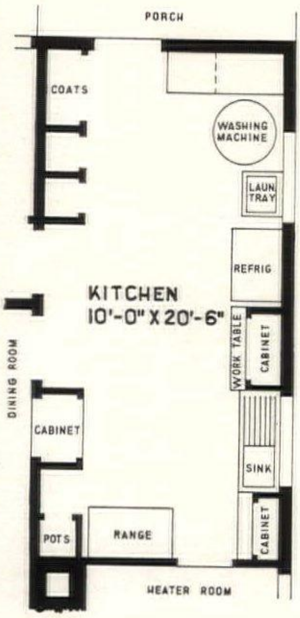
Materials: Exterior of California stucco. Split chestnut sapling fence. Wrought iron railing on porch, front entrance and front stairs. Bluestone paving on terraces and porch. Hand-finished plaster walls, chestnut trimmed, and wide board oak floors on first floor interiors.

Heating: Old hot-water system changed to vapor steam with gas-fired boiler. Concealed radiators in principal rooms.

Color scheme: Light neutral pink exterior with gray-green blinds. Iron railings, conductors and front-door lantern. Natural chestnut front door and fence. Neutral pink walls and natural wood trimmed beams in living room, study and hall.

REMODELED HOUSE OF FRANK BARNES
HAVERHILL, MASSACHUSETTS
ELEANOR RAYMOND, ARCHITECT

TECHNICAL NEWS AND RESEARCH



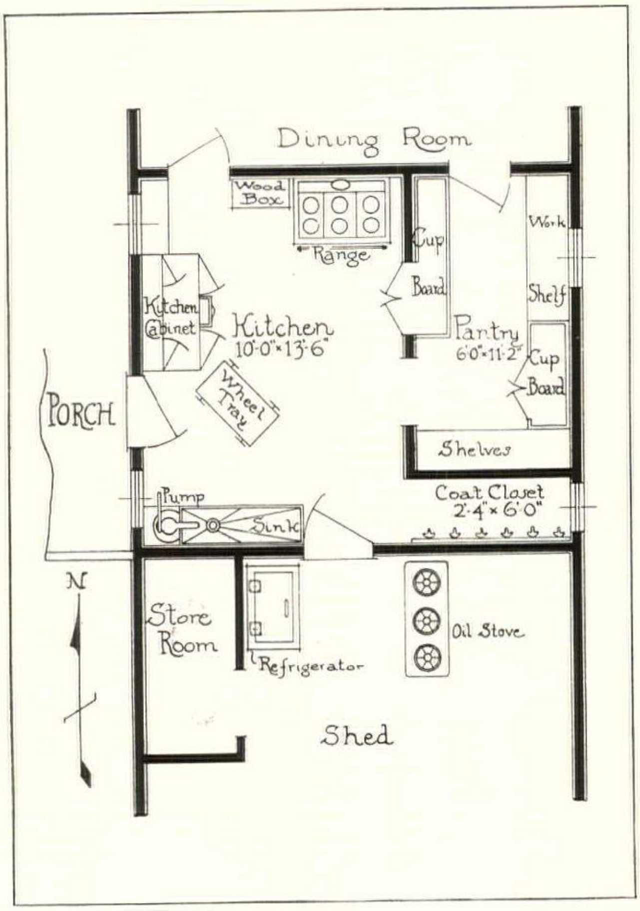
A rough installation used to test efficiency of kitchen plan in a farm housing project. Federal Civil Works Administration, U. S. Department of Agriculture.

PLANNING THE KITCHEN

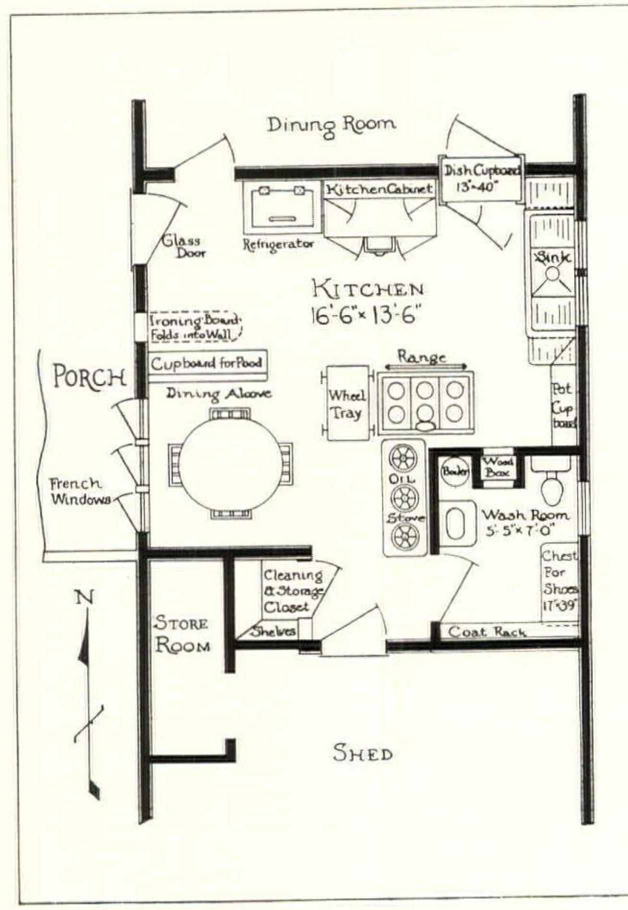
By
DR. LOUISE STANLEY, Chief
Bureau of Home Economics,
U. S. Dept. of Agriculture

The work center of the house is the kitchen, and the efficiency with which the work can be done there depends to a large extent upon its plan and arrangement. The general requirements of a well-planned kitchen are set up here as a guide for architects and builders in planning new construction. These same suggestions should be equally useful in replanning an old kitchen to make it more convenient.

There is no one model or ideal kitchen plan. Any kitchen, to be convenient, must be adapted to the needs of the family for food preparation and service. These needs vary with the size of the family, the amount of entertaining that is done, the type of dwelling, the substitute facilities at hand, the amount of outside service used, and the utilities available. Type kitchens can be set up which will meet these various needs, and general suggestions can be offered to make any kitchen more convenient.



Original floor plan of farm kitchen: Note scattered arrangement of working surfaces and poor placing of small equipment.



Revised plan: Note compact arrangement of all large equipment, placing of small equipment near surafce on which first used, washroom and closet.

from KITCHEN EQUIPMENT AND ARRANGEMENT by Marianne Muse. Vermont Agricultural Experiment Station Bulletin 375, May 1934.

CERTAIN equipment is required in every kitchen: a stove, water supply usually combined with a drain in the form of a sink, work tables or work surfaces at satisfactory heights, refrigeration, and adequate storage space designed for the articles to be stored and located as nearly as possible where these will be used.

This equipment should be selected and arranged with the different kinds of work which must be carried on in the kitchen in mind.

(1) The *preparation* of foods for cooking comes first. Vegetables are prepared at the sink and should be stored nearby. Short mixing jobs are done near the stove, and longer jobs at a work table which should be located near the main storage center, so staple supplies will be at hand, and if possible, the refrigerator should be nearby.

(2) The *cooking* is done at the stove. It should be well lighted and easily reached from food preparation and service centers, and the utensils used there should be stored close at hand.

(3) The *serving center* is a collecting station between the stove, the refrigerator, and the dining table. If there is a cupboard between the kitchen and the dining room, the lower shelf serves this purpose. If not, a wheel table makes a desirable serving surface for the housewife without a maid. The food can be arranged upon it and wheeled into the dining room at one trip. If families entertain much there should be facilities for increasing the surface by a hinged shelf or a movable table.

(4) For the *cleaning up* or the dishwashing center a place for soiled dishes, sorting, washing, rinsing, and draining is needed. A satisfactory dishwasher is the ideal solution, located away from the utility sink, but as yet this is too costly for most homes. Next best is a separate sink planned for dishwashing. For the lower-priced homes the all-purpose sink should be selected and located with the different needs in mind.

PLANNING SEQUENCE

The various pieces of equipment are available at different cost levels with great variety in size, quality and finish. While wise selection of equipment is an important factor in efficiency, more important is the arrangement of the large pieces of equipment in a step-saving sequence to form a compact working area. In general, the jobs indicated above as being carried out in a kitchen follow a definite order. The raw food is collected, prepared, cooked and served. In the cleaning up process, the soiled dishes are removed, scraped and stacked, washed, drained, and put away. This furnishes a guide to the order in placing the equipment on the floor plan. In the preparing process, first the food storage cupboard and refrigerator, then the cabinet, then the stove, and last the serving table; and for the clearing away process, first the stack table, then the sink, then the drain board, and last the shelves for china.

In the preparing sequence, the work can proceed either toward the right or toward the left, but should end at the dining room door or serving window. In clearing away, however, work proceeds most efficiently to the left—provided we are right-handed. For each dish or utensil as it is washed is held in the left hand, and if the drain board is on the right of the sink, the left hand must cross over the right with every piece that is put down.

The arrangement possible will be determined by the structural features of the room, its size and proportions and the location of the openings and provisions for water and gas. So it is important that the architect have in mind a definite plan for placing the kitchen equipment before finally fixing these structural features.

RECOMMENDED ARRANGEMENTS

Studies in kitchens with different arrangements have resulted in the following definite recommendations as to the location of specific pieces of equipment:

Sinks should be installed with drain board to the left and flat surface or drain board to the right, both at height of top edge of sink. The drain board should be at least 32 inches long and the stacking surface at the left at least 36 inches. There should be open space under the sink itself. Some space above the sink should be available for narrow shelves for the storage of cleaning materials, and a wider shelf or cabinet for the storage of cereal, double boiler, coffee and coffee pot, tea and tea pot, cocoa and cocoa pot should be near the sink or over the stove. Small utensils used at the sink, dish scraper, paring knife and can opener should be hung within easy reach. A ventilated cabinet for vegetable storage is desirable near the sink.

The sink should be well lighted with a window preferably in the wall at right angles so placed as to throw light on the sink. If it is on the same wall, it should not be placed directly over the sink unless on the north side or with some protection from the glare. *Wall space above the sink is valuable.* If the window is placed there it must be sufficiently high to allow the back of the sink to fit under and should allow space for a small shelf. Artificial light should be so placed and of sufficient height to give good light on the work at the sink without throwing a shadow.

If dishes are to be stored in the kitchen, the storage should be above the left drainboard or within reach of it. Dish storage accessible from both kitchen and dining room saves steps. In this arrangement the sink must be on a common wall between the kitchen and the dining room or on a wall at right angles. When dish storage is not possible in either of the above places, a wheel table is necessary.

The stove may be at right angles to the sink, or directly across from the sink if the kitchen is narrow. Shelves or a cabinet for storage of utensils used at the stove should be within reach of the cooking surface. A small preparation surface or table (which may be movable) should be available adjoining the stove (burner portion) at the same height as the burner, and if near the dining room door or pass cupboard, it can be used also as a serving table. If this is to serve as a service center also, space should be provided for storage of bread and cake and the other things needed in food service.

The *work table* for long mixing jobs, such as baking, cake making, dessert and the like, should be of sufficient height to permit work while sitting, and should have knee space below. Staple supplies should be within reach of the worker so seated. *This work table should preferably be between the refrigerator and stove.*

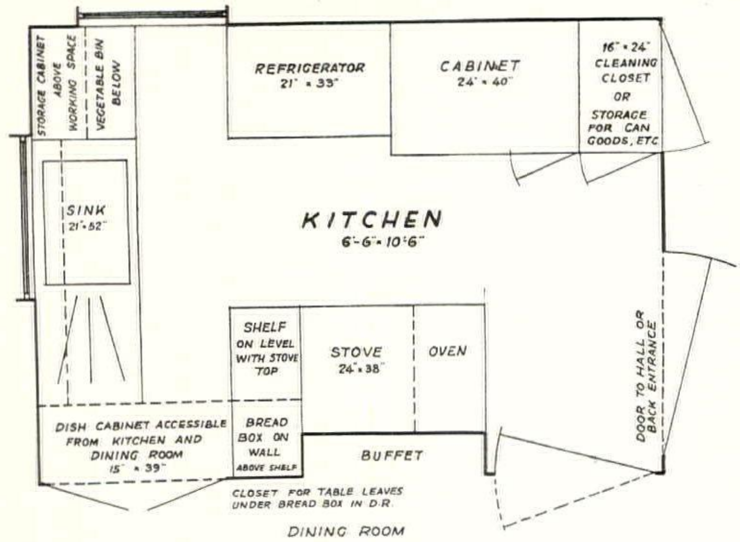
The refrigerator should, from the point of view of convenience, be as near as possible to both work table and stove. It must be remembered, however, that the higher the surrounding temperature the greater the cost of operation of the refrigerator. In most cases the housewife prefers convenience at a slight increase of expense in operation. If an iced refrigerator is used, a position near the door facilitates icing without undue mussing of the floor. A properly constructed draft cooler is desirable in most climates and makes possible a more efficient use of the space in the refrigerator.

Since the wall space is needed for placing equipment, the rectangular kitchen makes possible a more satisfactory arrangement than a square one. Unless a coal or wood range is used the width should not exceed 8 or 9 feet. *A kitchen should be at least 6½ feet wide* or only one side wall can be used for placing equipment, which is inefficient. The kitchen with all the proposed equipment should be drawn to scale before final decision as to location of opening and of utility outlets is made. So far as possible, the work portion should be kept free from doorways to prevent traffic way across it, and breaks in working surfaces.

The architect can contribute much to the efficiency of the kitchen by specifying convenient heights for working surfaces and by planning storage spaces so as to minimize stooping and stretching. The sink and work surfaces for short jobs should be at satisfactory heights for work while standing. This varies with the worker, good averages being from 34 to 36 inches. Work surfaces for longer jobs or for the woman who spends much time in food preparation should be provided with knee space underneath at a suitable height for sitting either on a stool or preferably in a comfortable chair with both feet on the floor.

Storage space should be adapted to the size of the articles to be stored and placed, so far as possible, *where the particular article will be first used.* The large one-purpose kitchen cabinet has served its day. It is replaced with built-in units placed where needed. Unfortunately, too many of these installations are planned by the manufacturer interested primarily in increasing the volume of his sales, and with too little knowledge of the kitchen activities and articles to be stored. As a result, there is likely to be an over-elaboration of cabinet space, artistically balanced but poorly arranged in relation to size or location of the articles to be stored.

The same amount of cabinet space—if arranged with the activities of the kitchen and the equipment to be stored in mind, will make possible much more efficient work. Kitchen units of standard size which may be adapted to various uses allow great flexibility in arrangement, but back of any arrangement should be a carefully worked out plan.

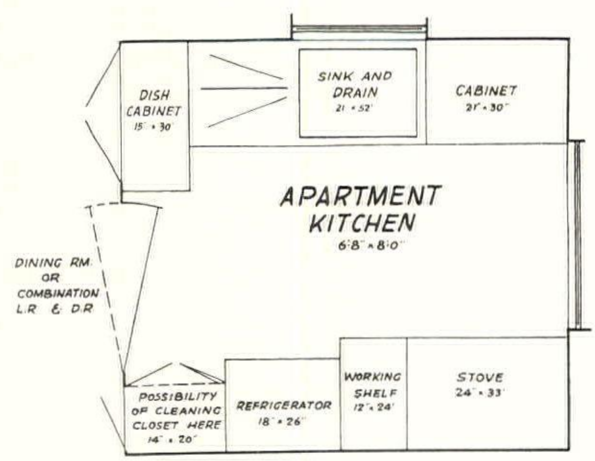


Large one-family house without maid service.

STORAGE SPACES

A satisfactory procedure in determining the built-in facilities is first to decide on the amount and the location of work spaces required by following the above listing of tasks to be done. No more work-table space should be required than is actually needed, not only for the sake of keeping down the cost of built-in units but also to keep the floor area as small as possible.

Having decided the amount and location of work-table spaces the next step is to plan the wise utilization of the cabinet spaces above and below each work area. In most home kitchens this will take care of all the articles to be stored. In the farm kitchen additional storage spaces may be needed in the basement or work-room. As a guide in planning these storage spaces the accompanying classification of material to be stored has been prepared.



Apartment or small house kitchen.

Serving center

Bread; cake; cookies.
Ready-to-eat cereal; crackers; wafers; zweiback; rusks, etc.
Loaf sugar; honey; candies; dried fruits served from packages.
Relishes not requiring low temperature.
Bread and cake knives; bread board; cake rack.
Ladles and serving spoons; serving forks; butcher knives.
Dishes, silver and linen used for everyday meals (unless warmed compartment is provided for platters, vegetable dishes, plates and cups).
Dishes, silver, linen, and table decorations used for company meals, and infrequently used dishes, unless storage is provided in dining room.
Mats for hot dishes.
Serving trays.

Sink center

Stew kettles; double boilers; saucepans.
Colanders; strainers.
Ice-cream dipper.
Paring knives; slicing knives; scissors; vegetable brushes.
Dish pans; rinse pans; dish drainers.
Pot cleaners; cleaning brushes.
Sink strainer; dish scraper.
Dish towels; dish cloths; hand towels.
Soap containers.
Garbage container.
Drinking glasses.
Cloth for wiping up spilled water from floor.
Drain cleaner; scouring powder; soap.
Hand lotion.

Mixing center

Flour; meal; other uncooked cereals used mainly in preparation of made dishes.
Sugar.
Leavening agents; dry yeast.
Cornstarch; gelatine; junket.
Spices; flavorings and colorings used in made dishes; cake decorations.
Mixing bowls; chopping bowl.
Measuring cups.
Grinders, choppers, shredders, graters; reamers; nut crackers; scissors; egg beaters; egg whips; meat pounder; meat saw.
Spatulas; knives; mixing spoons; measuring spoons.
Dough cutters; sifters; rolling pins.
Cake decorators, cookies "guns," etc.; molds.
Baking pans—bread, cake, pies, muffins, cookies, casseroles.
Boards—pastry; meat; vegetable.
Electric mixer.
Wax paper; paper napkins (for lunches); paper dishes.
Recipes.

EFT:
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mum floor space
rrangements for
itchens.

Stove center

Coffee and coffee substitutes; tea.
Salt; pepper; other seasonings. Flour in dredger.
Ladles; stirring spoons; masher; ricer.
Spatulas; turners; forks; wire toaster.
Skillets; griddles; broilers; roasters.
Coffee pot; tea pot.
Utensil-lids.
Deep-fat kettle and basket.
Pressure steamer.
Thermometers.
Pan-holders; lifters.
Matches; stove polishes.

Draft cooler

Fresh fruits and vegetables, unless highly perishable.
Cured meats; cured cheese.
Cooking fats.
Syrups; molasses. Chocolate; cocoa; cocoanut; malted milk.
Opened jellies; jams, relishes, etc. Candied fruits.
Salad dressing; vinegar.
Unshelled nuts.
Bouillon cubes.

Refrigerator*

Foods requiring chilling before use.
Left-over foods; perishable foods prepared in large quantities.
Milk and cream; butter; eggs; fresh meat.
Highly perishable fruits and vegetables.
Salad oil; peanut butter; shelled nuts; cod liver oil.
Opened packages of perishable foods—fruits, vegetables; meat, fish, evaporated milk.
Soft yeast.

*This classification is based on the assumption that frigerator space should be kept to a minimum, be-use of its cost, and that the refrigerator would not operated during the cooler months.

Unassigned

Containers used for foods kept in cooler or refrigerator should be kept near work surface which is most convenient to use in transferring foods to them.
Unopened canned foods.
Empty fruit jars, before taking to food-storage room.
Kitchen aprons.
Scales. Can openers; bottle openers, etc.
Tub for ice-cream freezer.
Popcorn; popper.
Sacks; wrapping paper; string.
Hammer and other tools; knife sharpener.
Picnic kit.
Clean rags, cheesecloth, etc.
Electric toaster; waffle iron; percolator; electric cords.
Waste basket. Paper; pencil.
Table leaves; false table-top (unless storage is provided outside kitchen).
Water jugs.

CONSTRUCTION OF STORAGE FACILITIES

Shelves should be readily removable and adjustable as to distances apart.

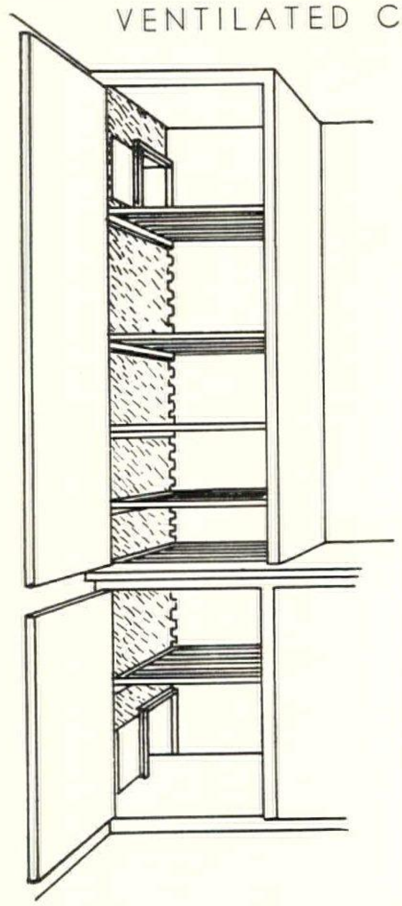
More efficient use can be made of space intended for articles which will hang, such as door or sides of cabinet, if the material used for lining permits one to place a hook wherever desired.

An upper cabinet should be made as shallow as possible, allowing for a single row of the largest articles to be stored in it.

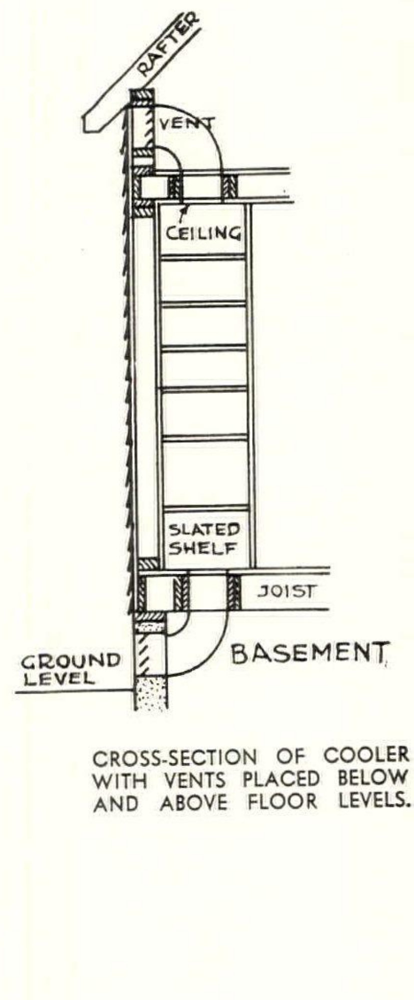
Movable trays are better than shelves in compartments below work counters. The trays should be four inches narrower than the compartment itself, to allow space for articles hung or placed in racks on the door.

Drawers may be used advantageously as bins. Larger drawers with movable metal insets are preferable to small drawers for supplies stored in less than twenty-five pound lots.

VENTILATED CLOSET FOR FOODS

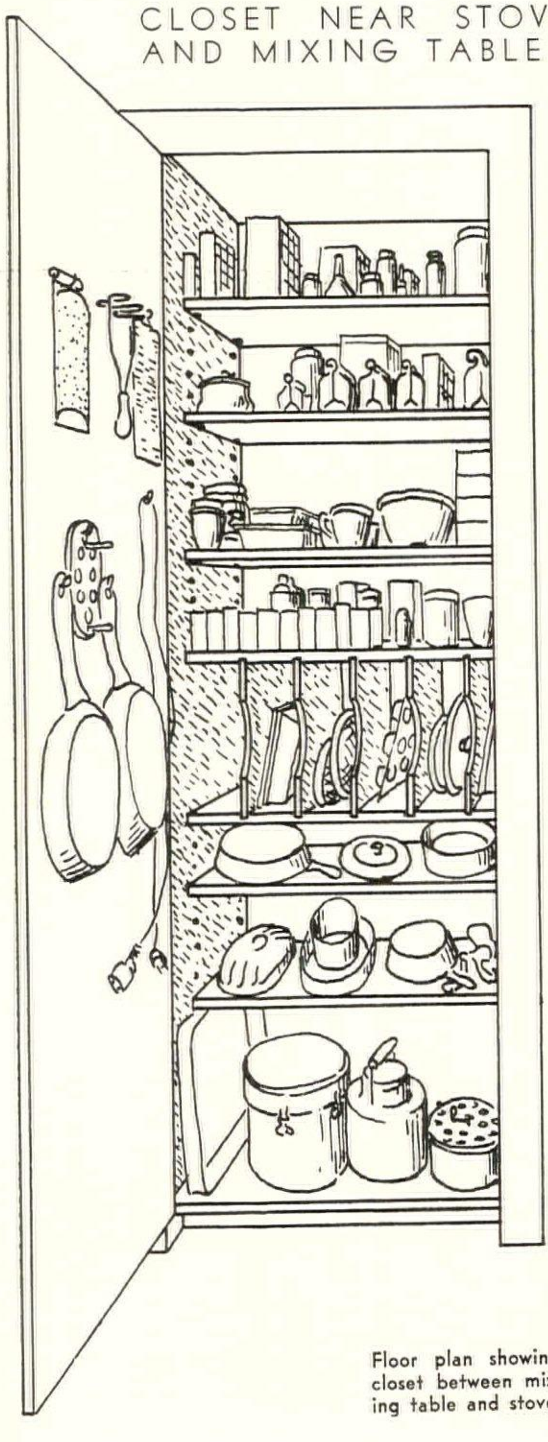


ESSENTIALS IN CONSTRUCTION:
Tight-fitting door. Shelves removable and adjustable as to distances apart.
Shelves as open as possible. They may be made of wooden slats or heavy wire.
Two vents are essential. The lower one should be at or below the floor level, the upper one should be as high as possible.
Large vents are more effective than small ones.
Vents should be covered with fine-mesh copper screening which can be removed for cleaning.
Vents should be fitted with some arrangement for closing which can be operated from inside.

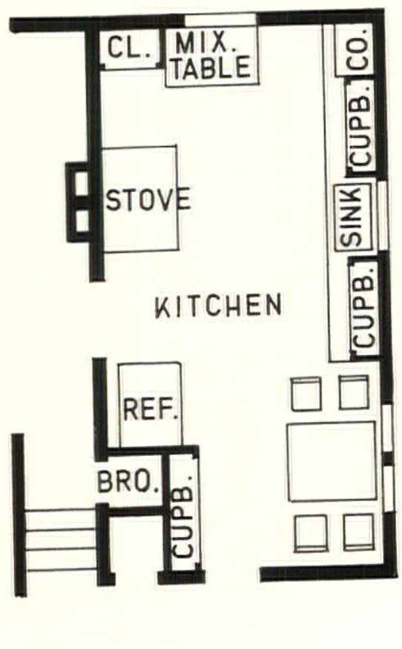


CROSS-SECTION OF COOLER WITH VENTS PLACED BELOW AND ABOVE FLOOR LEVELS.

CLOSET NEAR STOVE AND MIXING TABLE

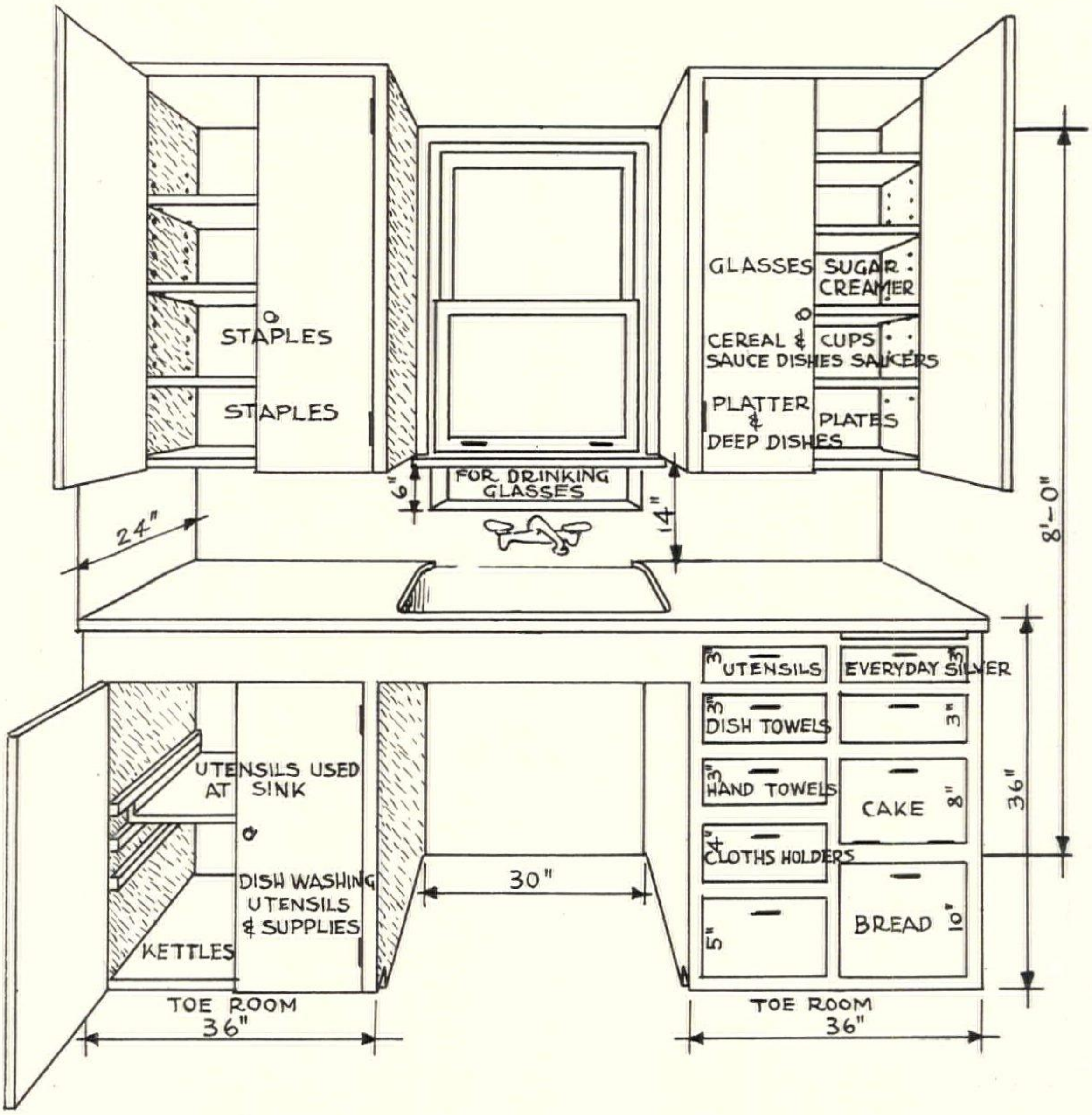


FOR EQUIPMENT AND STAPLE SUPPLIES USED AT BOTH CENTERS.
Shelves 15" wide. Lower part of partitioned section is 38" from floor. Shelves above and below are adjustable to 2" intervals.
Movable partitions form compartments for pie tins, muffin pans, etc.
Space is left between the door and the front edges of shelves to permit small articles to be hung on the door and at the sides of the shelves.

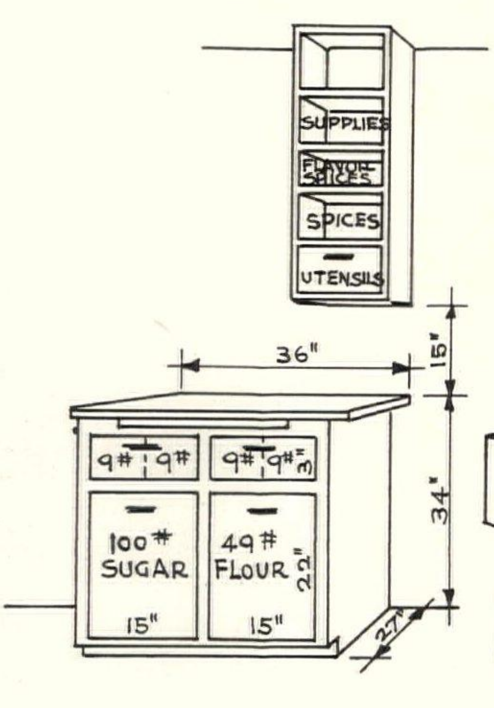


Floor plan showing closet between mixing table and stove.

SINK UNIT:
24″ wide,
36″ high,
8′6″ long.

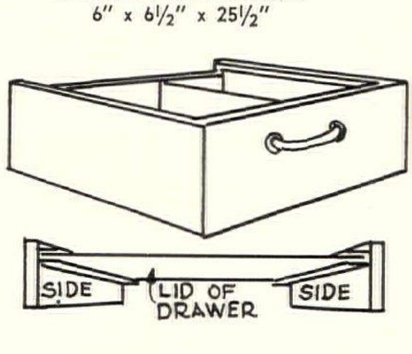


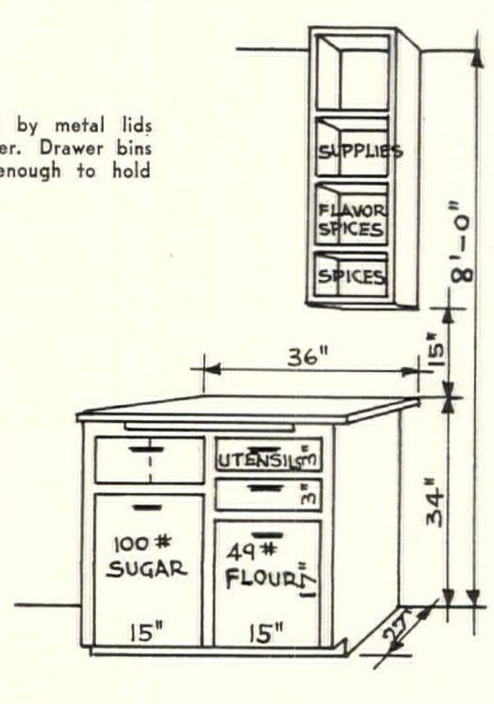
MIXING TABLES: 27″ deep, 34″ high and 36″ long.



Contents of bins are protected by metal lids which do not pull out with drawer. Drawer bins for flour and sugar are large enough to hold scoops, sifters, etc.

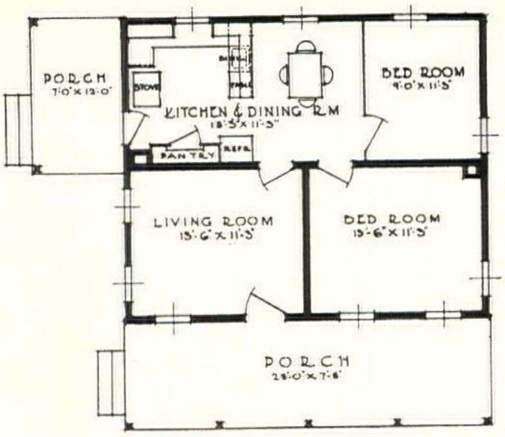
MOVABLE METAL INSET
6″ x 6½″ x 25½″





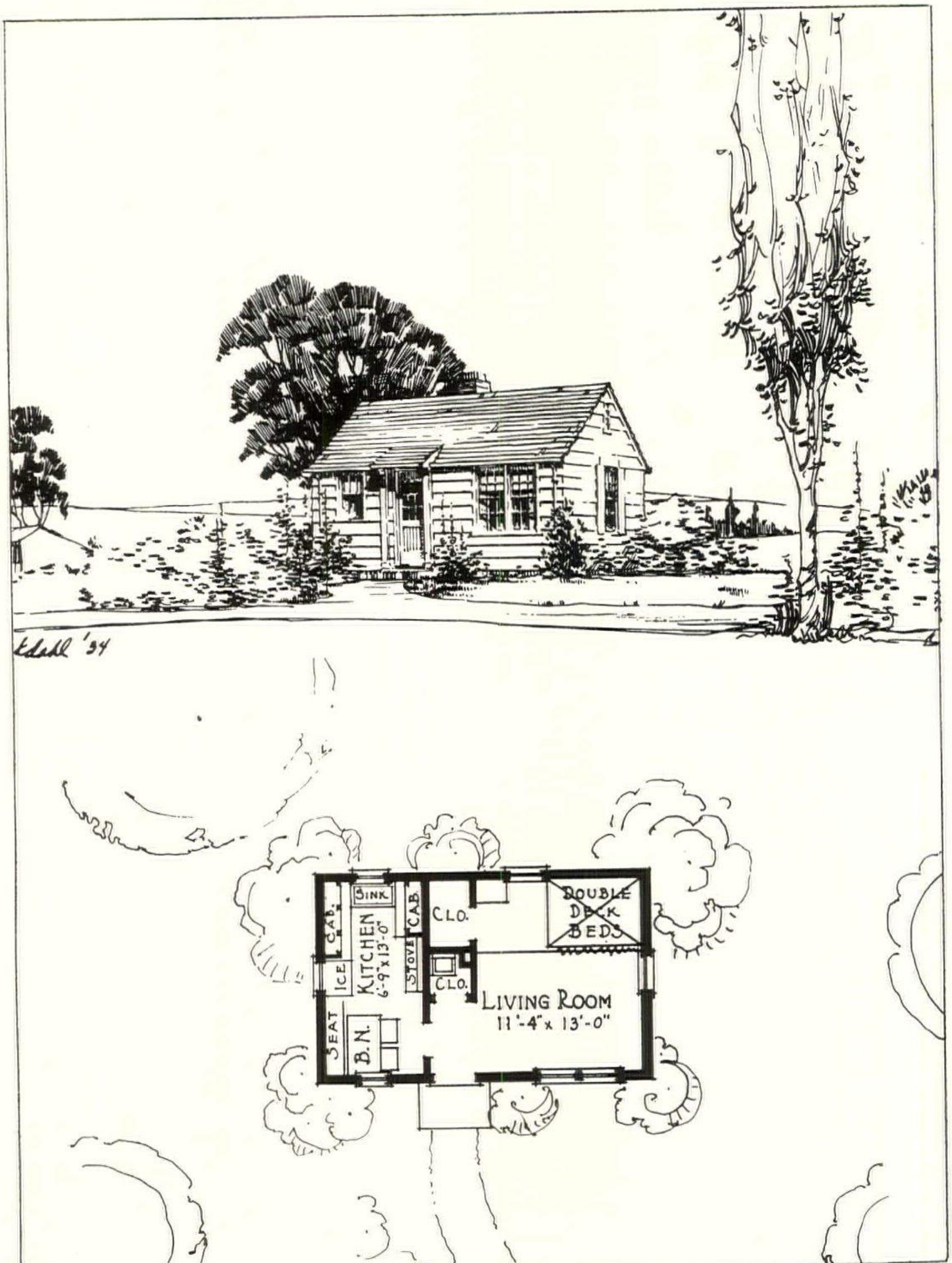
SPECIAL NEEDS OF THE RURAL KITCHEN

The farm kitchen has traditionally been much larger than the urban kitchen. It developed this way because of the use of the kitchen as a living and dining center, and the provision for carrying on there a number of activities other than food preparation, such as laundry and care of milk. It is considered the best practice now to provide for other activities in a separate workroom or a segregated portion of the kitchen. This makes possible the planning of the space devoted to food preparation on a more efficient basis and follows the same general principles outlined above. Where a wood or coal range must be used additional width may be needed. Satisfactory designs are suggested in the accompanying plans from the bulletin, "Farmhouse Plans" (Farmer's bulletin 1738), now in press.



FLOOR PLAN

Equipment can be arranged to separate dining space from kitchen.



FARM HOUSING PROJECT

(Left): Department of Archite ture, Kansas State College.

(Upper right): Department of Ag cultural Engineering, University Arkansas.

(Lower right): Department of Ag cultural Engineering, University Missouri.

U. S. DEPT. OF AGRICULTU

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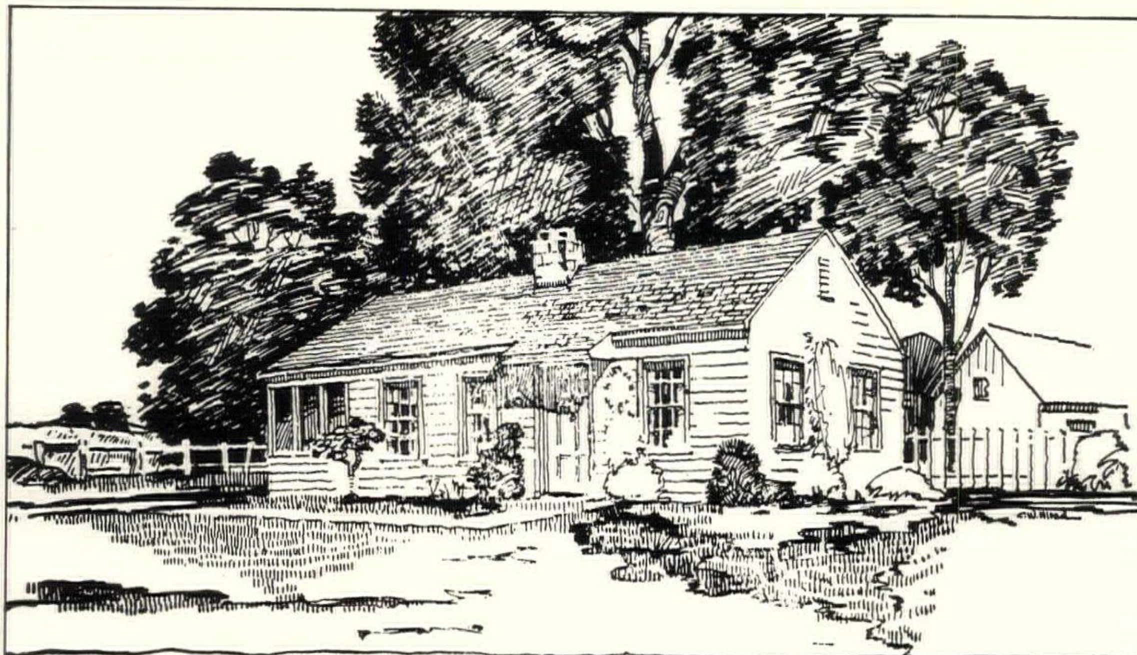
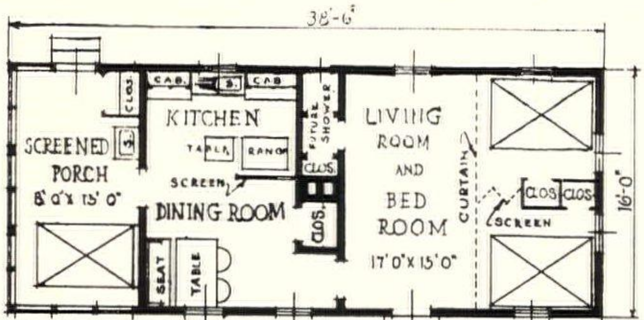
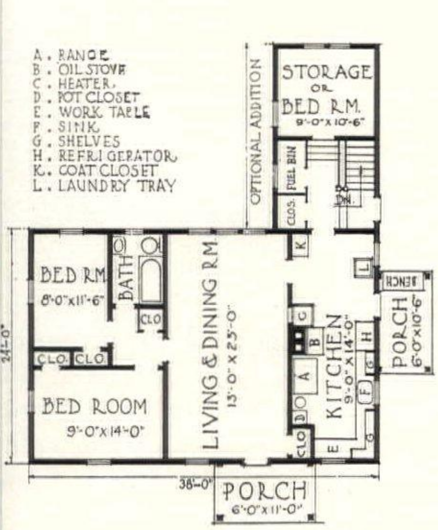
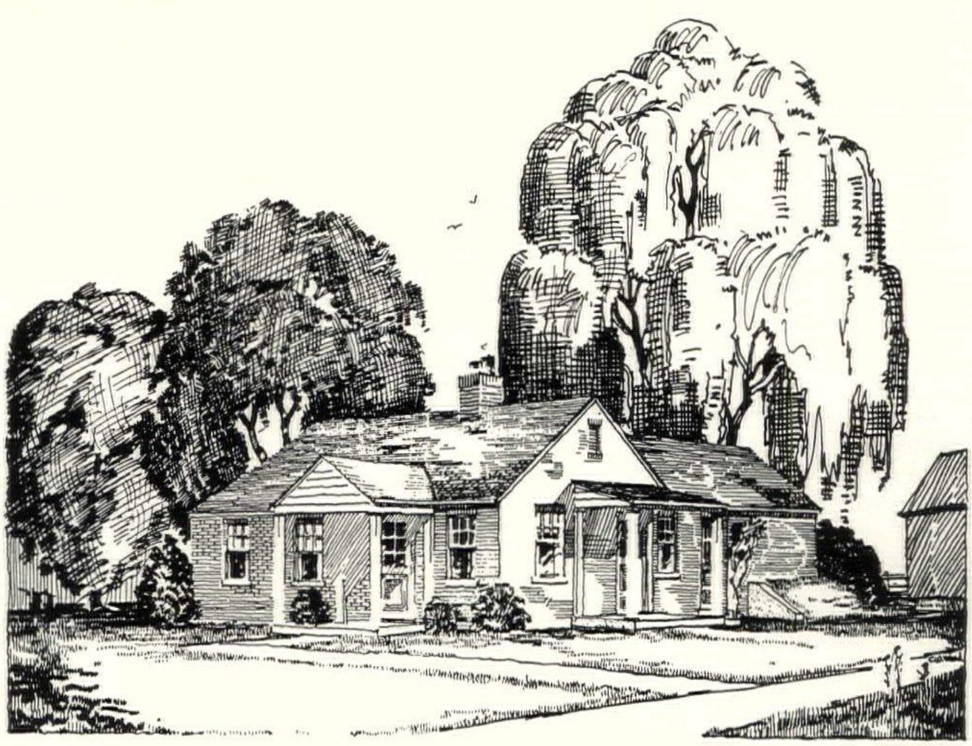




FLOOR PLAN

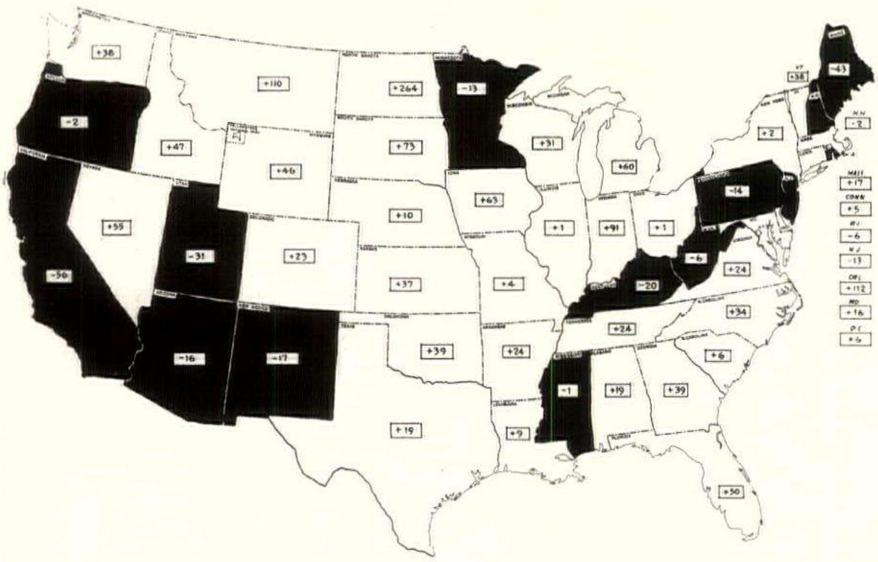
EVEN THE SMALL INEXPENSIVE FARMHOUSE
MAY HAVE A WELL-PLANNED KITCHEN





BUILDING TRENDS AND OUTLOOK

BY L. SETH SCHNITMAN
CHIEF STATISTICIAN
F. W. DODGE CORPORATION



BUILDING DURING 12 MONTHS—September, 1933-August, 1934, INCLUSIVE. Corresponding twelve months ended August, 1933, taken as base. SHADED AREA: BELOW BASE. UNSHADED AREA: ABOVE BASE. Figures denote percentage change from base. Floor space for new building contracts, 37 states east of the Rocky Mountains. Permit valuations for Rocky Mountain and Pacific coast states. Map, copyright American Map Co., N. Y. Authorized reproduction No. 5025.

RESIDENTIAL BUILDING SHOWS FURTHER LOSS

The volume of construction contracts placed during August was slightly higher than that reported for July and 13 per cent greater than the total shown for August, 1933. Out of the August, 1934, volume of $120,244,500 a total of $51,046,800 was reported for nonresidential building types; $41,905,900 for public works; $18,641,000 for residential building; and $8,650,800 for public utilities. The August totals for nonresidential building and public works classifications were larger than in August, 1933, while for residential building and public utilities the respective totals were smaller than a year ago. For both residential and nonresidential building the August totals were smaller than those reported for July.

The decrease in residential building awards from August, 1933, marks the fourth month of consecutive loss from a year ago, declines from last year starting with the record for May, 1934. This situation calls for correction for without recovery in the residential field no lasting revival in construction can occur. The Federal Housing Administration is now swinging into action; it is to be hoped that with this aid residential improvement on a lasting base may soon appear.

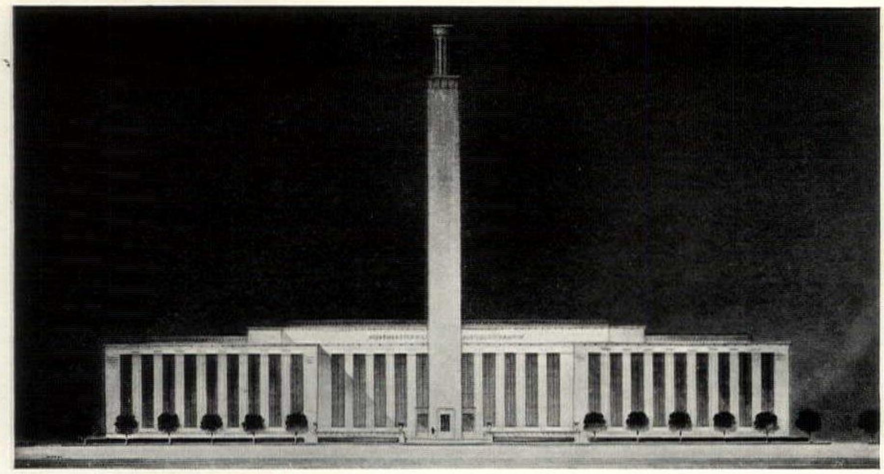
For the first eight months of 1934 residential contracts awarded in the 37 Eastern States totaled $170,233,500 as against $158,672,100 for the corresponding period of 1933. Although this indicates a gain of something more than 6 per cent, of greater immediate significance is the fact that for the month of August of this year the residential total was 15 per cent behind the volume of August, 1933. On this showing it is dubious now whether the residential total for all of 1934 can materially exceed the total for 1933 or that it can attain the volume of $280,000,000 reported for the 37 Eastern States for 1932. Contracts for residential building for the first eight months of the current year are running behind 1933 totals in the following major geographic areas: New England, Upstate New York, Pittsburgh, Central Northwest, St. Louis and Kansas City.

MATERIAL PRICE MEASURING ROD

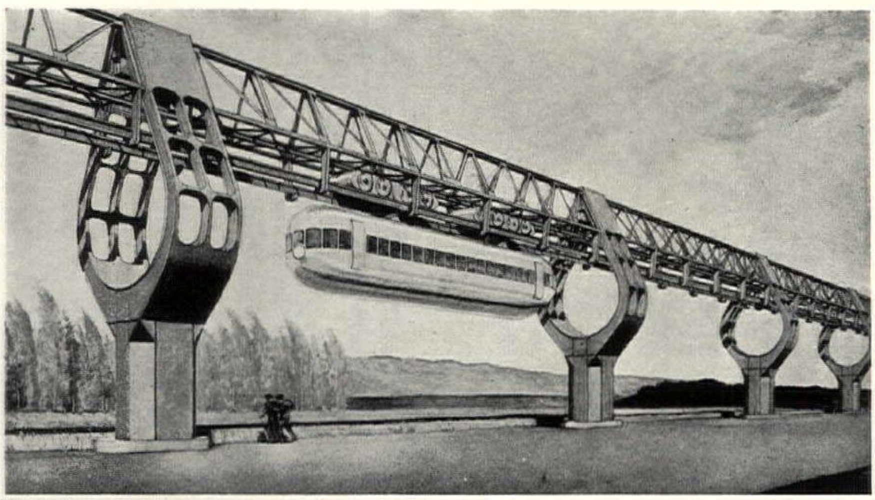
F. W. DODGE CORPORATION
COMPOSITE PRICES

MATERIAL	This Month	Month Ago	Year Ago
Portland Cement	$2.25	$2.25	$2.14
Common Brick	14.94	14.83	11.65
Structural Steel	1.65	1.65	1.60
Lumber	16.30	16.35	16.30

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 should be read carefully. 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. *Revised.



Winning design in a limited competition for a new building group for Northwestern University in Boston. Coolidge, Shepley, Bulfinch and Abbott, architects.



Keystone

A drawing by the chief engineer of the Golden Gate Bridge, under construction in San Francisco, suggesting the use of elevated trains to travel at 100 miles an hour in safety.

Keystone

Delegates to the Convention of the National Housing Association in Washington on October 12 (left to right): Charles Bennett, City Planning Engineer of Milwaukee; Ernest J. Bohn (Cleveland), President of the National Housing Association; Alfred K. Stern (Chicago), Chairman of the Illinois State Housing Board; Sidney T. Strickland (Boston), Chairman of the Massachusetts State Housing Board, and John Ihlder (Washington), Secretary of the District of Columbia Housing Board.

ILLUSTRATED NEWS

NEW GLASS TAKES HEAT OUT OF SUNLIGHT

New developments in the science of glass making for windows and skylights which take the "heat" out of sunlight but allow the light to pass were described at the October meeting of the Illuminating Engineering Society in Baltimore. Improvements in heat-absorbing glass, it is believed, will aid greatly the torrid conditions in Southern textile mills and other manufacturing plants during midsummer.

The new heat-absorbing glass, according to a Science Service report, contains iron. Objects viewed through it have a faint greenish-blue color because some of the red rays of the sunlight have been removed. Small amounts of iron in glass absorb ultraviolet and infrared, or heat, rays of sunlight. The visible part of sunlight, it is explained, contains only one-third of the heat in the sun's rays. The heat-absorbing glass cuts out as much of the invisible but hot 66 per cent as possible. At the same time, however, the visible rays are reduced as little as possible.

Describing the transmission of sunlight by these new type glasses, Dr. Roger S. Estey, physicist of the Electrical Testing Laboratories, New York City, and Dr. Robert A. Miller of the Pittsburgh Plate Glass Company, reported that 52 per cent of the heat in sunlight is stopped and absorbed by the iron-containing glass. Eight per cent is reflected off the front surface to the outside. The rest as visible light must be allowed to come through if the room containing a heat-absorbing window is to be illuminated by sunlight.

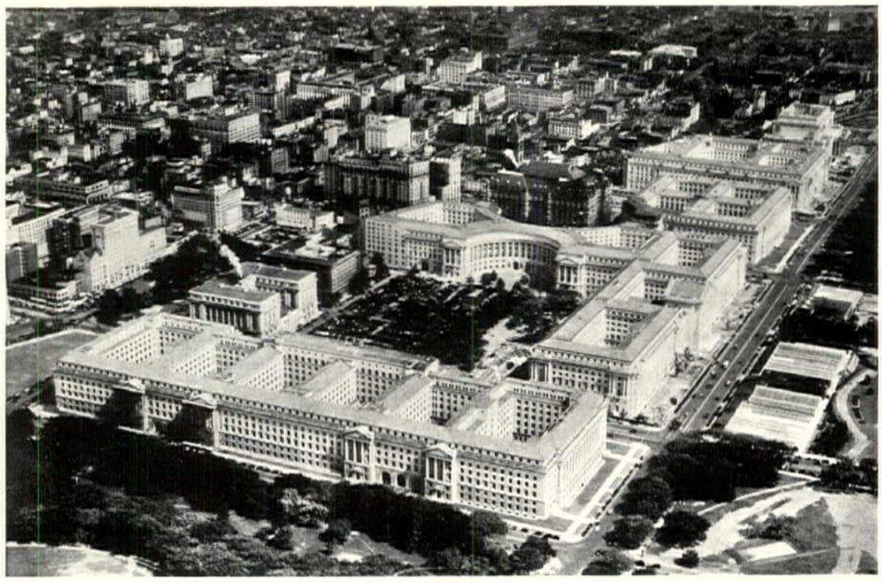
In practice it would be possible to conduct away much of the heat absorbed in the new-type glass windows by ventilation. What remains behind is re-radiated by the window; half to the outside and half into the room.

While the heated window might be expected to raise the temperature of the room as a whole, the effect on a workman in the direct sunlight would be much less than for ordinary glass. The re-radiated heat is given off in all directions from the window pane. Only the small part blocked out by the body of a workman would warm him. With normal glass the direct beam of the sun would make him much hotter and more uncomfortable.

Dr. H. P. Gage, chief of the Optical Laboratory of the Corning Glass Works, reporting on the same topic, suggested that the slight greenish appearance of objects when viewed through heat-absorbing glass might be overcome by combining with it a filter having a slight purple color. This would correct the faint greenish appearance of the objects and simulate more normal conditions.

The increase in the use of shatter-proof windshields for automobiles can claim some share in the credit for developing heat-absorbing glass for windows. It will be recalled that only a year or two ago the "sandwich" windshields of two layers of glass inclosing a layer of celluloid turned brown and colored with time. It was found that the action of the ultraviolet and infrared rays in sunlight was responsible for this coloring. In an attempt to discover some glass which would prevent windshield discoloring, scientists found they had to cut out these special rays. In so doing they were really producing a heat-absorbing glass. In the same sense, the heat-absorbing glass filters used in motion picture projection room equipment deserve their share of credit.

1 *Wide World*



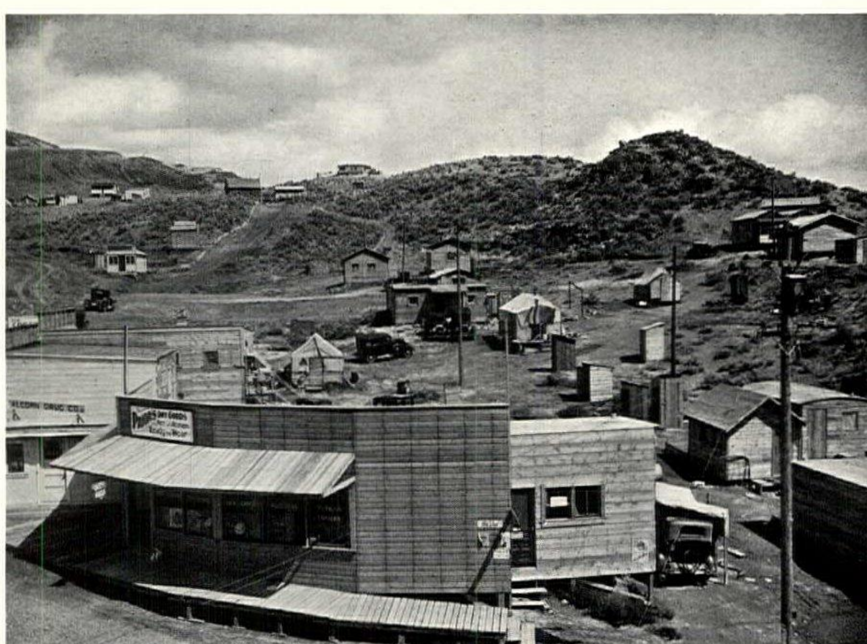
2 *Wide World; ©Aero Service Corp.*

(1) Harold L. Ickes, Secretary of the Interior, about to throw the switch starting the work of demolishing a building in Atlanta, Ga., marking the start of the work being conducted in the elimination of slum sections in the country.

(2) Aerial view of the Washington Triangle, a government building unit measuring ten blocks long and five blocks on its base. The group was authorized by the Coolidge Administration and is now rapidly nearing completion under the Roosevelt régime. In the foreground, forming the base of the Triangle, is the new Department of Commerce Building, situated on Fifteenth Street. Along the side (Constitution Avenue), looking toward the apex of the Triangle, are, successively, the Interstate Commerce, Internal Revenue, Justice and Archives Buildings. Looking from the base along Pennsylvania Avenue are the Customs Building, the new Post Office and the old Post Office.

(3, 4) Coulee City—the boom town at the site of the Grand Coulee Dam, now being built in Washington. The government is spending $63,000,000 on the first of two dams in this reclamation project.

3, 4 *Ewing Galloway Photographs*



AIR CONDITIONING IN HOSPITALS

Air conditioning has practical value as an addition to treatment facilities in hospitals, but at the present time it is too costly to be used throughout all or a large part of a hospital. When further perfected, however, air conditioning is likely to find a very definite place in hospital construction and operation.

This is the substance of a committee report made at a recent meeting of the American Hospital Association in Philadelphia. Chairman of the committee is Dr. C. W. Munger, director of Westchester County (New York) Department of Hospitals and Grasslands Hospital. Other members of the committee are: Dr. Lucius Wilson, John Sealy Hospital, Galveston, Texas; Charles F. Neergaard, engineer and hospital consultant; Perry W. Swern, hospital architect.

Most feasible use of air conditioning in hospitals at present consists of its use in single room units of the simpler type for the use of individual patients especially needing it. "Installation of complete air conditioning equipment for entire buildings more than doubles the cost of heating and ventilating work," the committee found. "The annual maintenance of an air conditioning plant for a given building is considerably greater than the cost of heating the same building without air conditioning." For a given building, the cost of heating without air conditioning was estimated at $19,000. The cost of heating plus air conditioning was estimated at $42,000.

GABRIEL FERRAND: A TRIBUTE

The enthusiasm of Gabriel Ferrand combined with his capacity for hard work carried him far in the fields of architecture. His pioneering spirit was responsible for his leaving his native land for the purpose of inculcating into the minds of the students of his adopted country the fundamental principles of planning and designing as developed by the Ecole des Beaux Arts.

His breadth of vision enabled him to absorb the spirit of American institutions and to make him one of us. While primarily a designer he was thoroughly convinced that the schools of architecture needed greatly to broaden their curriculum in order that the graduates might be more thoroughly prepared for the ultimate practice of their profession.

He was indefatigable in his efforts to create and develop the Association of Collegiate Schools of Architecture, and he was greatly elated over the program fostered by the Association at its convention in Washington in May of this year, and the cooperation of the State Registration Boards and the American Institute of Architects, which in substance widens the field of study so as to comprehend all of the branches that enter into the practice of architecture.

He was convinced that the resolution calling upon practicing architects to act as mentors for students for a period of three years after graduation would be most influential upon students as he considered the benefits to be derived would be far reaching not only upon the students themselves, but upon the future of architecture in this country.

He deplored the general lack of appreciation of architecture on the part of the public and believed that the architects themselves were partially to blame for this lack of understanding. As an attempt to correct this situation he had arranged with Mr. H. J. Gerling, Superintendent of Public Schools in St. Louis, for a series of talks on architecture that were to be delivered to the high school students as he felt this was a part of a broad educational policy.

The architectural profession incurs a real loss because of his death, and the American Institute of Architects mourns the passing of one of its influential members.

Gabriel Ferrand's death was an untimely one because he had not yet reached the full measure of his development. Therefore it falls upon the shoulders of those of us who survive him to carry on the ideals that he set up as his own standard.

Ernest John Russell, President,
American Institute of Architects.
October 10th, 1934.

GABRIEL FERRAND

In 1915, after teaching in the Carnegie Institute of Technology at Pittsburgh, Gabriel Ferrand took charge of instruction in design in the School of Architecture, Washington University, St. Louis. Under his direction the classes grew in size until their quarters became inadequate. In response to this need the Gevins Hall of Architecture was erected.

He designed important public buildings in the East, particularly Brooklyn and New York. In St. Louis and throughout Missouri, Mississippi, Texas, West Virginia and other southern states are to be found many churches and schools, monumental gateways and residences, which he produced. He served on commissions and advisory committees concerned with the St. Louis Municipal Auditorium and Convention Hall, the St. Louis Plaza, and Jackson Park in University City.

Photograph by Roger Sturtevant

HOUSE OF E. E. KAPLANSKY AT SANTA CRUZ, CALIF. . . . WILLIAM WILSON WURSTER, ARCHITECT

VOL · 76 NUMBER 5

19 11 34

NOVEMBER

THE

ARCHITECTURAL RECORD

COMPLETE RECOVERY OF BUILDING INDUSTRY REQUIRES PROPOSED DISCOUNT FACILITIES OF NATIONAL MORTGAGE ASSOCIATIONS

By WALTER S. SCHMIDT

Mr. Schmidt, President-elect of the National Association of Real Estate Boards, spoke in favor of the National Housing Bill before the Senate Committee on Banking and Currency. However, as chairman of the Mortgage Finance Committee of the National Association of Real Estate Boards, he advocated that the discount facilities provided by the Home Loan Bank and the insurance contemplated by the Housing Bill for mortgages on homes of $20,000 or less be extended in principle to mortgages on other types of real estate, and submitted a draft for a Federal mortgage discount corporation to be added as a separate title to the Housing Bill. The proposed title was not accepted, but the National Housing Bill as enacted permits the formation of National Mortgage Associations, which are authorized to provide discount facilities for all types of mortgages. Since Mr. Schmidt's article was written, announcement has been made that the RFC is ready to participate in furnishing capital for such associations.

THE new National Housing Act is designed primarily to make the home mortgage a more attractive investment by providing quasi-Federal insurance for the protection of the lender in case of default. The rehabilitation and remodeling feature, to the organization and promotion of which the Housing Administration at the moment is devoting itself, is a temporary expedient. In its major intents, the act is concerned with recreating a flow of mortgage money, without which no extensive new home building program is possible; it likewise seeks to make ownership—hence new building projects—more attractive by lessening the interest rate to the borrower and by eliminating undue junior finance costs through the insurance of eighty per cent loans.

Past failures of the mortgage insurance idea furnish no proper criterion for judging the success of the plan proposed in the Housing Act. These observations might be made: that many of those formerly engaged in the business of selling guaranteed mortgages were more interested in the promotional fees than in the security of the mortgage itself; that others insured bond issues of mortgage companies for the sake of an annual differential without themselves possessing knowledge of the field or facilities for investigating the real estate involved; and that better practice resulting from the nature of the quasi-Federal Insurance Corporation and the commencement of operations in this present period of deflated values, are auguries for success.

Undoubtedly, sound insurance is a most attractive feature to the investor and there is an optimistic feeling in administrative circles that many new sources of investment will be tapped through the fact that the corporation is quasi-Federal and that the Government has at least the moral obligation of supporting its insurance. Likewise, in many states, legislation either has been introduced or is in process of preparation liberalizing the laws so that the proposed insured mortgage up to eighty per cent of value may become a legal investment for financial institutions and trust estates. The Act itself amends the Federal Reserve Act, removing certain restrictions hitherto applying to action in real estate mortgage matters, and further permits the Home Loan Bank to lend members ninety per cent of the face of an insured mortgage.

It is beyond dispute that the interest rate on mortgages must be decreased if real estate ownership is to preserve any comparatively desirable position in relation to other forms of investment. Home ownership is the bulwark of a democratic form of government and must be encouraged, yet the rate on the home mortgage, recognized as the safest of all investments when conservatively placed, has exceeded the yield on almost every other type of secured loan. Capital wherever safely placed must be satisfied with lesser returns than it heretofore has enjoyed; there is recognition of the fact that it has taken too great a proportion of the productivity of human beings. Our country in addition has ceased to be a frontier nation requiring more capital than it possessed for new enterprise and expansion. It has ample money resources and its state of stabilization normally will tend to reduced interest returns. Real estate must not be laggard in recognizing this tendency.

The Housing Act points the way by endeavoring first to make the mortgage more attractive and then to reduce the return upon it to the investor. The Act provides a five per cent rate plus the cost of insurance, which is fixed at a minimum of one-half and a maximum of one per cent. In some sections this presents no great advantage, but in others the interest rate is standard at six and one-half, seven, eight and in some localities even nine per cent. As the insurance idea gains acceptance, standardization of rate and practice will come and with it reduction below the five per cent base now fixed.

Question has been raised as to whether an eighty per cent loan can be made with safety. Any substantial home builder will testify that losses under such mortgages on new construction have been negligible. In practice such large percentage to value probably will not be loaned except on new homes. The great advantage of a seventy to eighty per cent mortgage is that it will eradicate what in many communities was a scandalous abuse, the adding of large amounts to fair sale price in order to take care of the undue costs of junior finance. The builder could not carry the paper himself and was forced to arrange its sale at a substantial discount. In addition to the saving to the home owner there is a major advantage to him in the combination of his obligation in one mortgage amortized at a reasonable rate. Many a home owner has been forced to sell because he could not meet the capital obligation of a second or third mortgage maturing in one, two or three years after he acquired his home.

MUCH is expected from the Mortgage Associations which the Act authorizes. These Associations, to be of not less than five million dollars capital privately subscribed, are practically Banks of Discount, having the right to buy mortgages on any type of property and to issue their bonds against insured mortgages up to ten times their capital. It will not prove the easiest thing to secure the stock subscriptions required for starting these Associations. The question naturally arises as to whether, with their bond issuing power limited to the insured residential mortgage of low interest yield, they can sell their bonds, unguaranteed by government as they are, at a sufficiently low interest return to provide an adequate differential for profitable operation. On the other hand, the fact that the law may, and probably will, be amended as experience shows expedient, and the Federal Charters thus may come to have great value, perhaps will furnish a powerful incentive. It is also possible that other Federal agencies, as the Reconstruction Finance Corporation, may be induced to furnish a goodly portion of the capital, taking preferred stock at a low dividend return, so that the common stock will be more attractive. The presentation of such a picture to investment bankers, manufacturers of building supplies, to communities, well might lead to the formation of a number of Mortgage Associations.

THE principal business of the majority of architects never has lain in small home designing and it may be asked what specific benefit will accrue even if residential work is stimulated by making more fluid the flow of mortgage money in this field. In the first place, the energetic publicity campaign now going forward through the Housing Administration, pointing the desirability of home ownership and the advantages of keeping all types of buildings in good condition because of the solidity of real estate as an investment, cannot fail to have its results throughout the whole field. Next, in the matter of mortgage money for other than homes, a sympathetic reaction already is apparent, and many of the large agencies have announced willingness to recommence making mortgage loans on income projects demonstrated to be economically necessary and sound. Again, the resumption of activity in home construction will create wants for new building in many other directions. Finally, while it is regrettable that the Administration could not see its way clear to throw the weight of Government freely and fearlessly behind the whole mortgage structure, commercial and home, yet the Housing Act is epochal in character, and now that this long step has been taken to strengthen the mortgage structure based on the political appeal of help to the home owner, there is every reason to hope that there can be secured the changes and additions necessary to make thoroughly comprehensive, present Federal legislation dealing with the mortgage.

The amendments suggested are these:

(1) Modify membership requirements in the Home Loan Bank, so that every reputable and financially sound agency engaged in the business of making first mortgages on real estate can become a member without undue expense. The primary function of this bank is to lend money to members at low rates on the security of home mortgages they own.

(2) Perfect the Insurance Clause in Title Two of the Housing Act so that in case of default upon an insured mortgage the lender is made whole beyond peradventure. The present provision is that the lender receive, in the amount of principal due, a debenture of the Insurance Corporation, taxable, bearing not to exceed three per cent interest, and due three years after the original maturity date of the mortgage. The lender loses interest not paid and must bear foreclosure costs. The United States guarantees principal and interest on those debentures only, given for defaulted mortgages made prior to January 1, 1937. This is not cash insurance or its equivalent; it should be, if the borrower is to get the most advantageous interest rate, and if insured mortgages are to find ready sale. There is also a defect in the clause governing the cost of insurance, in basing the fee charged on the original face of the mortgage throughout the life of the insurance; it readily can be seen that the charge becomes disproportionately heavy as the mortgage is paid down.

(3) Abandon the Home Owners Loan Corporation at the first possible moment. Government has no business in the field of direct lending, except as a matter of dire emergency. Rather it should encourage lending through the usual channels and by constructive action designed to liquefy the mortgage, make it possible for the ordinary agencies to function under all conditions. The next section discusses possible means to this end.

(4) Eliminate the restriction that the Mortgage Associations can issue bonds only against insured mortgages, and provide both for government financing of these Associations and guarantee of their bonds. They thus would become true Banks of Discount for the whole long term credit structure. By standing ready to purchase sound loans from originating sources, they would liquefy the mortgage and in periods of stress prevent the frozen condition of long term credit which was one of the principal contributing causes of collapse. It is not always realized that long term credit is of greater magnitude than short term, a fact providing sound argument why government should take at least equal cognizance of the mortgage structure as it does of the banking. Thus far, however, it has been unwilling to place the weight of Federal credit fairly behind the mortgage structure.

As an alternate to the plan just proposed, a new Federal Corporation could be created, whose function it would be to act as a Discount Bank for other than home mortgages. Successful functioning of such a Bank is dependent on ability to sell its bonds at a low return yield, at least one per cent less than current interest rates on mortgages. The Bank therefore would require substantial capital, probably about a billion dollars, so that its bonds would have ready market at low rates. By this means the liability of government would be limited. When it is realized that three billion dollars has been authorized for the Home Owners Loan Corporation, the amount mentioned does not seem undue, especially in view of the fact that one such corporation could handle the whole mortgage situation in a complete and satisfactory manner. The very existence of the Discount Bank would bring money back into mortgages since they immediately would cease to be frozen credits. It further is to be pointed out that this desirable situation is possible of only partial attainment under legislation as it now exists; a purchaser still must be found for an insured mortgage, and there is no certain place to go to sell a mortgage in case of need.

EVENTS only can determine just what effect the Housing Act will have upon the mortgage structure of this country. That effect may well be far reaching, especially in view of the fact that men of business competence and energy have been secured to guide its destinies. Modifications along the lines set forth seem eminently desirable. The exact relationship of Government to the mortgage business must be definitized promptly, and permanent policies adopted comprehending the whole field. Not a great deal remains to be done, and the result once accomplished, confidence will be restored to lenders, and mortgage money for needed improvements again will flow in volume.

It is recognized that we are one of the worst housed of civilized nations, so far as the modest income group is concerned. There is great need for major rebuilding of sections of our cities, or the development of satellite towns to replace outmoded districts. During a long period no commercial or apartment building has gone forward; yet in these years obsolesence has been at work and the need for bettered facilities is becoming apparent. More is needed than restoration of mortgage credit to start movement in new construction. It is remarkable, however, when a little betterment of general conditions comes, how quickly what seems a surplus is absorbed, and shortage appears, a situation which means the creation of new facilities. Activity induced by the Housing Act can go far towards arousing consciousness of the fact that we are on the threshold of an expansion era for real estate improvement.

COLUMBIA ADOPTS NEW SYSTEM OF TEACHING ARCHITECTURE

Abandoning teaching methods employed for more than forty years, the School of Architecture of Columbia University has reorganized the study of design to embrace a three-year program of personal tutoring of each student by a master, according to an announcement by Dean Joseph Hudnut. The major change involves individual guidance for each student by a master. Group competitions are eliminated. The problem method, developed at the Ecole des Beaux Arts in Paris, will be retained as the basic principle of instruction.

"At the Ecole the problems are given in the form of competitions," Dean Hudnut explained. "Competitions of this character have been held at Columbia for many years. We shall now continue the problem method, but abandon the competitions. Our reason for doing this is to be found in the fact that the competitive process has developed so many conventions and so many arbitrary standards of judgment as to become almost completely divorced from reality, and it is felt that these deficiencies could not be corrected except by the substitution of some new technique.

"The most important aim at Columbia is to develop a system of teaching which will be highly realistic in character. We wish to do away so far as is possible with the artifices and conventions of our teaching and to encourage in our schools the methods, the habits of thought, and even the atmosphere which obtains in the office of a practicing architect.

"For this reason we shall substitute an individual method of teaching for the group competitions. Each student will work on his own design under the direct guidance of a master, and his performance will be judged by the master as an individual exercise in no way related to the work of other students."

The new system, it was pointed out, eliminates the juries of professional architects formerly called upon to judge the finished drawings of the students. The juries saw only the "presentation" drawings, and were not acquainted with research and preliminary drawings upon which they were based.

Three studios have been equipped in the School of Architecture where design work will be carried on in the future. In order to secure a more direct and personal contact between teacher and student, the students will be divided not into classes but into studio groups, each group comprising both beginners and advanced students. Each of these groups, which will be limited to about twenty-five students, will be placed in charge of a master who will guide them in such a way that they may be successful by their own efforts in developing designs.

Jan Ruhtenberg, Swedish architect and designer of apartments and country homes in "modern style," will be the master of one studio. His assistant will be William T. Priestley. Dean Hudnut and Russell M. Krob will be the masters of the other two studios. Pierre A. Bezy will assist Mr. Krob. Walter B. Sanders will assist Dean Hudnut. Henry S. Churchill and Frederick Woodbridge, Jr., will be the masters of the evening studios, in which students of University Extension, not candidates for a degree, will pursue the design course under the new plan. Prof. Harold V. Walsh and William F. Drewry, Jr., were named construction critics to assist the masters of each studio.

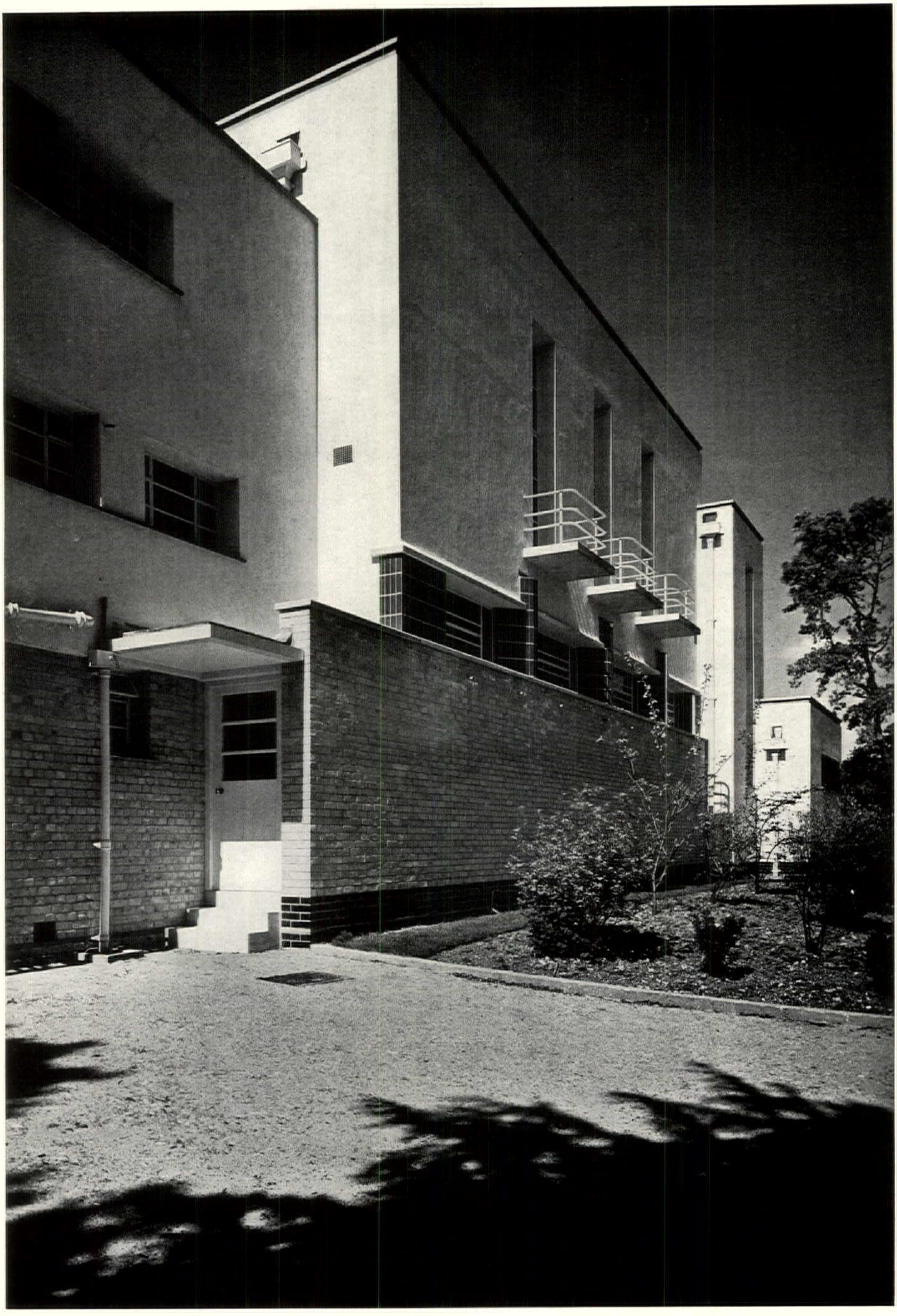
Dean Hudnut declared that the new system has a certain resemblance to the master school system of the German technical high schools "where the relation of master and student is direct and intimate and where the emphasis is upon the technical development of the student rather than upon graphic presentations."

Photographs by Dell and Wainwright

SIR JOHN BURNET, TAIT & LORNE, AND D. G. ARMSTRONG, ARCHITECTS

Howard Hall—the Temple of St. Mary Lodge—situated in the Causeway, Bocking, on the outskirts of Braintree in Essex, England. The site was a garden originally forming part of the grounds of a large house which was demolished several years ago. To obtain the requisite accommodation with the funds available a severely simple design was adopted, color and massing being relied on for effect. Owing to the necessity of providing sufficient parking space and to suit the nature of the garden, it was decided to place the dining hall immediately above the Temple.

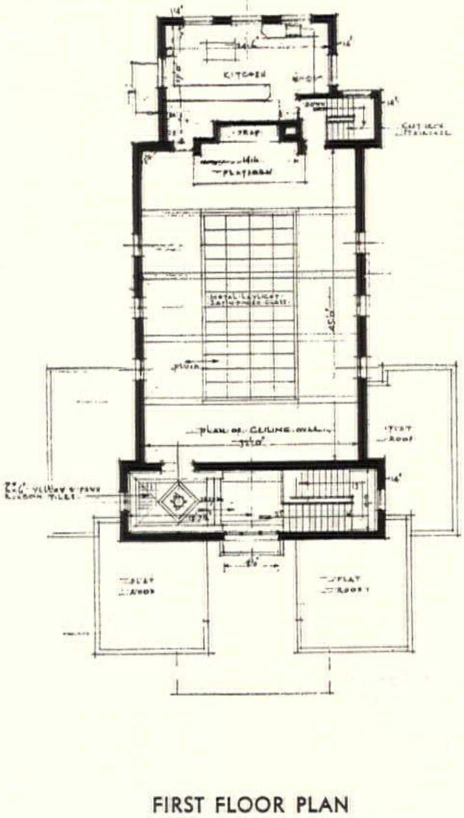
The building is of normal construction with the general elevations finished in pale cream Cullamix and a plinth and piers of mottled black glazed brick. Parapets throughout are of 2" blue York stone with a recessed course of sky blue tile below. The side and rear elevations have a base of yellow Kent stock facings and azure blue tile to the faces of the dwarf piers between the Temple windows. All brick facings are finished with a flush vertical joint and raked out horizontal joints. Crittall metal windows have been used throughout, well recessed from the outer face of the walls and with 1" slate sills, set to a very slight weather.



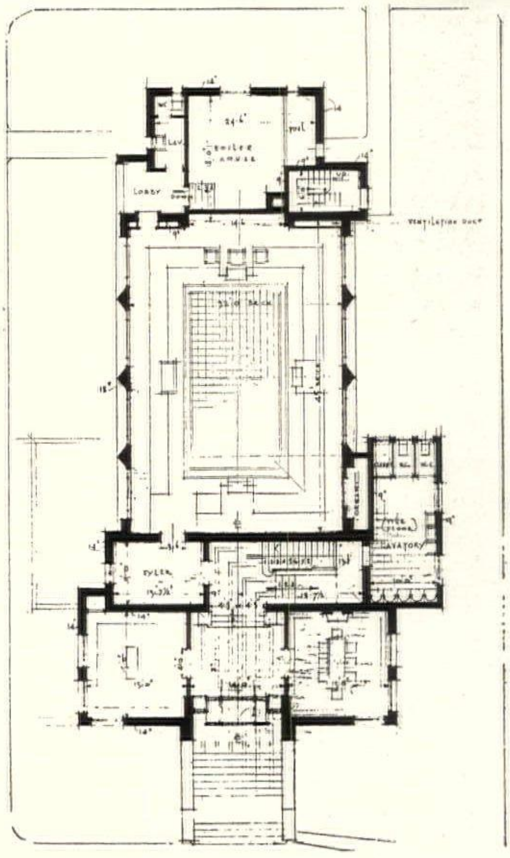
Photographs by Dell and Wainwright

HOWARD HALL
THE CAUSEWAY
BOCKING, BRAINTREE,
ENGLAND

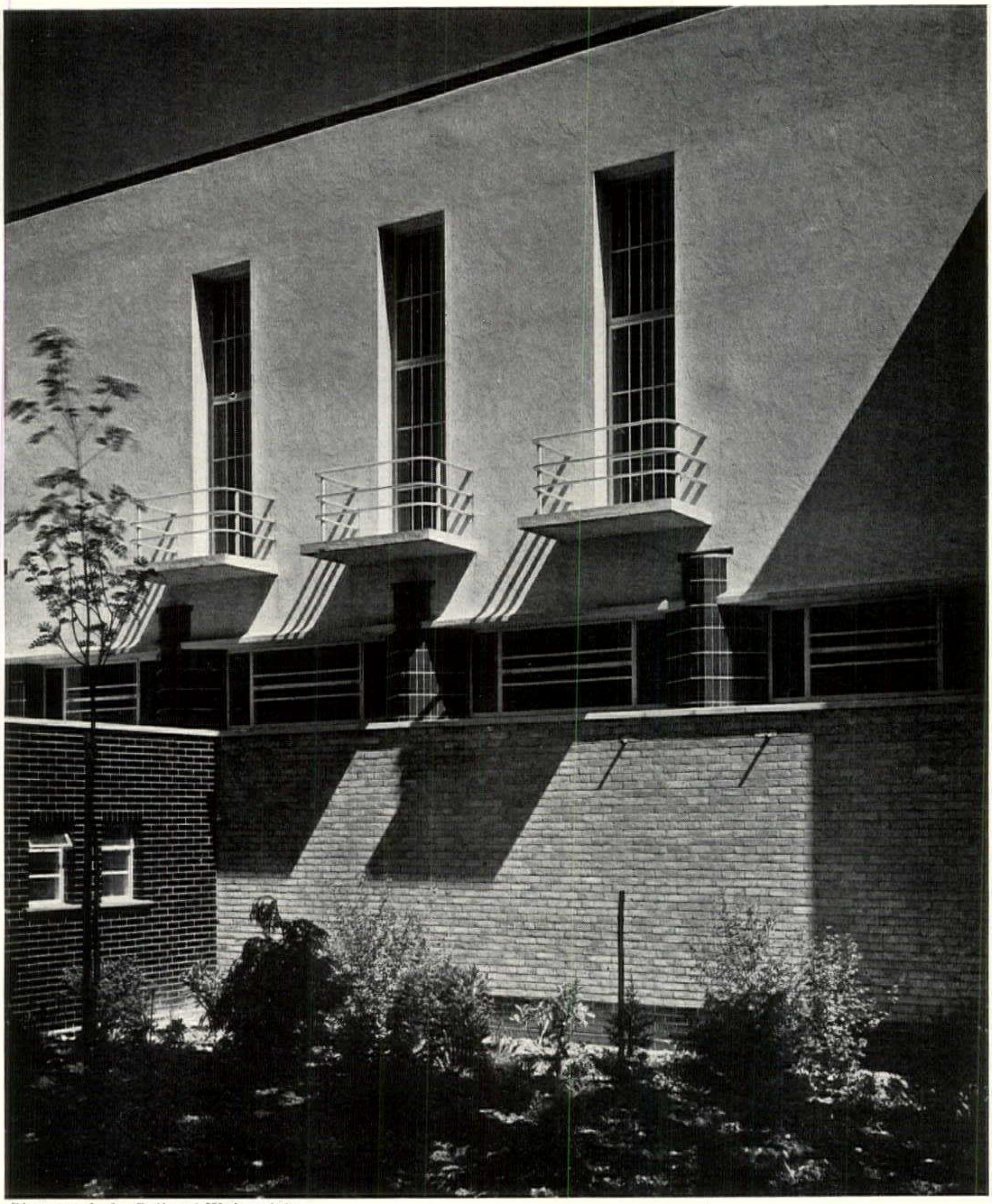
SIR JOHN BURNET,
TAIT AND LORNE,
AND D. G. ARMSTRONG
ARCHITECTS



FIRST FLOOR PLAN



GROUND FLOOR PLAN

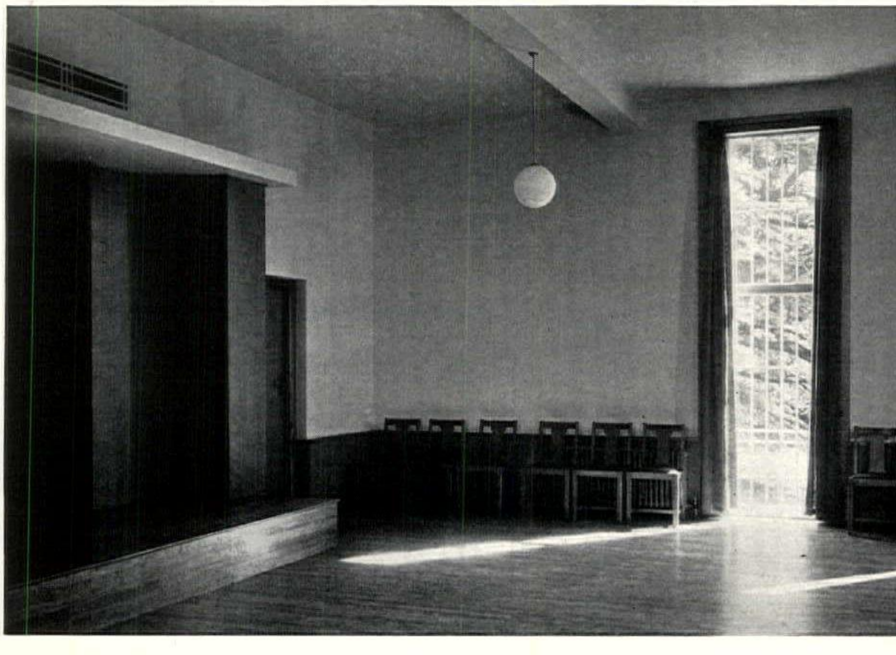


TEMPLE OF ST. MARY LODGE AT BOCKING, BRAINTREE, ENGLAND

(Right)
The Temple has been designed on simple lines to form a background for Masonic ritual; it seats about 120 persons on raised oak platforms arranged on the four sides. Windows high up on the two long sides give natural lighting for the few periods when the room is used during the day. From floor to window sills the walls have a flush oak finish with horizontal bands of silver bronze. Macassar ebony has been used for the recessed skirtings, jambs of doors and to the truncated piers at each side of the recess behind the Master's chair. Lighting of the Temple is by concealed strip lights arranged in continuous runs on each side of the main beams supporting the floor above and on each of the two short walls. The lights reflect from the ceiling and can be dimmed or made brilliant according to the nature of the Masonic function. At the rear on the ground floor is arranged the boiler house equipped with a fully automatic oil fuel-fired boiler which provides for heating and hot water, and storage for lodge furniture.

Photographs by Dell and Wainwright

On the first floor is the dining hall, seating 120 persons, and the kitchen. The dining hall has an oak floor and dwarf flush oak dado, with flat enameled walls in pale buff above. A small stage at the kitchen end is finished in oak and has a trap door in the floor giving access to a table and chair storage arranged on a mezzanine floor below. At each side of the dining hall are three narrow windows running the full height of the room and with doors in the lower portions opening on to small balconies.



SIR JOHN BURNET, TAIT & LORNE, AND D. G. ARMSTRONG, ARCHITECTS

Photographs by Dell and Wainwright

TEMPLE OF ST. MARY LODGE AT BOCKING, BRAINTREE, ENGLAND

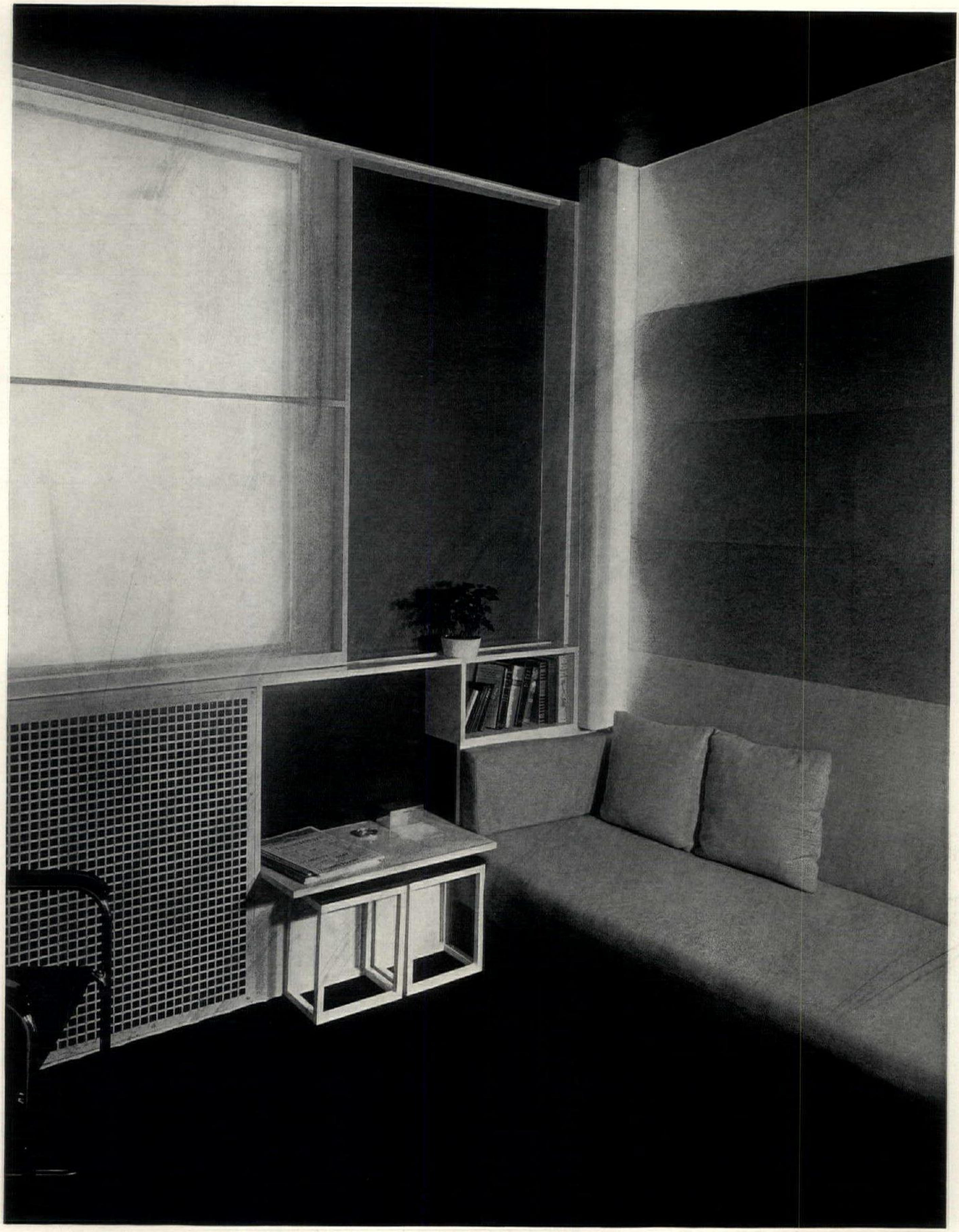
SIR JOHN BURNET, TAIT & LORNE, AND D. G. ARMSTRONG, ARCHITECTS

The crush hall and staircase and landing have plastered walls, flat enameled in a pale buff, skirtings of black glazed tile, and floors and treads and risers to stairs of gray and buff tile.

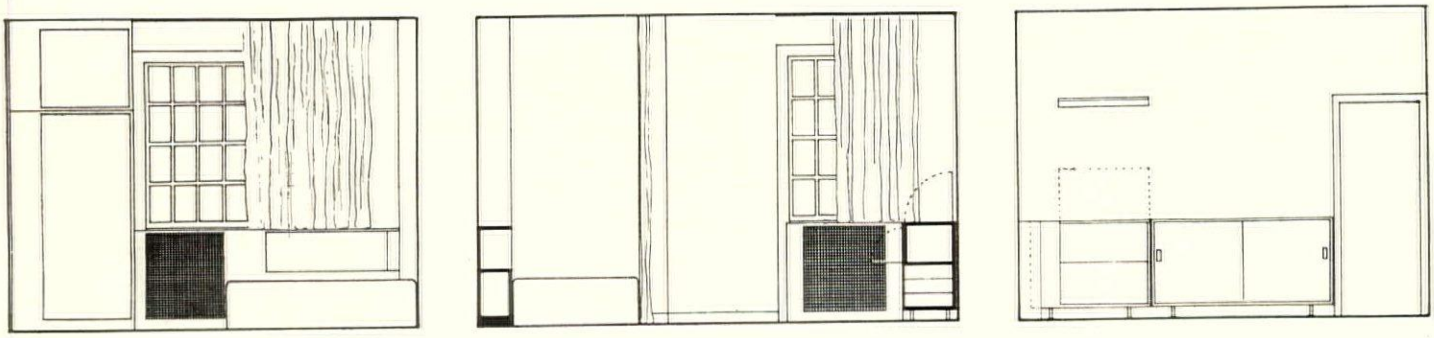
Photographs courtesy of ARTS AND DECORATION

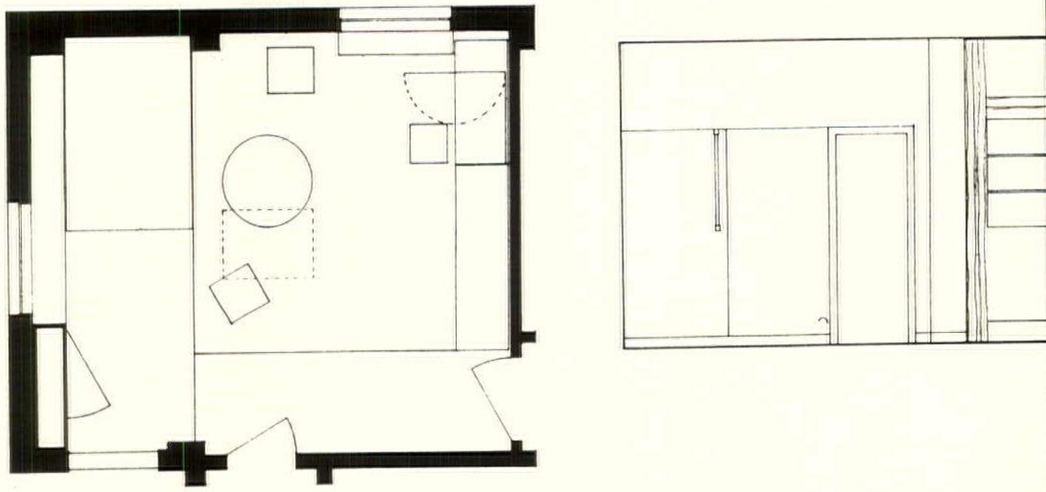
WILLIAM MUSCHENHEIM, ARCHITECT

 A PENTHOUSE APARTMENT IN NEW YORK CITY



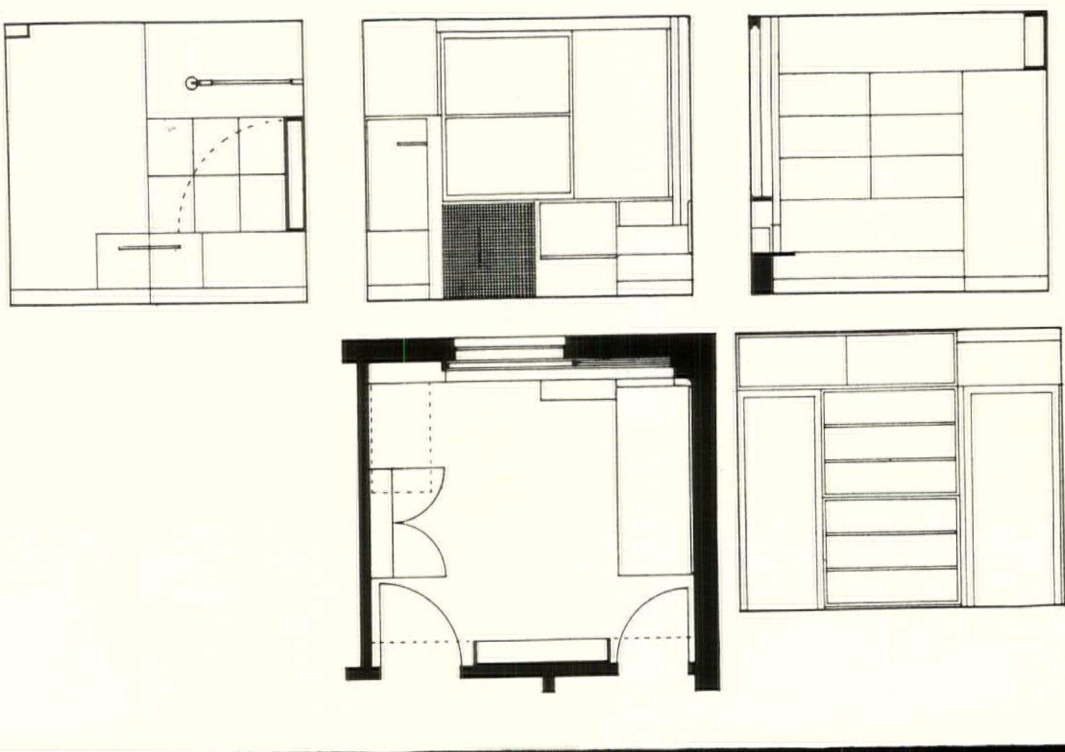
In this apartment of Mr. and Mrs. Immo Gulden the library has been designed to include a number of activities in a floor space measuring not more than 9 square feet. The desk folds up off the hanging chest when not in use. The cork covered wall serves as a convenient place to tack up notes and memoranda. The ceiling and carpet are black. The panel to the right of the window is blue and the built-in couch is a pale yellow.



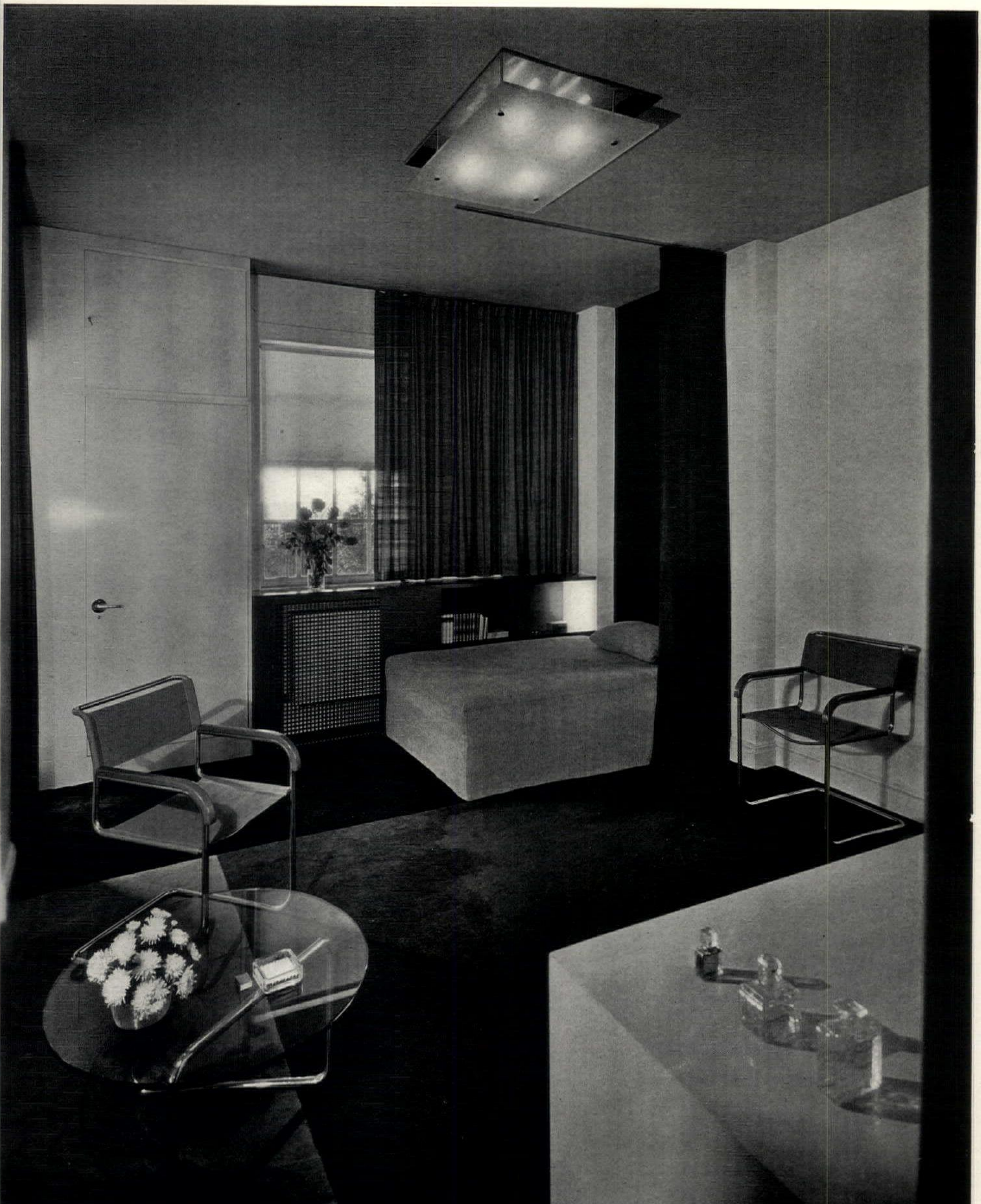


PLAN OF BEDROOM

APARTMENT OF MR. AND MRS. IMMO GULDEN IN NEW YORK CITY
WILLIAM MUSCHENHEIM, ARCHITECT

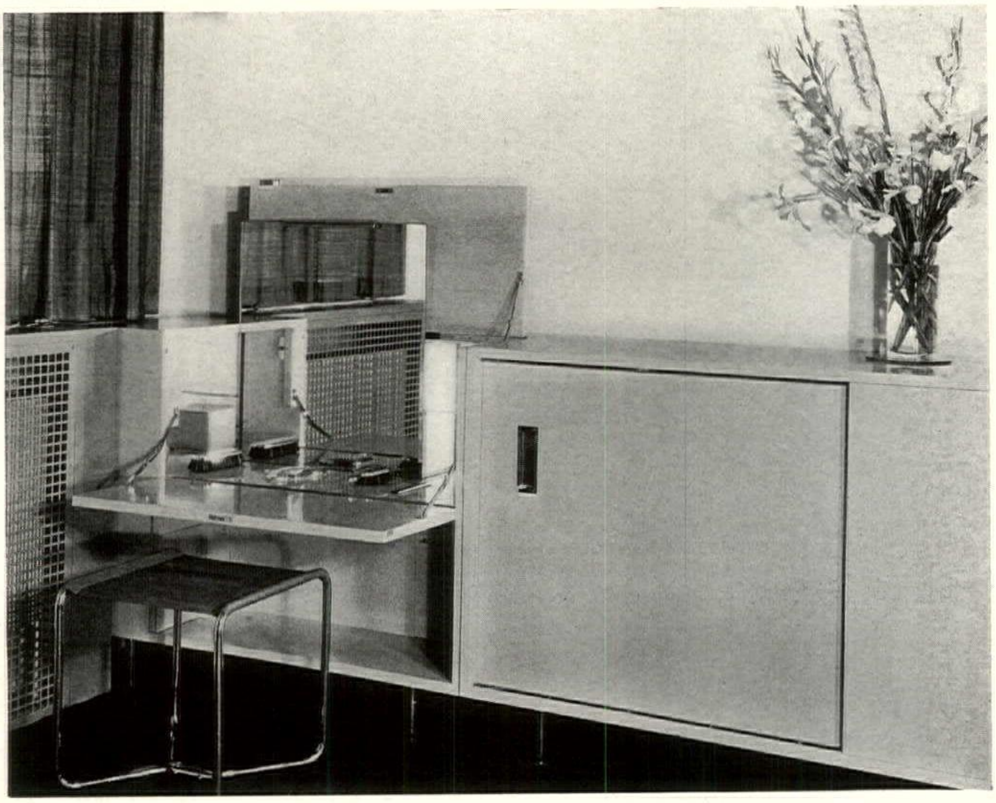


 PLAN OF STUDY

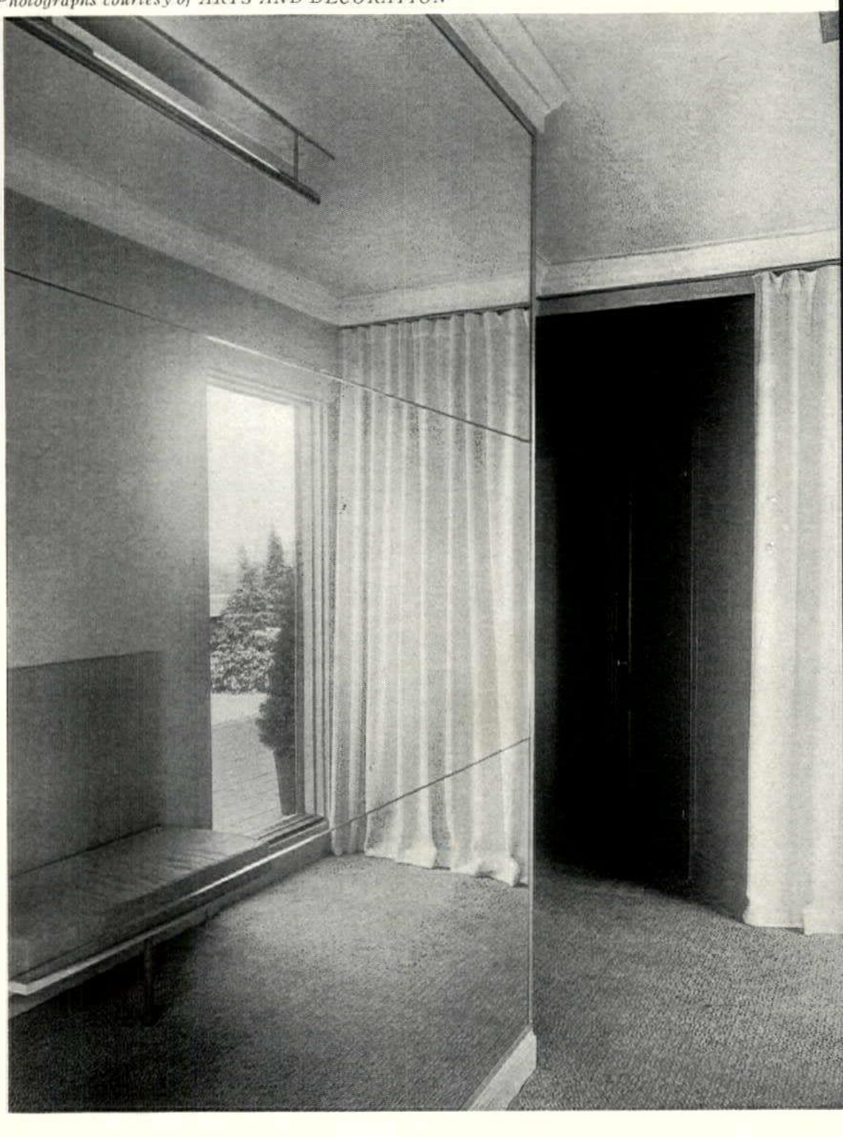


Photograph by F. S. Lincoln

The color scheme in the bedroom is gray, blue, and orange. The carpet has a blue center, a gray strip running before the mirror wall on the left, a black strip from the door under the bed. The bed covering is an imported orange chenille. The radiator box is blue. The blue burlap used for the bed curtains also makes a panel above the bed. Window curtains are gray silk.



Photographs courtesy of ARTS AND DECORATION



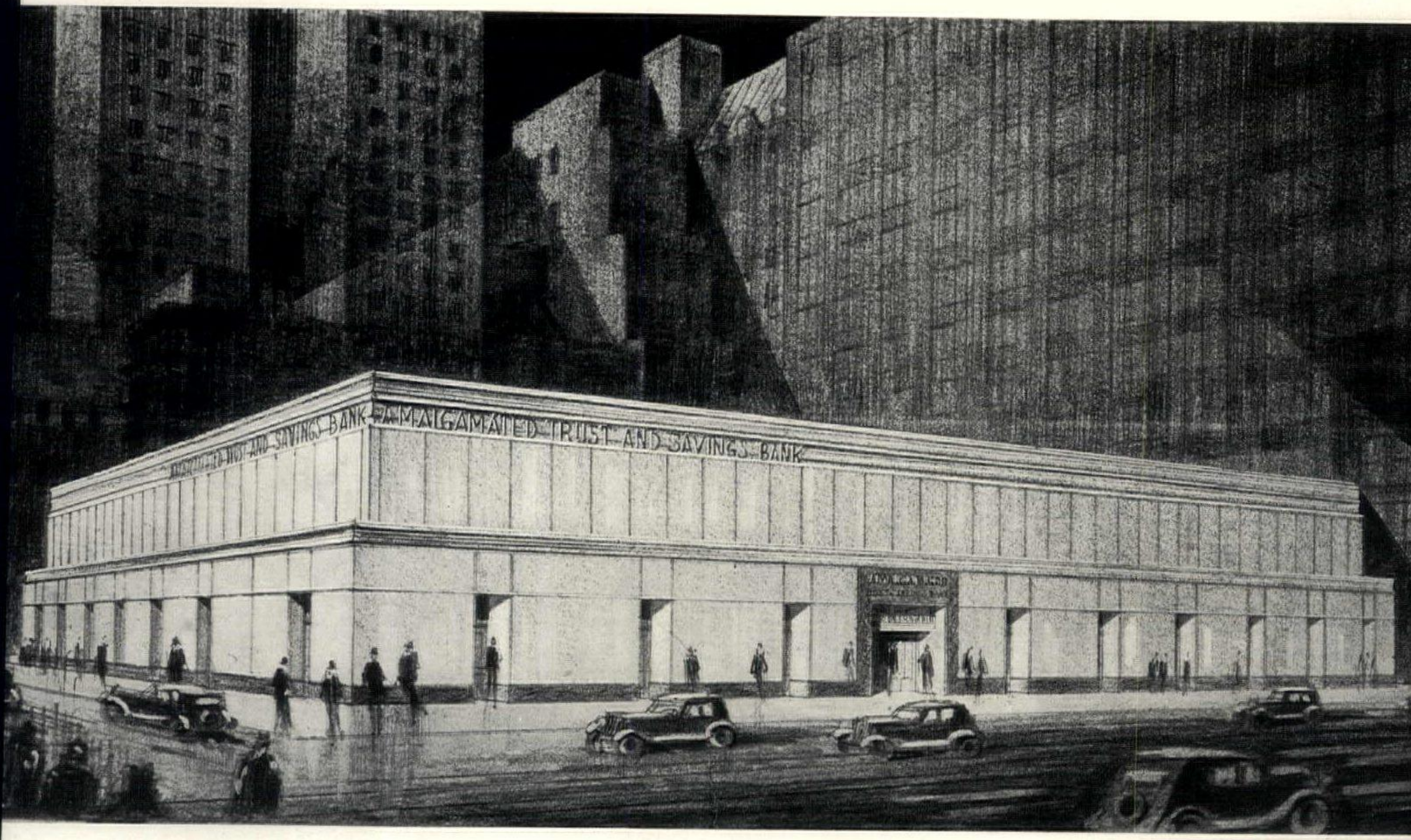
Above:

The combination dressing table and clothes chest is made of white holly and extends the width of one end of the bedroom. The wall is white, the radiator cover orange. The chromium stool has gray canvas seating.

Right:

Entrance hall to apartment.

NEW YORK CITY APARTMENT
OF MR. AND MRS. IMMO GULDEN
WILLIAM MUSCHENHEIM, ARCHITECT



AMALGAMATED TRUST & SAVINGS BANK BUILDING
CHICAGO . . . HOLABIRD & ROOT, ARCHITECTS

This "taxpayer" is to replace the old 7-story Guardian Bank Building and 11-story Adams Express Building on the southeast corner of Monroe and Dearborn Streets, located in the heart of Chicago's business Loop.

The new building is to have two stories and basement for shops, offices, and the bank. It will front 131½ feet on Monroe Street, 190 feet on Dearborn Street, and will cost from $275,000 to $350,000, depending on requirements of tenants with whom negotiations are pending. At present rentals the building will pay operating expenses, taxes and upkeep, together with amortization, over ten or twelve years.

The first story completely covers the property. The second story is set back from the street line approximately 5 feet and is 65 feet deep in both wings. The first story is 13½ feet in the clear, the second generally 12 feet with a portion 15 feet clear.

The materials are glass and stainless steel. The building is to be air conditioned with individual control, the windows being completely sealed with the heads on a line with the ceilings. Construction was begun September 10, this year. The building will be completed February 28, 1935.

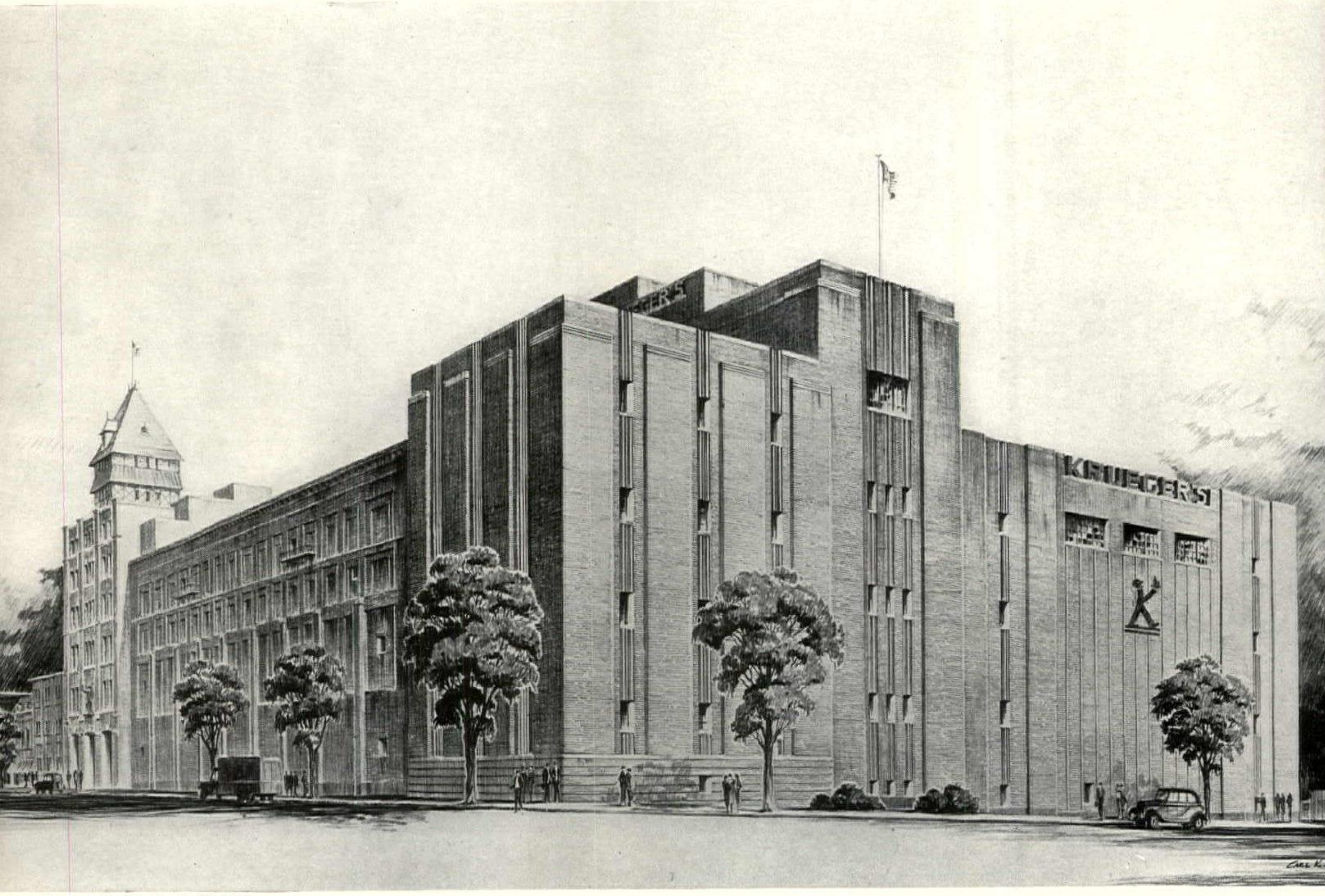
A "TAXPAYER" IN CHICAGO

Photographs by F. S. Lincoln

MALLET-STEVENS, ARCHITECT

F. S. Lincoln

A SIGNAL TOWER IN FRANCE



ving photographed by Louis H. Dreyer

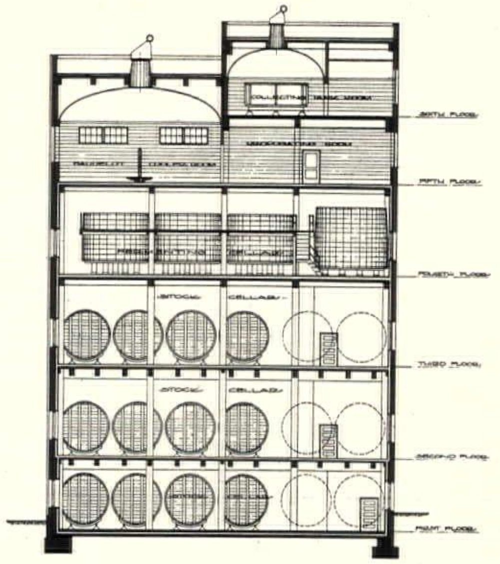
G. KRUEGER BREWING CO. LAGER STOCK HOUSE ADDITION
NEWARK, N. J. . . . WALDEMAR MORTENSEN, ARCHITECT

To increase manufacturing capacity, the G. Krueger Brewing Co. decided to build a lager storage building adjacent to the stock house in which their product had been produced for many years, and also to extend this building as a complete ale production unit to facilitate the fermenting, aging and packaging of ales, stouts and porters.

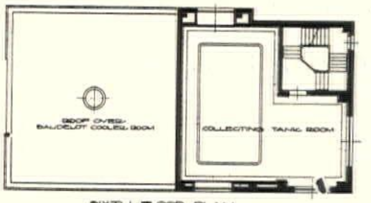
The lager storage building is 55 x 51 feet and 5 stories high. The ale unit consists of a building 146 x 71 feet, part of which is 6 stories high and part 4 stories.

The hot wort from the hop jack in the present brewhouse is pumped to the copper collecting tank on the sixth floor and after standing for a proper interval is allowed to flow by gravity over the wort cooler located on the fifth floor. The cooled wort runs to the settling tank located in the fermenting room on the fourth floor. After requisite settling period the wort is pumped to the vertical fermenting tanks where it is fermented. From the fermenters the ale or stout or porter is allowed to flow to the storage tank assigned to it where it remains during the aging period. When the product is ready for shipping, it is piped to the racking room located on the ground floor where it is racked into the various packages for distribution. The wash room for the returned kegs is located on the ground floor beside the racking room. The delivery platform is recessed into the building to give protection from the weather and to prevent blocking of the sidewalk by the trucks.

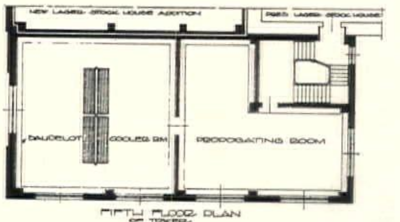
The building is of steel skeleton construction, with brick walls independent of the steel, allowing the insulation to be applied to inside of brick walls in an unbroken envelope of insulation. Interior walls are plastered and painted white. The floors are of mastic finish. The walls of the propagating room, collecting tank room, and Baudelot cooler room and wash house are finished with a buff colored terra cotta. The cellars are cooled by coil type air conditioners, hung from the ceiling in the lager cellars and standing on the floor in the ale cellars and fermenting rooms.



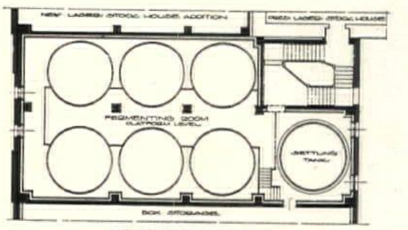
CROSS SECTION
THRU TOWER



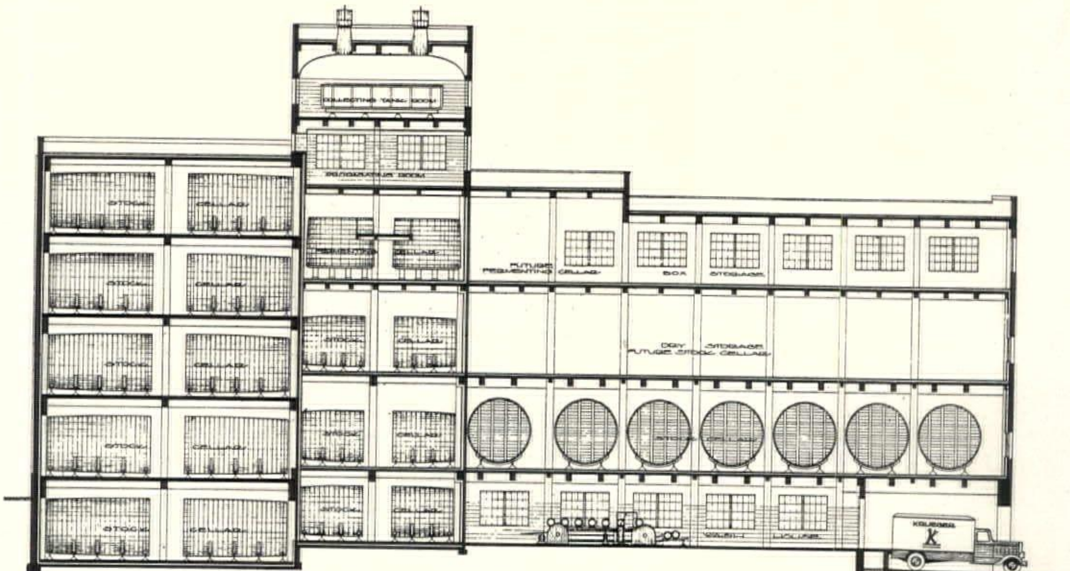
SIXTH FLOOR PLAN



FIFTH FLOOR PLAN
OF TOWER



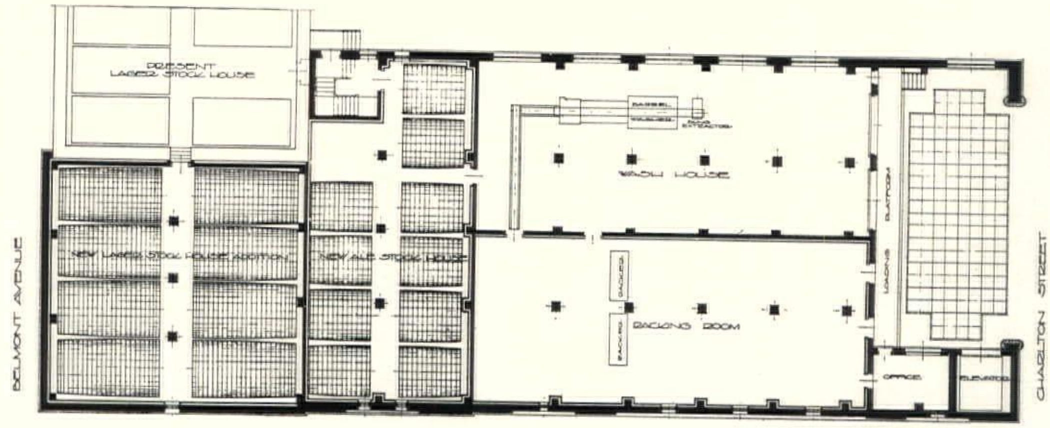
FOURTH FLOOR PLAN
OF TOWER



LAGER STOCK HOUSE ALE DEPARTMENT

WALDEMAR MORTENSEN
ARCHITECT
NEW YORK CITY

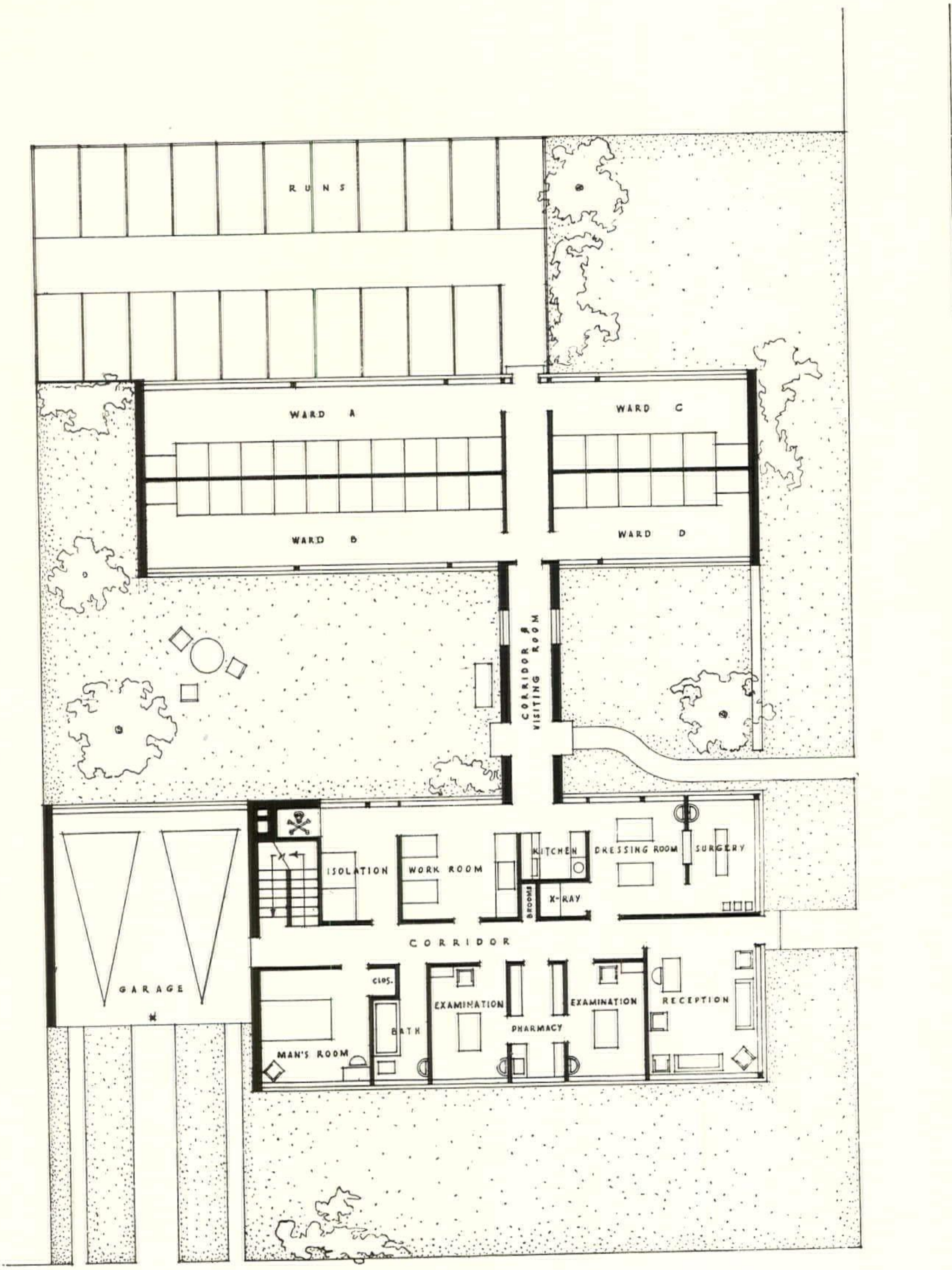
LONGITUDINAL SECTION



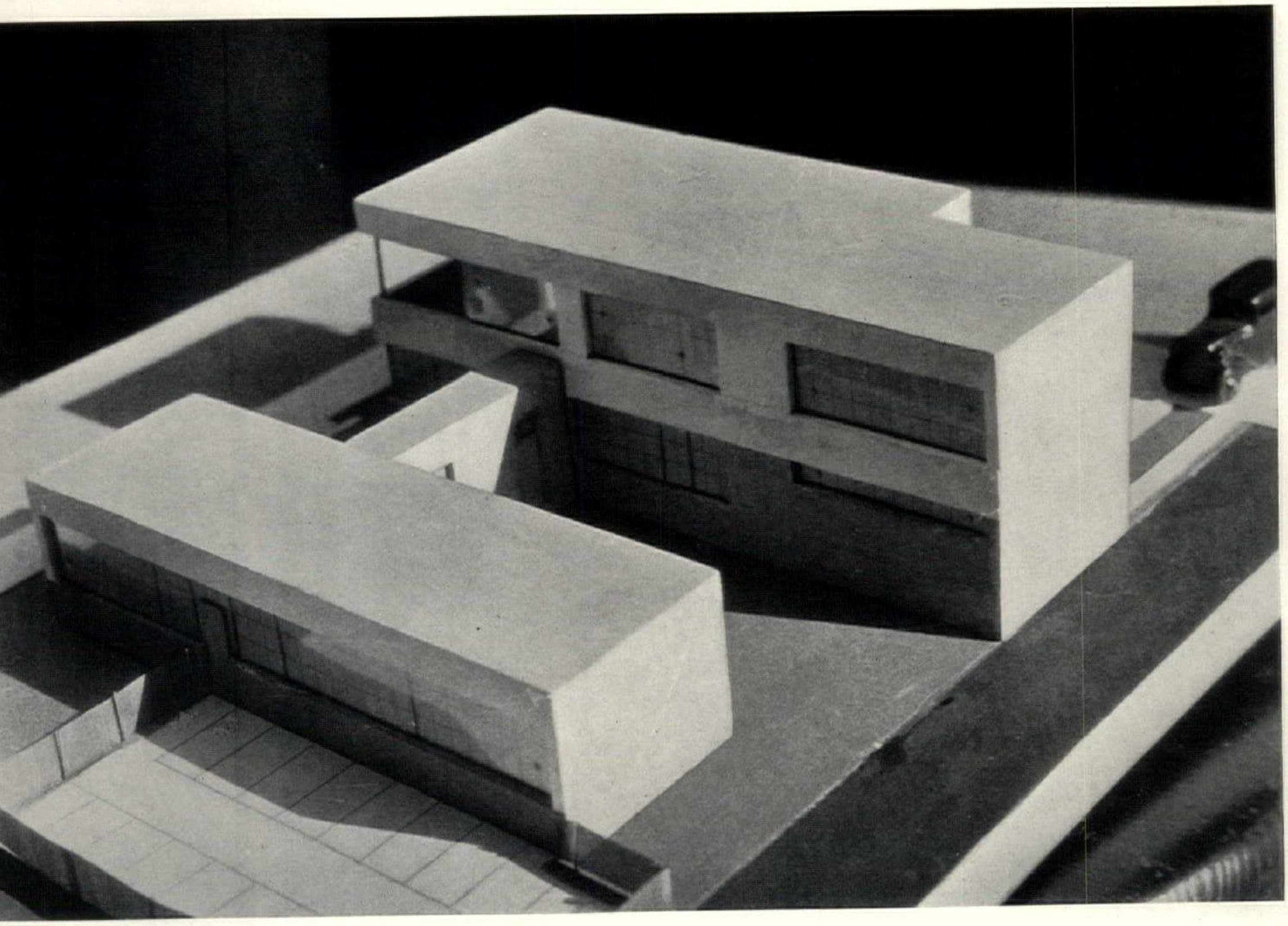
FIRST FLOOR PLAN

A VETERINARY HOSPITAL FOR LONG ISLAND CITY, N. Y.

NORMAN N. RICE, ARCHITECT

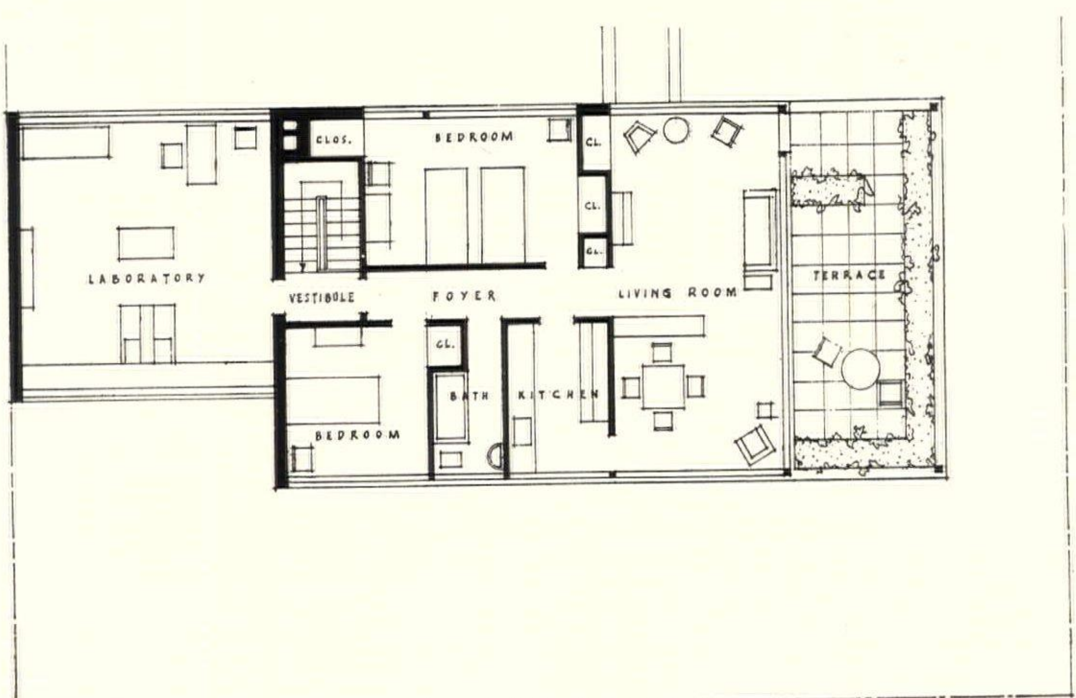


FIRST

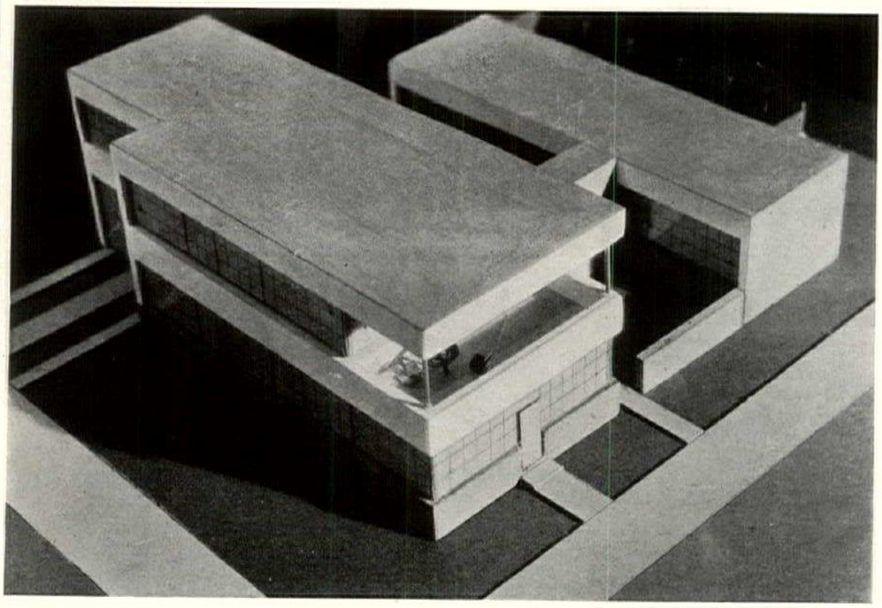


REQUIREMENTS FOR VETERINARY HOSPITAL

In general, the problem of the veterinary hospital is similar to that of the human hospital. The differences are results of the size, characteristics and treatment of patients. The building illustrated is designed for the hospitalization of dogs and cats and an occasional bird or monkey. As in all hospitals, abundance of sunlight and air, sanitary surfaces, segregation of diseases, quiet, convenience and efficiency of equipment and layout are desirable features. From the financial point of view, the small veterinary hospital is similar to a private hospital. It is an income-producing building in which the doctor's fees and hospital charges must show a reasonable return over and above carrying charges and operating expenses. Unlike an apartment or office building, it is not possible to arrive at an expected gross income from rentals.



SECOND



VETERINARY HOSPITAL, LONG ISLAND CITY, N. Y. . . . NORMAN N. RICE, ARCHITECT

From previous experience, the veterinary was able to determine the minimum of essential rooms and furnishings which would allow him to work with utmost efficiency and convenience. The operating personnel includes the doctor, his assistant, a kennelman, and a reception clerk.

The layout can be divided roughly into in-patient and out-patient divisions, although practice in a small hospital means a constant overlapping of the two.

The OUT-PATIENT GROUP includes the reception, pharmacy and two examination rooms. In emergency cases, the dressing, X-ray and surgery rooms may be considered as out-patient. These are the rooms to which clients are admitted to hear the diagnoses, watch treatments, and receive instructions and drugs for further treatment of the animals.

(1) Reception room: seating for 10 clients; reception clerk's desk and chair.

(2) Examination rooms (diagnosis and minor treatments): 25 x 40 inch glass top table, small wall cabinet for instruments and dressings (top used as a writing shelf), lavatory, and chair.

(3) Pharmacy: cupboards and drawers for storage of drugs and dressings, sink, and small preparation table; for direct access, the examination rooms are placed on either side with communicating doors.

The IN-PATIENT GROUP includes the four wards, the outside runs, the dressing, X-ray, surgery, kitchen, work, and isolation rooms.

Owners are seldom admitted to these rooms; visiting the animals is discouraged, but when owners insist, the corridor connecting the ward and hospital wings may be used as a visiting room.

(1) Dressing room (treatment of in-patients, irrigation, treatments after X-ray diagnosis, surgical preparation, instrument sterilization, and also used as an extra examination room): two 25 x 40 inch glass top tables, irrigation stand, lavatory, instrument and dressing cabinet (in wall opening) with glass doors on both sides and sterilizer beneath.

(2) X-ray room: small dark room for a fluoroscope.

(3) Surgery (major treatments and operations): operating table, instrument tray, basin stand, lavatory, and access to instrument and dressings cabinet.

(4) Wards (Ward A, 20 cages for cats and maternity cases; Ward B, 20 cages for non-contagious diseases, surgical cases, and boarders; Ward C, 10 cages for skin diseases; Ward D, 10 cages for distemper cases): cages are in two superposed levels and face the windows to receive sunlight either in the morning or afternoon; an open closet in each ward for slop sink, cleaning equipment, refuse can, etc.; corridor between wards arranged to control the movement of animals to the outside runs while emptying one ward for general cleaning.

(5) Runs (segregation and control of animals while outdoors): compartments separated by wire fabric fences.

(6) Workroom (washing, clipping and plucking): two glass top tables with clipping machines hung overhead, large sink with double drain board, and cupboard.

(7) Kitchen (storage and preparation of food for in-patients): small range, refrigerator, table, cupboards and bins.

(8) Isolation room (special observation cases, rabies cases, destroying cabinet): four cages, and an airtight cabinet for destroying animals by lethal gas.

SERVICE ROOMS:

(1) Room and bath for the kennelman who is caretaker of the animals; the bathroom will be used by clients also.

(2) Garage for the ambulance and the doctor's personal car.

(3) Broom closet for cleaning equipment.

(4) Furnace room in basement for heating plant and small incinerator.

On the second floor are the doctor's apartment and his laboratory. The location of the stairs between these two units was essential in order to allow private access to the laboratory at all times. The laboratory will be used as a library and study as well as for research. The apartment includes living room, terrace, two bedrooms, kitchen and bath. A separate first floor entrance to the apartment was not considered necessary.

Photograph by Albert Frey

AUTO SERVICE STATION

The plan has a definite separation of gasoline sales and service. Space is given to sales of accessories, car laundry and repairs. The driveway is illuminated by overband flood lamps. There is localized illumination of pumps and car shelter.

A MUSIC SHELL IN MILWAUKEE

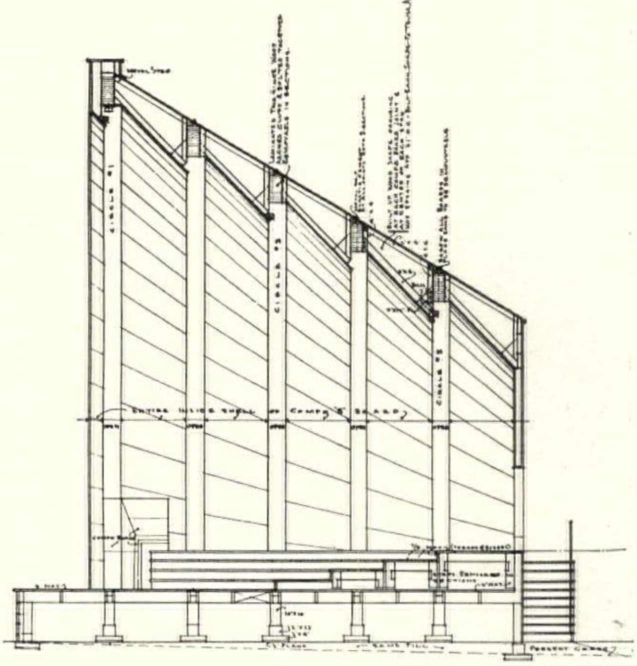
HUMBOLDT PARK MUSIC SHELL
MILWAUKEE . . . CLAS AND CLAS, ARCHITECTS

The general design is similar to the music shells in Hollywood and Chicago on a somewhat smaller scale and using different materials. The location is a natural crescent-shaped amphitheater with an easy rise to a crown several hundred feet away, allowing a seating capacity in excess of 30,000 persons. Approximately 100 musicians and 300 choristers can be seated in the shell. Total cost of project: $8,800.

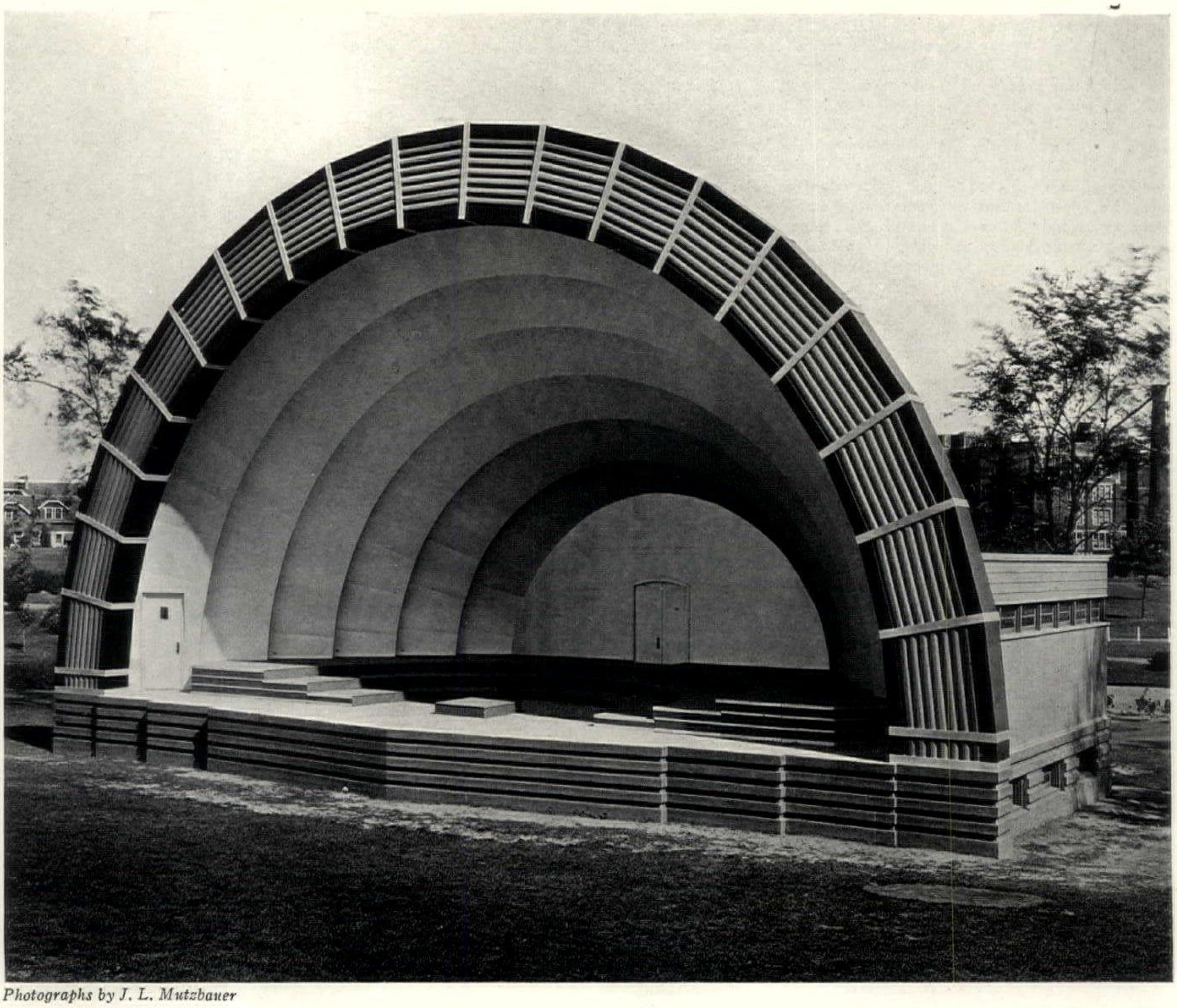
An interlocking arch roof construction is used in the wood frame superstructure. The deflector blades are furred out with reused form lumber with Masonite tempered Presdwood with sheet metal trimmings. The base is of reinforced concrete and has storage space for benches and general park equipment.

The shell interior has lighting in each trough formed by junction of the deflecting blades and not in alternate troughs as in the case of other music shells. No lighting was required in the amphitheater since the silvery reflecting surface of the shell casts the light several hundred feet forward.

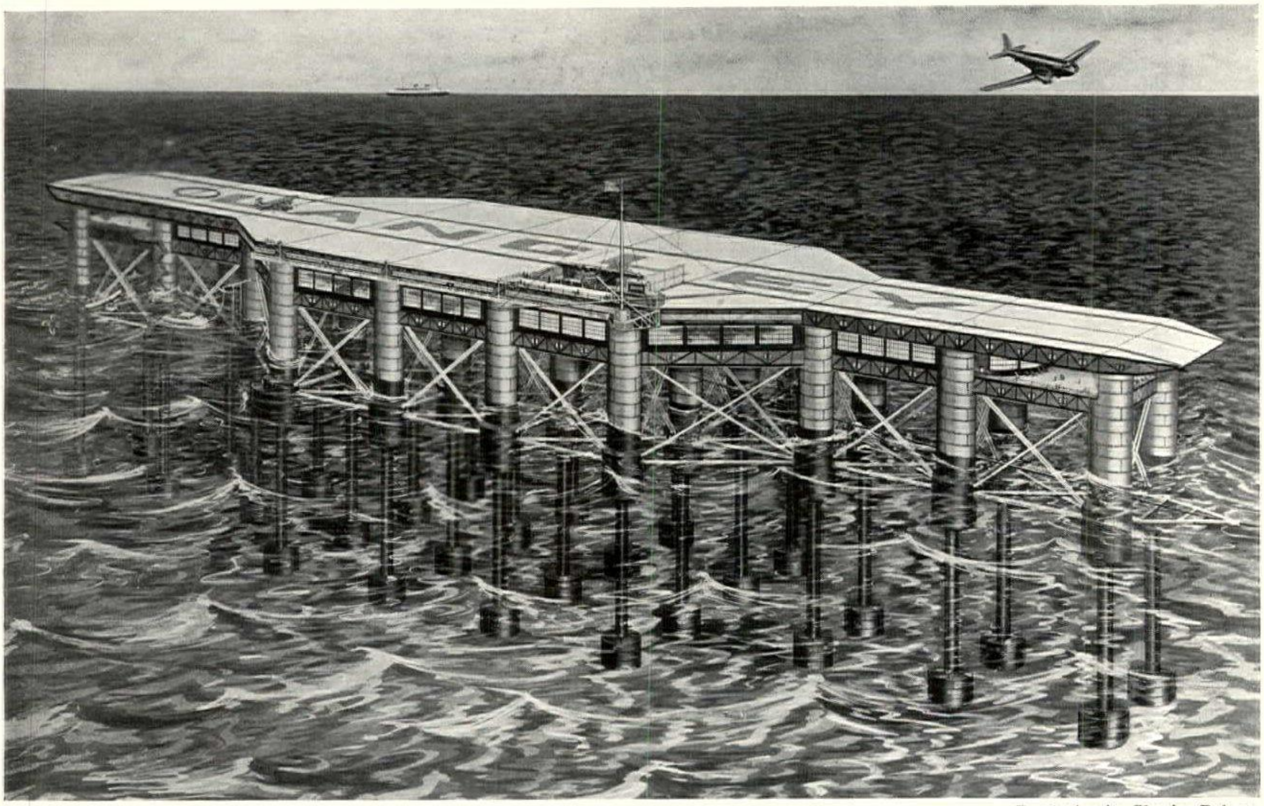
Color scheme: Silver interior, and light blue exterior trimmed with silver and black. The main arch has black outer bands and graded blue reeds and silver cross bands.



Courtesy of AMERICAN LUMBERMAN



Photographs by J. L. Mutzbauer

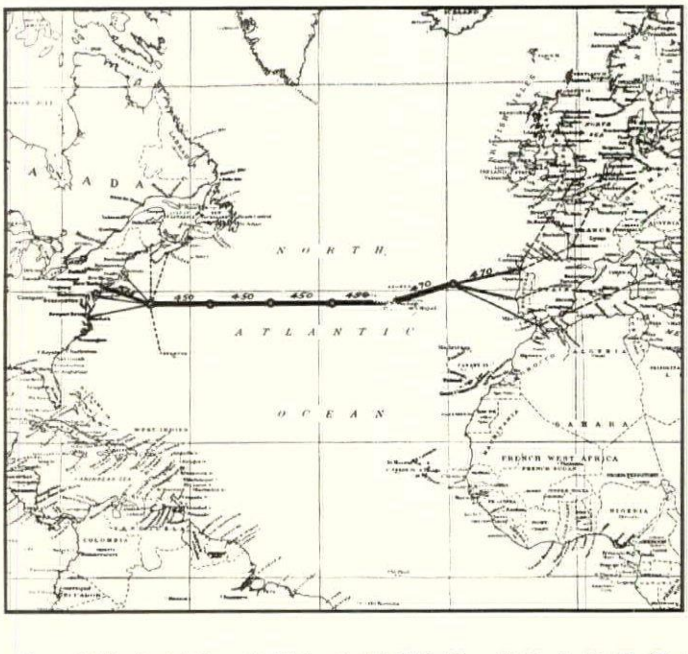


Rendering by Charles Roberts

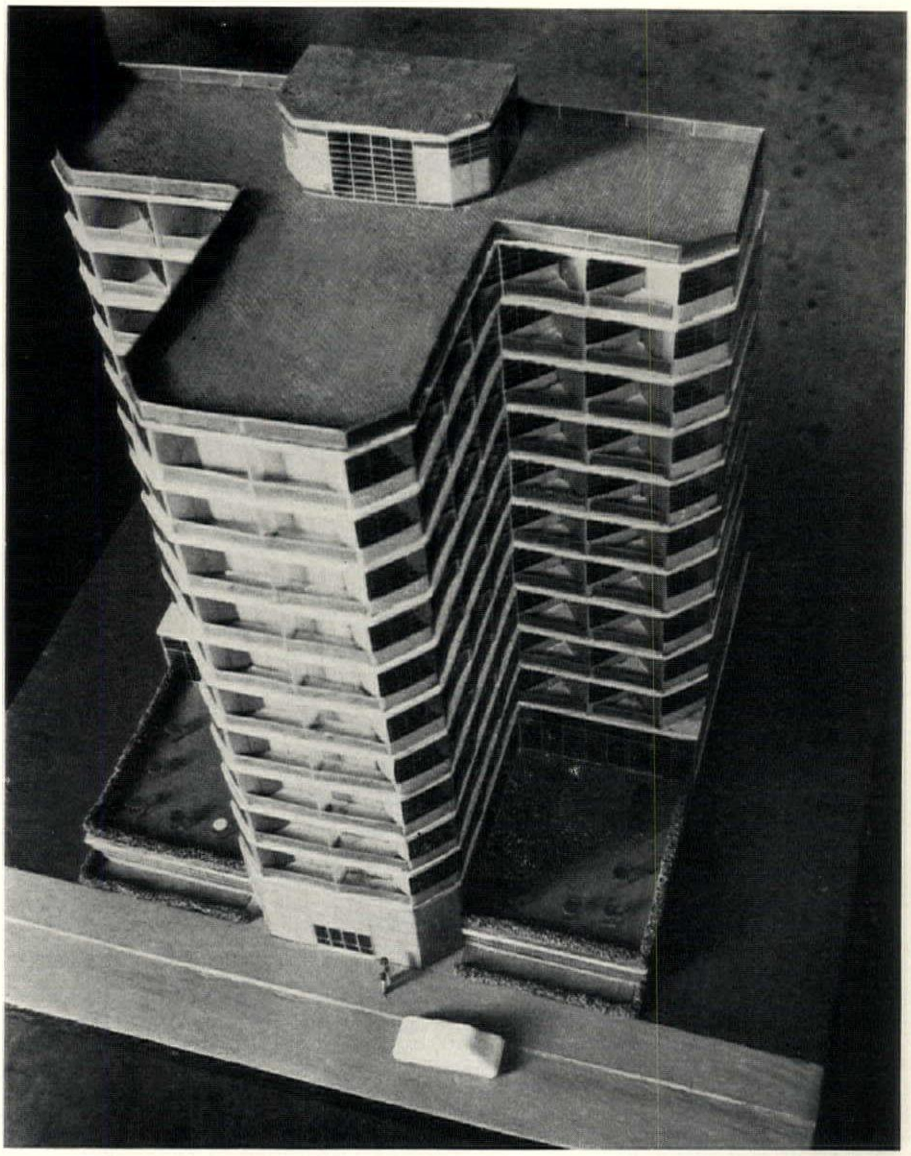
SEADROME DESIGN BY EDWARD R. ARMSTRONG

About a year ago the Seadrome Ocean Dock Corporation applied to the Public Works Administration for a loan of approximately $30,000,000, to be used to build and permanently anchor at sea five Armstrong seadromes. These were to be 1,225 feet long on deck, 300 feet wide at the center section and 150 feet wide at the narrower ends.

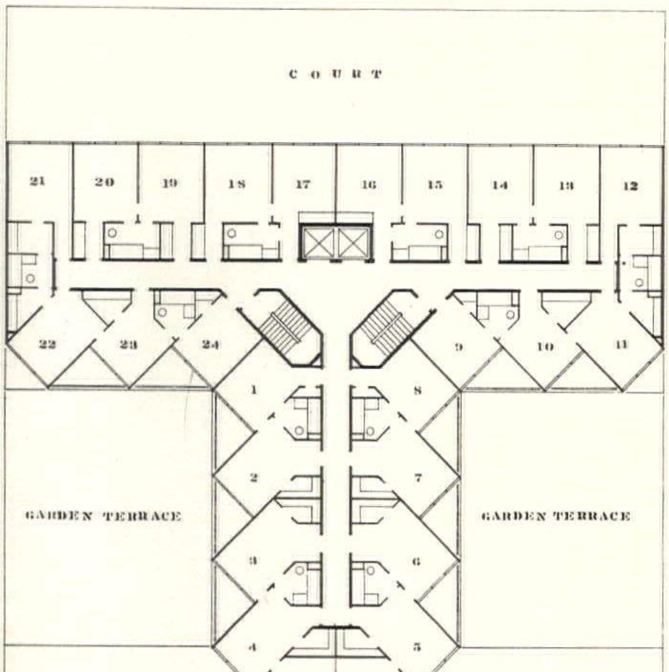
Because approval of the State Department, the War Department, and particularly the Navy Department was also necessary, the Secretary of Commerce suggested that the President appoint a committee to study the project. This committee was created. The Department of State expressed the opinion that this government had a right to anchor such seadromes above the high seas, provided that their purpose was peaceful. Under consideration now is a plan to build one complete seadrome of greater length than originally contemplated in order to permit very heavily loaded planes to take off and land with complete safety.



 A TRANS-ATLANTIC SEADROME ROUTE



GOTHAM GROUP HOUSE
MILTON LOWENTHAL, DESIGNER



● TYPICAL FLOOR PLAN
SCALE IN FEET

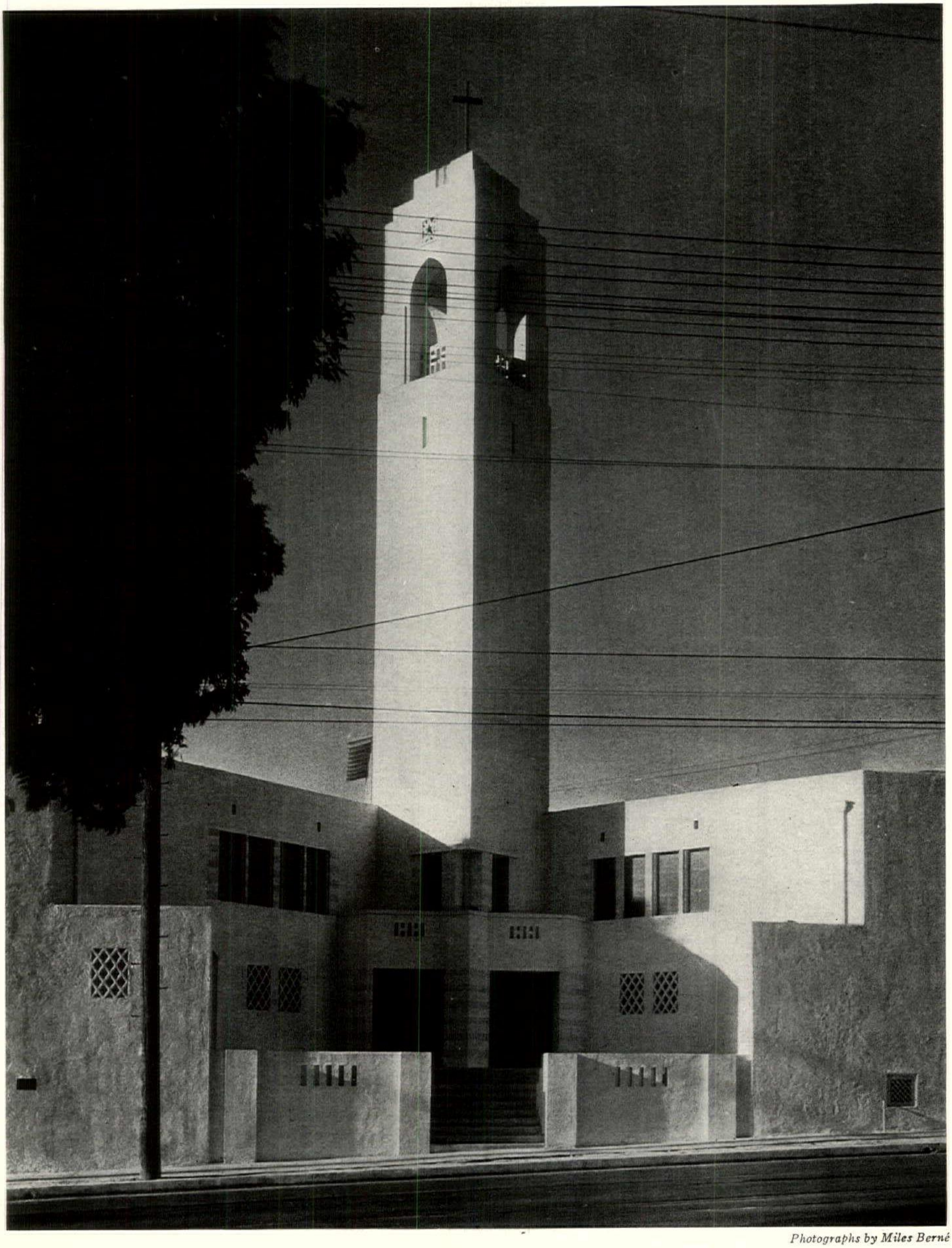
Architectural Problem:

To provide the largest number of desirable rooms on an inside city lot, also facilities for social and recreational activities. The T-plan was selected for the sake of efficiency. Diagonal rooms utilized to provide privacy, balconies, the use of the interior corner, and windows running room width. Group facilities include garden terraces, a lounge, dining and meeting space, half story above street level; reading and writing rooms, lobby, office, gymnasium and pool below street level.

Social Problem:

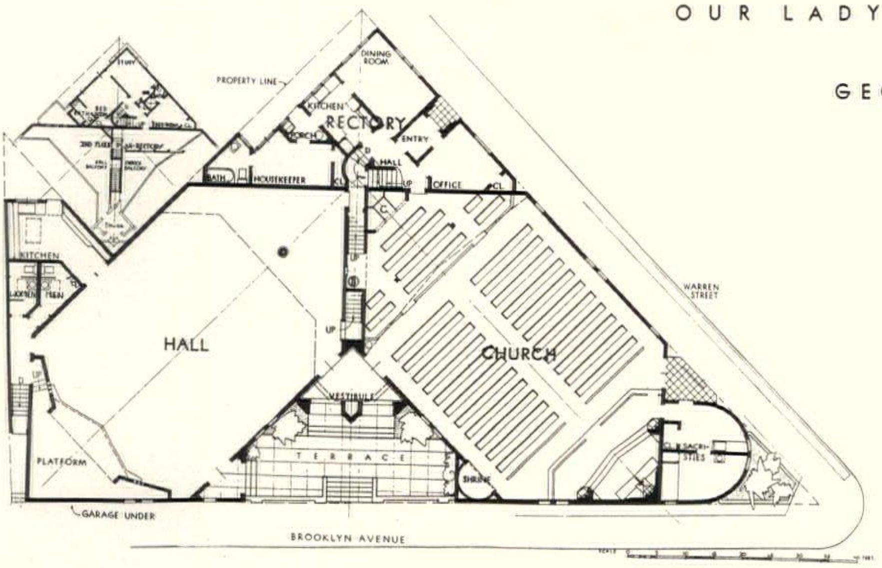
To provide a satisfactory substitute for the rooming house. The Gotham Group, in its present temporary quarters, provides the following activities—group dinners, community kitchens, group buying, placement service, emergency loans, made work and house scrip, medical and nursing service, local counsel, house library, and recreation. Extension of this plan contemplates other activities—group insurance, adult education, special classes and round table discussions, group workshop, and exhibition rooms. The movement, which began in 1928, has as its purpose the establishment of "living centers" based upon group economics.

A LOW-COST CHURCH IN LOS ANGELES



Photographs by Miles Berné

OUR LADY OF LEBANON CHURCH
LOS ANGELES
GEORGE J. ADAMS, ARCHITECT

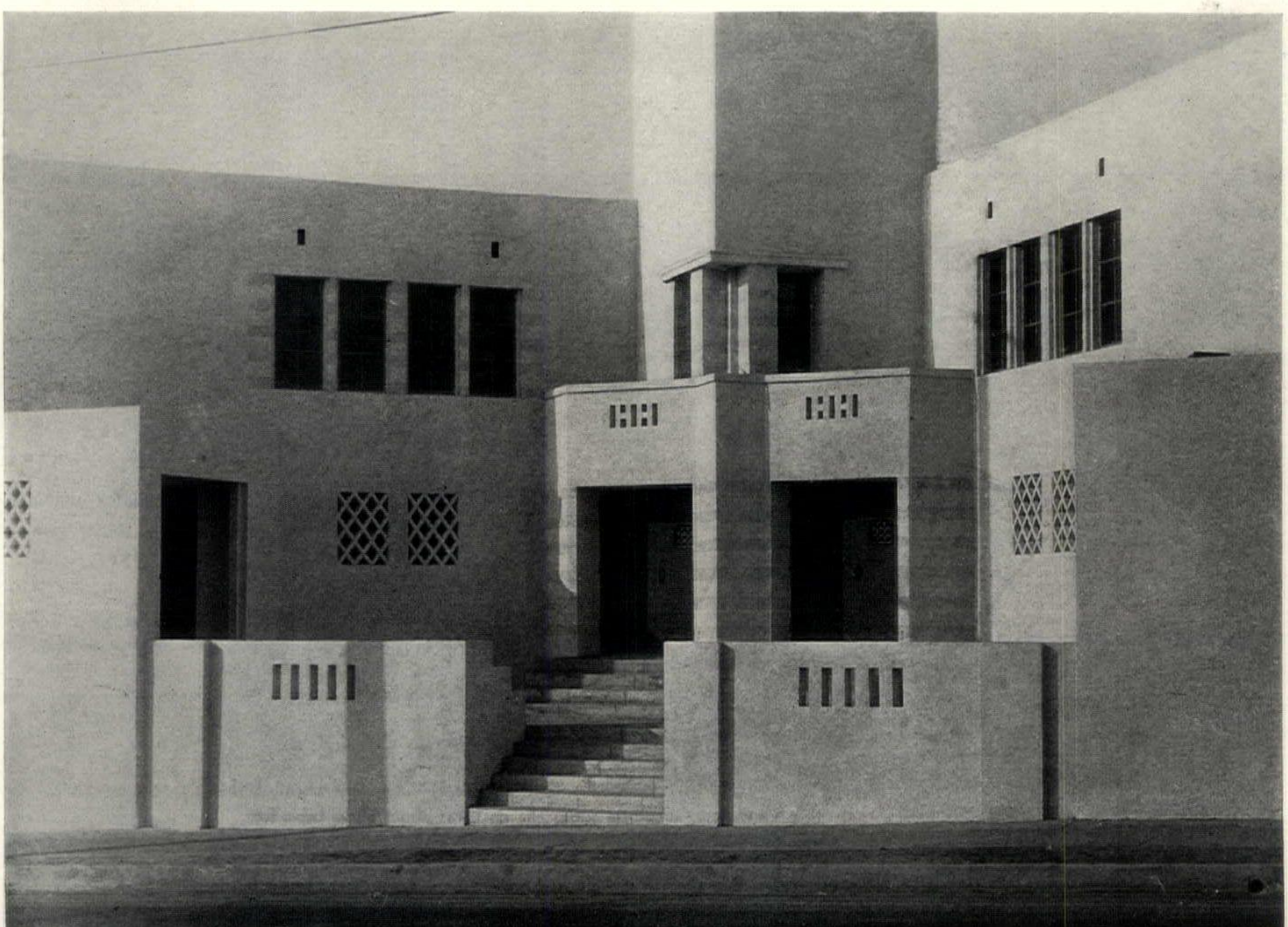


This church, completed in June last year, cost $12,000, or 7.7¢ a cubic foot. This cost includes the architect's fee, two stained glass windows and folding banquet tables for the hall, but excludes cost of church pews and stations of the cross.

Construction: Concrete foundations and terrace walls. Concrete walls, floor and slab over garage. Wood frame construction with roofs supported by stock bowstring trusses. Exterior, cement plaster on galvanized netting, interior of hardwall plaster finished with parchment color stucco. Floors of ½-inch thick oak over pine subfloor, with tile in baths and toilets. Composition roofing. No heating is provided except in the rectory where individual gas wall heaters are installed. No forced ventilation. A large, wind-driven rotary ventilator on the roof can be used to draw air from either of the two balconies or the confessional.

Seating capacity of the church: 350.

Seating capacity of the hall: 400.



Photograph by Paul J. Weber

PERRY, SHAW AND HEPBURN
ARCHITECTS

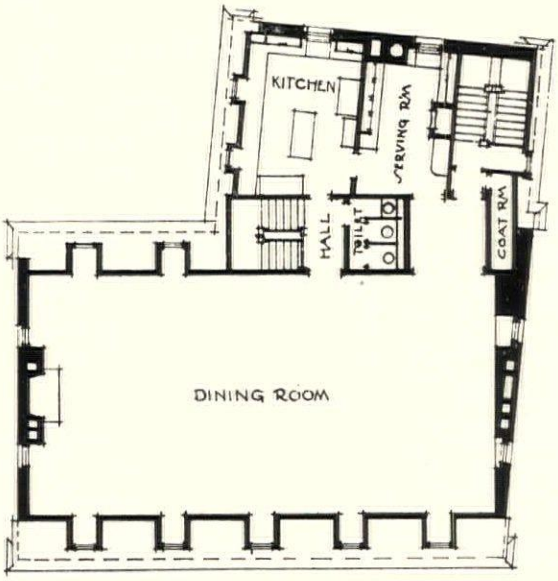
The D. U. Clubhouse occupies a plot 60 by 90 feet on the corner of Mt. Auburn and Dunster Streets, Cambridge, Massachusetts. The building was planned for club activities for a limited number of members and includes a store 22 by 44 feet for rental purposes.

Entrance to the Club is from Dunster Street and from the vestibule a door to the left gives access to the visitors' room. Beyond is a spacious hall with circular stair and curved end wall. In line with the needs of a building of this sort a billiard room and coat and washroom are provided on the main floor, a lounge or living room, library and private dining room on the second floor, besides living quarters for the steward. The third floor comprises a large banquet hall with necessary kitchen and serving rooms. In the basement is a squash court, showers, locker and toilet rooms, boiler room, and the store basement.

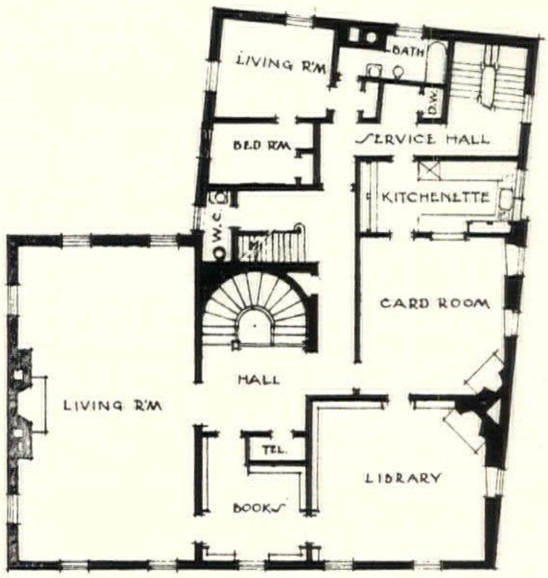
The exterior design is an adaptation of early New England architecture with brick walls, wood trim, and slate roof. The cost was about 55c a cubic foot.

A CLUBHOUSE AT HARVARD

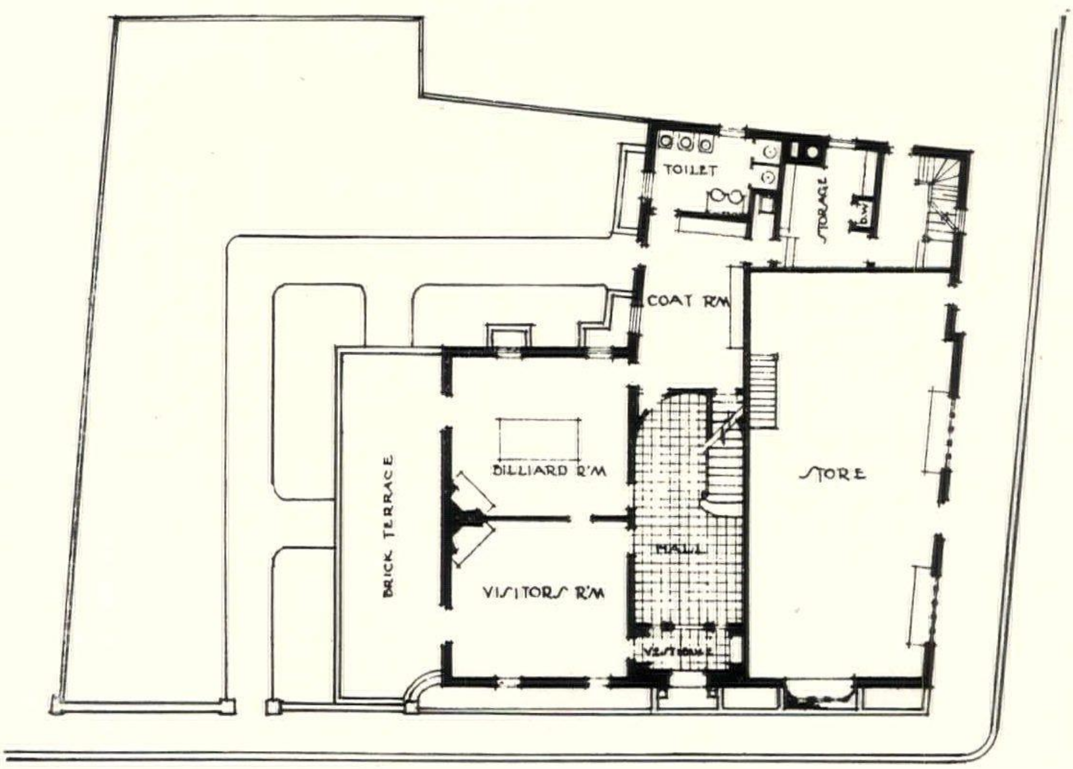
RRY, SHAW AND HEPBURN, ARCHITECTS



ATTIC FLOOR PLAN

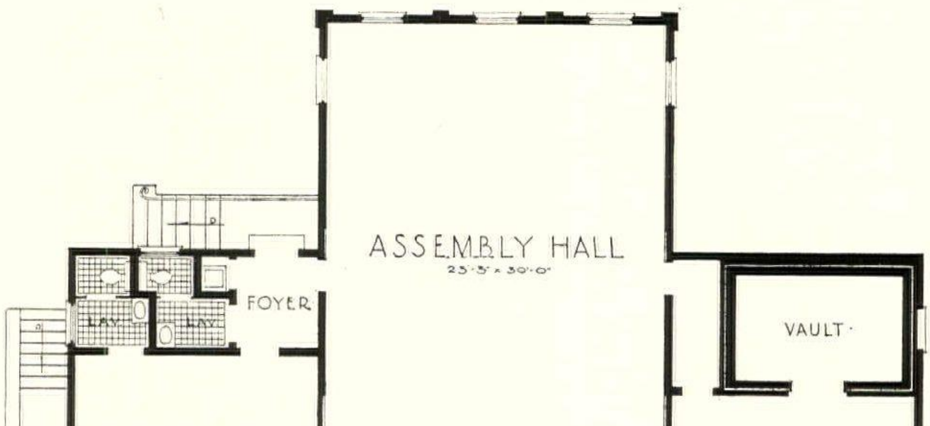


SECOND FLOOR PLAN



RST FLOOR PLAN

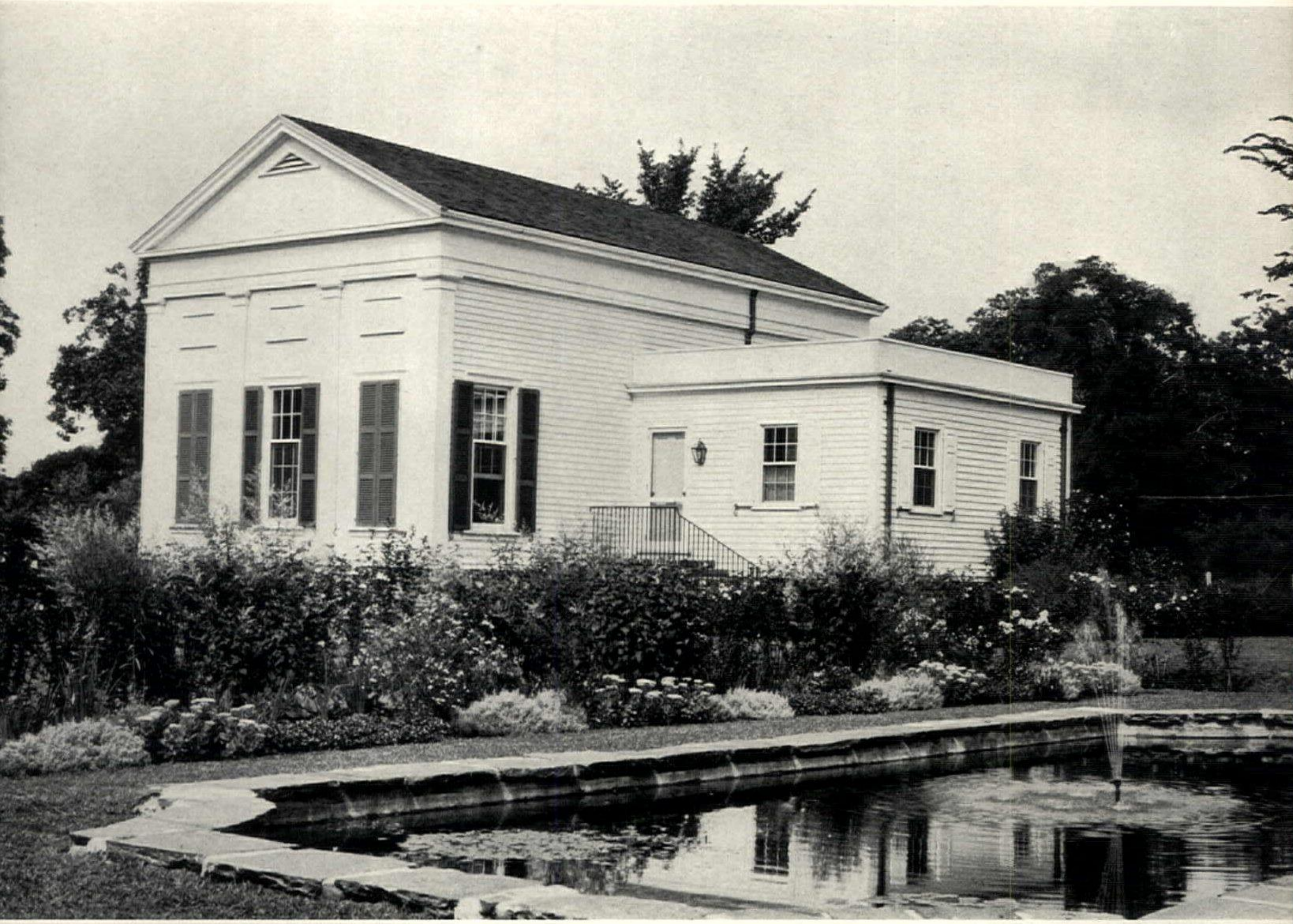
A VILLAGE HALL



The village hall was built as a general gathering place; it is used for elections and for displaying tax maps, occasional art exhibits, and documents of local interest. The building contains a fireproof vault of reinforced concrete for records.

Frame construction. Exterior: Wood clapboards and flush boarding. Roof: White cedar shingles, unstained and left to weather.

Color scheme of assembly hall: Tones of gray with white moldings. The stars and anchor on frieze in pediments of interior windows and doors are blue.



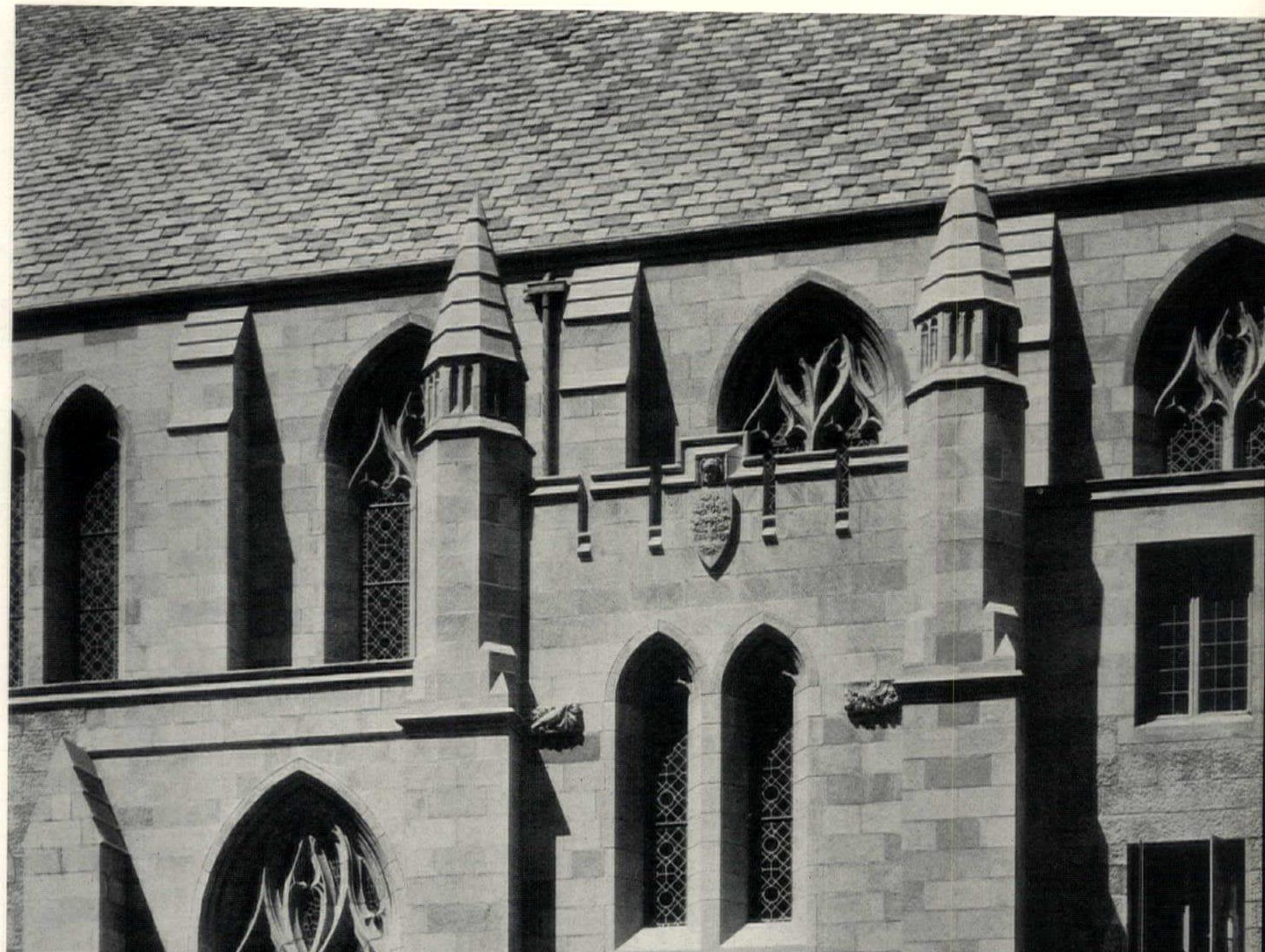
VILLAGE HALL
DERING HARBOR
NEW YORK

ALFRED EASTON POOR
ARCHITECT

The eagle in the pediment is gilded wood. The shield contains the coat of arms of the village and is of wood painted blue and white. The incised lettering is gilded.

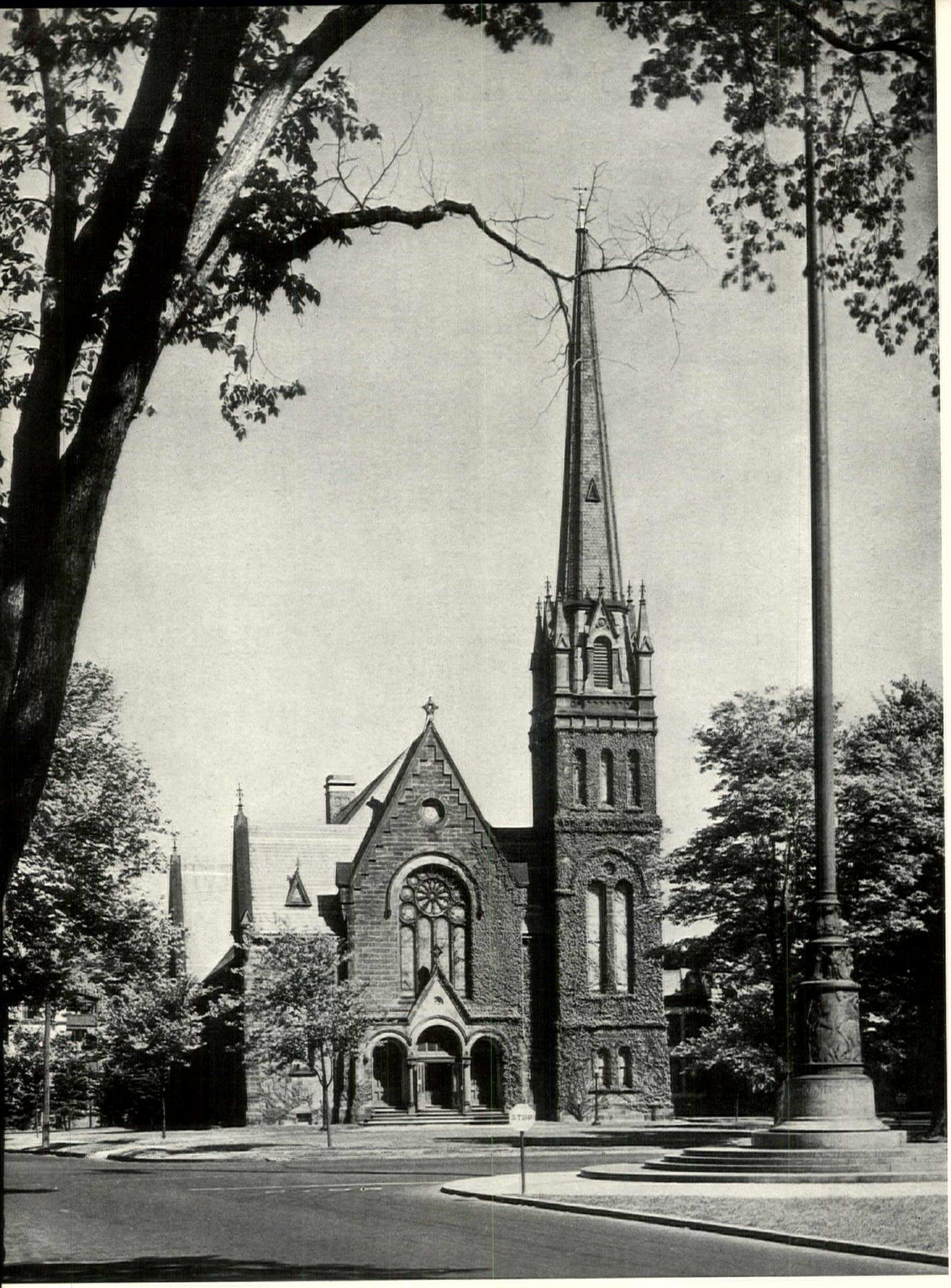
ALFRED EASTON POOR
ARCHITECT

MODERNIZATION and ALTERATION



Photographs by R. Tebbs

CRESCENT AVENUE PRESBYTERIAN CHURCH AT PLAINFIELD, NEW JERSEY
ZANTZINGER, BORIE AND MEDARY, ARCHITECTS



BEFORE MODERNIZATION

CRESCENT AVENUE PRESBYTERIAN CHURCH AT PLAINFIELD, NEW JERSEY

Photographs by R. Tebbs

AFTER MODERNIZATION

ZANTZINGER, BORIE AND MEDARY, ARCHITECTS

Photographs by Wurts Bros.

BEFORE MODERNIZATION

109-111 DIVISION STREET APARTMENTS
NEW YORK CITY
HERMAN M. SOHN, ARCHITECT

AFTER MODERNIZATION

Photographs by Wurtz Bros.

BEFORE REMODELING

15 THIRD PLACE, FRANKLIN COURT
GARDEN CITY, LONG ISLAND
SLEE AND BRYSON, ARCHITECTS

AFTER REMODELING

In this development old houses are altered to order for purchasers who agree to pay from $8,400 to $9,000, according to their selection of plans furnished by the builders. An average of $6,000 is spent on each house for alteration work.

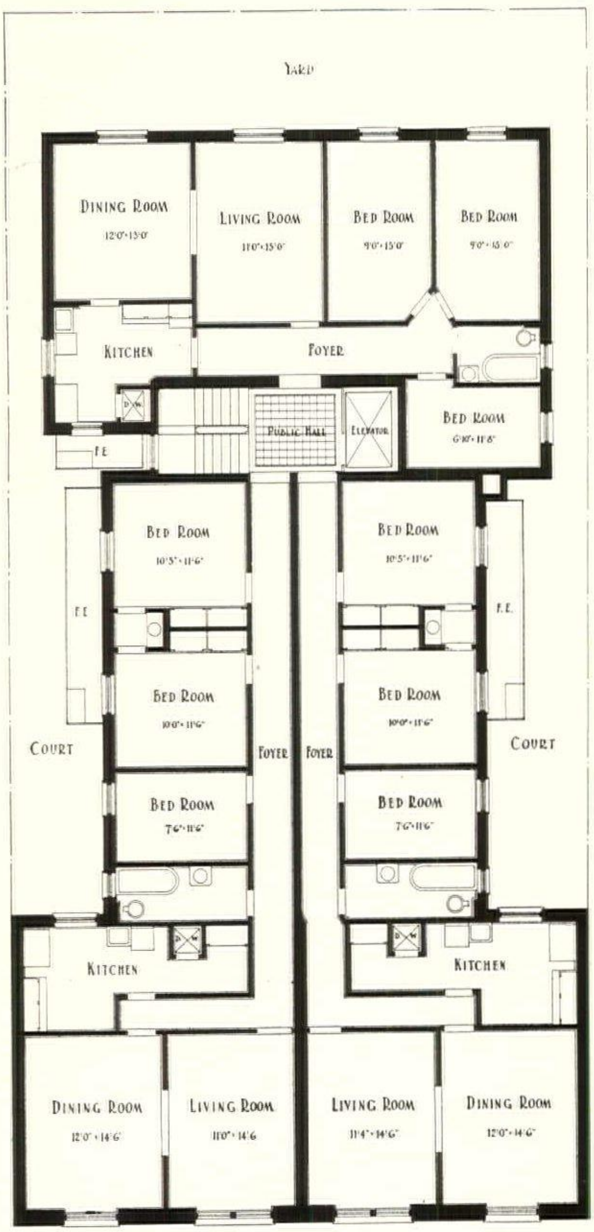
The houses when altered have 6 rooms, tiled bath, kitchen with all new conveniences. A garage is added together with a bedroom above. In the rear of the house is an open porch. Heating: steam system with oil burner.

APARTMENT HOUSE ALTERATIONS
439 WEST 123 STREET, NEW YORK CITY
CHARLES H. LENCH, ARCHITECT

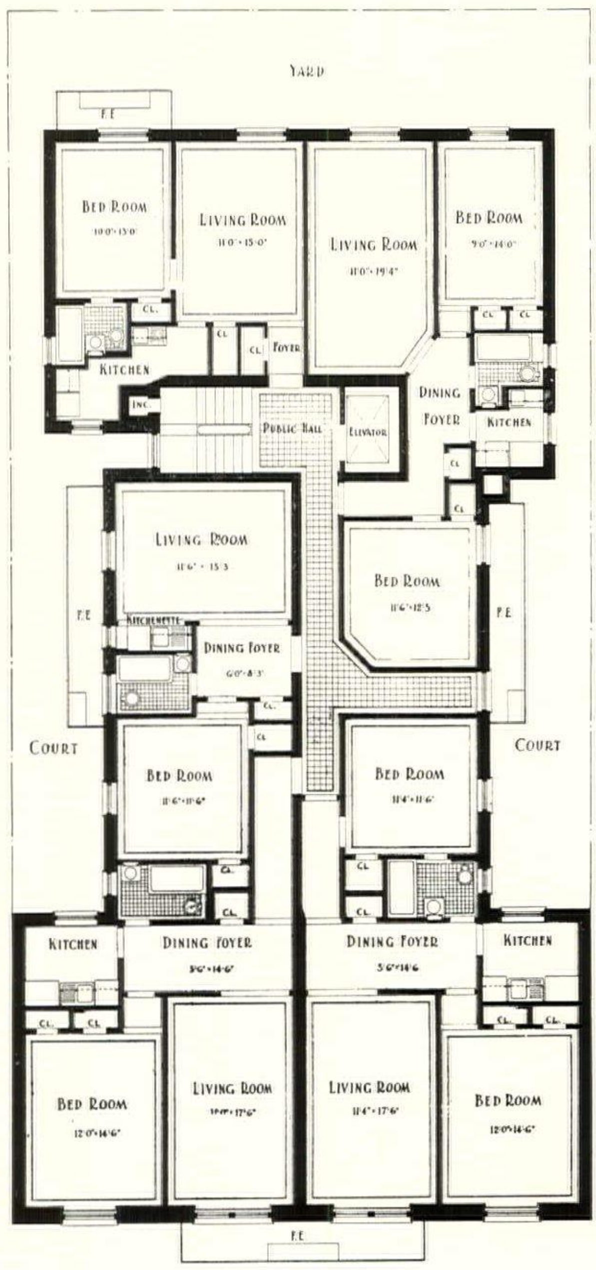
Nature of alterations: General demolition of interior construction. Excavation for new boiler and elevator pits. Existing masonry patched and pointed. Entire front of building sandblasted. New Ruberoid roof together with new metal skylights, flashings, gutters and the like. New stud partitions with new trim and new doors. Windows throughout newly caulked. Bathrooms tiled, and entrance hall and lobby surfaced with rubber tile. New plaster throughout practically the entire building. New hardware, including new gas ranges, electric refrigerators, and window shades in each apartment. New fire escapes. New Otis self-service elevator substituted for old lift. New electric wiring and fixtures. New system of plumbing, gas, water supply and heating.

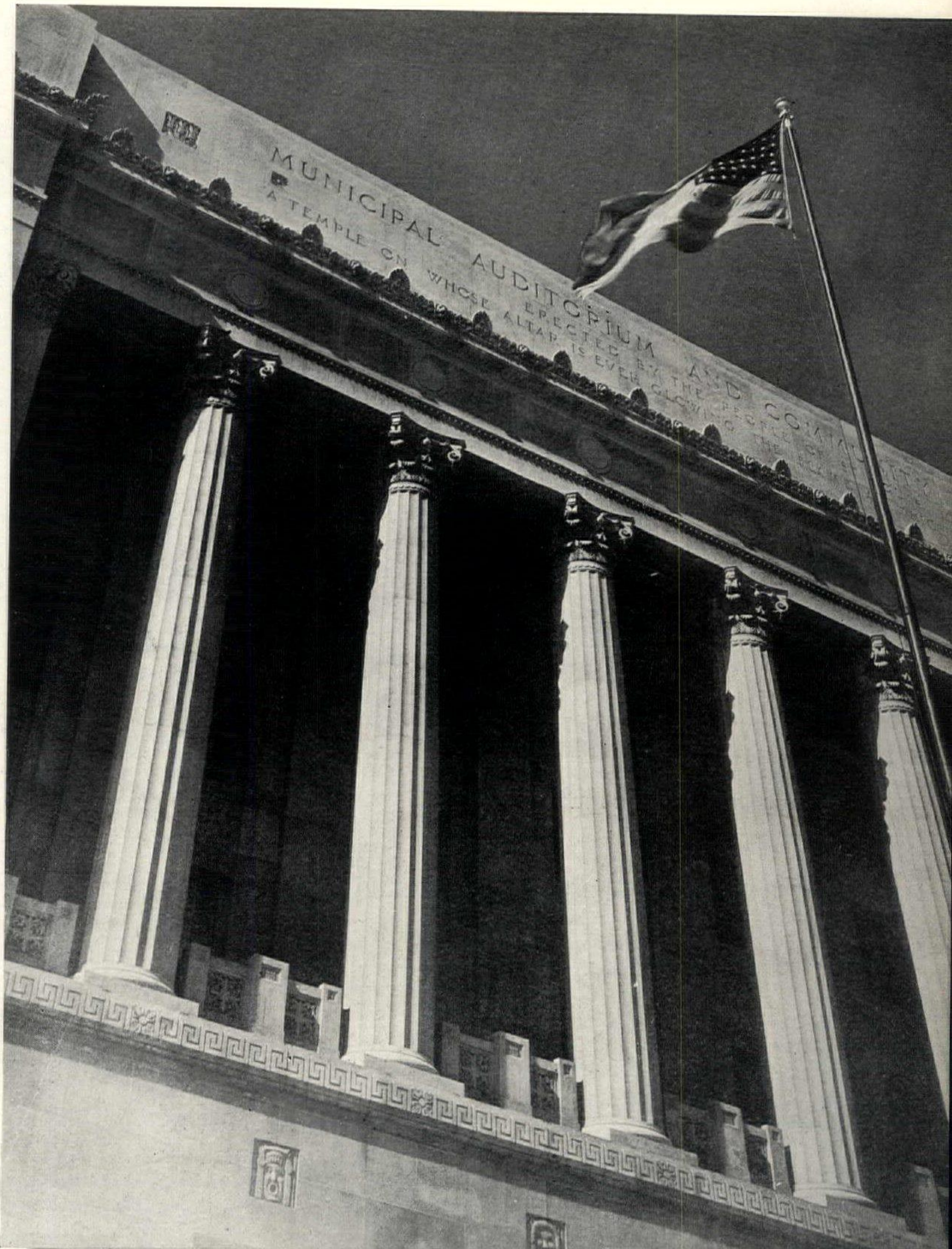
When preliminary sketches were first prepared the building was vacant; it is now 100% rented.

ORIGINAL PLAN ARRANGEMENT



NEW PLAN—AFTER ALTERATIONS





Photograph by H. Aylette Meade

In 1923 when a bond issue was voted by St. Louis for the erection of a civic group on the Memorial Plaza, of which this building is a unit, a company known as Plaza Commission, Inc., was formed to design and supervise the new buildings. The late J. L. Mauran of the architectural firm of Mauran, Russell and Crowell was president of this Commission; he was also a president of the American Institute of Architects. The secretary of the Commission is Louis La Beaume, in whose office (La Beaume and Klein) the plans of the Auditorium were prepared. William B. Ittner, well-known school architect, is now president of the Plaza Commission.

ST. LOUIS MUNICIPAL AUDITORIUM and COMMUNITY CENTER

Photographs by H. Aylette Meade

GENERAL VIEW OF BUILDING FROM NORTHEAST

THE new Municipal Auditorium and Community Center Building is one of several projects provided for in the eighty-seven million dollar bond issue passed by St. Louis voters in 1923. Funds were approved for the acquisition of land for a Memorial Plaza and two specific amounts set up for buildings. One was for the Civil Court House—four million dollars; the other for the Municipal Auditorium—five million dollars. A third building, the Soldiers Memorial, was also contemplated and funds for it, in the amount of one million dollars, were tentatively included in the sum granted for the purchase of the land.

In due course, ordinances were introduced and a Plaza Commission, composed of eight architects and two engineers, was created to design all features connected with the Plaza, including the buildings. The Plaza Commission, instead of establishing a general office, divided itself in groups to study the different elements involved. As a result of these subdivisions, the studies prepared by La Beaume and Klein were approved by the Commission and the design of this building allocated to this office. An elaborate program, specifying the uses of the building, had previously been prepared in consultation with city officials and all of the local groups interested in its use.

REQUIREMENTS

It was decided that the building should provide for a large auditorium, or arena, with a seating capacity of not less than twelve thousand persons; a theater, or music hall, with a seating capacity of approximately thirty-five hundred; several smaller recital, or assembly halls, with seating capacities of seven hundred or more. In addition to these principal features, it was necessary to provide the maximum amount of exhibition space consistent with the dimensions of the site and the terms of the budget.

The site measures approximately 322 feet from east to west and 493 feet from north to south. Therefore, it became necessary to consider the use of a common stage to serve both the arena and the music hall. It also seemed advisable to place the exhibition space under these features and extending over the complete area. Thus the music hall and arena were elevated above the street levels, and the exhibition space depressed below.

In addition to the main elements, foyers, corridors, committee rooms, rest rooms and many types of service space were required. The most decorative unit of the building, i.e., the music hall, faces on the Memorial Plaza and is directly accessible from it. The mass of the music hall is flanked on either side by masses each containing two assembly halls with separate means of entrance and egress. The theater, or music hall, is separated from the arena by a stage 142 feet from east to west and 48 feet in depth. The arena occupies the main portion of the lot extending to the south. Each element is independent of the others, and each part of the building can be used without interference with activities in any other part. Also, the entire building can be used as a unit, as circulation has been provided between all of the elements.

Seven entrances under the colonnade give access to the ticket lobby of the music hall; broad stairways at either end of the ticket lobby lead to the main lobby of the theater and to the lobbies on the balcony and upper levels. Elevators are also provided in this unit. Likewise stairways and elevators provide access to the assembly halls.

The exhibition space and arena are accessible from the side streets—Fourteenth and Fifteenth Streets. These units are served by spacious lobbies on the street level, and the different lower and upper levels are reached by six ramps. One of these ramps has been especially designed to permit the entrance of trucks, large machinery, and the like.

CONSTRUCTION FEATURES

The foundations of the building are carried on 365 caisson columns sunk to rock at depths varying from 27 to 80 feet below the datum point, which is the level of the exhibition floor; there are also 50 spread footing columns.

Both the auditorium and music hall are spanned by steel trusses. Nine main trusses carry the roof of the auditorium, or arena. These trusses have a span, from wall to wall, of 266 feet. The height from the arena floor to the center of dome is 97 feet. The height from the datum level of the exhibition space to the ridge of the auditorium, or arena, is 170 feet. The music hall proscenium has a width of 63 feet by a height of 49 feet. The proscenium on the auditorium, or arena, side has a width of 95 feet and a height of 41 feet. The steel soundproof curtains closing both these stage openings were furnished by Peter Clark, Inc., and weigh respectively 21 and 31 tons.

The stage is completely equipped electrically and mechanically for performances of every character. When both steel curtains are raised, the stage may serve both the auditorium and the music hall, with a

EAST FACADE SHOWING ENTRANCE TO ARENA AND EXHIBITION SECTION

[Phot]ographs by W. C. Parsons

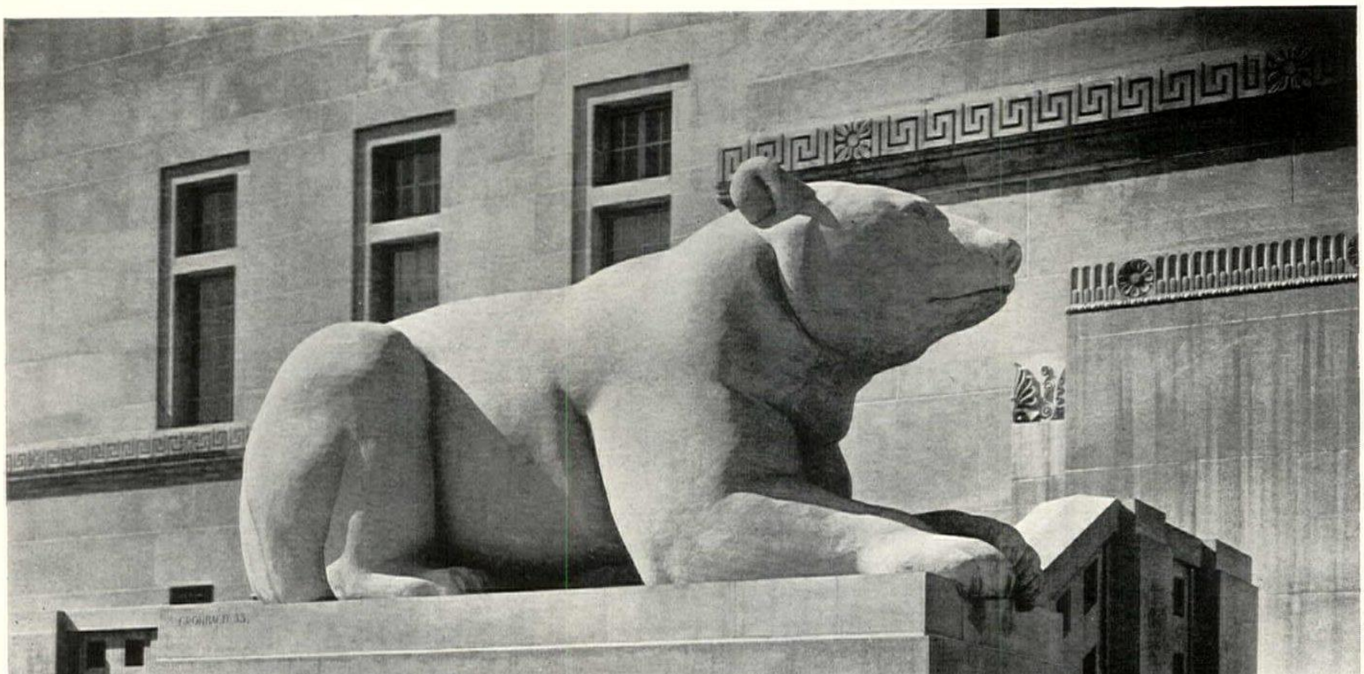
combined seating capacity of 15,600, for mass meetings, conventions, and so on. Dressing rooms are provided in several tiers for stars, principals and chorus, men and women, on either side of the stage. Twenty-seven committee rooms are arranged around the arena section for use during large conventions.

The building is heated from a central municipal plant three blocks away. Fifteen fan rooms serve different sections of the building. Air conditioning is specified for the main units.

The exterior walls of the building are faced with Indiana limestone; the pitched roofs are covered with cement tile. All interior wall surfaces are plastered and in some cases wainscoted with marble. The floors are of marble in the important public spaces and lobbies serving the music hall; monolithic or tile terrazzo in subsidiary spaces, and cement in service areas.

No special parking facilities have been provided since the building is surrounded by four streets and faces the Plaza. Parking regulations covering an area of four blocks in every directioin will permit convenient parking facilities for approximately ten thousand persons.

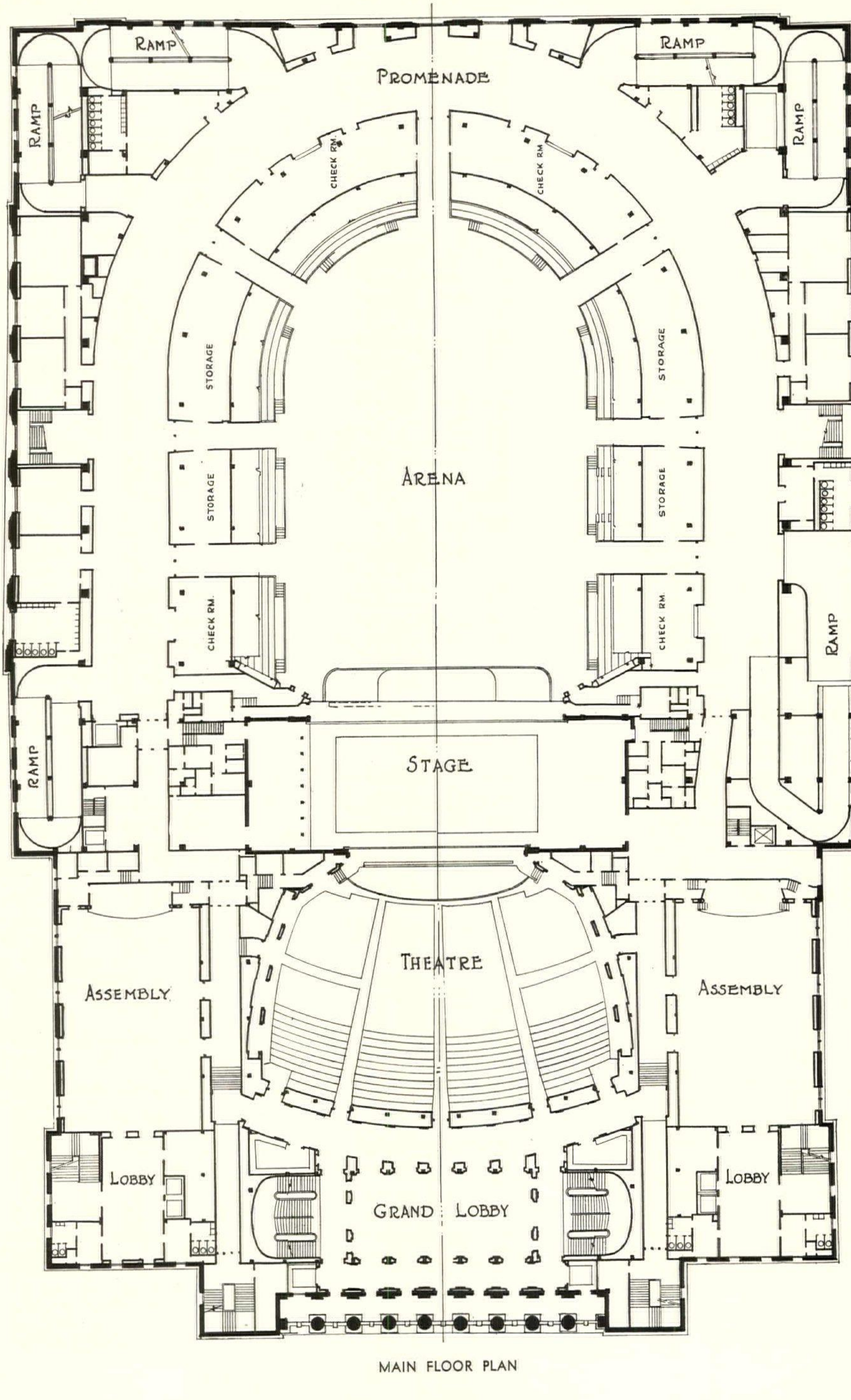
DETAIL OF ENTRANCE SCULPTURE BY ROBERT CRONBACH



CONSTRUCTION BEGUN AUGUST 11, 1932 — BUILDING COMPLETED APRIL 14, 1934

MUSIC HALL COLONNADE

Photographs by H. Aylette Meade

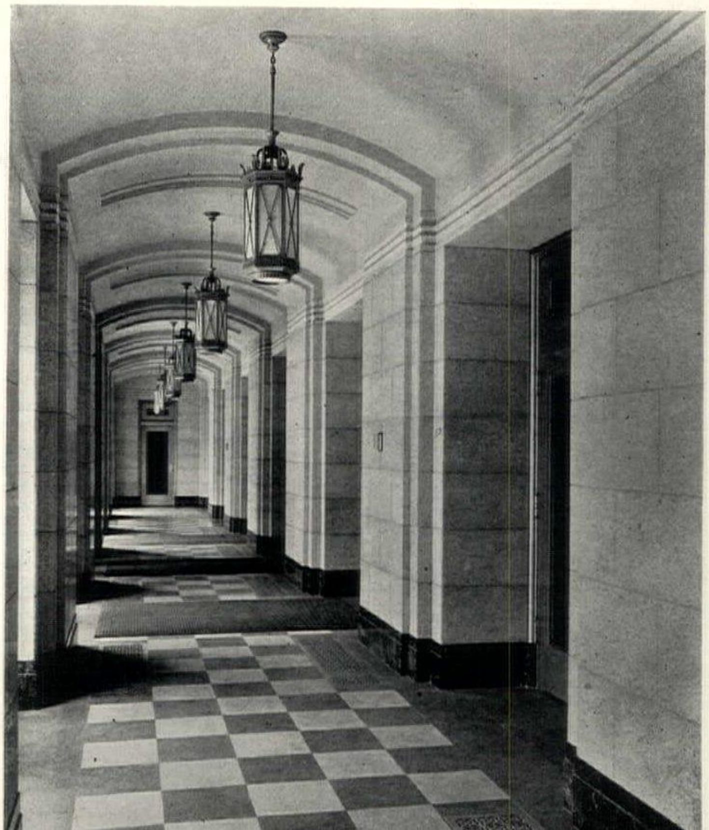


MAIN FLOOR PLAN

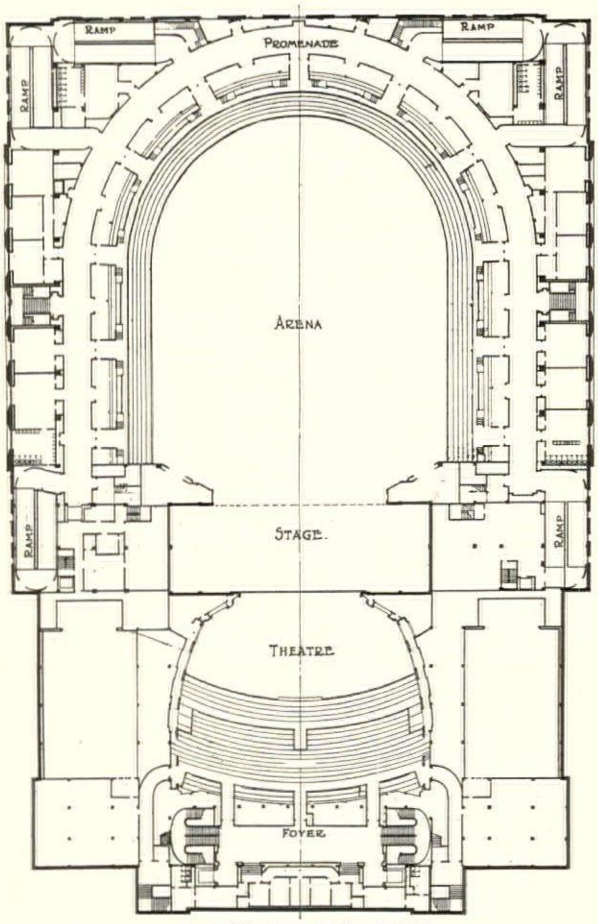
tographs by H. Aylette Meade

(ABOVE): DETAIL OF EXTERIOR ENTRANCE.

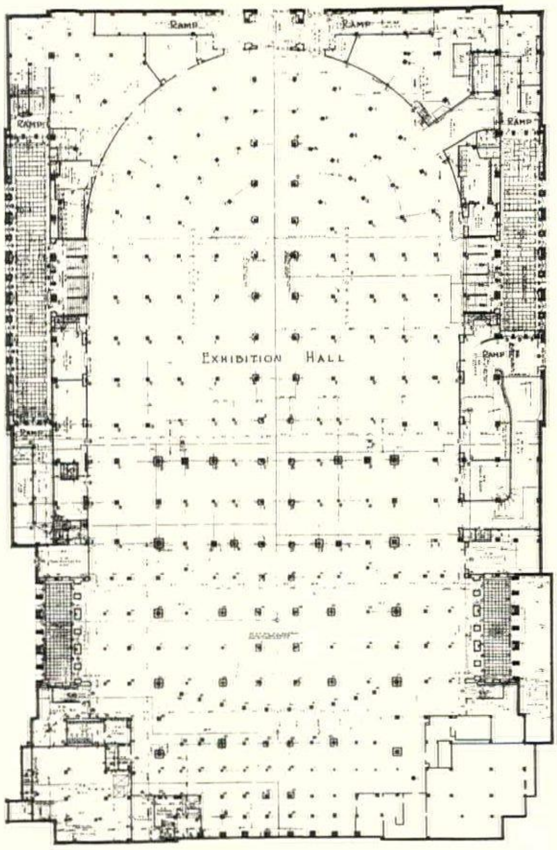
(RIGHT): ENTRANCE LOBBY TO MUSIC HALL



It was early decided that the building should provide for a large auditorium, or arena, with a seating capacity of not less than twelve thousand persons; a theater, or music hall, with a seating capacity of approximately thirty-five hundred; several smaller recital, or assembly halls, with seating capacities of seven hundred or more. In addition to these principal features, it was necessary to provide the maximum amount of exhibition space consistent with the dimensions of the site and the terms of the budget.



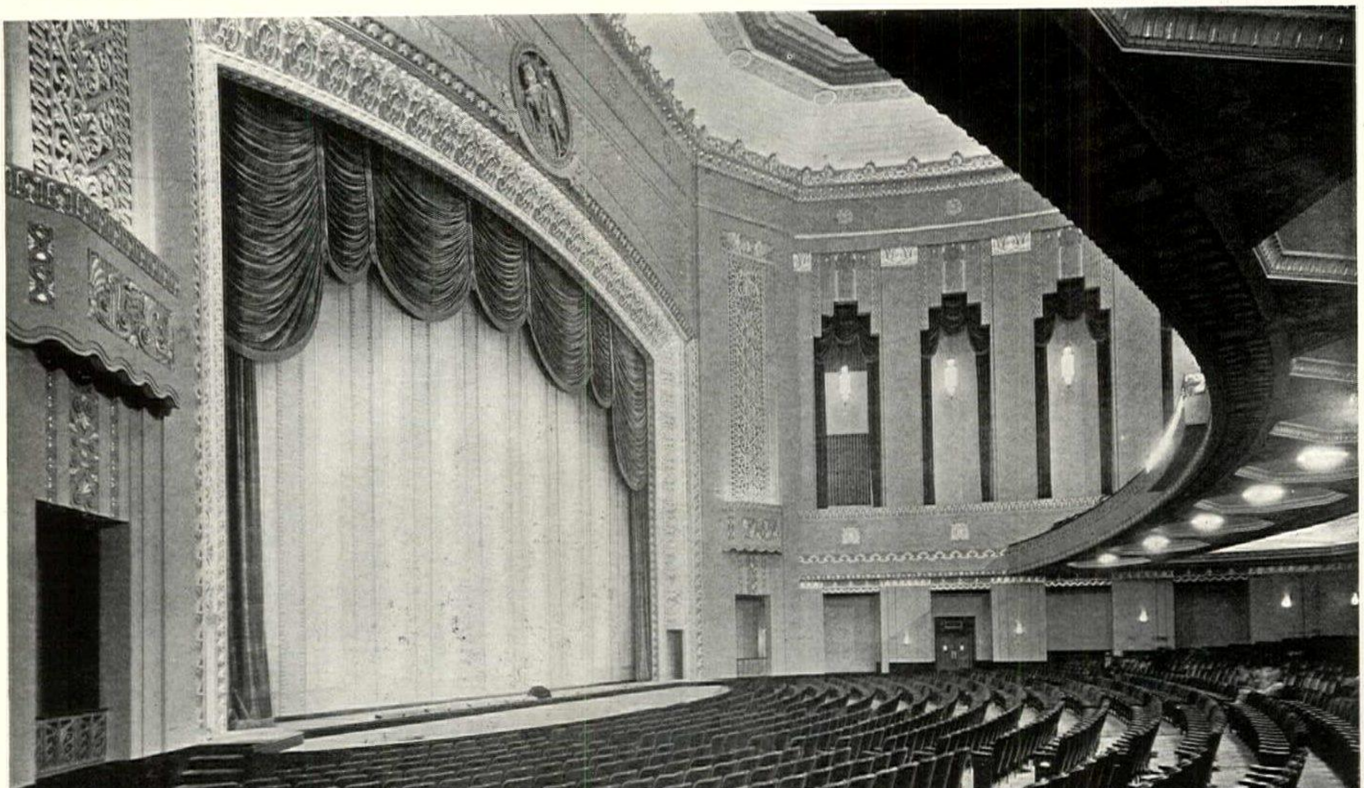
BALCONY FLOOR PLAN



EXHIBITION FLOOR PLAN

MUSIC HALL: VIEW TOWARD STAGE

Photographs by H. Aylette Meade

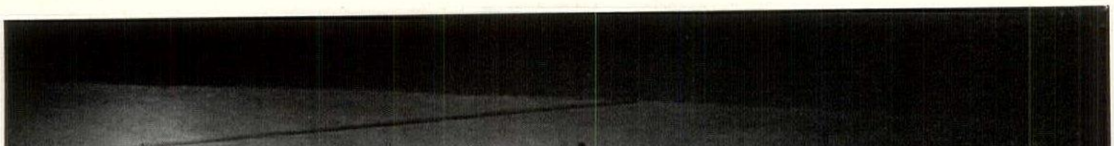


MUSIC HALL BALCONIES

LA BEAUME AND KLEIN, ARCHITECTS

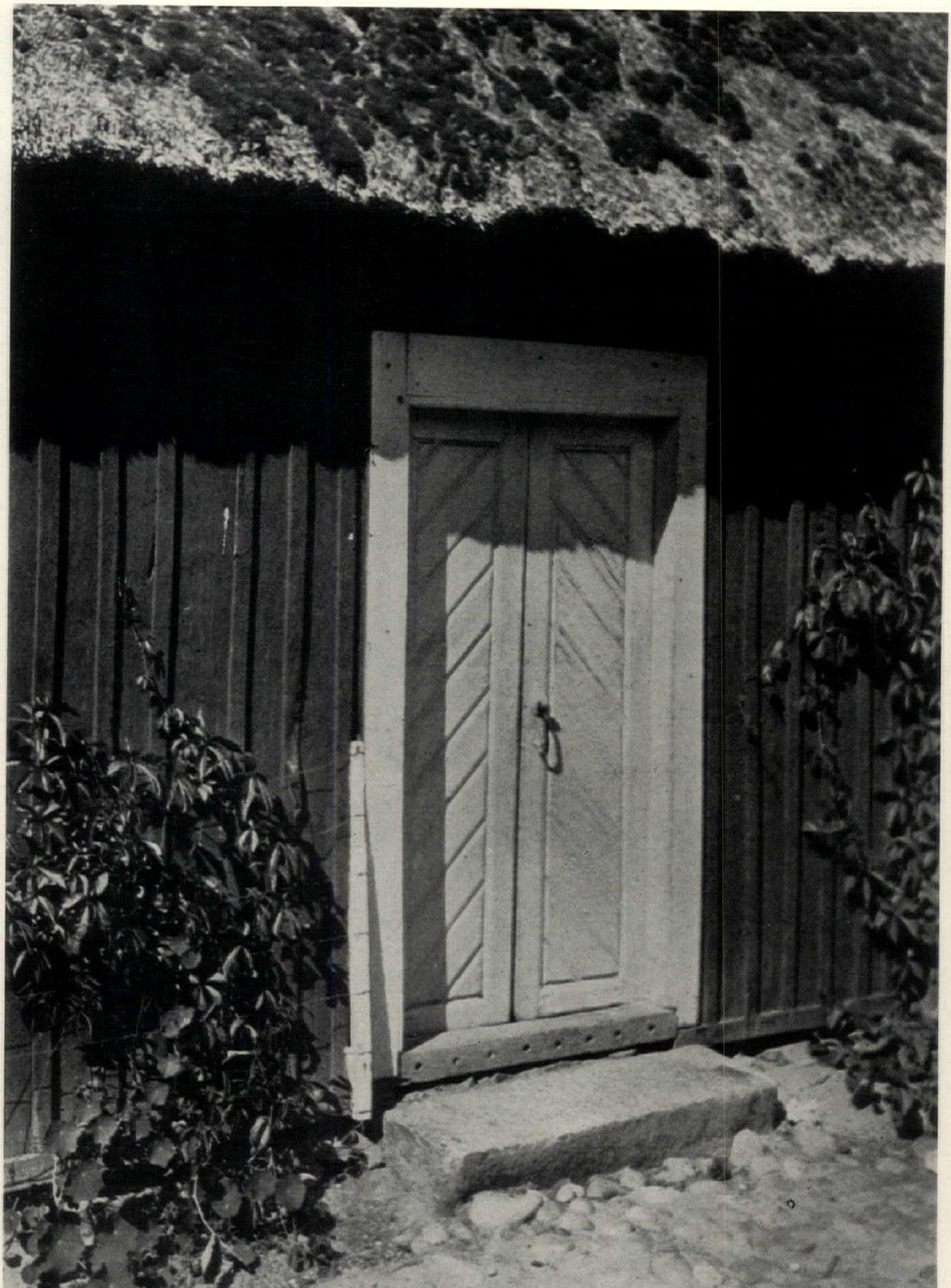
ASSEMBLY HALL

EXHIBITION SPACE UNDER MUSIC HALL AND ARENA



Photographs by W. C. Parsons

PROVINCIAL SWEDISH ARCHITECTURE

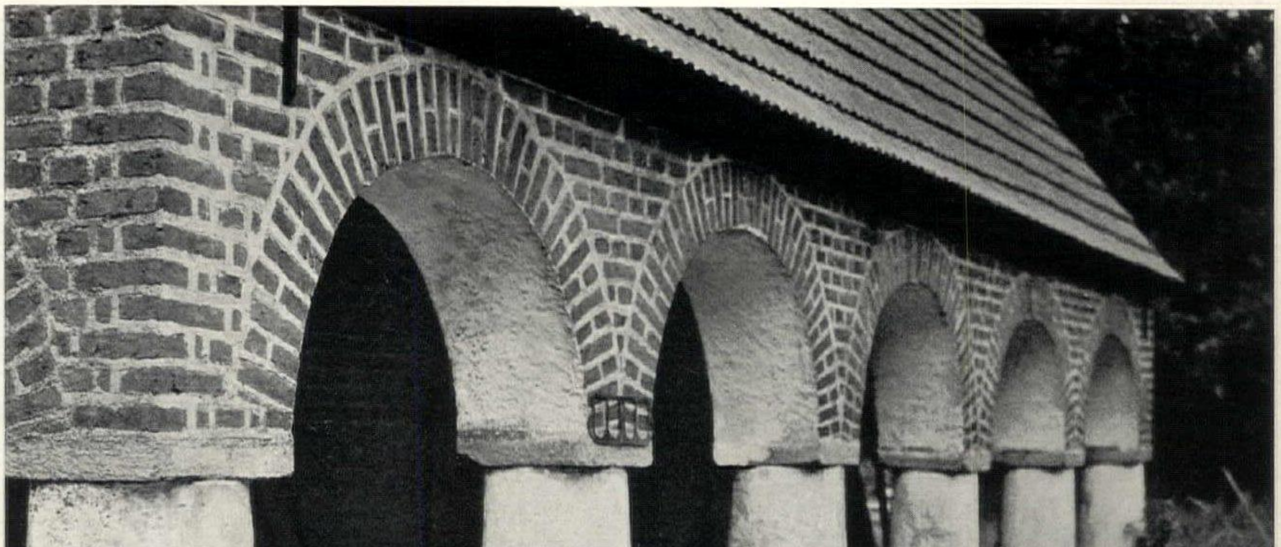


PHOTOGRAPHS BY R. W. McLAUGHLIN, JR.

FARM BUILDING NEAR HÄLSINGBORG, SWEDEN

GATEWAY TO A CASTLE IN SCANIA

PHOTOGRAPHS BY R. W. McLAUGHLIN, JR.

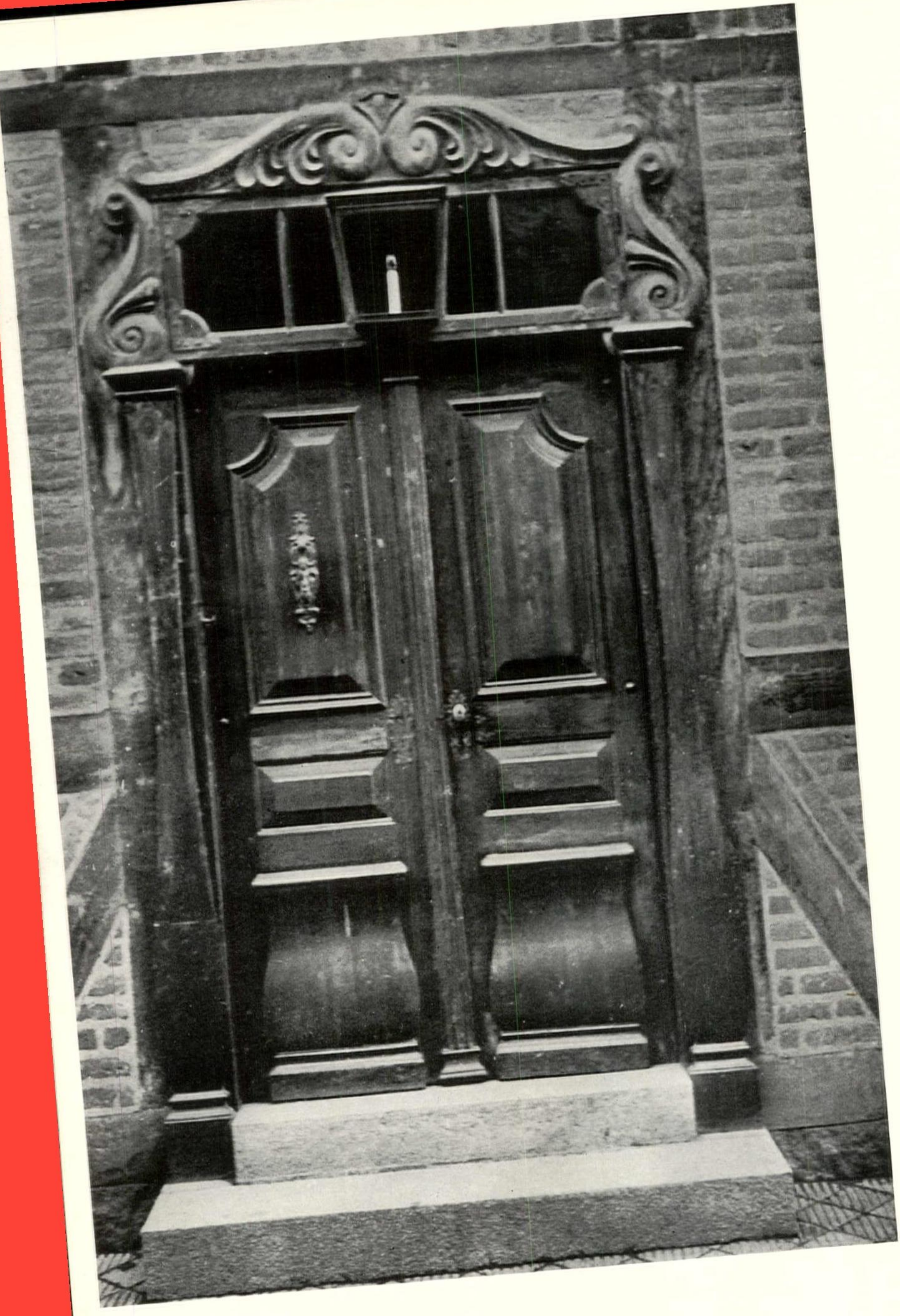


A BLACKSMITH'S SHOP IN SCANIA

PHOTOGRAPHS BY R. W. McLAUGHLIN, JR.

GATE IN A FARM BUILDING
AT SKARHULT, SWEDEN

KRONBORG CASTLE
HELSINGÖR, DENMARK



DOORWAY IN HÄLSINGBORG, SWEDEN

TECHNICAL NEWS AND RESEARCH

The following publications cover a study of unit masonry, extending over a 10-year period and conducted at the National Bureau of Standards:

1. "The Cause and Prevention of Kiln and Dry House Scum and of Efflorescence on Face Brick Walls," National Bureau of Standards Technologic Paper No. 370.
2. "Wet Walls and Efflorescence," publication by American Face Brick Association.
3. "Some Absorption Properties of Clay Bricks," National Bureau of Standards Research Paper No. 88.
4. "Some Results of Freezing and Thawing Tests Made with Face Bricks," Proceeding A. S. T. M., Vol. 30, Part II, 1930.
5. "Durability and Strength of Bond between Mortar and Brick," National Bureau of Standards Research Paper No. 290.
6. "Volume Changes in Brick Masonry Materials," National Bureau of Standards Research Paper No. 321.
7. "Water Penetration through Brick-Mortar Assemblages," Journal of the Clay Products Institute, Vol. I, No. 1, September 1931.
8. "The Rate of Stiffening of Mortars on a Porous Base," Rock Products, Vol. 35, No. 18, pp. 18-24, September 10, 1932.
9. "The Properties of Mortars and Bricks and Their Relation to Bond," National Bureau of Standards Research Paper No. 683.
10. "Permeability Tests of 8-in. Brick Wallettes," Proceedings A. S. T. M., Vol. 34, Part II, 1934.

These publications show how the properties of the separate materials—bricks and mortars—are related to the properties of a finished wall of masonry. The subject of design has been left to the architect who is better qualified to deal with that topic, but the possibilities of improving unit masonry (especially from the standpoint of watertightness) through an intelligent selection and adaptation of materials are good, and warrant earnest consideration.

HOW MORTARS CONTRIBUTE TO DRY WALLS

By L. A. PALMER, Construction Department, National Lime Association

A correlation of the results of the Bureau of Standards investigation shows that certain fundamental principles are applicable to masonry generally. Once these principles are understood and their importance appreciated, one is able to apply them to particular problems. In so doing, it is necessary that the reader accept statements that in the light of recent research are obviously true. Many of them are axiomatic.

1. Water tends to become distributed throughout a wall. All other things being equal, the greater the wall thickness, the less is the probability of any part of it becoming completely saturated.
2. Water follows the path of least resistance. Holes, cracks and open joints are more accessible to its entrance than capillaries or voids in the solid masonry materials.

3. Water that pours into an open joint or crack does not pour out of it. Its exit is by evaporation from the surface of the wall. Water gets in much more quickly than it can get out and hence during a wet season, moisture accumulates in a wall having cracks and open joints.

4. The rate at which a wall dries from the exterior surface is dependent on the porosity of the masonry materials. If the materials are impervious and the wall has openings between bricks and mortar, evaporation can only take place through these openings. Water enters as liquid and leaves as vapor. The rates of the two processes, wetting and drying, are widely different in any case and the more so if the solid masonry materials have low porosity. In a wall of fairly porous materials with no openings between them, the difference between the rates of wetting and drying of the wall is minimized.

5. An excessive amount of water in a wall is always damaging. Efflorescence and wet interior walls are symptomatic of this condition. The condition may exist without these symptoms. The freezing and thawing of water saturating a building material does far more damage than occurs when the same material is only partially saturated. The problem is not solved by selection of materials that may be highly frost resistant in a very wet wall. Immunity of the wall from oversaturation is the real objective. Frost resistance of materials in a wall that remains comparatively dry may be more or less superfluous. The fact that the masonry materials are frost resistant in a wall that is excessively saturated again and again is no comfort to the occupants of the building or to its owner.

6. The weakest points of masonry are open spaces, i.e., open joints, and areas where units and mortar meet but are not attached to one another.

7. To be "watertight," a wall must first of all have integrity. All joints must be filled completely with mortar and wherever building units and mortar meet, they must be firmly and permanently attached.

8. To adhere uniformly and well to building units, it is necessary that mortar be of the type that spreads easily, uniformly and well when it is applied.

9. If the adhesion (bond) of mortar to masonry units is only in spots, the wall lacks its fullest strength and is accessible to rain, regardless of the strength and imperviousness of the separate materials, building units and mortar. Strength of materials is no guarantee of strength of brickwork. Imperviousness of materials is no guarantee of dry walls of unit masonry.

10. If the extent or distribution of adhesion (bond) is poor, the adhesion or bond lacks resistance to differential volume changes and to the freezing and thawing of water that collects in the wall. Such poor adhesion is not likely to be permanent even with normal wall exposure, a condition that will not usually obtain since the openings admit water too freely. When complete failure of the bond (initially poor) takes place, the tensile strength of the brickwork is zero.

11. Building units vary with respect to the rate at which they absorb water.

12. Freshly mixed mortars vary with respect to the rate at which they lose water to a porous building unit with which they are in contact. Some mortars retain water when on a porous base much more than other mortars.

13. A proper balance between the two physical processes, the rate of receiving moisture from the freshly mixed mortar by the building unit and the rate of loss of water by the freshly mixed mortar, is necessary if intimate contact between the two materials is to be obtained.

14. Given a fair degree of mortar strength, then from the standpoint of masonry strength, the intensity of adhesion (bond strength) between the mortar and units should be at least equal to the tensile strength of the mortar.

15. From the standpoint of watertightness of the wall, the intensity of adhesion of mortar to units can never be too high (regardless of the mortar strength).

16. The pressure of units on the mortar bed while the mortar is workable, at least to some extent, helps to get intimacy of contact between bricks and bed joints. A too rapid rate of stiffening through water loss by mortar to the unit or through hardening of the mortar by cementing action or because of both processes, offsets more or less this natural tendency toward improvement of contact by superimposed weight.

17. The general absence of lateral pressure in vertical joints makes these localities especially vulnerable.

18. The more workable the mortar, the more it tends to slump from the mortar bed into any unfilled vertical joints.

19. The more workable the mortar, the greater is its tendency under any pressure whatsoever to fill the depressions and interstices on the surface of a brick or other building unit of rough texture. Poorly workable mortars tend to bridge across such grooves or depressions on the surface of the unit. Water can run under the "bridges."

ALTHOUGH these facts are elementary, by and large, proper use of them has not been made. They have been included, more or less, in various technical publications which, because of their technical phraseology and masses of tabulated data, have left the reader more wearied than enlightened.

A quantitative study of these simple facts leads to some new concepts involving the use of new terms. These will be considered in detail. The first of these is the water retaining capacity of mortars.

Figure 1

Mortar of high strength and low porosity is no guarantee of either strong or watertight masonry. This is a typical result obtained with a mortar deficient in water-retaining capacity on a dry porous brick.

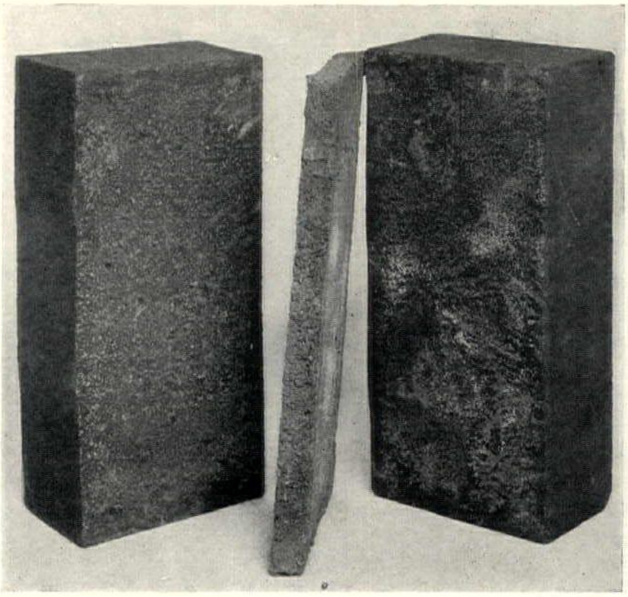
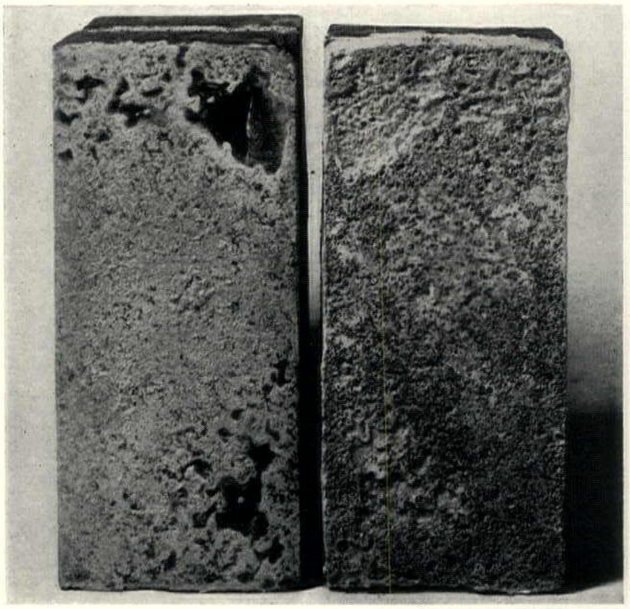


Figure 2

The destructive effect of volume changes subsequent to hardening when the extent of adhesion is incomplete. During storage, bricks and mortars separated. The mortar, deficient in water-retaining capacity, segregated when spread on porous bricks that were thoroughly wetted before being laid.



WATER RETAINING CAPACITY

This is the measurable resistance of a mortar to loss of water by filtration. Certain mortars when first spread on dry porous units stiffen far more rapidly than others. Certain modified natural cements and eminently hydraulic limes have high water retaining capacity. Other materials, similarly designated, are as noticeably deficient in this property as a mortar containing only portland cement and sand. High water retaining capacity is an outstanding characteristic of lime and rich in lime mortars. Present day specifications take no cognizance of the existence of this very necessary mortar property.

Figure 1 illustrates the poor extent or distribution of adhesion obtained with a dry porous brick and a mortar deficient in water retaining capacity. Figure 2 shows that wetting such a brick by total immersion in water for 15 minutes does not always overcome the difficulty when such a mortar is used. Mortars of low water retaining capacity tend to undergo segregation on an impervious base, e.g., when on the mortar board, on a saturated porous brick or on a dense impervious one. Puddles form, some portions of the mortar bed (supplying water to the puddles) becoming over-stiff. Neither the puddles nor the over-stiff areas bond well. Unbonded areas on the undersurface of the brick atop the mortar bed are seen in Figure 2. The bricks were set wet in this case but on account of segregation in the mortar, the distribution of bond was initially poor and later, volume changes occurring in the hardened mortar caused complete separation of the bricks at the plane where bricks and mortar met.

With most dry-press and other fast absorbing bricks set dry, a mortar of low water retaining capacity stiffens and loses practically all of its workability in less than 30 seconds. Hardening through cementing action is not begun by that time. The rapid stiffening through water loss is attended by a marked diminution in volume called *compacting on a porous base*. In vertical joints, such compacting draws the mortar away from the bricks and openings result. Compacting on a porous base must not be confused with shrinkage attending hardening through cementing action. The first is unidirectional, very rapid and is finished before the second begins. Mortars which compact most on a porous base shrink least during hardening and conversely. Openings in joints are seldom caused by shrinkage during early hardening.

TABLE 1: AVERAGE BONDING EFFICIENCIES, BOND STRENGTHS, TRANSVERSE STRENGTHS OF MORTARS AND WALL PERMEABILITIES. Bricks laid dry in all brick-mortar assemblages. The test procedures are described in detail in No. 9 and No. 10 of the list of publications on page 377 of this article.

Mortar mixture, proportions by volume of Lime (L), Portland Cement (P.C.), Masonry Cement (M.C.) and Sand (S)	Mortar No.	Average transverse strength of three months old 1 by 4 by 12 inch mortar slabs. lb./in²	Average tensile bond strength of three month old brick-mortar specimens. Cured same as mortar slabs. lb/in²	Bonding efficiency, values of third column divided by those of fourth column and multiplied by 100 Per cent	Average maximum rate of leakage through 8-inch test walls of each mortar and the 5 different makes of bricks laid dry. Each test wall contained half-inch joints and 16 bricks (four courses). Milliters of water per minute
1 P. C.: 3 S.	1	472	48.1	10.2	not determined
0.15 L.: 1 P. C.: 3 S	2	646	45.0	7.0	329
1 L.: 1 P. C.: 6 S.	3	166	42.8	25.8	not determined
1 L.: 1 P. C.: 6 S.	4	149	37.3	25.0	149
1 M. C.: 3 S.	5	109	27.0	24.8	93
1 M. C.: 3 S.	6	172	14.6	8.5	101
1 M. C.: 3 S.	7	157	17.3	11.0	250
1 M. C.: 3 S.	8	184	21.9	11.9	308
1 M. C.: 3 S.	9	118	14.3	12.1	74
2 L.: 1 P. C.: 9 S.	10	118	31.0	26.3	127
3 L.: 1 P. C.: 12 S.	11	109	22.9	21.0	100

ADAPTABILITY OF MORTARS AND BRICKS

An adaptable mortar tends to provide good extent or distribution of adhesion (bond) with a diversity of building units, varying both in absorption rate and surface texture. An adaptable brick or other unit is one having an absorption rate such that it tends to afford good extent of bond with a diversity of mortars of varying water retaining capacities. The ideal condition is had if the brick and mortar are both adaptable but this would likely only be realized accidentally because of the wide variation in the absorption rates of individual bricks of a type, all taken from the same kiln. The best possibility is to use the most highly adaptable mortars available with whatever type of brick is selected. It is both extremely difficult and uneconomical to try to control the absorption rate of bricks by wetting them. The simpler and safer procedure is to use mortars of high water retaining capacity and not wet bricks of any kind. This can only be done with some sacrifice in mortar strength but, despite this, there will be in many cases an appreciable gain in *masonry strength* through better distribution of bond in the wall.

In Research Paper No. 683 of the National Bureau of Standards Journal of Research, it is shown that a brick of best adaptability (from the standpoint of both strength and extent of adhesion) absorbs, when dry, from 20 to 25 grams of water per 30 square inches of brick surface during the first minute of its contact with water. Considering mortars of all types, such a brick has the optimum rate of absorption. If the absorption rate of the brick exceeds 40 grams of water per minute through 30 square inches of its surface, then if it is to be used with mortars of low water-retaining capacity, its absorption must be reduced by wetting. Obviously it is impracticable to bring each individual porous building unit to within the optimum range by wetting it. Furthermore, over-wetting leads to difficulty since mortars of low water-retaining capacity under this condition tend to segregate and form water films and puddles at the surface of the mortar bed (see Figure 2).

Again, the so-called optimum rate of absorption varies to some extent with the speed of the mason's operations. With poorly adaptable mortars, any bricklayer will experience difficulty in getting a desired intimacy of contact both with bricks of very low and very high rates of absorption and with bricks of more intermediate types he will yet experience more or less difficulty, depending on the variability of the absorption rate among the individual bricks of a kind and his speed of operation. Many deplore excessive speed in bricklaying and yet a combination of either impervious or dry porous bricks together with a mortar of low water retaining capacity renders high speed necessary. The mortar bed must be covered by the next course of bricks before there is either segregation (with impervious bricks) or rapid stiffening (with dry porous bricks). No one can fully appreciate these difficulties until he himself has laid different bricks with different mortars.

A highly adaptable mortar is always one of very good workability and excellent troweling properties but beyond this, *it tends to maintain its "trowelability" after it is placed on bricks of any type.*

THE BONDING EFFICIENCY OF MORTARS

The ratio, tensile strength of brickwork to tensile strength of mortar, expressed as per cent, is the bonding efficiency of the mortar. The computed bonding efficiency varies relatively little with the type of brick used if the mortar is adaptable. This statement is made on the basis of *comparable data* obtained with various brick-mortar combinations.

The data of Table 1 include the average bonding efficiencies obtained with 11 different mortar mixtures and 5 different makes of brick all laid dry. The average bond strength values as obtained with each of these mortars as used with all of the 5 makes of brick are also included in this table. In the last column are values for the maximum rates of water penetration through 8-inch test walls of these same brick and mortar combinations.

A complete compendium of the data obtained during the last 3 years of the investigation at the National Bureau of Standards, Washington, D. C., will be supplied by that Bureau on request. The values of Table 1 are computed from these data.

The rates of absorption of the 5 different types of bricks considered in Table 1 were:

	Grams of Water Per 30 Sq. In. During the First Min.
Brick 1 (dry-press, surface clay)	117.3
Brick 2 (stiff-mud, side-cut, shale)	22.9
Brick 3 (" " ")	10.4
Brick 5 (fire clay, stiff-mud, side-cut) ...	1.5
Brick 6 (surface clay, stiff-mud, side-cut)	71.8

The range in absorption rates included both extremes, low and high, as well as intermediate types.

Bonding efficiency, as here defined, depends chiefly upon three things, the extent and the intensity of adhesion and the tensile strength of the mortar. It is assumed that the mortar slabs, tested in transverse, failed in tension.

The average tensile mortar strengths of mortars 3 and 4 (Table 1) were higher than those of mortars 5 (1 M.C.:3 S), 10 (2 L:1 P.C: 9 S) and 11 (3 L:1 P.C: 12 S) but the extent of bond obtained with mortars 5, 10 and 11 was practically ideal and much better than that characteristic of mortars 3 and 4 when laid with dry bricks of No. 1 type. Two of the masonry cement mortars (mortars 6 and 9) have good records from the standpoint of wall permeability, but they had relatively low bonding efficiencies (fifth column, Table 1). This was due to their relatively low intensity of adhesion as indicated by their low bond strengths (fourth column, Table 1) as compared to their transverse strengths (third column). The extent of bond obtained with these two mortars was good and this accounts for their contribution to watertightness (last column, Table 1). However with mortars 6 and 9 (Table 1) failure in tension was invariably at the plane where brick and mortar met. In other words these mortars had poor bonding power (adhesiveness).

The bonding power of mortars 5, 10 and 11 was such that failure in tension was usually within the mortar. In these three mortars the conditions, good bonding efficiency, exceptionally high bonding power and fairly good tensile strength of brickwork, were combined.

Mortars of types 5, 10 and 11 are considered as superior to any of the other 11 mortars of that table. They produce good masonry strength and wall integrity. Due to the great severity of the permeability tests, it is believed that any brick-mortar combination transmitting an average maximum of 130 milliters of water per minute or less would be watertight for all practical purposes were it an integral part of an 8-inch wall. The *ideal combination* of masonry strength and watertightness is more closely approached by mortars 5, 10 and 11 than by any of the others of Table 1.

MINIMUM TENSILE STRENGTH OF BRICKWORK OBTAINED WITH A MORTAR

When mortars are bonded to different makes of bricks having different absorption rates, a tabulation of the average minimum tensile strengths of the brickwork for each brick and mortar combination helps to indicate the relative degrees of adaptability of the different mortars. It also indicates the most adaptable types of the bricks used. In Table 2, note the degree of variation in minimum bond strength values for the different mortars with the 6 different makes of brick and the corresponding degree of variation among the values as obtained with any one of the 6 bricks, bonded with the 11 different mortars. Considering "bond" as the attachment of brick to brick through the medium of an intervening mortar joint, then regardless of the location of the section of failure in the joint, it is bond strength that is measured. The absolute values of Table 1 must be considered as well as their variation with one mortar. Thus the bond strength with mortar 10 (2 L:1 P.C.: 9 S) and brick 1 was about the same as that of mortar 4 (1 L:1 P.C.: 6 S) with this brick, due to a better extent of bond in the former than in the latter case. Had it not been for this fact, the bond strength would have been considerably higher for mortar 4 (of higher strength) than for mortar 10 with brick 1. The minimum bond strengths of the 1:1:6 mortars (3 and 4, Table 2) with bricks 3 and 5 (low absorption) were about equal to that of the portland cement mortar (1) and these bricks.

The minimum values (Table 2) with brick 2 were obtained in all cases with this brick set wet. When dry it had the optimum rate of absorption. Brick 4 when dry absorbed about 59 grams of water per 30 square inches of surface during the first minute. The 11 mortars of Table 2 are the same as those of Table 1.

TABLE 2: MINIMUM VALUES FOR TENSILE BOND STRENGTH AS OBTAINED WITH EACH BRICK AND MORTAR.
Each value is an average of 6 tests.

Mortar mixture, proportions by volume	Mortar number	BRICK						Adaptability of mortar
		No. 1	No. 2	No. 3	No. 4*	No. 5	No. 6	
		lb. 1/in²	lb. 1/in²	lb. 1/in²	lb. 1/in²	lb. 1/in²	lb. 1/in²	
1 P. C.: 3 S.	1	0.4	56.1	45.4	38.5	26.5	0.8	poor
0.15 L.: 1 P. C.: 3 S.	2	0.2	72.7	51.5	67.5	32.3	16.1	poor
1 L.: 1 P. C.: 6 S.	3	26.3	34.9	52.2	37.1	22.8	35.0	fair
1 L.: 1 P. C.: 6 S.	4	23.2	27.4	40.4	33.6	26.4	21.3	fair
1 M. C.: 3 S.	5	15.9	16.9	39.0	30.9	9.4	27.9	good
1 M. C.: 3 S.	6	17.4	20.4	13.6	27.7	1.4	8.2	fair
1 M. C.: 3 S.	7	1.8	28.0	27.1	16.3	10.6	4.5	poor
1 M. C.: 3 S.	8	0.1	27.6	35.6	33.2	10.0	8.4	very poor
1 M. C.: 3 S.	9	2.7	8.7	14.3	5.5	1.2	6.5	fair
2 L.: 1 P. C.: 9 S.	10	22.6	27.5	32.8	28.5	12.1	24.0	good
3 L.: 1 P. C.: 12 S.	11	13.0	11.6	17.0	13.0	4.3	15.8	good
Adaptability of brick		poor	good	good	fair	poor	poor	

*Soft-mud, sand-struck brick, made from surface clay. Absorption rate, 59 grams of water per 30 sq. in. of brick surface during first minute.

TABLE 3: STRENGTH OF BRICK BEAMS (AGED 3 MONTHS) IN FLEXURE. Each value is an average of 3 tests. Bricks 1, 2, 4 and 6 laid wet (15 minutes total immersion) and bricks 3 and 5 laid dry.

Mortar mixture, proportions by volume	Mortar number	AVERAGE MODULUS OF RUPTURE WITH BRICK No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	
		lb. 1/in²	lb. 1/in²	lb. 1/in²	lb. 1/in²	lb. 1/in²	lb. 1/in²	
1 P. C.: 3 S.	1	52.0	208.0	39.4	100.7	18.2	0.0	Extent of bond poor. Some complete bond failures in storage due to volume changes subsequent to hardening.
0.15 L.: 1 P. C.: 3 S.	2	19.7	132.3	38.8	126.0	4.1	149.2	Ditto
1 L.: 1 P. C.: 6 S.	3	42.9	47.6	68.2	88.8	6.8	122.9	Extent of bond good in most cases.
1 L.: 1 P. C.: 6 S.	4	56.6	66.8	73.5	90.5	15.8	104.7	Ditto
1 M. C.: 3 S.	5	40.8	36.2	68.5	61.9	21.1	68.4	Ditto
1 M. C.: 3 S.	6	8.1	39.5	13.5	47.1	2.1	1.0	Volume changes subsequent to hardening destroyed the bond (initially poor) in some cases.
1 M. C.: 3 S.	7	19.9	42.1	33.2	34.4	3.2	18.2	Ditto
1 M. C.: 3 S.	8	0.0	66.8	36.6	7.1	3.2	1.0	Ditto
1 M. C.: 3 S.	9	2.9	11.9	14.8	16.1	0.6	18.3	Ditto
2 L.: 1 P. C.: 9 S.	10	45.1	42.0	39.9	83.4	10.4	88.7	Good extent of bond in all cases. No failures before test.
3 L.: 1 P. C.: 12 S.	11	29.8	24.2	30.4	35.0	15.2	42.1	Ditto

As previously mentioned, by working very rapidly, one can avoid having poor initial contact between bricks that absorb very little water and mortars that are deficient in water retaining capacity. By so doing, the mortar bed is covered with bricks before segregation takes place to an appreciable extent. This was the procedure in bonding together pairs of bricks for tension tests. However, in making brick beams, the time required to spread a joint of desired thickness (½ inch) was 15 or 20 seconds longer than that required in making two brick specimens and this additional time permitted noticeable segregation in mortars 1, 2, 7 and 8 to take place both with porous bricks laid wet and bricks of low porosity laid dry.

The minimum values for all mortars, except 5, 10 and 11 and porous bricks 1, 4 and 6, were obtained with these three makes of bricks set dry. For mortars 5, 10 and 11, the minimum values were obtained with these three bricks set wet.

The essential difference in bonding properties between brick 2 set wet and brick 5 set dry was in surface texture, the rates of absorption being nearly the same. Brick 5 was smooth and glassy whereas brick 2 was very rough. Bricks 2 (wet or dry) and 3 (dry) were the most adaptable of the 6 types studied and brick 2 laid dry was the most adaptable of all the bricks. Similarly, mortars 5, 10 and 11 were the most adaptable of the 11 mortars.

THE STRENGTH OF BRICK BEAMS IN FLEXURE

The flexural strengths of 3-months-old brick beams (5 bricks in single tier, set flat, 4 intervening mortar joints) comprising the 11 mortars and 6 bricks listed in Table 2, are given in Table 3. As already indicated, in making these beams, mortars of low water-retaining capacity tended to undergo segregation. Bricks 1, 2, 4 and 6 were wetted by total immersion for 15 minutes just before laying them in making the beams. Bricks 3 and 5, dense and impervious, were laid dry.

The low values (Table 3) obtained with mortars 1, 2 and 8, of high strength, with bricks that when laid had their suction greatly reduced by wetting, indicate that the wetting procedure does not satisfactorily solve the problem, getting good distribution of adhesion of mortar to bricks. The extremely low values were due to poor extent of bond (see Figure 2) which in some cases resulted in complete separation of the mortars from the bricks when later on, volume changes took place in the hardened mortars. It is definitely known that this separation occurred during the last two months of the aging period, during which time the beams were not moved or handled.

The most concordant results were obtained with mortars 3, 4, 5, 10 and 11 and particularly with 5, 10 and 11. These mortars had less tendency to segregate than any of the others of these 11 mortars. This tendency was greatest in the case of mortars 1, 2, 7 and 8 (less with 7 than the other three) and accounts for the poor extent of bond obtained with these mortars. Mortar 7 was characterized by low volume changes subsequent to hardening and although its distribution of bond was often poor, it did not tend to separate completely from the bricks during storage and prior to tests.

VOLUME CHANGES SUBSEQUENT TO HARDENING

One conclusion reached during the investigation is the following. If the extent of bond is initially complete or very nearly so, then volume changes subsequent to hardening are much more apt to crack the mortar joints transversely than they are to shear them loose from the bricks. If however the extent or distribution of bond is poor, such volume changes when relatively high (characteristic of dense cement mortars of high strength) will often cause complete separation of mortar and bricks, leaving the wall both

Figure 3
Change in volume of bricks when wet and dry is seldom as much as 0.01 per cent. Volume changes in hardened stucco are ordinarily 0.08 per cent or greater. Differential shrinkage and expansion caused this stucco to fall away from the brickwork.

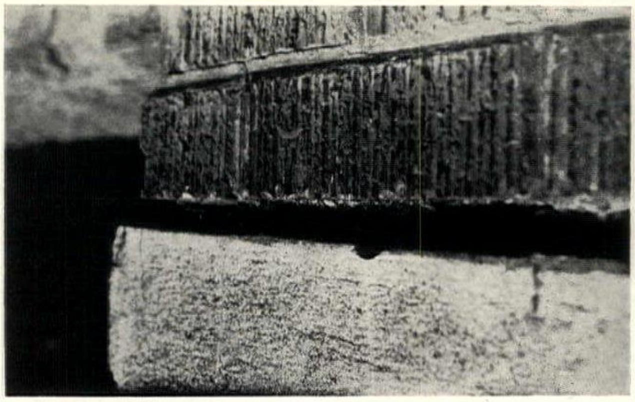


Figure 4. Dense cement mortar poorly adapted to dense impervious bricks. Water entering shrinkage cracks cannot subsequently evaporate through the dense solid materials.

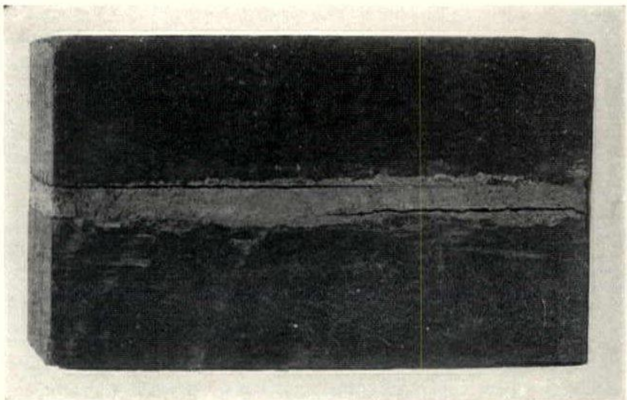


Figure 5. The bond of dense cement mortar to the porous bricks was initially poor in extent and later, volume changes in the hardened mortar caused complete bond destruction.

weak and very accessible to the entrance of rain. A wall, wherein this condition exists, drys far more slowly than it accumulates moisture both before and after complete separation of mortar from bricks occurs, and from the beginning and throughout its life, the wall is subjected to the maximum severity of exposure to weathering agents.

Figure 3 illustrates the separation of stucco from a brick chimney. Volume changes in cement products are accelerated and magnified in chimneys. Figures 4 and 5 illustrate the separation of mortar joints from building units. Figures 6 and 7 show the effects of a slow drying rate of walls that are freely exposed to moisture. Since water could not exude sufficiently rapidly from the almost impervious surfaces, the walls became and remained highly saturated. The forces created by freezing this collected moisture rivals the power of dynamite. Professor H. Kreüger in "The Transactions of the Royal Swedish Institute for Scientific-Industrial Research, No. 24, 1933, Stockholm," and R. J. Schaffer in "The Weathering of Natural Building Stones," Special Report No. 18, 1932 of the British Building Research Station, have both stressed the necessity of avoiding the use of dense cement mortar for pointing for the reason indicated. Kreüger discusses at length the disastrous effect of volume changes in hardened cement surfaces.

Figure 8 is the same as Figure 1 of National Bureau of Standards Research Paper No. 683. As lime is substituted more and more for portland cement, volume changes subsequent to hardening as caused by variations in the moisture content, are decreased.

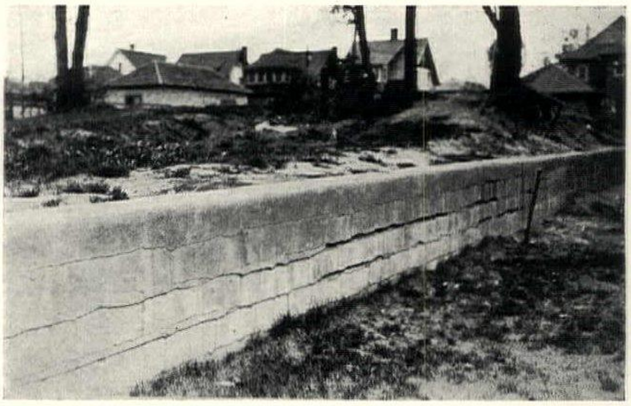


Figure 6. Water accumulated in this wall and froze, exerting forces that rival the power of dynamite. The effect of rapid wetting and slow drying.

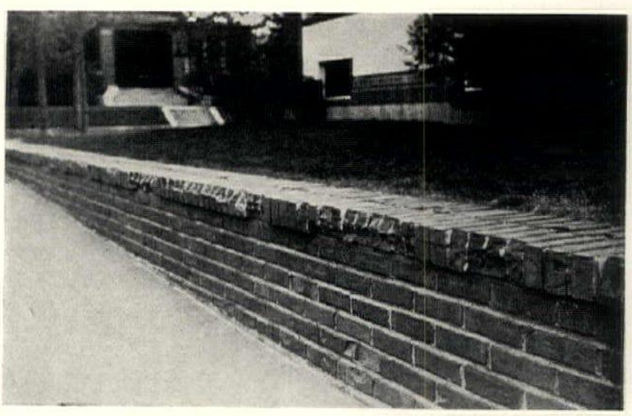


Figure 7. Dense impervious bricks, tooled joints of dense cement mortar, a very rapid rate of wetting (through cracks and open joints) and a very slow rate of drying all combined to keep this wall highly saturated.

ASSOCIATED MORTAR PROPERTIES

It is both fortunate and unfortunate that certain mortar properties are associated. For instance it is unfortunate that outstanding hydraulic properties and

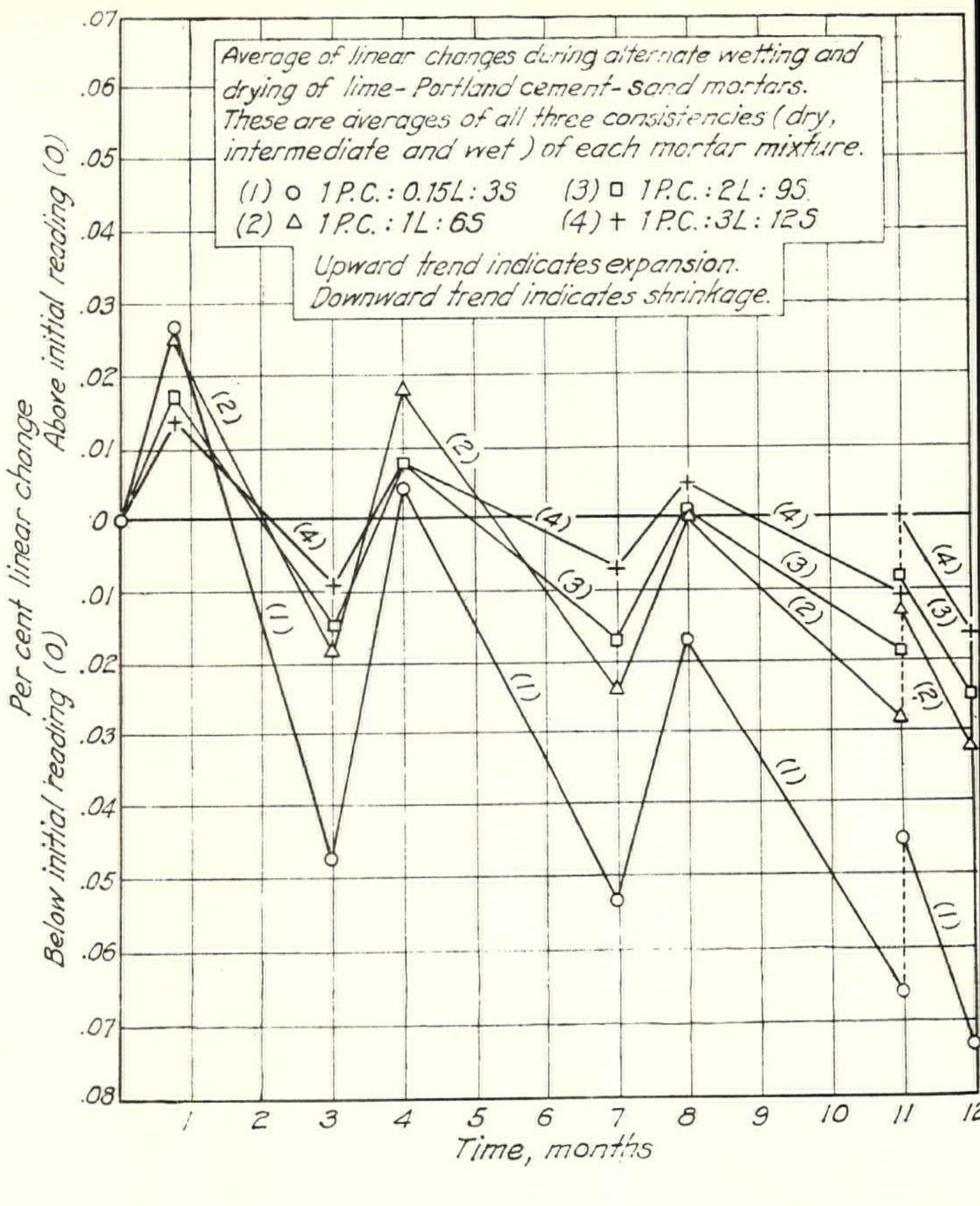


Figure 8

As lime is substituted more and more for portland cement, volume changes subsequent to hardening of the mortar decreased correspondingly.

high strength are usually associated with low water retaining capacity and high volume changes subsequent to hardening. On the other hand it is very fortunate that the properties, high water retaining capacity, adaptability, bonding power and low volume changes subsequent to hardening are usually associated. The resultant effect of this combination of desirable mortar properties is bonding efficiency. It must be borne in mind that these necessary mortar properties are usually associated with only relatively low to medium mortar strength. However, as the data of Tables 1, 2 and 3 show, good masonry strength is obtained under these conditions whereas, owing to poor adaptability, mortars of high strength often afford weak masonry. The first consideration in the matter of masonry strength is wall integrity. Especially is this true for masonry construction in earthquake districts. To many, the fact that weak masonry may be had with materials which in themselves have high strength may seem a paradox. However, with the diversity of types of building units as used today, there is no doubt that this condition exists and hence mortar adaptability is highly important.

The selection of adaptable mortars involves some sacrifice in mortar strength, without necessarily sacrificing masonry strength. Often the latter is increased, as we have seen. Usually, the greater the sacrifice in mortar strength, the more enhanced are the properties, low volume changes after hardening, high water retaining capacity, workability and adhesiveness. With continued sacrifice of mortar strength the point is of course reached where the masonry strength is reduced.

For all ordinary brickwork, the masonry strength obtained with a mortar made with 2 volumes of lime (dry hydrate or stiff putty) to each volume of portland cement and 9 volumes of sand, is eminently satisfactory. If greater masonry strength is desired, it is preferable to reduce the amount of sand from 9 to 7 or 8 volumes retaining the 2:1 volume proportion, lime to cement. A 2 lime: 1 portland cement: 9 sand mortar hardens quickly enough to meet all demands of modern construction. It is far more workable and adaptable than the 1:1:6 mix, which is preferred for brickwork below grade. The use of the 2:1:9 mortar mixture or any other mortar having the same properties will go far toward providing watertight walls.

MEASURED DETAILS FROM SAN GIMIGNANO

By IVES VAN DER GRACHT
and ROBERT W. McLAUGHLIN, JR.

Solemn and austere, the Palazzo del Podestá frowns down upon the small Piazza in front of the Collegiata, the Cathedral of San Gimignano. All about rise the massive towers of the fortified residences of the great families of the town, notably the Salvucci and Ardinghelli, whose bloody feuds form one of the most colorful pages in its stormy history, and finally resulted in the voluntary submission of the townspeople to the Florentine Republic in 1353. Probably the most attractive feature is the courtyard, reached by means of a brick-paved, vaulted passageway. A staircase mounts to a flanking loggia, supported on heavy arches, which are generously decorated with frescoes of exquisite color. The well, strong and simple, and framed by the sweep of the arch supporting the stairway, bears the coat-of-arms of Messer Jacopo di Caroccio Alberti, who was Podestá in 1360.

Photograph by Alinari

THE CORTILE OF THE PALAZZO PUBLICO

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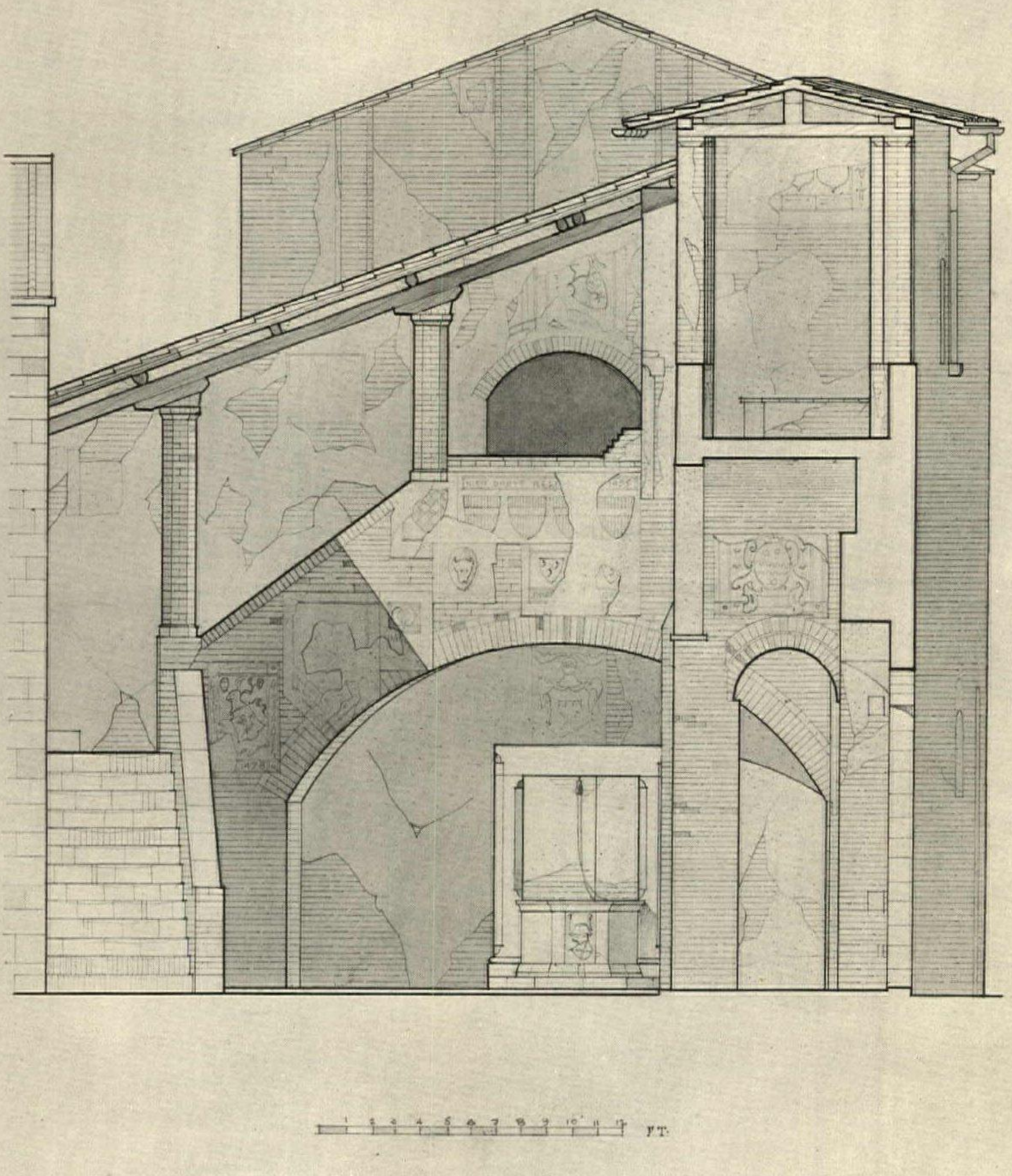
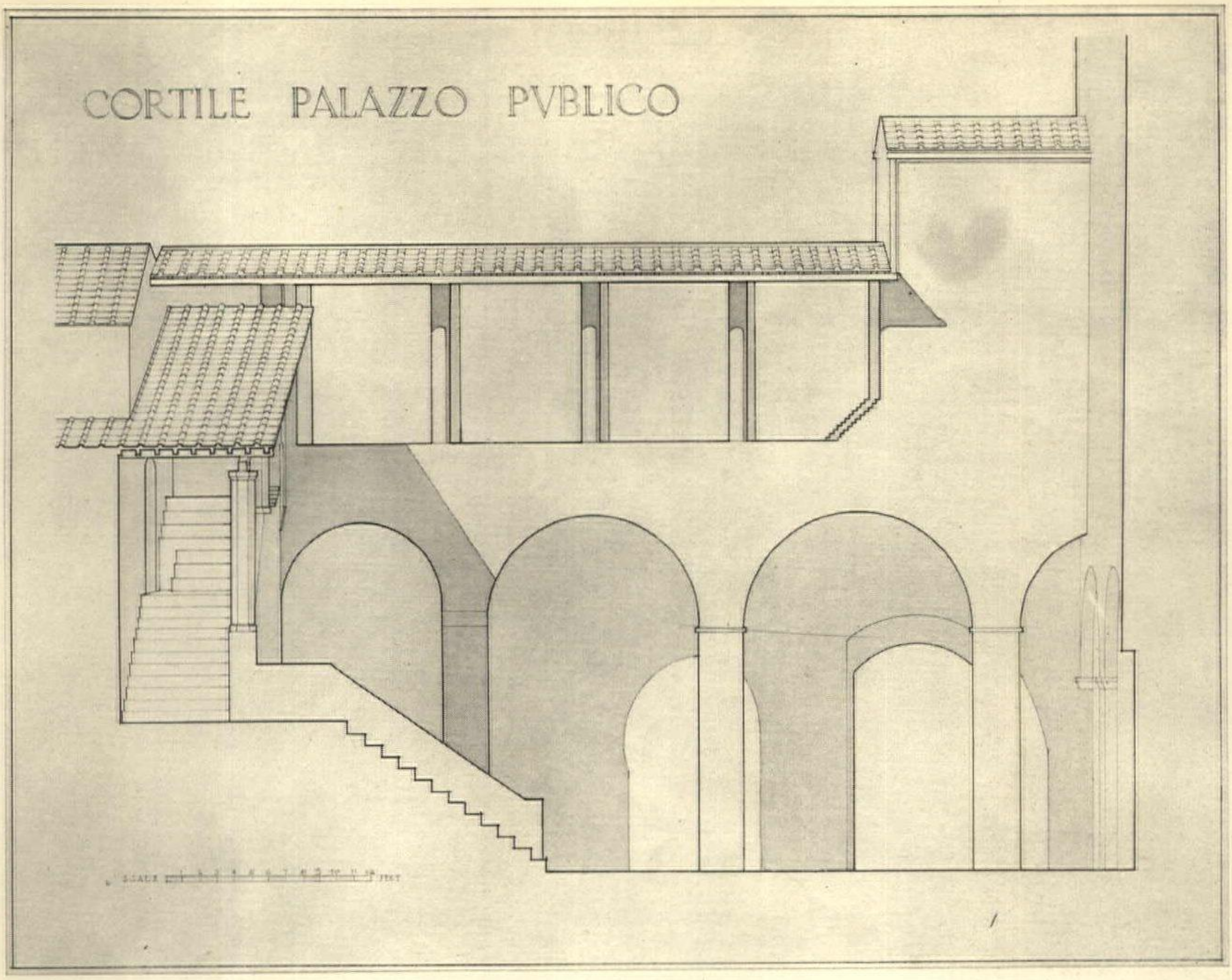
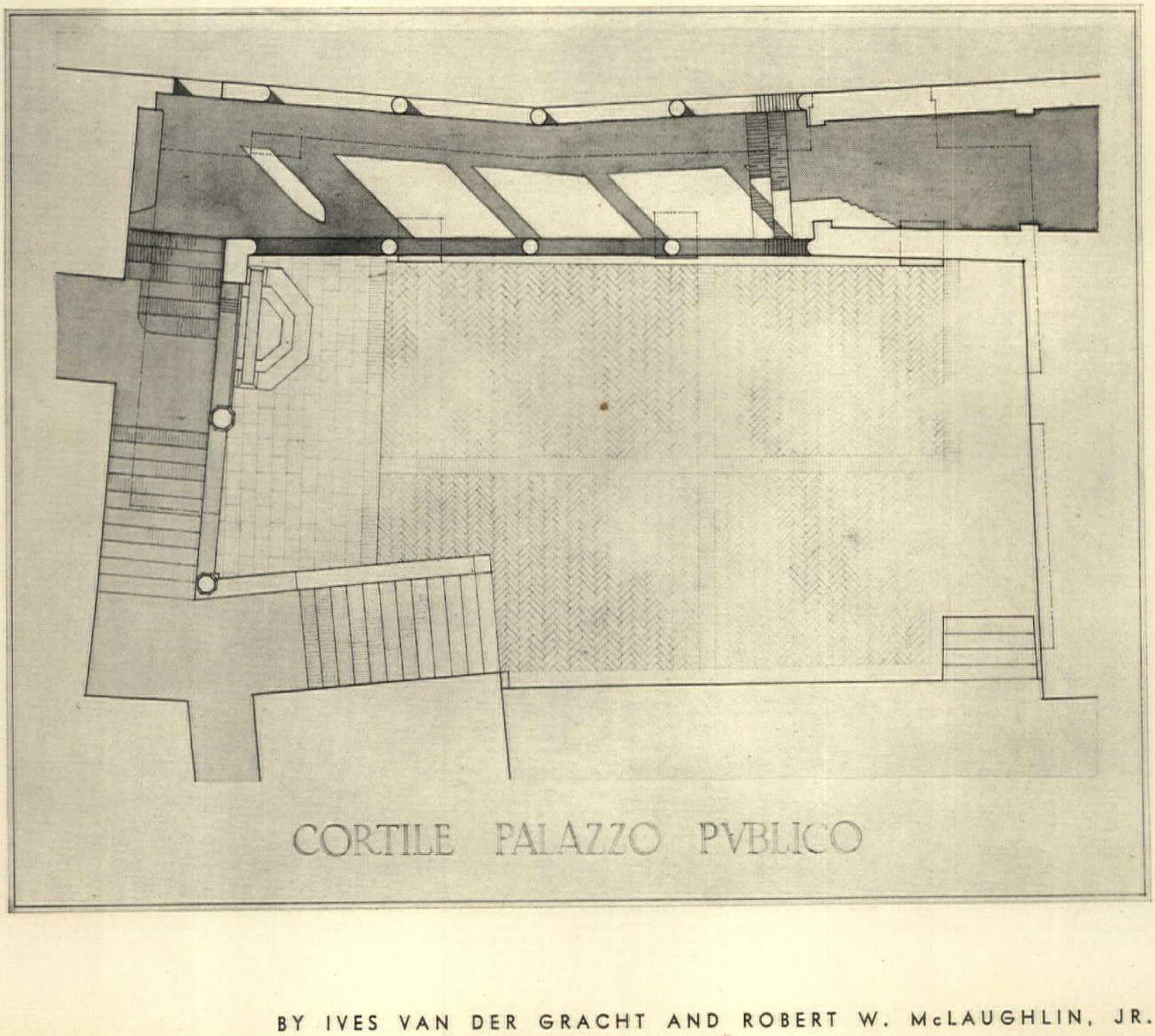
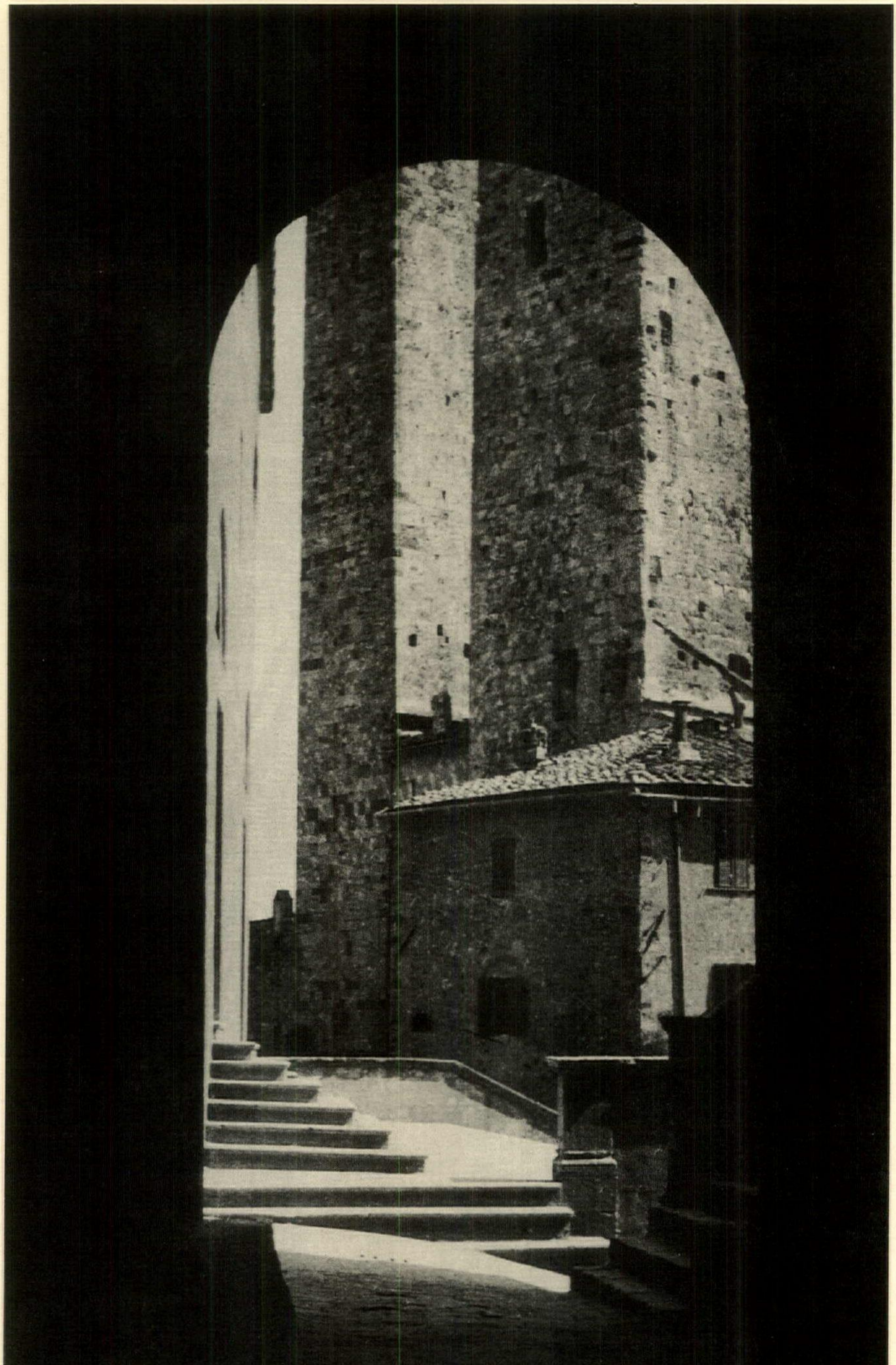


MEASURED DETAILS FROM SAN GIMIGNANO, ITALY





BY IVES VAN DER GRACHT AND ROBERT W. McLAUGHLIN, JR.



Photograph by I. van der Gracht

THE TOWERS OF SAN GIMIGNANO VIEWED FROM THE CORTILE, PALAZZO PUBLICO

VOL · 76 NUMBER 6

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DECEMBER

THE ARCHITECTURAL RECORD

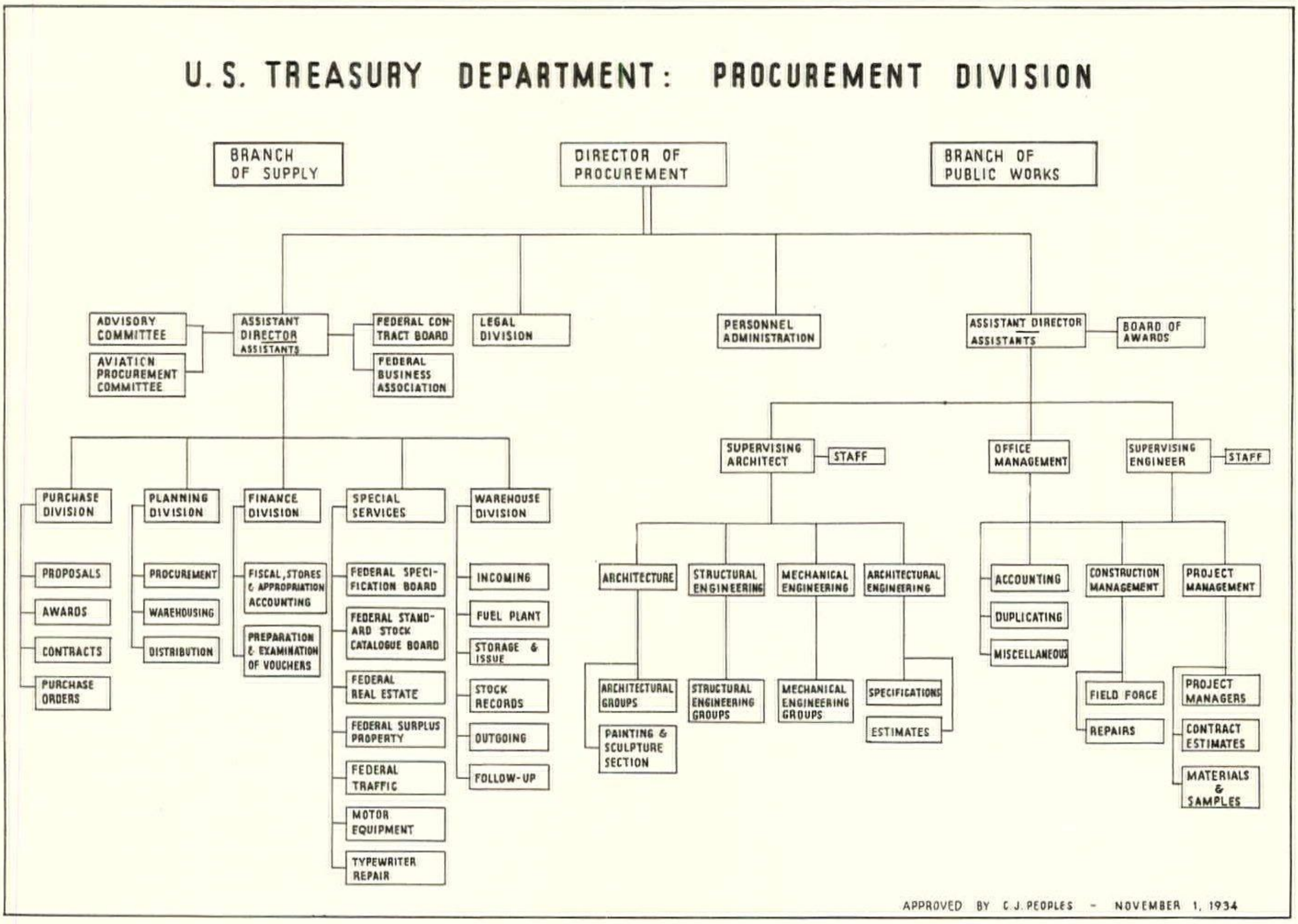
On November 12, in Washington, a farewell dinner was given by friends and associates to James A. Wetmore, acting supervising architect of the Treasury Department who now retires to private life. For 15 years Mr. Wetmore has been head of the Federal architectural program and responsible for the erection of more than a thousand post offices and other public buildings throughout the country.

Within the past year the architectural organization of the Government has been revamped. In the belief that an account of these changes will be of interest to the architectural profession, The Architectural Record has asked the officials of the Procurement Division of the Treasury Department to describe the new set-up. As their report states, "The Procurement Division is now so highly organized that only the addition of personnel would be needed to carry out any large public building program the Government might undertake."

THE GOVERNMENT ENLARGES ITS BUILDING SERVICE

The Procurement Division came into being June 10, 1933, under authority granted in Executive Order No. 6166 and is now law under Act of Congress. The Executive Order charged this newly formed division with the function of determination of policies and methods of procurement, warehousing and distribution of property, facilities, structures, improvements, machinery, equipment, stores and supplies. The General Supply Committee of the Treasury Department was abolished and the office of the Supervising Architect was transferred to the Procurement Division, with the exception that the administration of those buildings containing major Post Office activities was transferred to the Post Office Department, and those buildings containing neither Postal nor Treasury activities were transferred to the Interior Department. This order also transferred the Fuel Yards of the Bureau of Mines, Department of Commerce, to the Procurement Division.

The Procurement Division is divided into two parts, namely, the Branch of Public Works and the Branch of Supply. The approved working organization chart of the Division is shown elsewhere in this article.



The functions of the Public Works Branch are to collect and prepare for submission to Congress all data and estimates for public building projects; to acquire land for public building sites; to prepare plans and specifications, and estimates for public building construction and to take bids and award contracts therefor; to supervise the construction, remodeling, extension, etc., of public buildings; and to repair all public buildings.

In respect to the procurement, warehousing, or distribution for any agency the Procurement Division may, with the approval of the President, (a) undertake the performance of such procurement, warehousing, or distribution itself, or (b) permit such agency to perform such procurement, warehousing, or distribution, or (c) entrust such performance to some other agency, or (d) avail itself in part of any of these recourses, according as it may deem desirable in the interest of economy and efficiency. No centralization of architectural and engineering services for all Government departments has taken place, but with few exceptions, the Procurement Division will either represent other agencies in procurement, warehousing, or distribution in the interests of efficiency and economy or work through them as provided in the Executive Order as above. The Procurement Division is now so highly organized that only the addition of personnel would be needed to carry out any large public building program the Government might undertake.

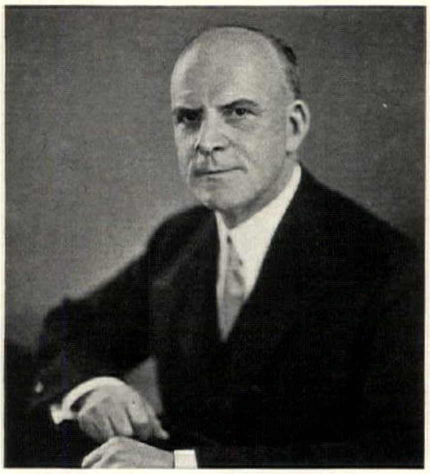
The plan to design standardized buildings under $60,000 value is being followed extensively. Standardized interior designs are creating great savings, while exterior must deviate in some cases because of topography, or for harmony of general planning.

The procurement of public buildings is an essential part of the general activities of the Procurement Division. It now has a procurement program, including the obtaining of sites, for the construction of 822 buildings in as many communities evenly distributed throughout the country, which is being energetically pressed with a view toward relief of unemployment.

The Supply Branch is charged with the purchase, storing, and delivery of material, supplies and equipment for the Federal departments. This branch has under its supervision the Federal Traffic Board, the Federal Real Estate Board, the Federal Specifications Board, the Federal Contract Board, the Federal Catalogue Board, and the Aviation Procurement Committee.

In charge of the Procurement Division is the Procurement Director, Rear Admiral Christian Joy Peoples. Rear Admiral Peoples is also chief of the Navy Bureau of Supplies and Accounts, and Paymaster General of the Navy. He has been with this new government division from its inception.

W. E. Reynolds, assistant director in charge of the Branch of Public Works, has been with the Procurement Division since its formation. Prior to that Mr. Reynolds was Engineer Examiner with the Reconstruction Finance Corporation and later technical assistant to Assistant Secretary of the Treasury, L. W. Robert,



uLeft: LOUIS A. SIMON, Supervising Architect of Public Works Branch. Right: Rear Admiral CHRISTIAN JOY PEOPLES, Director of Procurement Division.

Photographs by Underwood & Underwood

Left: W. E. REYNOLDS, Assistant Director in charge of Public Works Branch. Right: Capt. H. E. COLLINS, Assistant Director in charge of Supply Branch.

Jr., who was then in charge of the Supervising Architect's office in the Treasury Department. He is a graduate of the Iowa State College and a Member of the American Society of Civil Engineers.

The Assistant Director in charge of the Branch of Supply is Captain H. E. Collins. After twenty-five years with the United States Navy, Captain Collins resigned to enter private industry in executive capacities. His connection with the Procurement Division has been for the last six months. His office really acts as a liaison between all Federal Departments and the NRA and the Petroleum Administration Board concerning alleged violations of codes and any questions to exceptions to codes.

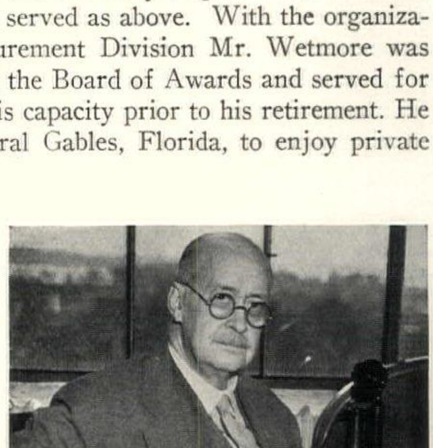
Louis A. Simon, supervising architect of the Public Works Branch, has had nearly forty years of service in Government work. He first started as a draftsman in the Treasury Department and worked his way up to superintendent of the architectural division in the Supervising Architect's office under the old set-up. With the formation of the Procurement Division he was made supervising architect of the Public Works Branch, where all matters pertaining to buildings, up to the letting of contracts, are under his supervision.

G. O. Von Nerta, supervising engineer of the Public Works branch, has had training of many years in private and government work. His office is charged with the superintending of all public building programs after the same have been let to contract.

In charge of the Legal Department of the Procurement Division is William K. Laws. He assumed office three months ago. Formerly Mr. Laws was in private practice in New York City with the law firm of Sullivan and Cromwell. Later he was chief attorney for the New York Guaranteed Mortgage Protective Corporation. He is a graduate of Syracuse University and Columbia Law School.

James A. Wetmore, acting supervising architect under the Treasury Department, last month retired from Government duties after nearly fifty years of continuous service in the Treasury Department, seventeen years of which he served as above. With the organization of the Procurement Division Mr. Wetmore was made chairman of the Board of Awards and served for nine months in this capacity prior to his retirement. He has moved to Coral Gables, Florida, to enjoy private life.

JAMES A. WETMORE, former supervising architect of the Treasury Department, who has retired to private life.



Underwood & Underwood

HOUSING NEWS FROM WASHINGTON

In New York City there are approximately 550,000 *dwellings, and* 15 *per cent of these dwellings are in need of structural repair. Throughout the country,* 16,000,000 *out of* 29,000,000 *buildings need repairs;* 3,000,000 *should be demolished, and if* 13,000,000 *were renovated at* $100 *each the campaign would prompt the spending of* $1,300,000,000, *of which* 75 *per cent would go to labor.*

WARD M. CANADAY,
Director of Public Relations
Federal Housing Administration

BETTER HOUSING CAMPAIGN

Over 70,000 jobs employing almost twice as many men have been created by FHA loans alone, which on November 16 numbered 41,275 and totaled $17,587,850. Counting the amount of cash work and work on other financing terms stimulated by the Better Housing Program, which is about five times as great as that financed under the Modernization Credit Plan, there are probably more than 700,000 men who owe their present employment directly to the Better Housing Program.

More than half the states are progressing faster in the amount of modernization and repair being done than was originally expected. Six states are proceeding fully twice as fast. On November 16 there were 3,904 community campaigns either already organized or in the process of organization. Canvassers in many of these communities have produced more modernization and repair work than can be taken care of by local contractors and dealers.

During the week ending November 23, 316 more lending agencies joined the ranks of those entitled to make loans under the Modernization Credit Plan, bringing the figure up to 11,157; 5,884 new loans were issued, making the total 47,159; and $2,416,695 in modernization credits were issued, making the amount loaned so far $20,004,545.

FHA ARCHITECTURAL SUPERVISORS

After an intensive course in real estate valuating, 58 architects and real estate experts from all over the country have been formally appointed architectural supervisors for the Federal Housing Administration. J. Howard Ardrey, Deputy Administrator in charge of Titles II and III, announced the appointments.

These appointments, made with the approval and on the recommendation of state and regional directors, make possible the completion of organizations for the handling of applications for insurance of mortgages on new homes and the refinancing of old mortgages in the cities to which they are assigned. These cities, together with the appointments, are as follows:

N. Y.: Clarence H. Gardinier, Rensselaer, N. Y.; Buffalo, N. Y.; John J. Wade, Buffalo, N. Y.; New York City: Frederick Mathesius, New York City; Portland, Me.: Philip S. Wadsworth, Portland, Me.; Hartford, Conn.: Philip N. Sunderland, Danbury, Conn.; Boston, Mass.: John T. Whitmore, Boston, Mass.; Providence, R. I.: Albert Harkness, Providence, R. I.; Cleveland, Ohio: George R. Harris, Cleveland, Ohio; Concord, N. H.: Carl E. Peterson, Manchester, N. H.; Newark, N. J.; Neil J. Convery, Newark, N. J.; Philadelphia, Pa.: Charles Lewis Borie, 3d, Philadelphia, Pa.; Pittsburgh, Pa.: Raymond M. Marlier, Pittsburgh, Pa.; Wilmington, Del.: G. M. Whiteside, Wilmington, Del.; Atlanta, Ga.: Hal Fitzgerald Hentz, Atlanta, Ga.; Jacksonville, Fla.: Jefferson D. Powell, Jacksonville, Fla.; Birmingham, Ala.: William T. Warren, Birmingham, Ala.; Columbus, Ohio: Walter E. Pettit, Columbus, Ohio; Parkersburg, W. Va.: H. Rus Warne, Charleston, W. Va.; Detroit, Mich.: Lancelot Sukert, Detroit, Mich.; Richmond, Va.: Merrill C. Lee, Richmond, Va.; Baltimore, Md.: W. Gordon Beecher, Baltimore, Md.; Asheville, N. C.: Louis H. Asbury, Charlotte, N. C.; Charleston, S. C.: Albert Simons, Charleston, S. C.; Des Moines, Iowa: Charles A. Watrous, Des Moines, Iowa; Memphis, Tenn.: Joe T. Wallace, Memphis, Tenn.; Jackson, Miss.: Frank Fort, Meridian, Miss.; New Orleans, La.: Solis Seiferth, New Orleans, La.; Chicago, Ill.: John O. Merrill, Chicago, Ill.; Springfield, Ill.: Ralph W. Varney, Champaign, Ill.; Indianapolis, Ind.: George Caleb Wright, Indianapolis, Ind.; Helena Mont.: Sigvald L. Berg, Helena, Mont.; Mineapolis, Minn.: Edwin H. Hewitt, Minneapolis, Minn.; Milwaukee, Wis.: Roger C. Kirchhoff, Milwaukee, Wis.; Denver, Colo.: George H. Williamson, Denver, Colo.; Louisville, Ky.: Ossian P. Ward, Louisville, Ky.; Kansas City, Mo.: William H. Sayler, Kansas City, Mo.; St. Louis, Mo.: Wilbur T. Trueblood, St. Louis, Mo.; Little Rock, Ark.: George H. Wittenberg, Little Rock, Ark.; Sioux Falls, S. D.: Harold J. Spitznagle, Sioux Falls, S. D.; Bismarck, N. D.: Ira L. Rush, Minot, N. D.; Dallas, Texas: James Bruce Cheek, Dallas, Texas; Houston, Texas: Alfred Finn, Houston, Texas; San Antonio, Texas: Raymond Phelps, San Antonio, Texas; Fort Worth, Texas: Wiley G. Clarkson, Fort Worth, Texas; Topeka, Kan.: Ben H. Byrnes, Salina, Kan.; Omaha, Nebr.: Alan McDonald, Omaha, Nebr.; Cheyenne, Wyo.: W. M. Dubois, Cheyenne, Wyo.; Salt Lake City, Utah: Edward O. Anderson, Salt Lake City, Utah; Reno, Nev.: George Ashmead Ferris, Reno, Nev.; Boise, Idaho: Frederick C. Hummel, Boise, Idaho; Portland, Ore.: William G. Holford, Portland, Ore.; Seattle, Wash.: A. M. Albertson, Seattle, Wash.; Phoenix, Ariz.: Leslie J. Mahoney, Phoenix, Ariz.; Tulsa, Okla.: Arthur M. Atkinson, Tulsa, Okla.; Oklahoma City, Okla.: Thomas L. Sorey, Oklahoma City, Okla.; Santa Fe, N. M.: A. Leicester Hyde, Santa Fe, N. M.; San Francisco, Calif.: Albert J. Evers, San Francisco, Calif.; Los Angeles, Calif.: David J. Witmer, Los Angeles, Calif.

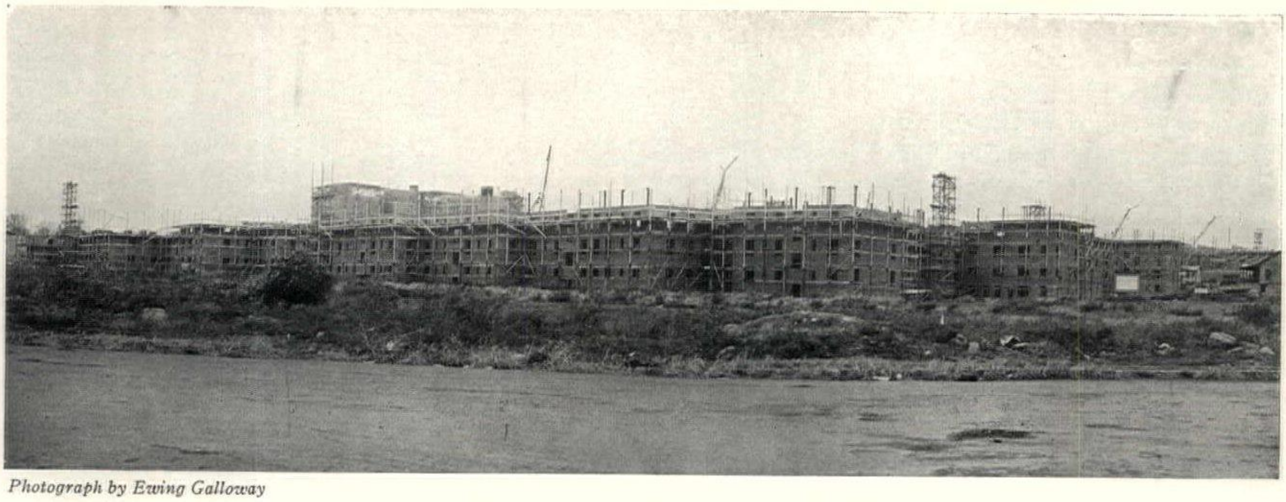
CHICAGO HOUSING PROJECT

Ten Chicago architects and firms have been retained to develop the plans for the Southwest Chicago low-cost housing and slum-clearance project. The architectural work in connection with the project has been delegated to a major group, which will in turn collaborate with an associate group. Members of the major group are: Mundie and Jensen; Armstrong, Furst and Tilton; John Holabird; Ernest A. Grunsfeld, Jr., and Philip Maher. Associated with this group will be the following architects: Ralph Huszagh, Chester Walcott, Fred Hodgdon, John Merrill, and Melville Chatten.

The two groups will have charge of the plans only for the Southwest project in Chicago. In order to spread the architectural work to as many persons as is consistent with sound procedure, another group of 10 firms and individuals will be selected to handle the South Side project, the second announced on the $25,-000,000 Chicago program. The same procedure will be followed with other Chicago projects.

At the time of their selection, the architects for the Southwest project were asked to name from themselves one person to act as chairman to coordinate the work. By unanimous vote, John Holabird was elected to act as director.

The Southwest Chicago project, to cost approximately $12,500,000, is the largest single project in PWA's national $150,000,000 slum-clearance and low-cost housing program. Taking up 37 square blocks, it will provide metropolitan housing for some 3,000 families at moderate rents. The new buildings will consist of 2, 3 and 4-story apartments and row houses.



Photograph by Ewing Galloway

The Hillside Housing Corporation's development near Boston Post Road in The Bronx, New York, as it looks today, one year after work was started.

PROGRESS REPORT ON LOW-COST HOUSING AND SLUM CLEARANCE

By NORBERT BROWN

Two instruments have been used by the Federal Government to advance a low-cost housing and slum clearance movement: (1) the Emergency Relief and Construction Act of 1932, which has been superseded by (2) the National Industrial Recovery Act of 1933.

Both acts provided for loans to limited-dividend corporations, and the latter enlarged the government's power by making possible outright grants to public bodies of 30 per cent of the cost of labor and materials employed in housing and slum clearance.

The National Industrial Recovery Act further allowed the Federal Government itself to engage directly in housing and slum clearance through the Public Works Emergency Housing Corporation which was incorporated on October 28, 1933.

Under the Emergency Relief and Construction Act and the National Industrial Recovery Act, eight projects have been started by limited-dividend corporations and are in varying stages of completion. These projects vary in size from the large Knickerbocker Village development in New York, consisting of two 12-story buildings on a two-square-block tract, to small, single-family houses erected at Alta Vista, Virginia. The total amount loaned to limited-dividend corporations is $19,546,600.

The completion of these eight projects promoted by limited-dividend corporations and financed in part by the Reconstruction Finance Corporation and Public Works Administration will mark the close of the first phase of the Federal Government's housing and slum-clearance program.

The failure of this program, due principally to an inability to reconcile unsubsidized construction with low rentals, has prompted the Public Works Administration to embark on the second phase of its program through its own real estate and construction company, the Public Works Emergency Housing Corporation.

The Emergency Housing Corporation enjoys definite advantages over limited-dividend companies, at least one of which will tend to enable the establishment of lower rentals than the limited-dividend companies could offer.

The most important advantage is that the Public Works Emergency Housing Corporation is able to receive a grant on its projects covering 30 per cent of the cost of labor and materials employed in housing and slum clearance. This advantage, of course, did not accrue to limited-dividend corporations.

In New York State and in other states where the New York State Housing Law was used as a model for housing legislation, the limited-dividend corporations theoretically enjoy the States' power of condemnation just as the Public Works Emergency Housing Corporation through the Federal Government enjoys the power of eminent domain.

This instrument of condemnation has never been used by the State Housing Board in New York largely because the Board itself is not certain of its constitutionality and also because of the considerable delays involved in court proceedings.

The Public Works Emergency Housing Corporation has undertaken to devise a condemnation procedure by which land may be acquired without undue delay at fair market valuations and to support the constitutionality of the procedure in the courts. It is now exercising the powers of condemnation in several cities, but as yet the question of the constitutionality of the power as at present exercised has not come up for judicial review. In Cleveland where the first condemnation suits have been started, the Court permitted the suits to proceed without formally passing on the question of constitutionality.

The demarcation between the first and second phases of the Government's housing and slum-clearance program was made at the time Federal support to limited-dividend corporations was withdrawn.

The experience of the Housing Division of the Public Works Administration in its consideration of 533 applications for limited-dividend projects indicated the impossibility of reconciling low rents with privately promoted projects. Eighteen of the applications proceeded to a point where actual allotments were made, but in all but seven of these cases, the allotments were withdrawn. In one of the seven latter cases, the Public Works Administration demanded a 35 per cent write-down in the land valuation even after work on the project was definitely under way and the original valuation had been approved.

With the reallocation of $88,528,400 originally earmarked for Government loans to limited-dividend companies by the Public Works Administration, together with the original $50,000,000 allocated to the Public Works Emergency Housing Corporation, the Emergency Housing Corporation now can draw on $138,528,400 for housing and slum clearance.

The use of $73,000,000 of this fund has been tentatively set aside for projects in New York, Chicago, Atlanta, Cleveland, Indianapolis, Detroit and Montgomery. This estimated expenditure would go to nine projects in the cities named, while the remainder could be used on thirty other projects which are under consideration by the Public Works Emergency Housing Corporation.

Of the nine projects, two have proceeded beyond the land assembly stage. Both of these are in Atlanta. The two projects in Atlanta were originally promoted by limited-dividend companies but these companies declined to go through with the government loan contract and the work from this point on was resumed by the Public Works Emergency Housing Corporation. Title has been acquired for both Atlanta sites, and demolition of existing buildings has been started.

Title has also been acquired for the Cedar-Central project in Cleveland and demolition bids have been taken. Condemnation has been started in Chicago and Cincinnati for projects there. In the other cities options are being taken or exercised.

As no complete statement has been made public concerning any of these nine projects, it is impossible to know whether the Emergency Housing Corporation has actually worked out a successful formula for slum clearance and low-rent housing. However, it is encouraging to find that the Corporation is taking the initiative in establishing the legal principles involved and that it is dealing with municipalities. The responsibility for housing conditions in a municipality rests with the municipality itself, although it must look to the state for enabling legislation.

BASIC DATA CONCERNING LIMITED-DIVIDEND HOUSING PROJECTS

Place	Promoter	Loan	Estimated Cost	Number of Units	Type of Buildings	Percentage of Completion
The Bronx, N. Y.	Hillside Housing Corp.	$5,060,000	$5,717,871	1,388	Fireproof Apartments	15
Woodside (Queens), N. Y.	Boulevard Garden Housing Corporation	3,450,000	4,086,600	957	Fireproof Apartments	20
Philadelphia, Pa.	Juniata Park Housing Corp.	1,039,000	1,153,607	284	Fireproof Apartments	50
St. Louis, Mo.	Neighborhood Gardens Corp.	640,000	730,000	252	Fireproof Apartments	4
Alta Vista, Va.	Alta Vista Housing Corp.	84,000	100,000	50	Frame Houses	90
Euclid Village, Ohio	Euclid Housing Corp.	1,000,000	1,250,000	300	Semi-Fireproof Houses	4
Raleigh, N. C.	Boylan Realty Co.	198,600	233,600	54	Non-Fireproof Houses	0
New York, N. Y.	Fred F. French Operators, Inc.	*8,075,000	9,500,000	1,592	Fireproof Apartments	85

*Reconstruction Finance Corporation.

BASIC DATA CONCERNING PUBLIC WORKS EMERGENCY HOUSING CORPORATION PROJECTS

Place	Tentative Allotment	Number of Units	Type of Buildings	Progress
New York, N. Y.	$25,000,000	5,000	Fireproof Apartments	Options Being Exercised
Chicago, Ill.	25,000,000	3,000	Houses and Apartments	Condemnation Proceedings
Atlanta, Ga.	2,700,000[1]	603	Dormitory and Apartments	Clearing Site
	2,100,000[2]	617	Houses and Apartments	Clearing Site
Cleveland, Ohio	3,000,000	799	Apartments	Condemnation Proceedings
Indianapolis, Ind.	3,000,000	1,044	Houses and Apartments	Condemnation Proceedings
Cincinnati, Ohio	6,000,000	1,950	Houses and Apartments	Options Being Started
Detroit, Mich.	6,000,000	....	Houses and Apartments	Options Being Started
Montgomery, Ala.	320,000	160	Row Houses	Condemnation Proceedings

[1]Techwood (White); [2]University (Negro)

Marceau

By GEORGE S. CHAPPELL

With this inquiry on the doings of architects Mr. Chappell begins a series of monthly articles for The Record. Although known in the field of humorous literature as Dr. Traprock, explorer, Mr. Chappell is professionally an architect. Since leaving the Ecole des Beaux-Arts he has been practicing architecture—in partnership with Charles Ewing until 1920 and individually thereafter—filling in the time between jobs with writing. "Most of my architectural work," he states, "has been residential, including college dormitories, Y. M. C. A.'s, and the like. In other words, I am not a skyscraper architect, having always had, in art as in life, a preference for 'the low and rambling'."

"WHAT ARE THE ARCHITECTS DOING?"

A SURVEY OF THE ACTIVITIES OF ERSTWHILE ARCHITECTS

If the lean years through which we are so gallantly struggling—don't cheer, men: the poor lad is cuckoo—have done nothing else they have at least put a blessed quietus on the old remark made by so many multi-chinned matrons and Bright Young Things, to wit, "I have always said that if I were a man I would be an architect." This banality, always productive of an about-to-be-ill feeling in the architectural midriff, is definitely out. Even the dumbest dowager or lightest of lighter-than-air debutantes knows better than to pull the ancient line.

In its place the architect who is fortunate enough to be asked out to an occasional dinner or cocktail party, if you will (loud cries of "We will!"), finds himself confronted, if any one has the bad taste to mention his profession, with the searching question, "What *are* the architects doing?" The query is accompanied by a glance of tender compassion.

This is a refreshing change and yet, faced by this question, I have found myself as unable to answer it as I had been to say anything but "Oh yeah" to the earlier ineptitude. "Just what are the architects doing?" I asked myself, aware that I had not seen many of my fellow craftsmen for months. They seemed to have disappeared into a sort of fourth dimension. Then and there I resolved to look into the matter, to make a sort of survey, this being an excellent time for that sort of thing.

I jotted down a list of five or six of the missing whom I assumed to be definitely among the unemployed, exempting, naturally, the fortunate few who have been steadily occupied by some princely enterprise like Rockefeller Center, the mere thought of whom made me feel liverish. No, I said, my quarry is the architect of my own ilk, who used to have a small but steady practice which has dried up. Five or six investigations, I thought, would be enough to give me an idea which way, if any, architecture was going. Noting my friends' addresses I sallied forth.

Right there I struck my first snag. Two days of door-to-door canvassing convinced me that the run-of-the-mill architectural office had, temporarily at least, gone out of existence. At my friend Andrews' address a sleepy blonde made an obvious effort to remember her employer. "Mr. Andrews," she said thoughtfully, "oh, yes . . . he comes in sometimes, on Wednesday I think it is, to look over his circulars. Mr. Badger comes in on Thursday . . . or is that Mr. Callahan's day? I get them all mixed up. A whole bunch of them use the same address and telephone number but they're very irregular. I don't think I've seen Mr. Andrews in a coupla weeks."

My next stop was at Tom Fletcher's office where a card on the locked door read, "Out to lunch. Back next month." I decided not to wait.

Horace Horton's establishment was a little more productive. A solitary draftsman, who looked vaguely familiar, brightened at my entrance and greeted me by name. "No, Mr. Chappell," he said, "Mr. Horton is in the country. He won't be in this week, I imagine. He has a water-color class or something that keeps him out of town a lot. No, we're not very busy. For the last three months I've been making perspectives of all his old work but I'm just about down to the last vanishing-point."

Something ominously suggestive in his last remark made me stare at him fixedly, half expecting to see him and his surroundings fade into nothingness before my eyes. Noting this, he said, "You don't remember me, do you, Mr. Chappell? My name is Cooney . . . I worked for you for five years."

"Of course, of course," I lied enthusiastically, suffused by that guiltiest feeling, after which I kicked myself down the hall. I have written no less than ten letters for Cooney but I can never remember him. It's terrible but that's the way I am.

After that I decided not to try to find any of my victims but just to roam around and see what happened. Immediately things improved. One by one I met them, on the street, in the Architectural League, at the Grand Central bar and elsewhere. Their stories were interesting, uniformly cheerful and linked by a certain common philosophy.

I caught Andrews as he was coming out of the Ritz. We were in adjoining compartments of the revolving door and I made a complete circuit in order to grab him by the coat-tails. "Come in here," he said, moving toward the men's bar. "I drop in here about once a week . . . can't afford it oftener . . . but it's quiet and I like to feel civilized and a little extravagant once in a while. What am I doing?" He grinned. "Boy, I'm on the air . . . sure, radio. Listen. Three weeks ago a lady decorator friend called me up and asked me if I would be the other end of a dialogue she'd cooked up. 'Look at Emily Post,' she said, 'and what she's done with Etiquette, telling young men which elbow to hold when they steer a dame across the street, and what fork for which food, and all that. She gets away with it, doesn't she?' 'Sure,' I said. Then she went on to explain. She and I would frame up a lot of thoughts about The Home, see? . . . how to furnish the different rooms and so on, she supplying the information and me putting in the wise-cracks. It's a bunch of hooey but, by gum, I believe she's sold the idea! Why, the outlet for furniture, rugs, hangings and all the gadgets that go into a house is simply enormous. As she says, it isn't so much what you say as how you say it. The dear old public loves to be told things and if you tell 'em their taste is terrible they eat it up. Take my tip, boy; if you haven't anything to do, hook up with some energetic mommer and let nature take its course. They'll accomplish something while you and I sit around and think about it!"

"I believe you're right, Andrews," I said. "You are on the highroad to success." And I meant it.

A little later I met Horton, who had blossomed so miraculously into a water-color artist.

"Its the nerts," he enthused. "I've had a class of ten pupils twice a week all summer. They range from infants to grandmothers and they've certainly kept me out in the open air. Of course they make some awful messes. My job is to rush from one puddle to another and do rescue work."

"Do you think they have learned anything?" I asked dubiously.

"I'm not sure," Horton answered, "but I have. The point is they think I'm a wizard because I can put in a tree without having it blot out the whole sky."

"God alone can make a tree," I murmured.

"I know that," Horton admitted, "but they think I can, too, and I know just enough more than they do to get away with it."

"Horton," I said, "you have put your finger on a great principle."

I found that my next witness, Lawton, was doing nicely with a series of lectures on modern art, addressing women's clubs, Junior Leaguers and similar organizations.

"Where, for the love of Mike, did you learn anything about modern art?" I asked him.

"Out of a book," he said, "out of mar
Listen to this." Rolling back his eyes he rec
ly. "'Impressionism is a science in that it u
cialized, selective instrument, the retina, to abstract or extract all of the visual evidence which a particular object contains.' Does that mean anything to you? No, . . but it goes over big. Man, I've got barrels of stuff like that. It's made by the mile and I sell it by the foot, and old ladies come up to me after the lecture and tell me they think they know what I was talking about."

Another of my friends, Patton, I found had taken a more obvious tack for his extra-curriculum endeavor. "I'm doing articles for the popular home magazines," he explained with a hint of apology. "It's funny about them. The subjects can't be too banal. What I mean is they *must* be, the banaler the better. The same old things have to be said over and over again. Actually" . . . he blushed deeply . . . "I had a piece in the last number of *The Householder* called 'Colonial Doorways in Old New England.' You might be interested to know that the same title has been used exactly twelve hundred and sixty-three times."

"I can well believe it," I said. "I've used it two hundred and twenty times myself."

Frank Randall was the only one whom I actually found in his office and we both showed our embarrassment.

"Fancy meeting you here," I said.

"I know," he said confusedly. "It's a small world, isn't it? It wouldn't have happened except that one of my friends has actually given me something to do."

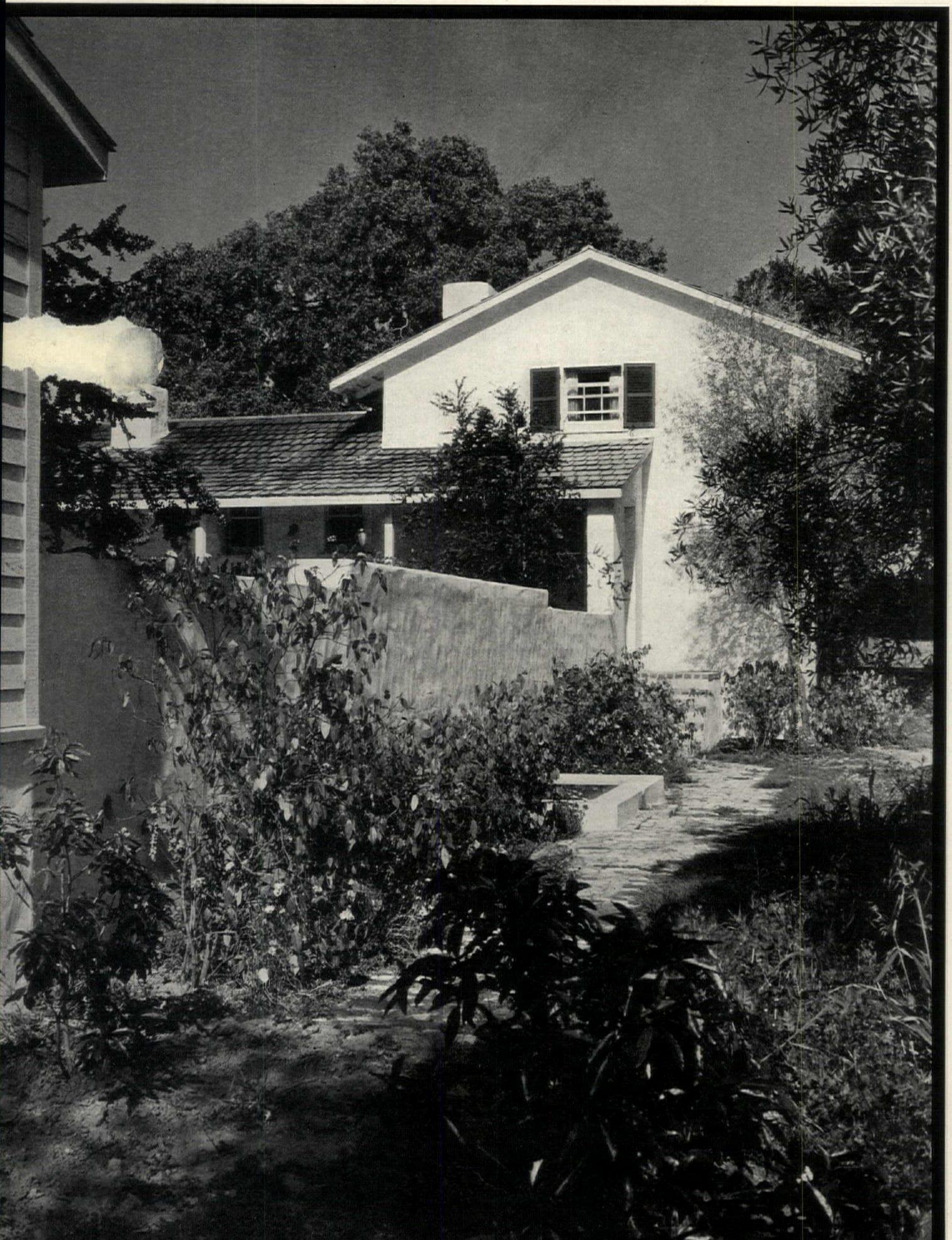
"Not new work," I exclaimed. "Not really?"

"Definitely so," he said, "and definitely new, at least new to me. You see, this friend is an ardent angler and the walls of his house are lavishly decorated with dead fish, all sizes and kinds. The spots and stripes have faded with the years and he wants me to do a bit of restoration work. Don't you think ordinary aluminum radiator paint would do for a tarpon?"

"Anything, in my estimation, would do for a tarpon," I said, but my friend's face was shining with an enthusiasm which I had not seen for a long, long time.

"That's the wonderful thing about architecture!" he said. "Every job is so different."

Good old Randall, I thought, as I left him. Somehow I loved him for sticking to his last.



ograph by Roger Sturtevant

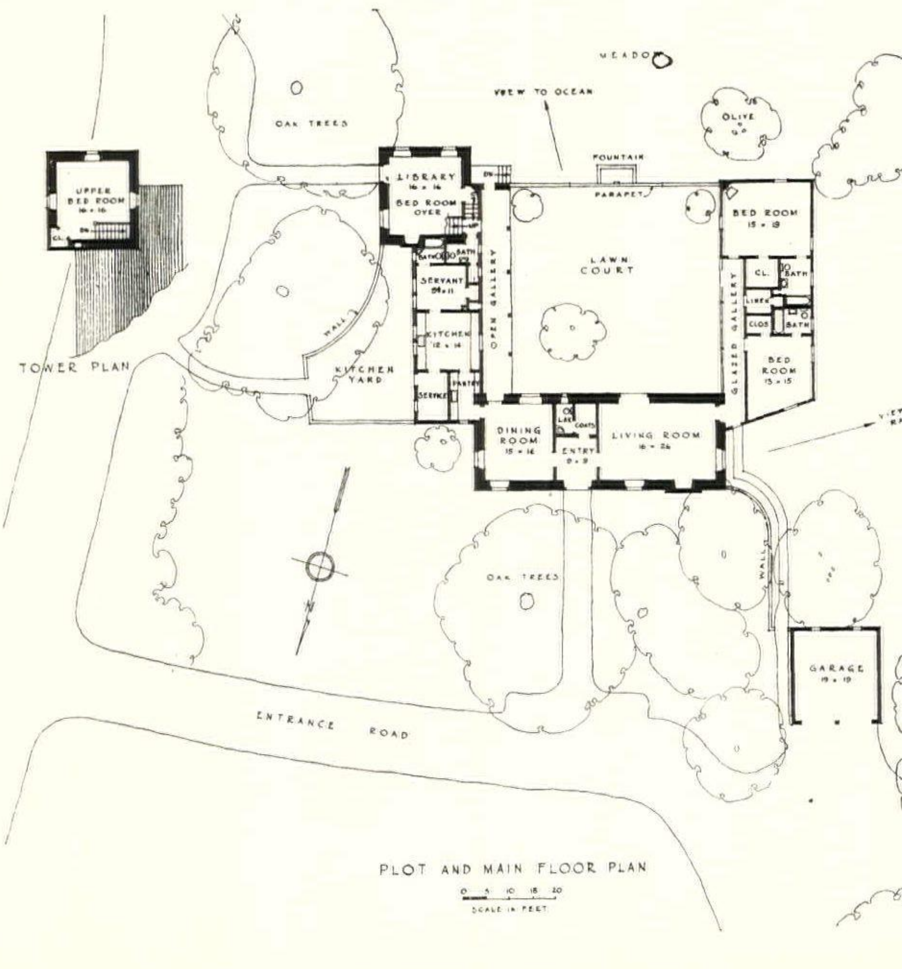
HOUSE OF E. E. KAPLANSKY, SANTA CRUZ, CALIF.
WILLIAM WILSON WURSTER, ARCHITECT

Photograph by Roger Sturtevant

HOUSE OF MR. AND MRS. EARL ELLICOT KAPLANSKY

PASATIEMPO COUNTRY CLUB & ESTATES, NEAR SANTA CRUZ CALIFORNIA

WILLIAM WILSON WURSTER ARCHITECT

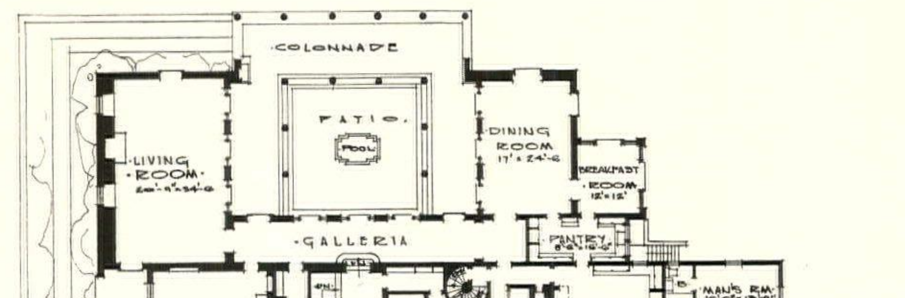


PLOT AND MAIN FLOOR PLAN

To the south the view is over meadow and fairway to the sea with Monterey Peninsula in the distance. This view together with a wooded ravine on the west and fine oaks to the north made three exposures for the living room desirable. The library and one bedroom are planned so that separate access can be had from the road. The main wing and tower walls are plastered and the side wings are rough siding, whitewashed. The roof is of commercial split redwood shakes (1/4" thick) laid 12" to the weather. The shutters are dark green, the doors and windows white. Interior floors are of waxed brick, the walls plaster with adobe finish, and the ceilings of rough shiplap. Cost: $13,000, or $3.25 a square foot.

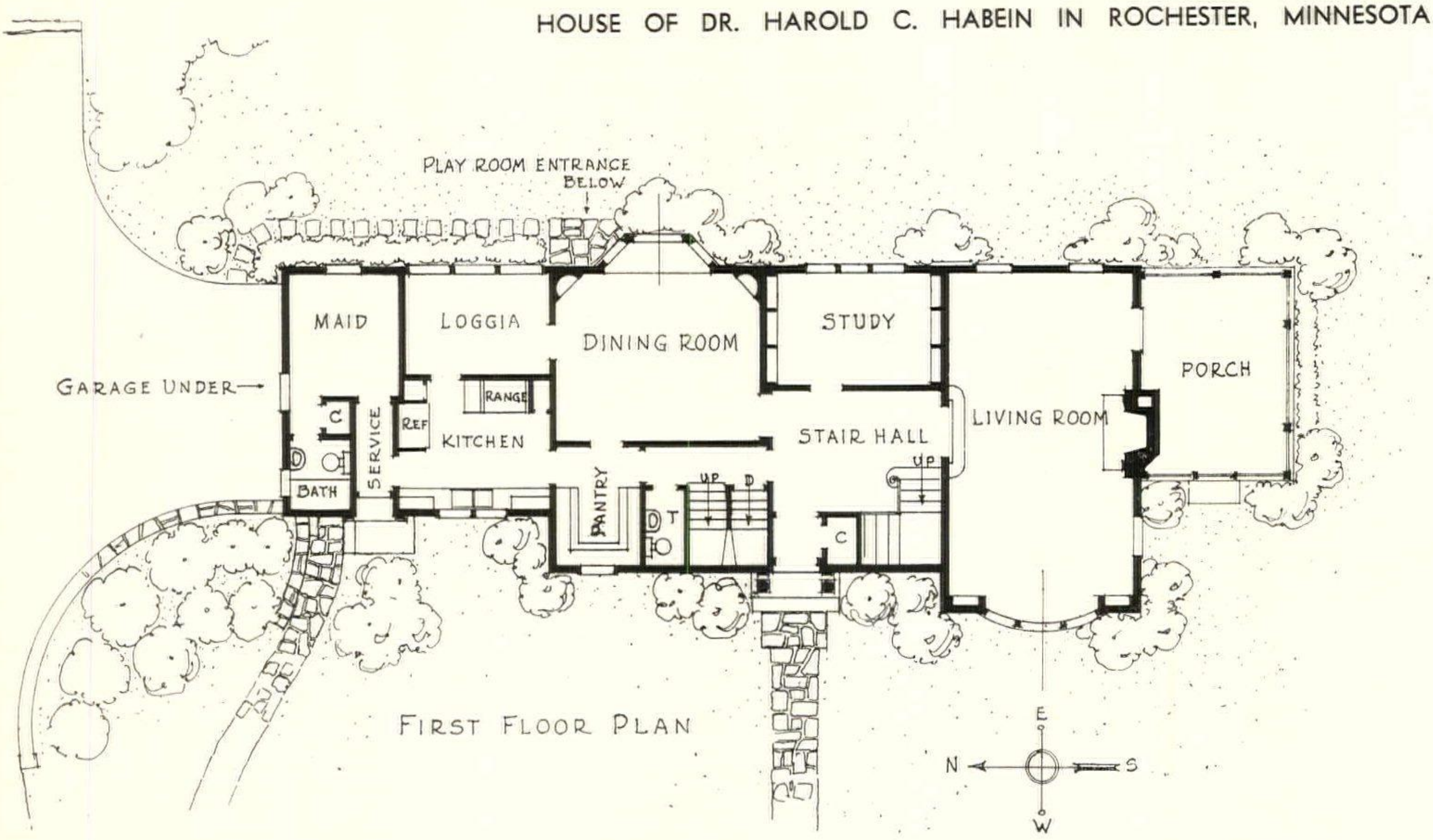
Photograph by George D. Haight

HOUSE OF JACOB STERN
HOLMBY HILLS, CALIFORNIA
ROLAND E. COATE, ARCHITECT



HOUSE OF DR. HAROLD C. HABEIN
ROCHESTER, MINNESOTA
ROLLIN C. CHAPIN, ARCHITECT

Photograph by Henry Elleby


PLAY ROOM ENTRANCE BELOW
MAID
LOGGIA
DINING ROOM
STUDY
PORCH
GARAGE UNDER
RANGE
REF
KITCHEN
SERVICE
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BATH
PANTRY
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STAIR HALL
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LIVING ROOM
FIRST FLOOR PLAN
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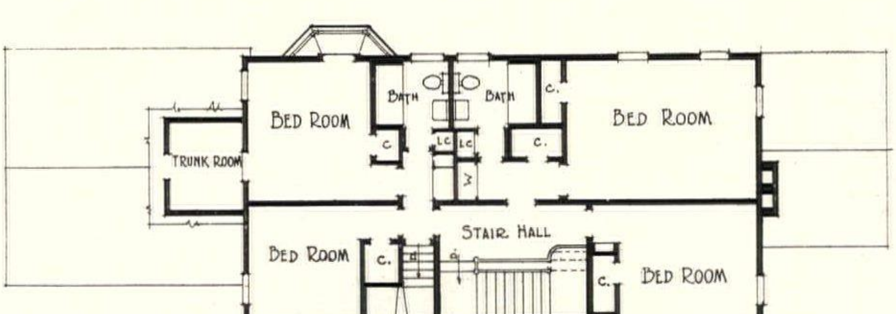
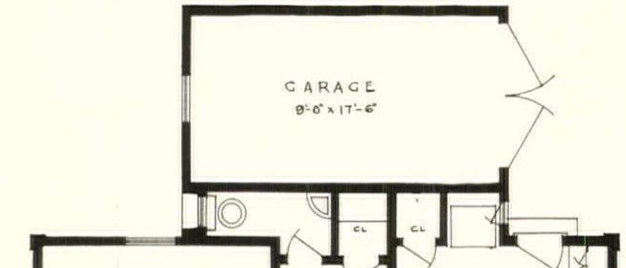
Photograph by Henry Elleby

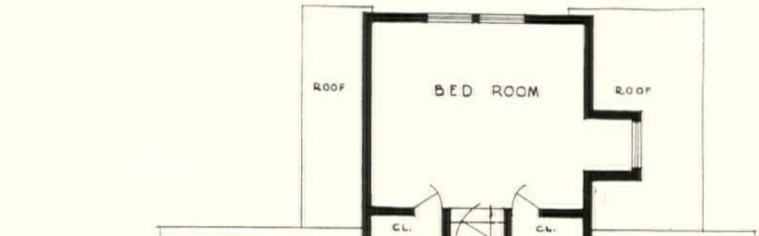


SECOND FLOOR PLAN

ROLLIN C. CHAPIN
ARCHITECT

Photographs by Gustav Anderson

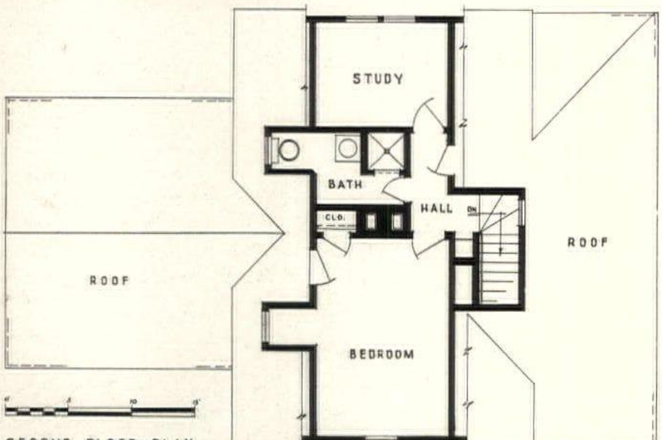




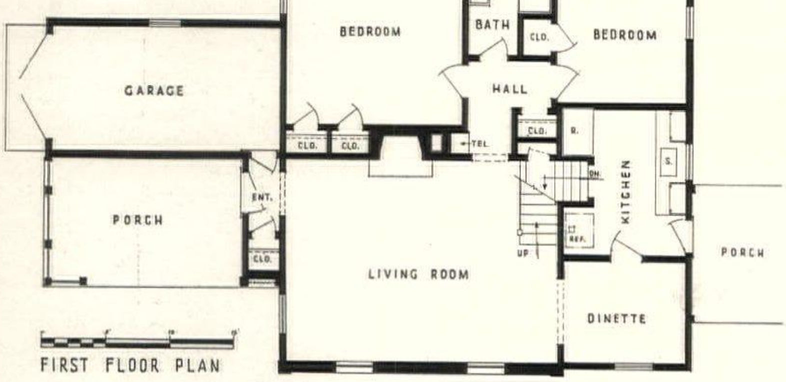
"THE FAIRFIELD"—CHATHAM MANOR
CHATHAM, NEW JERSEY

RANDOLPH EVANS, ARCHITECT

Construction: Gray shingled walls with white trim and mulberry shutters. Composition roofing. House completed this year at cost of $6,450.



SECOND FLOOR PLAN

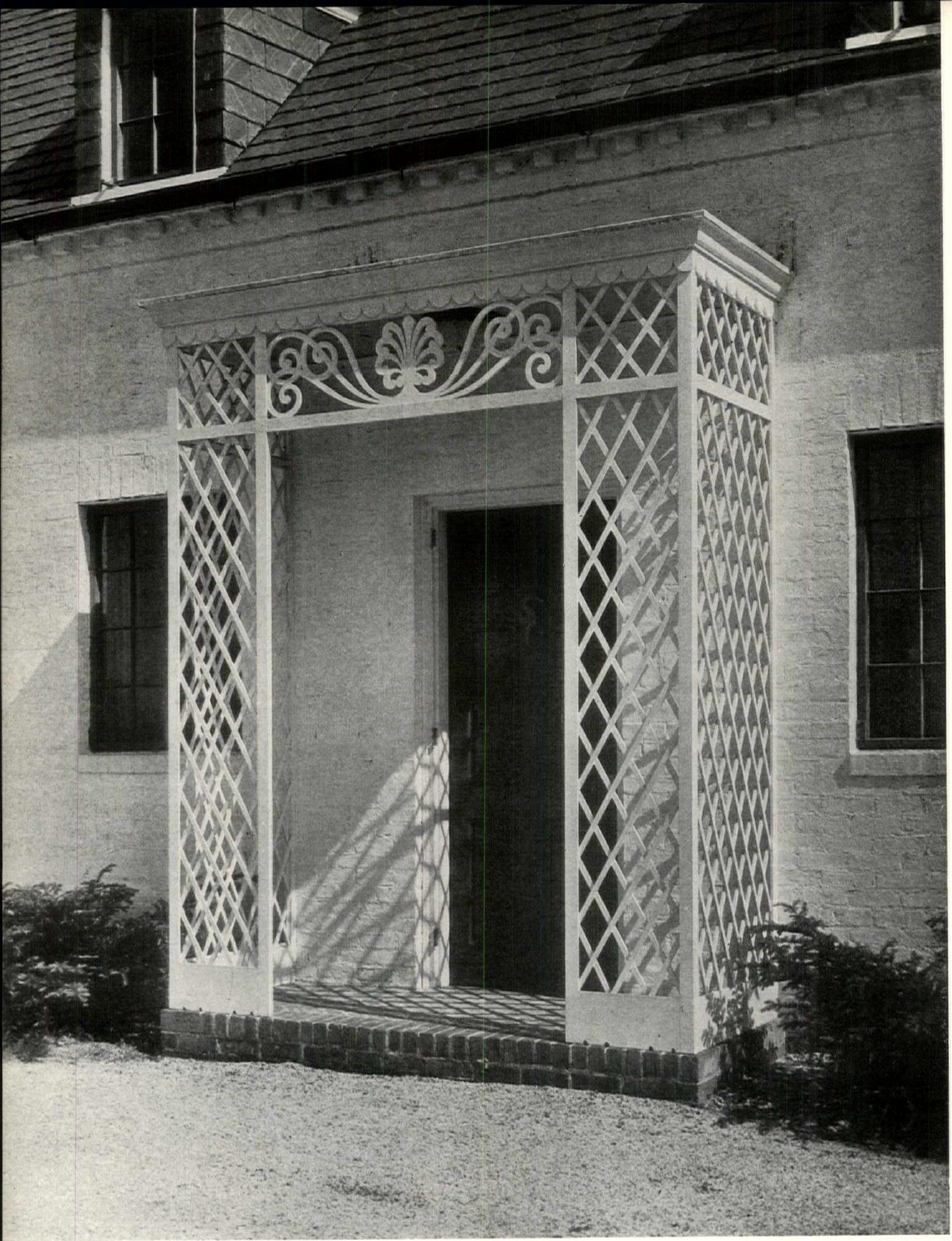


FIRST FLOOR PLAN

Construction: Brick and shingled walls painted a light ivory color. Rust colored shutters. Stained cedar shingled roof. House completed this year at cost of $6,200.

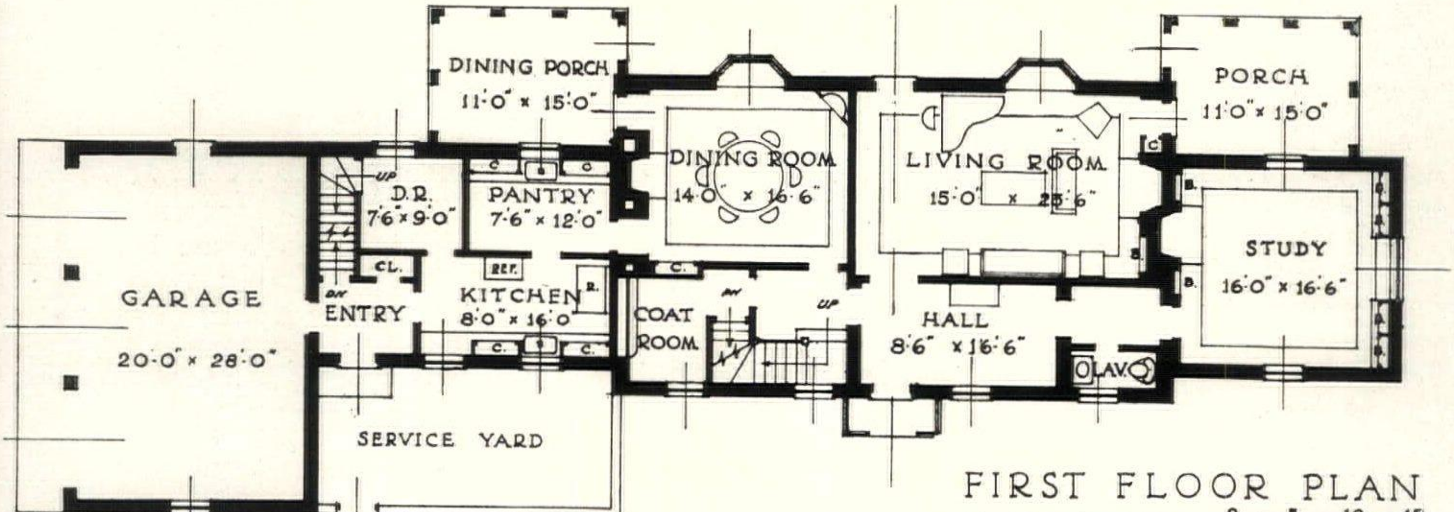
HOUSE OF MISS LOUISE MORTON
HARBOUR GREEN, LONG ISLAND

RANDOLPH EVANS, ARCHITECT

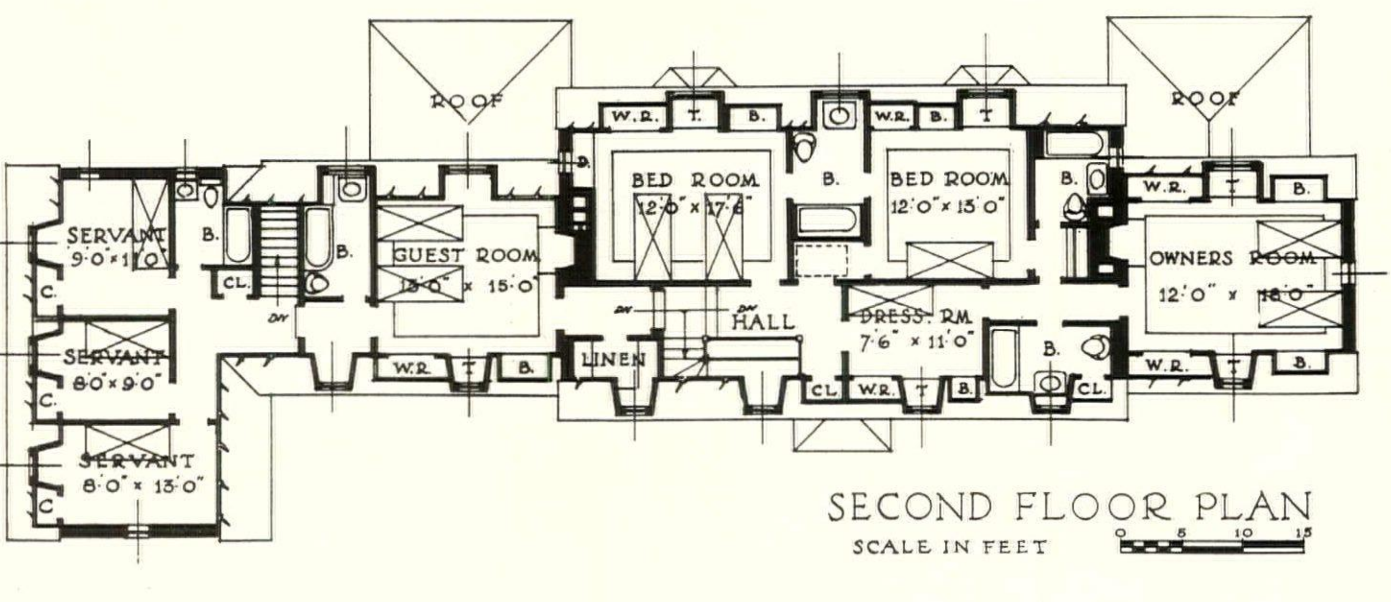


Photograph by George Van Anda

HOUSE OF ALLEN T. KLOTS
LAURELTON, OYSTER BAY, LONG ISLAND
WALDRON FAULKNER, ARCHITECT



Special problems considered in planning this house for owner, wife, and two children: (1) Provision of 4 master bedrooms; (2) arrangement of all master bedrooms so as to provide southern exposure. The front entrance faces north. Construction: Whitewashed brick veneer walls, black slate roof, painted white trim and peacock blue doors and windows. Awarded Second Prize, Class II, 1934 Small House Competition conducted by House Beautiful combined with Home and Field.



SECOND FLOOR PLAN

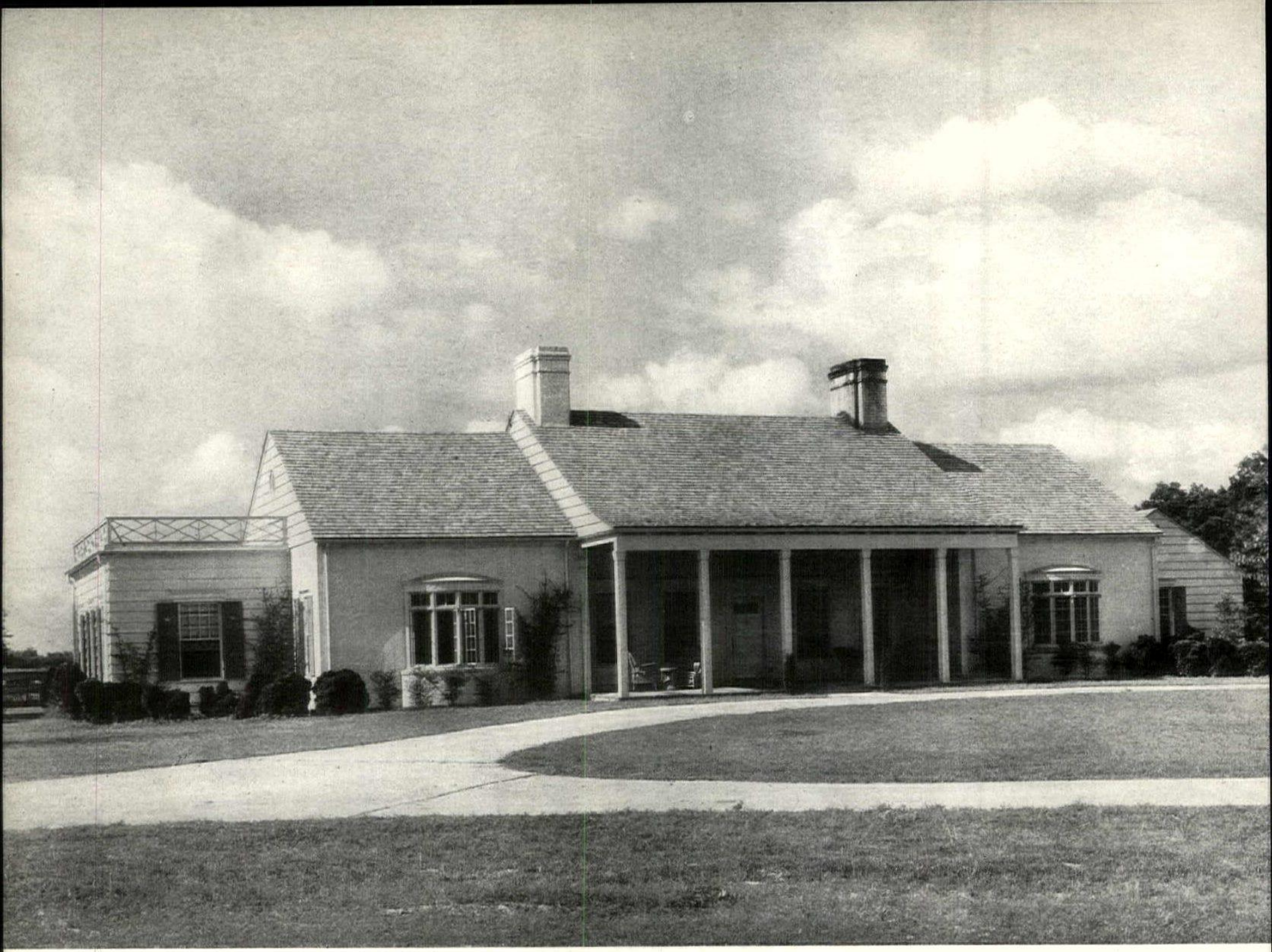
SCALE IN FEET

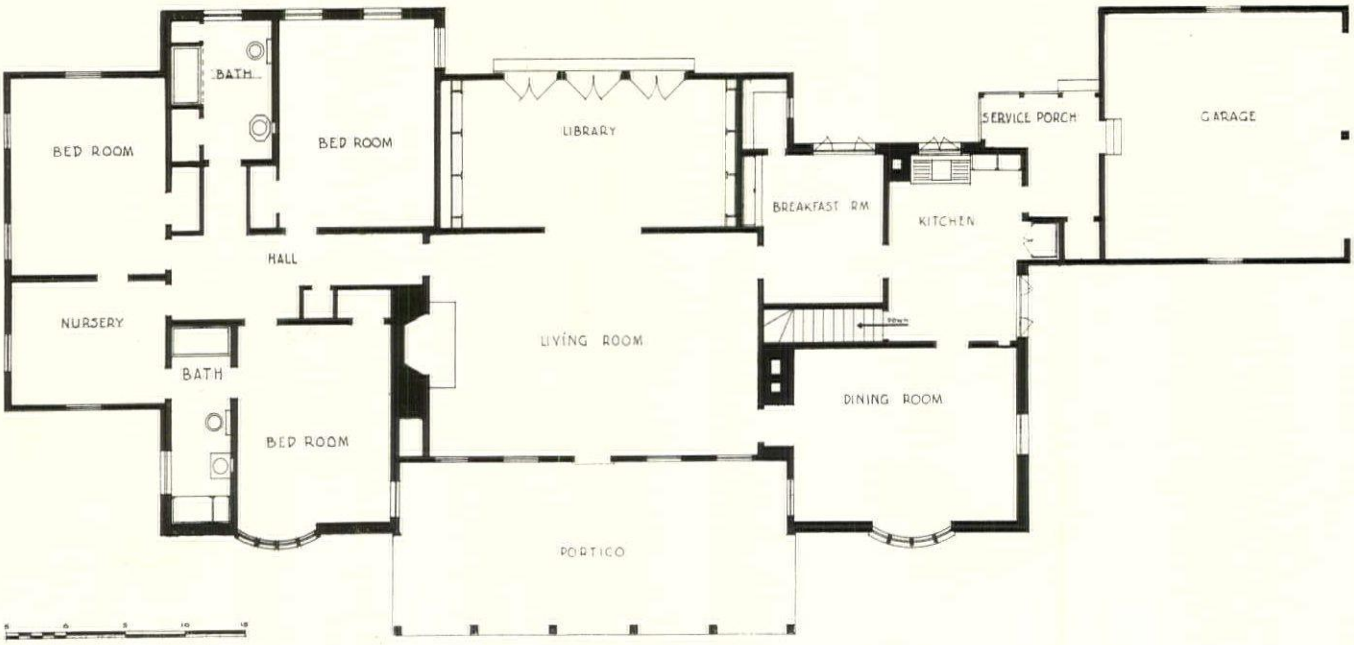
HOUSE OF ALLEN T. KLOTS

LAURELTON, OYSTER BAY, LONG ISLAND

Photographs by George Van Anda

WALDRON FAULKNER, ARCHITECT





HOUSE OF OLIVER J. ALBRIGHT
MEMPHIS, TENNESSEE

JONES, FURBRINGER AND JONES, ARCHITECTS

Photograph by George D. Haight

HOUSE OF MRS. J. W. COURTNEY
FLINTRIDGE, CALIFORNIA
DONALD D. McMURRAY, ARCHITECT

Photograph by Sydney W. Newbery

EMPIRE POOL AND SPORTS ARENA IN WEMBLEY, ENGLAND — SIR OWEN WILLIAMS, ENGINEER

EMPIRE POOL AND SPORTS ARENA

at WEMBLEY, ENGLAND . . . SIR OWEN WILLIAMS, DESIGNER and ENGINEER

This building is a covered arena of approximately two acres in extent situated adjacent to the Empire Stadium, Wembley, an open air arena accommodating 100,000 persons, which was built in 1923 for the British Empire Exhibition. The new building is intended to be used for a variety of purposes, principally swimming, ice skating and tournaments. It contains a swimming bath 200 by 60 feet with a capacity of 650,000 gallons and capable of being decked over to take an ice skating rink 200 by 85 feet and also a tournament arena of 300 by 85 feet. It is placed 300 feet back from the public road, the frontage being occupied by car parks and gardens. On each side of the building there is a 40-foot roadway for exits.

The site was originally a lake, the configuration of which was used to accommodate a basement under a part of the building. The whole of the lake was not built on, leaving a portion at the back or east end of the building which is inclosed as a garden to be used for sun bathing and outdoor recreation.

The building itself is 420 by 240 feet wide, including the annexes back and front. The annexes were necessary constructional bases to give stability to the end gable walls, and in them are accommodated at the front the turnstile halls, ceremonial retiring rooms and offices, and at the back the kitchens and staff quarters.

The main hall between the annexes is of uniform cross section for its entire length. Every 44 feet in length of the main hall is a complete entity as far as accommodation of the public is concerned, having within that length the appropriate exits, buffet bars, lavatories, staircases and gangways to meet the requirements of the Licensing Authorities.

The whole building was planned and built to a unit of 2′ 9″, this being the width of the spectators' terraces. This unit and multiples of it are carried throughout for widths of lavatories, dressing boxes, doors, and windows. Vertically the unit of construction is 3′ 0″. A subdivision of these dimensions into 11″ and 6″ respectively gives the limiting tread and rise of stairs allowed by the Licensing Authorities and produces also the pitch of the spectators' terracing.

The construction of the building is entirely of reinforced concrete. Floor slabs are of standard 6″ thickness over 22-foot spans without beams, and walls have a standard 9″ thickness. The construction of the main building is a three-hinged arch of 236′ 6″ span; the necessary stiffening of the roof is effected by planes of concrete intersecting at right angles producing fin-like effects on the exterior, the main fins of the roof being 21′ deep and 9″ thick immediately over the side walls.

The galleries, lavatories and buffet bars are all integral parts of the roof. The whole of the roof sits on two parallel "hinges" or "knife edges" each consisting of a 6″ width of concrete carrying a load of 20 tons every foot of length. At the apex of the roof the vertical ribs are cut away leaving only horizontal slabs 6″ thick and 2′ 9″ wide to pass through to form virtual hinges, the horizontal pressure on each being approximately 70 tons. The vertical ribs are at 22-foot centers and for the purpose of stability during striking of centering were constructed in pairs. The roof immediately over the permanent fixed galleries is a solid concrete slab lined with cork but the middle two-thirds of the area is glazed on steel purlins with a center ventilating lantern light with concrete access gangways and in the lantern are accommodated the main electric lights and sound amplifiers.

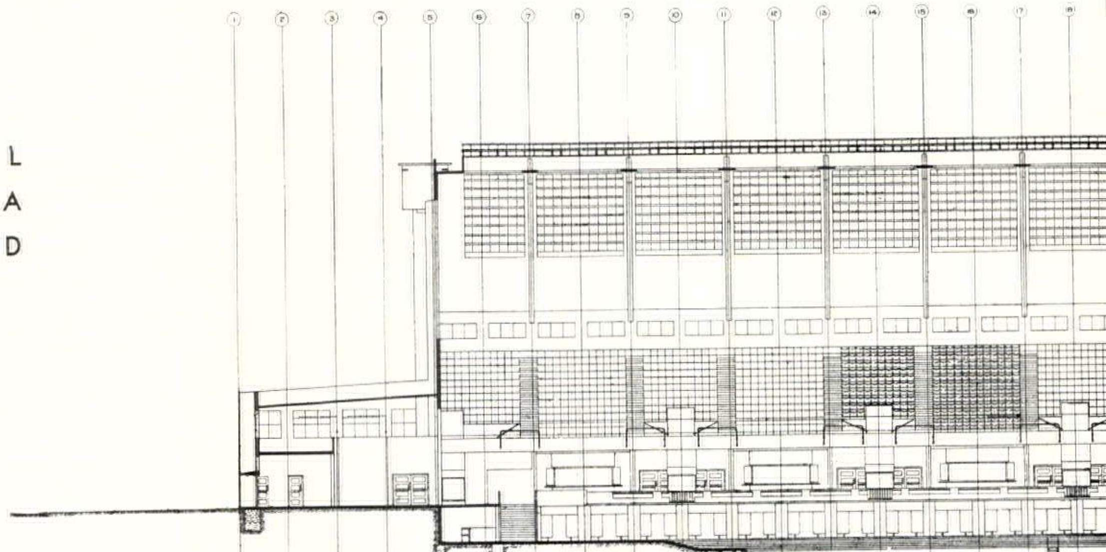
The ventilation of the building is natural, the height of the building being sufficient by "stack" action to give the necessary changes of air to the spectators. Artificial lighting is of the most efficient direct type throughout. Heating is generally by unit heaters under the main galleries; in summer it is possible to pass refrigerated water through them for cooling the building. The heating of the building and bath warming is by electric thermal storage.

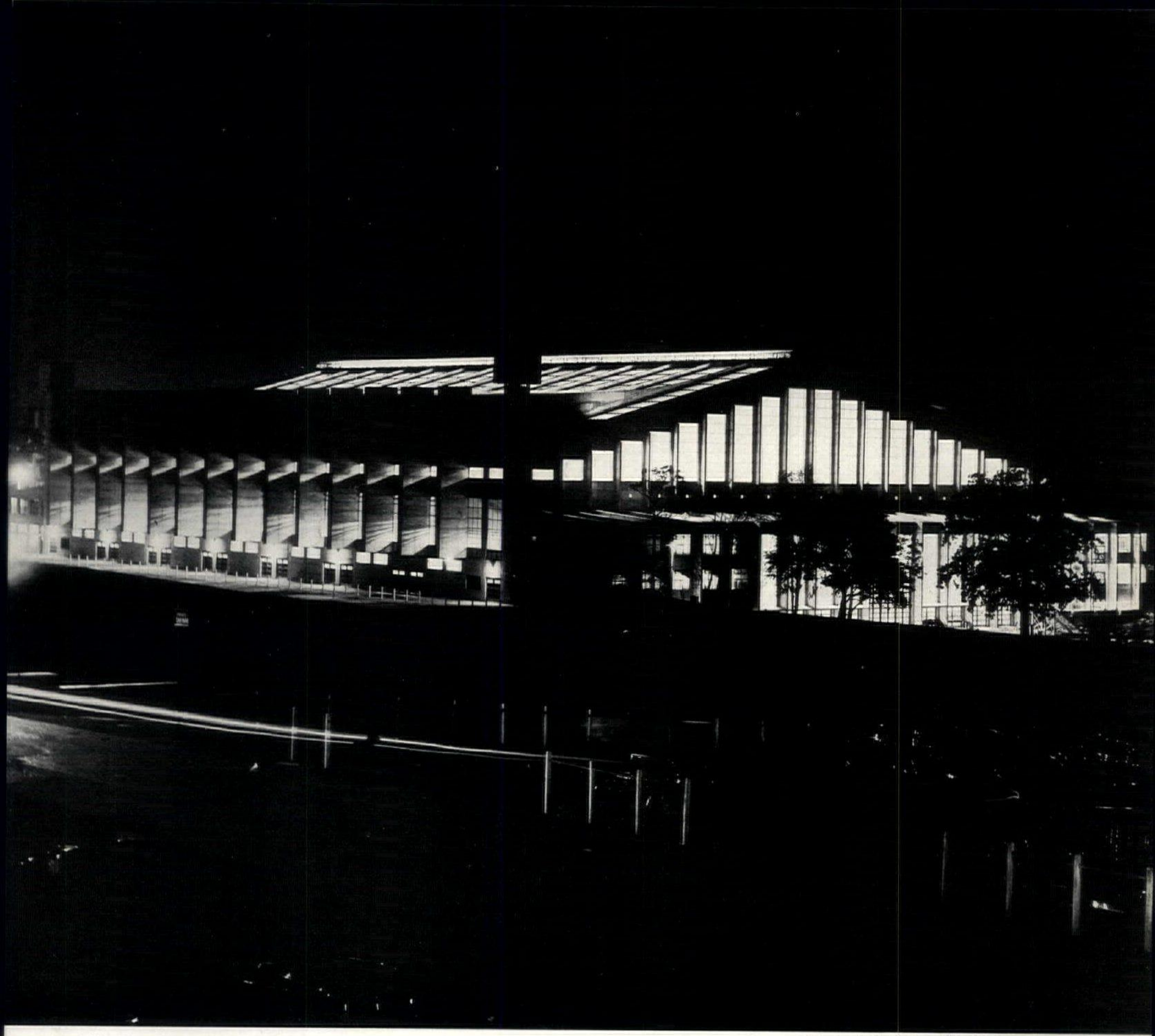
Dressing accommodations are in two colonnades running on each side of the bath. Bathers pass through shower baths and walk on a section of water-submerged floor before going on to the bathers' terrace. Bathers' restaurants are provided, and access directly to the gardens and the lake and sun bathing terraces is through the eastern annex.

The fixed seating capacity is approximately 4,500 and can be increased by temporary seating to the maximum accommodation of 12,500 seats. All seats have been designed specially for the building. The fixed seats cantilever off the riser of the terrace and therefore have no legs standing on the terracing, thus facilitating cleaning of the terracing. The permanent concrete terracing is perforated with slots, the slots being used for attachment of seats and allowing free circulation of air.

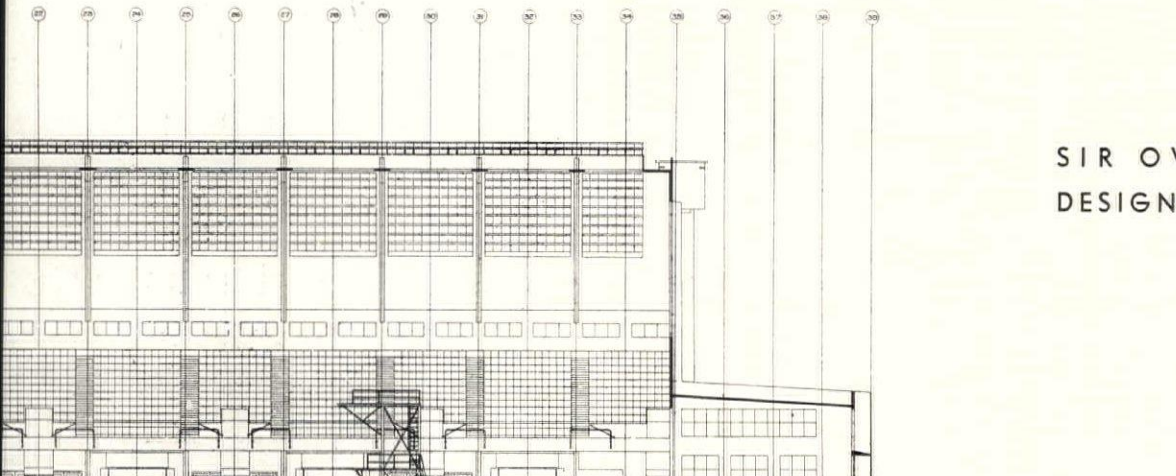
Photograph by Bedford Lemere & Co.

EMPIRE POOL
and SPORTS ARENA
WEMBLEY, ENGLAND

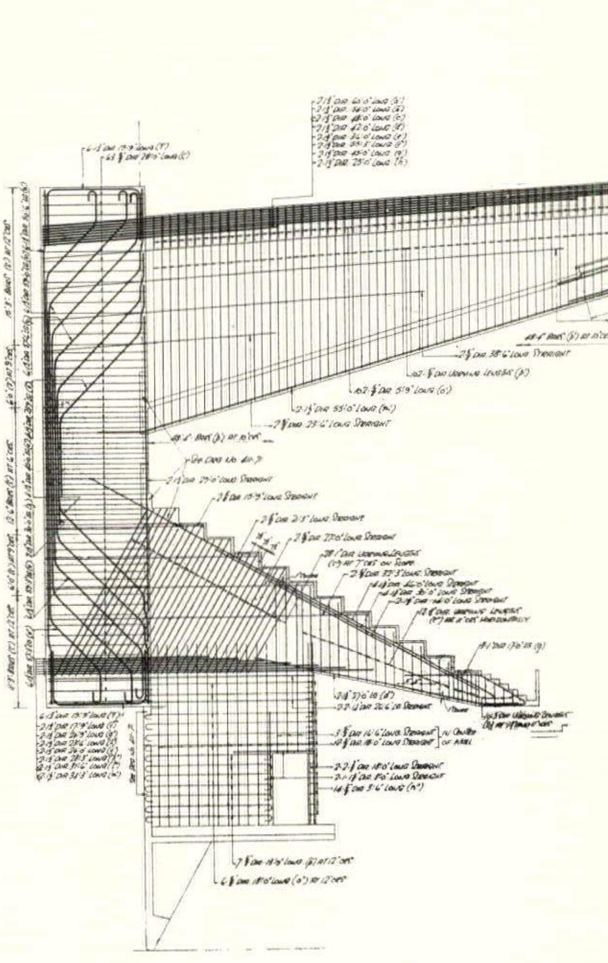


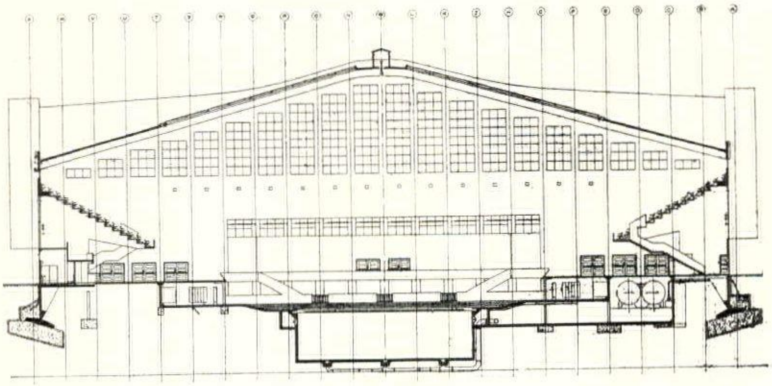


Photograph by Sydney W. Newbery



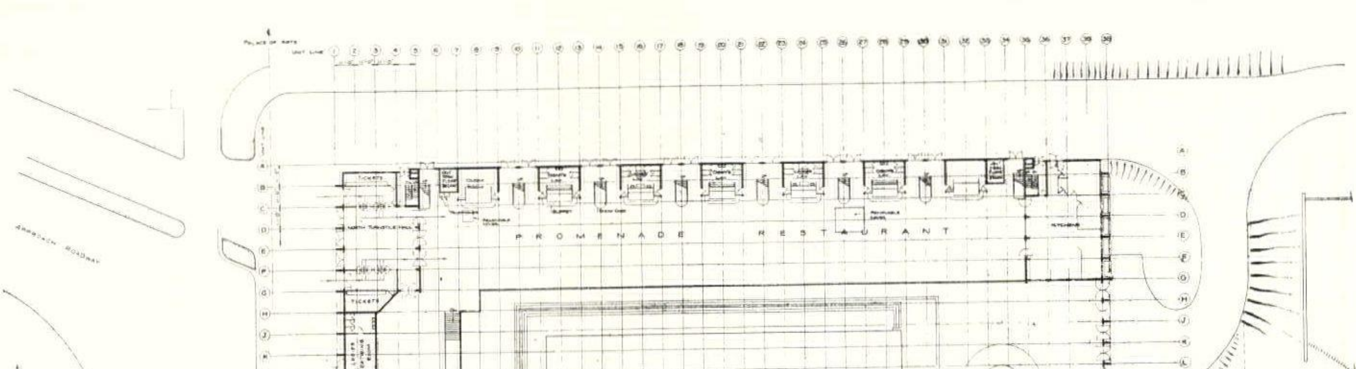
SIR OWEN WILLIAMS
DESIGNER and ENGINEER





EMPIRE POOL and SPORTS ARENA
WEMBLEY, ENGLAND
SIR OWEN WILLIAMS, ENGINEER

The swimming pool is built according to Olympic specification with a maximum water depth of 16 feet. It is surrounded by a subway in which are accommodated lights projecting under water lighting through 20-inch portholes of armor plate glass in the sides of the pool. Behind the deep end of the pool is a chamber accommodating the wave-making machinery, consisting of four hydraulic plungers in reinforced concrete boxes. Scum troughs are provided all around the pool and are unusually wide to break eddies and currents caused by swimming competitors.



INTERIOR OF AQUATIC BIRD HOUSE . . . TROWBRIDGE PHOTOGRAPH

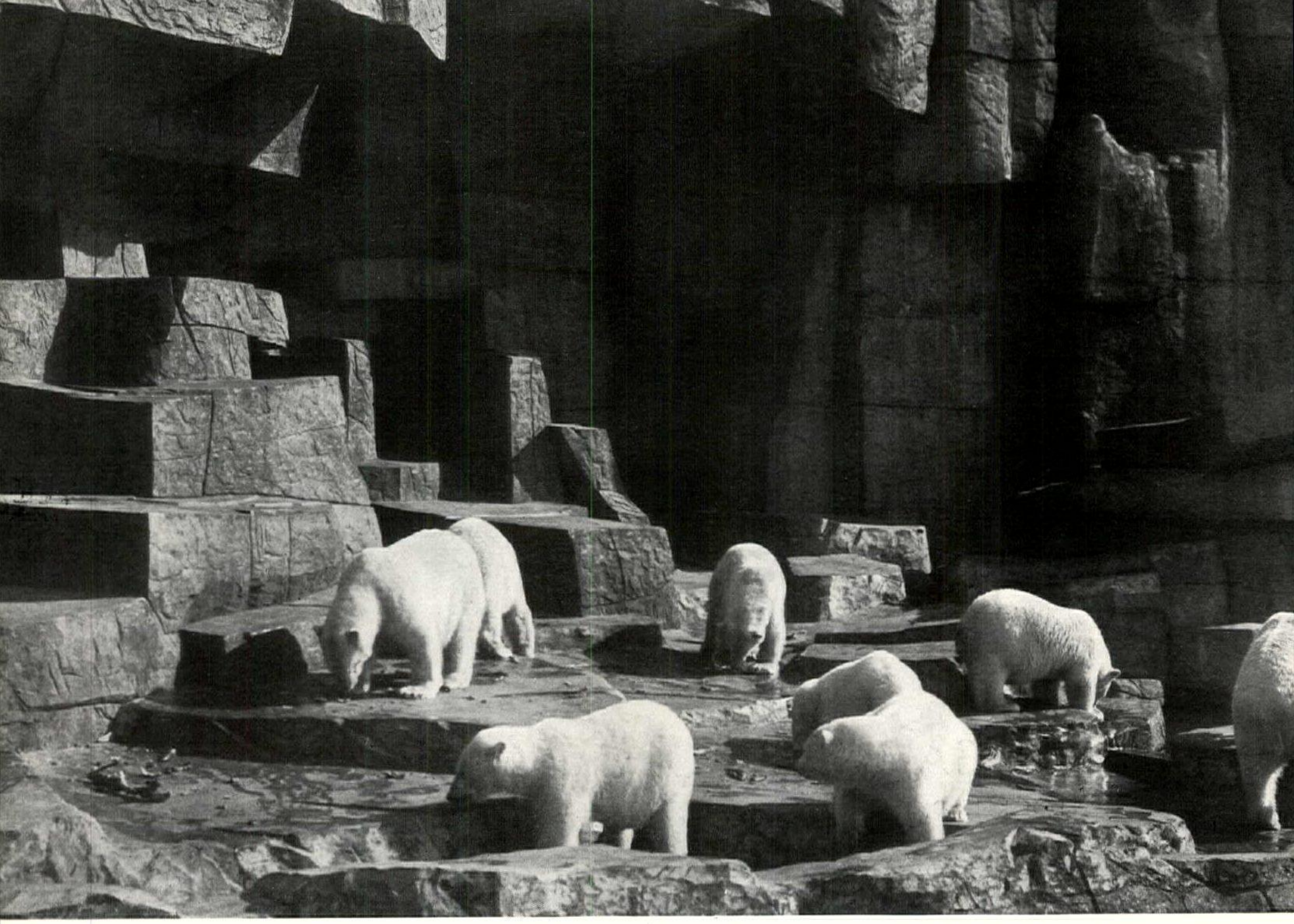
CHICAGO ZOOLOGICAL PARK

BROOKFIELD, ILLINOIS - - - EDWIN H. CLARK, INC., ARCHITECTS

Work was started in the latter part of 1926, and the park was opened to the public on July 1 of this year. Part of the site was donated by Mrs. Edith Rockefeller McCormick and other land acquired through the Cook County Forest Preserve District, comprising a total of 196 acres in Brookfield, 14 miles to the Chicago Loop.

The long narrow flat plot is heavily wooded at one end; the remainder is practically barren. A long axis through center was chosen (see plan, page 422) with a cross-axis connecting the two gates and with a large circular pool motif for the intersection of the two malls on these axes as best circulation and general plan organization. Although one of the principal requirements of this Zoo was a barless naturalistic environment, it was also considered essential to display many and rare varieties for scientific interests. This factor, plus the Chicago winters, necessitated many public exhibition houses. The wooded west end of the site offered poor building sites. An artificial lake was developed here with adjacent picnic grounds and a large future North American scene and bird sanctuary. The fill from this lake was utilized to raise the east end of the long mall. The type of architecture is Italian Peasant with common brick walls painted white, Bedford stone trim, and red tile roofs, and with fireproof construction throughout. Terrazzo floors are well pitched for easy hose cleaning. All buildings are ventilated by a system which keeps air in public space separate from cage ventilation.

The project is approximately two-thirds complete. Future work comprises landscaping, pools, roads, a possible large restaurant, additions to service group, animal hospital, wolf and fox inclosures, a large antelope house, equine house, paddocks for buffalo, yaks, etc., and sea lion pools, a pheasantry, large flying cages and numerous smaller outside flying cages, an ostrich house, monkey island, and many other small inclosures.



BEAR PITS IN CHICAGO ZOOLOGICAL PARK

BEARS: Five outside dens. Concrete moats approximately 12 feet wide. Polar bear inclosure is 100 feet wide and about 35 feet deep with large pool. Rock work constructed of concrete, gun-blown on reinforced metal lath shapes, then troweled and textured. Large pockets left in the rock for planting. All outside dens connected with inside dens by concrete passage and alcoves. One den has a concealed rear moat, so that bears can climb to top of rocks at back and be seen in silhouette against the sky.

FELINAE (lions, tigers, pumas, leopards, etc.): Four large outside barless dens, concrete moats 25 feet wide. Passages from outside dens to inside by door controlled from service space. Large Lion House, 220 feet long, concealed by rock on outside den elevation. Glass skylights over entire inside cages. Art marble floors and walls in cages.

PACHYDERMS (elephants, hippos, rhinos, tapirs, etc.): Monolithic concrete building, 225 feet long. Barless inclosures, inside and outside. Exercise corridor 12 feet wide along entire building. Moats 10 feet wide. Entire building surrounded by naturalistic rock setting, completely concealing it. Large outside pools.

AUSTRALIA (kangaroos, etc.): Building concealed in rock, moated inclosure. Beside smaller cages, there is one large group cage in building with naturalistic background. Interior cages not barless.

Future Monkey Island, Goat Hill and North American Panorama, Foxes and Wolves, Seals, and the like.

HOOFED ANIMAL INCLOSURES (deer and antelope): Moated fronts.

TROWBRIDGE PHOTOGRAPHS

BIRD GROUP: Aquatic Bird House, Parrot House, Insect House, Perching Bird House and Reptile House grouped around a large Duck Pond, viewed from a terrace.

AQUATIC BIRD HOUSE: One large group picture with naturalistic background and wading pools. Smaller inclosures around public space have thin welded wire toward the public space and glass on all sides and top, affording a view directly out of building and allowing the use of outside planting as background. Public space wall areas of aluminum. Cove lighting. Future diving tank with glass front.

PERCHING BIRD HOUSE: Entire glass roof. Large center cage, sliding wire cage fronts.

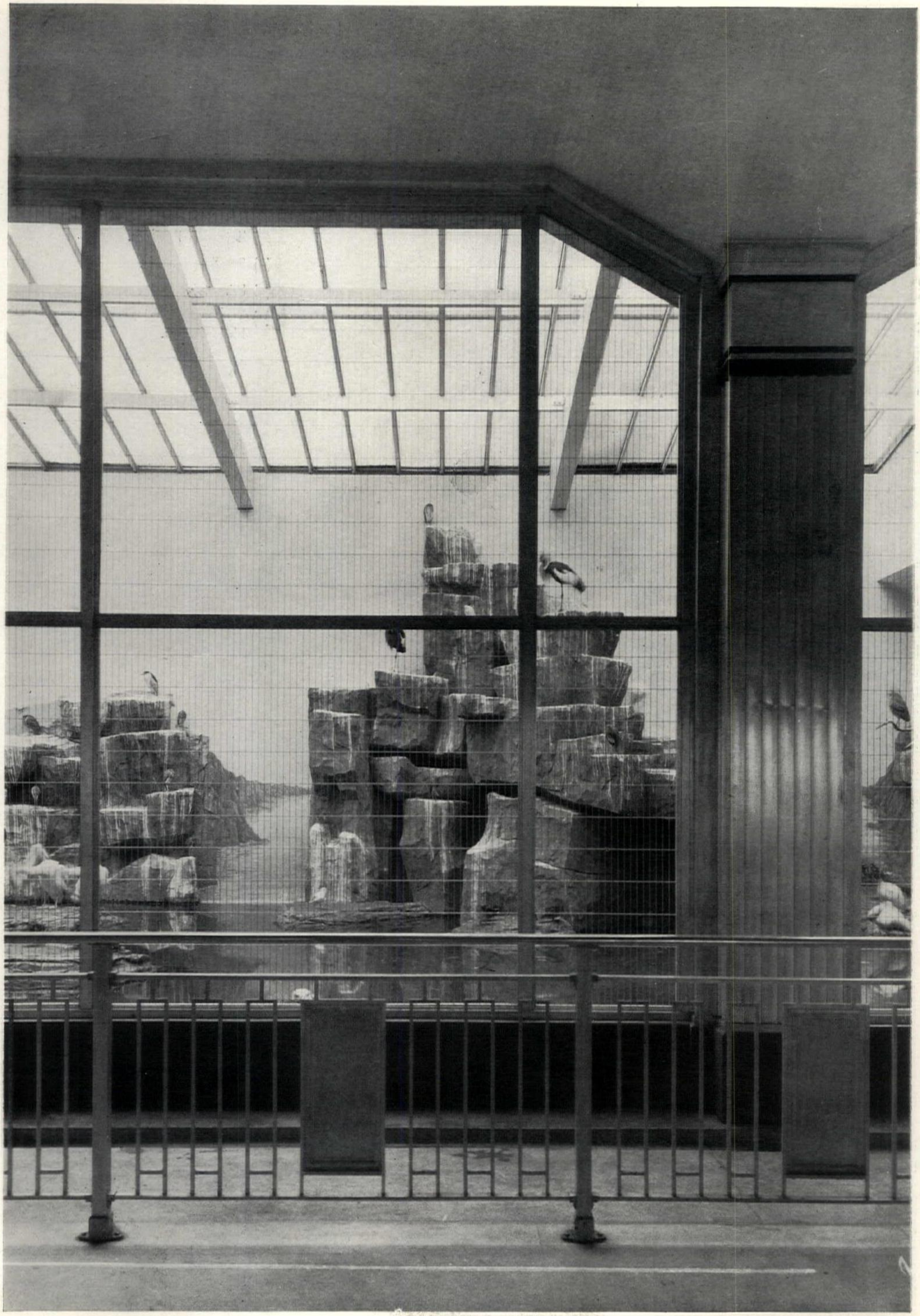
REPTILE HOUSE: Many built-in top lighted cages, approximately 3 feet square by 8 feet high with painted naturalistic backgrounds in future. Glass fronts give an appearance similar to an aquarium. Cages serviced from the rear by a service passage. Large jungle scene in center of building, with surrounding public space. Four large swamp scenes entirely glass-inclosed; barless for turtles and alligators.

PRIMATE HOUSE: Approximately 50 inside cages, roughly 6 feet square, with large cages for apes grouped together. Public space surrounds large central skylighted inclosure 35 by 80 feet, tropically planted and providing three large cages for gibbens, and a group of smaller monkeys. There are thirty-six outside cages. Each group of cages has a shift cage off service.

ENTRANCE GROUP: Power house, garages, shops, commissary and hospital for animals. All these not fully completed.

(1) Entrance. (a) Administration. (3) Comfort stations. (4) Small mammals. (5-13) Bears. (14) Refectory. (15) Lions. (16) Lion house. (17) Wolves, etc. (19) Entrance, comfort stations. (21-23) Pachyderm house. (24) Australia. (26) Antelopes. (28) Deer. (29) Equine. (32) Small antelopes. (34) Buffalo. (36) Yak. (38) Waterfowl. (41) Sea Lions. (46) Flying cage. (47) Eagles. (48) Aquatic birds. (49) Pheasants. (50) Parrots. (51) Bird house. (52) Insects. (53) Duck pond. (54) Ostriches. (55) Reptiles. (57) Primate house. (58) Monkey island. (59) Power. (60-61) Commissary. (62) Shop. (66) Hospital.

DETAIL OF AQUATIC BIRD HOUSE INTERIOR (Right)



CHICAGO ZOOLOGICAL PARK AT BROOKFIELD, ILL.

EDWIN H. CLARK, INC. ARCHITECTS

TROWBRIDGE PHOTOGRAPHS:

(1) Aquatic Bird House.

(2) Birds.

(3) Entrance Pavilion.

(4) Small mammals.

(5) Primates.

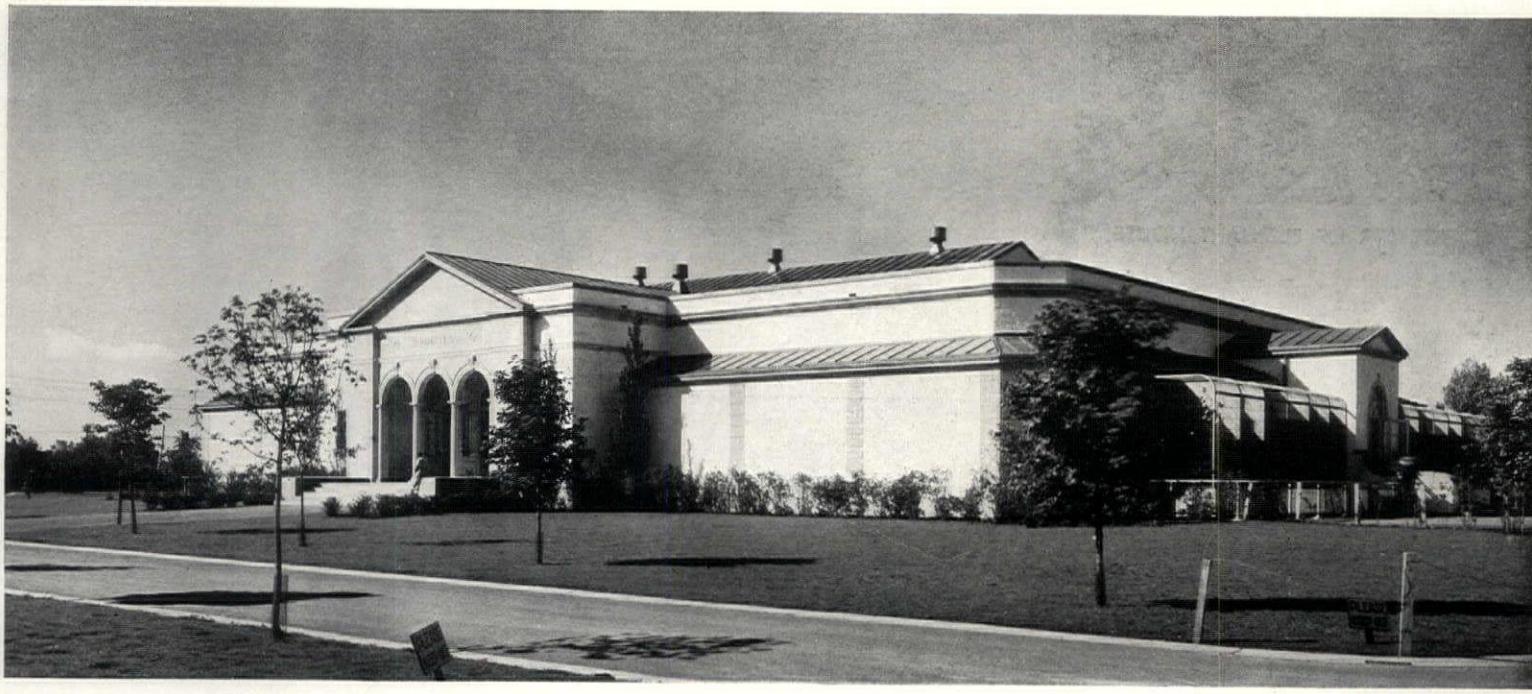
(6) View over pool towards Reptile and Bird Houses.

1

2

3

4



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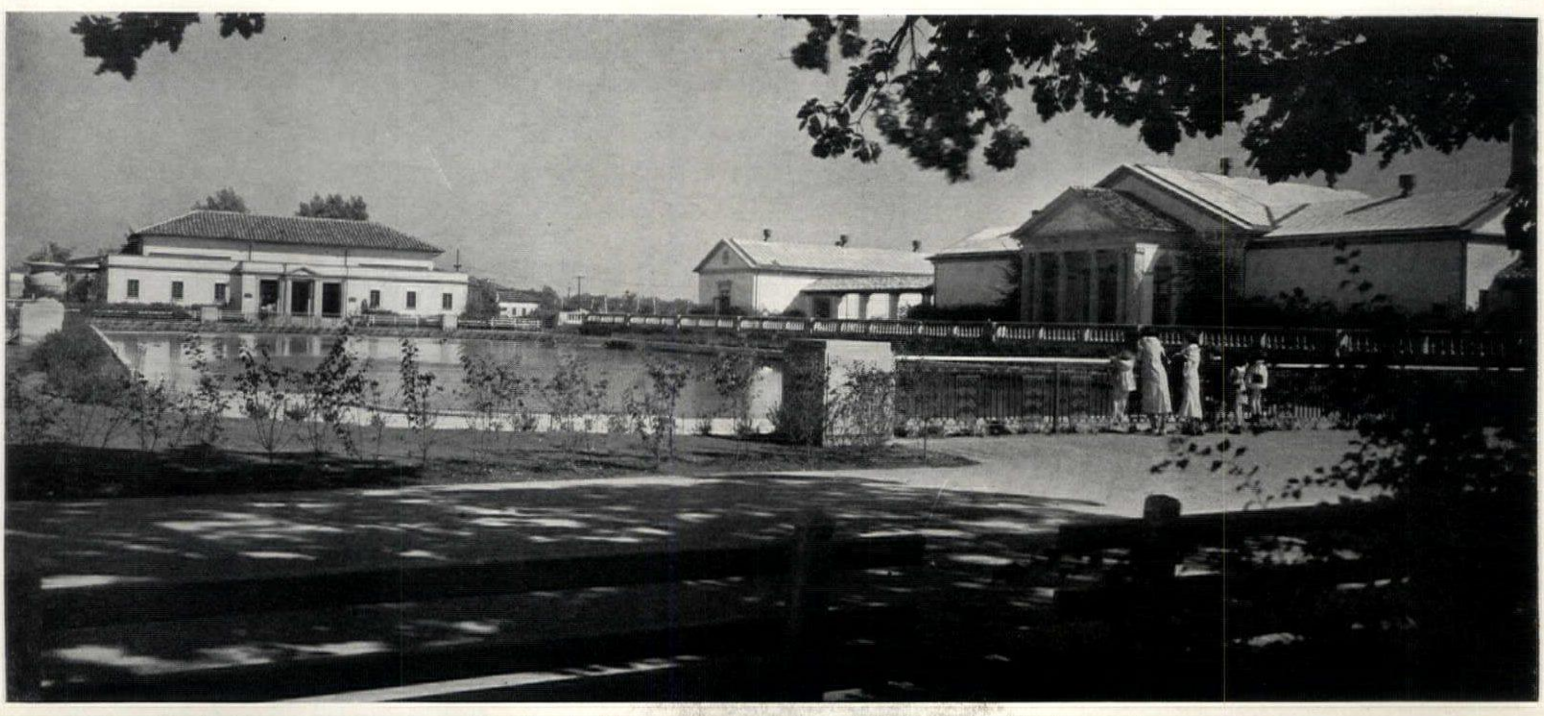


EXTERIOR OF ELEPHANT HOUSE

INTERIOR

CHICAGO
ZOOLOGICAL PARK
BROOKFIELD, ILLINOIS

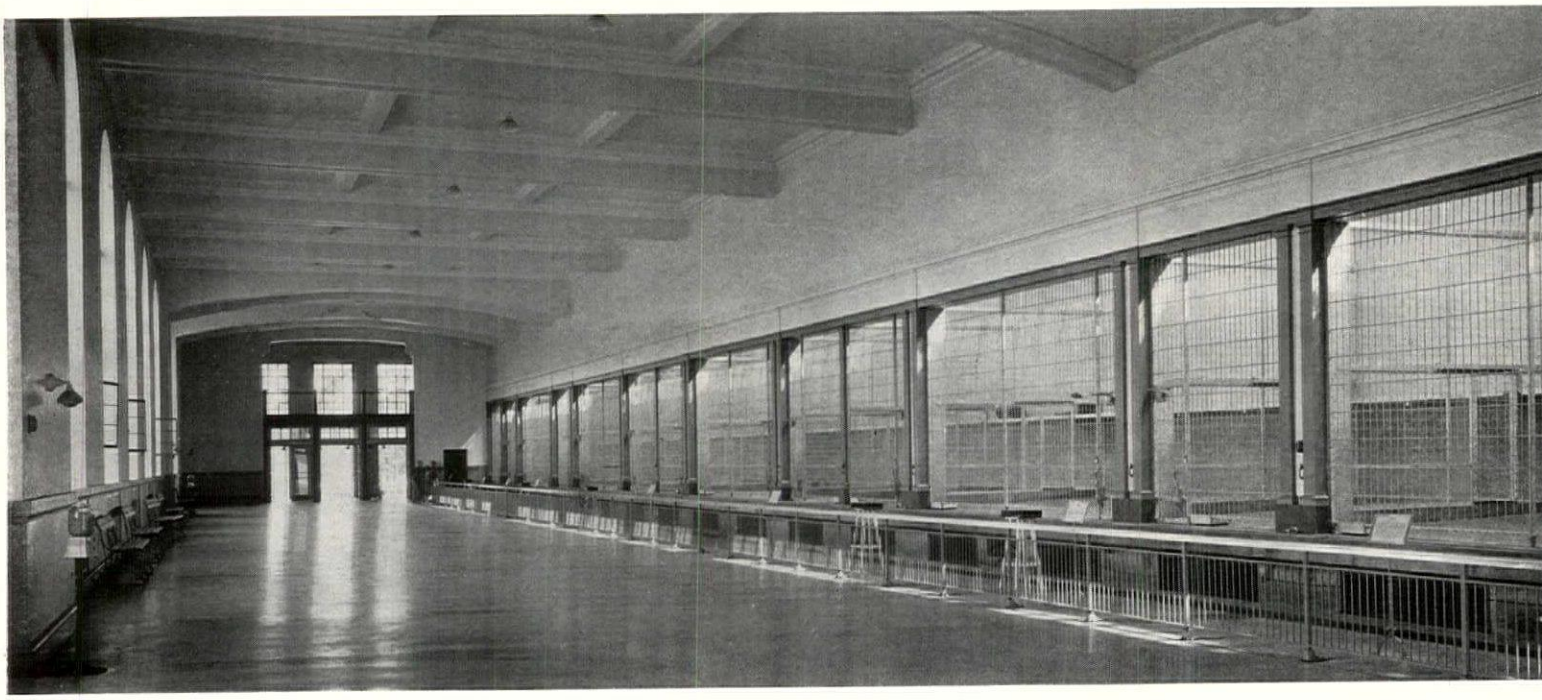
EDWIN H. CLARK, INC.
ARCHITECTS

LION HOUSE

Trowbridge Photographs

REPTILE HOUSE

1



2

3

TROWBRIDGE PHOTOGRAPHS:

(1) Exterior cages of Primate House.

(2) Interior of Lion House.

(3) Interior of Parrot House.

CHICAGO ZOOLOGICAL PARK at BROOKFIELD, ILL.

EDWIN H. CLARK, INC., ARCHITECTS

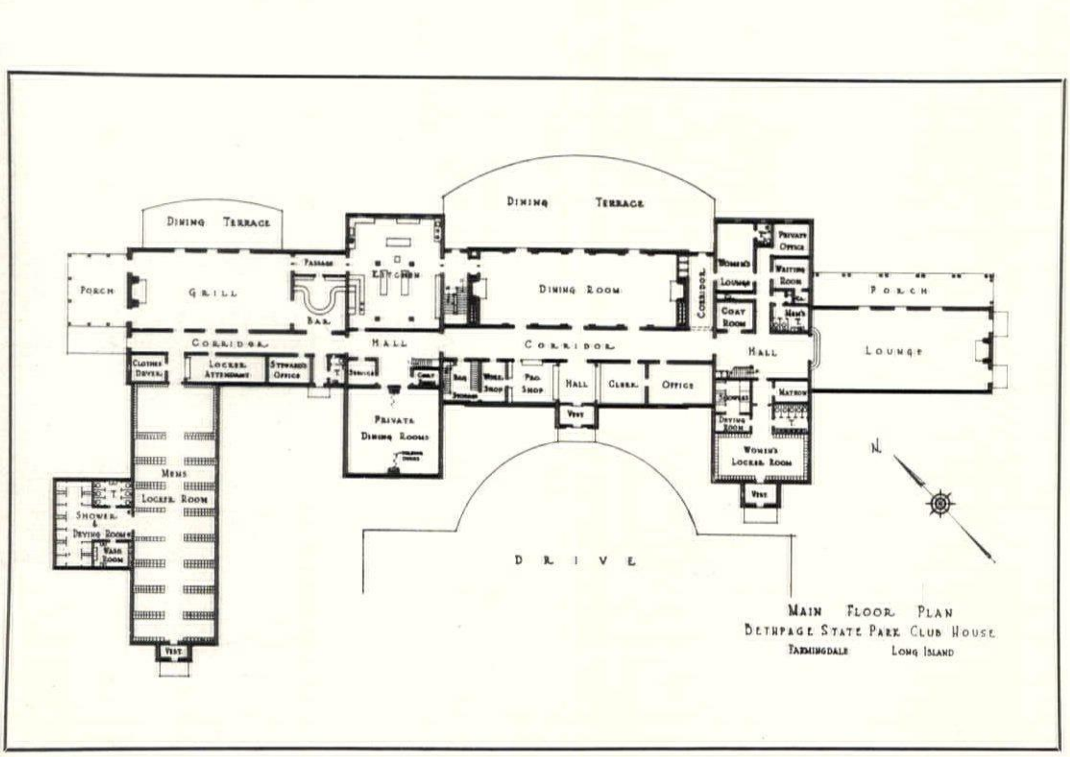
In Bethpage State Park near Farmingdale, the Long Island State Park Commission is constructing what will be one of the most modern and up-to-date public country clubs. There will be four 18-hole golf courses all centering from a new clubhouse now under construction, polo fields, bridle paths, livery stables, picnic and playground areas. The site of the new clubhouse is a commanding one: a broad, flat hilltop overlooking the golf courses.

The building is a whitewashed brick and handsplit white shingles with a roof of red cedar shingles. The main portion of the building has a total length of 358 feet, exclusive of open terraces across the east end of the lounge. From the western end of the main mass of the building, the men's locker room wing, lower than the other masses of the building, runs 96 feet southward with a width of 33 feet. The main entrance leads into a vestibule and lobby which, in turn, give access to broad corridors, all with quarry tile floors, connecting the stair halls and various rooms.

The men's locker room is to be finished with trussed high ceilings, plastered walls and ceiling panels of plaster between trusses. This room will contain 300 full height lockers and 75 smaller box lockers set up on cement bases above a rubber tile floor. There are also ample shower rooms, washrooms, and toilets.

Across the corridor from the men's locker room there is a large grill 62 by 30 feet with random pattern quarry tile floors and a high wainscot of stained pine above which acoustical plaster stained to an old soft color will cover the walls and high sloping ceiling between the heavy wood trusses stained to match the wainscoting. A large fireplace almost fills the end wall, except for the space taken out by two pairs of doors leading to a screened dining porch. Three other pairs of glazed doors open on a paved terrace along the north side of the grill. In a large alcove of the grill is a horseshoe-shaped bar. A well-equipped kitchen, 36 by 44 feet, supplemented by extensive storage, refrigeration and preparation rooms in the basement, is situated between the grill and the Canton room (the main dining room).

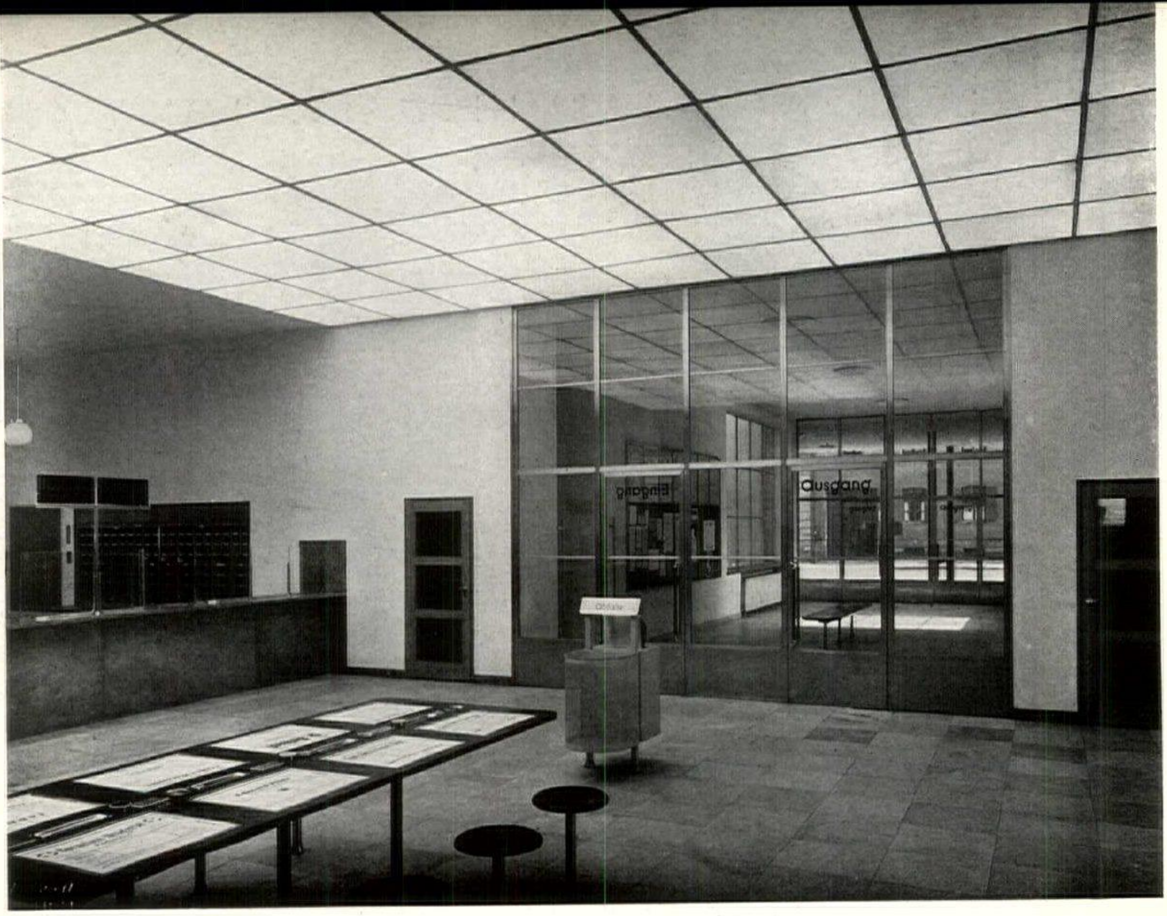
The Canton room, 75 by 29 feet, is two stories high with dormer windows in the slope of the trussed ceiling on one side and balconies from the conversation gallery in the second floor on the other side. A large fireplace with a wood mantel in old colonial style will occupy the center of each end wall. Four large windows and three pairs of French doors with sidelights and transoms on the north wall of this room open on a flagstone terrace.
In addition to these main rooms, there will be private dining rooms, lounge, card rooms and other facilities.

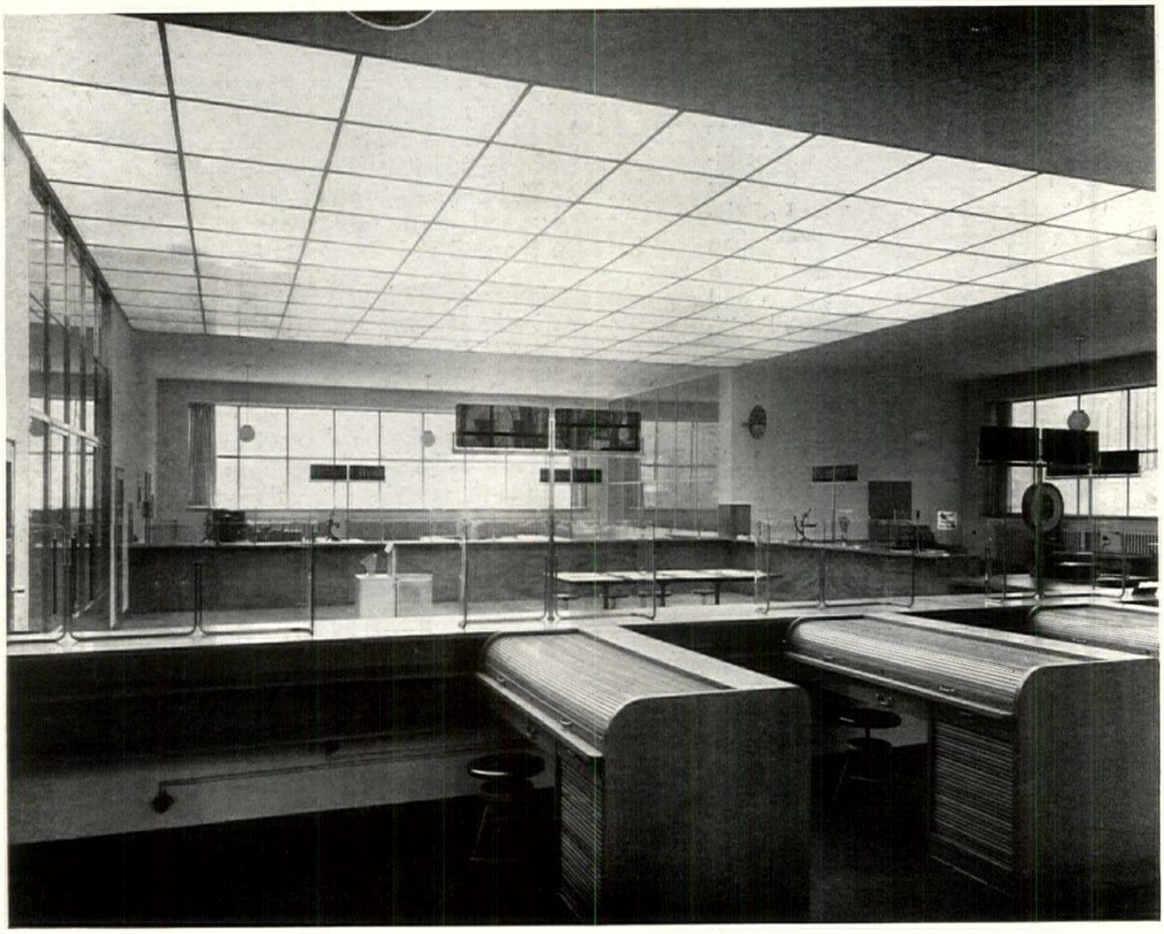


MAIN FLOOR PLAN
BETHPAGE STATE PARK CLUB HOUSE
FARMINGDALE LONG ISLAND

From a large hall at the east end of the main corridor an archway opens into the lounge which is down three steps from the hall. This room will be 70 by 31 feet with a large fireplace and mantel at the far end. There will also be a women's locker room with 56 full size lockers, and showers, dressing rooms, and toilets.

The clubhouse is under construction and will be completed in time for the 1935 golf season.





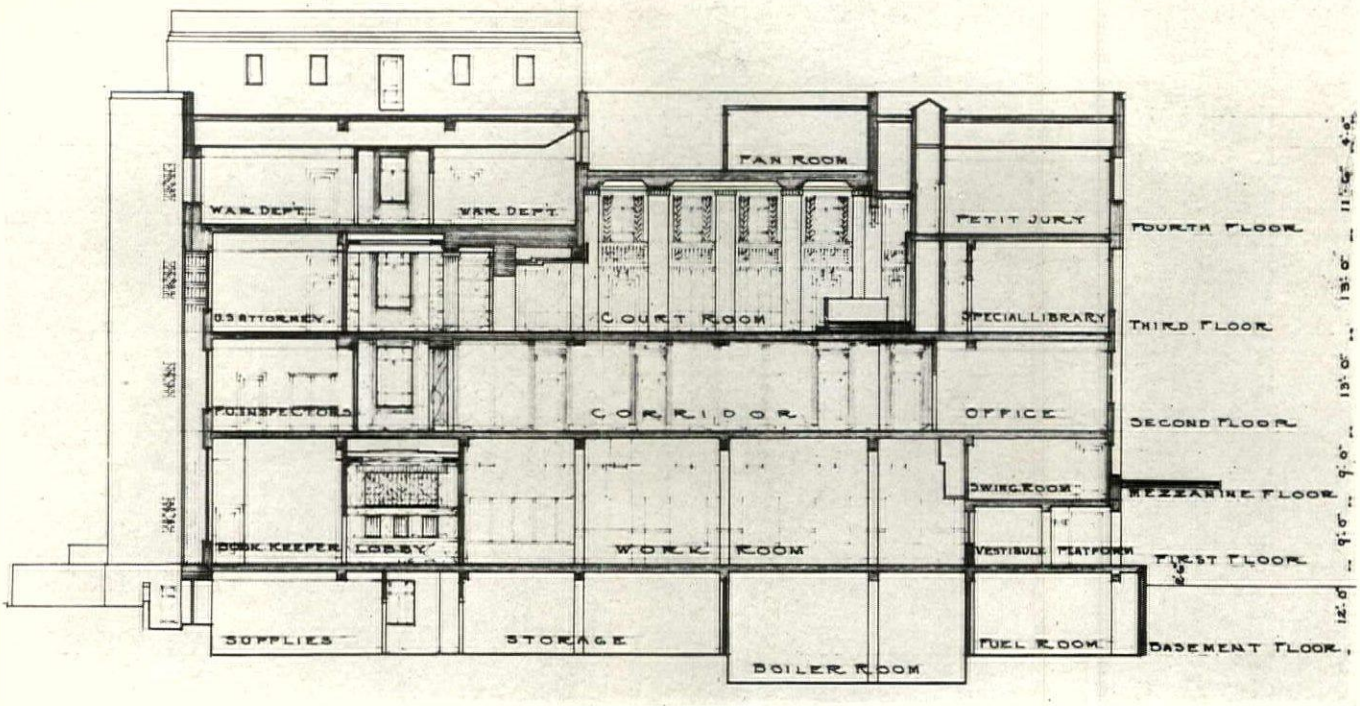
POST OFFICE IN MUNICH, GERMANY

Photograph by R. Tebbs

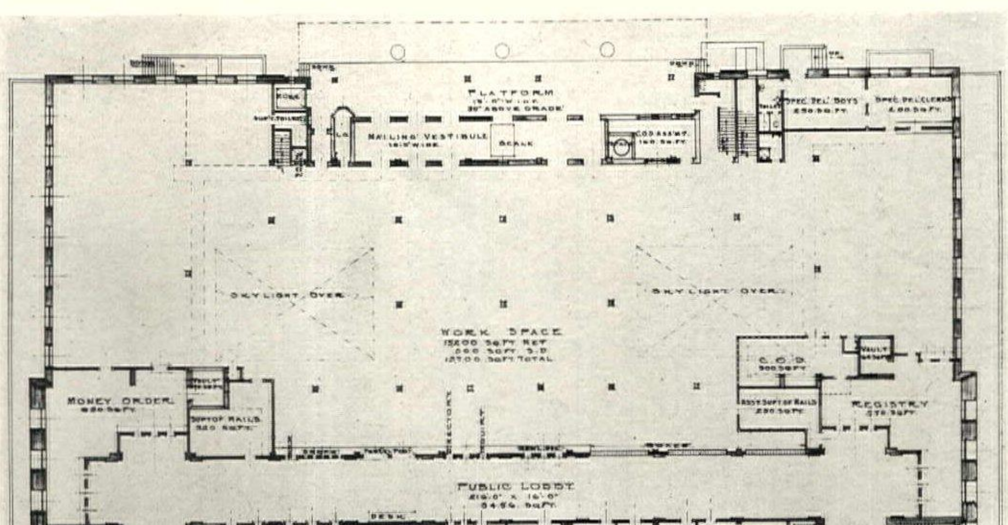
R. H. HUNT COMPANY, ARCHITECTS
SHREVE, LAMB AND HARMON
CONSULTANTS

POST OFFICE and COURTHOUSE

CHATTANOOGA, TENNESSEE


FAN ROOM
WAR DEPT.
WAR DEPT.
PETIT JURY
FOURTH FLOOR
U.S. ATTORNEY
COURT ROOM
SPECIAL LIBRARY
THIRD FLOOR
P.O. INSPECTORS
CORRIDOR
OFFICE
SECOND FLOOR
SWING ROOM
MEZZANINE FLOOR
BOOK KEEPER
LOBBY
WORK ROOM
VESTIBULE
PLATFORM
FIRST FLOOR
SUPPLIES
STORAGE
FUEL ROOM
BASEMENT FLOOR
BOILER ROOM

Photographs by R. Tebbs



R. H. HUNT COMPANY
ARCHITECTS

SHREVE, LAMB AND HARMON
CONSULTANTS

U. S. POST OFFICE AND COURTHOUSE CHATTANOOGA, TENN.

COURT ROOM

STAIRCASE

Photographs by R. Tebbs

CHATTANOOGA POST OFFICE and COURTHOUSE

R. H. HUNT COMPANY ARCHITECTS

SHREVE, LAMB AND HARMON CONSULTANTS

CHECK LIST FOR NEW CONSTRUCTION AND MODERNIZATION OF STORES

INCLUDING

DIMENSIONS OF STORE EQUIPMENT

STORE LOCATION

SURVEY TRADE AREA.

Undertake survey of volume of traffic at considered location, analyzed by hours of the day. Evaluate the purposes of traffic. Crowds of working people going to and from places of business at opening and closing time are very moderate buyers. Classify traffic according to sex. Determine increase in population. List existing retail outlets, density, shifting of retail trade area, relation of rents to estimated sales.

LOCATE DRUG STORES AND CIGAR STORES DIRECTLY IN THE TRAFFIC STREAM.

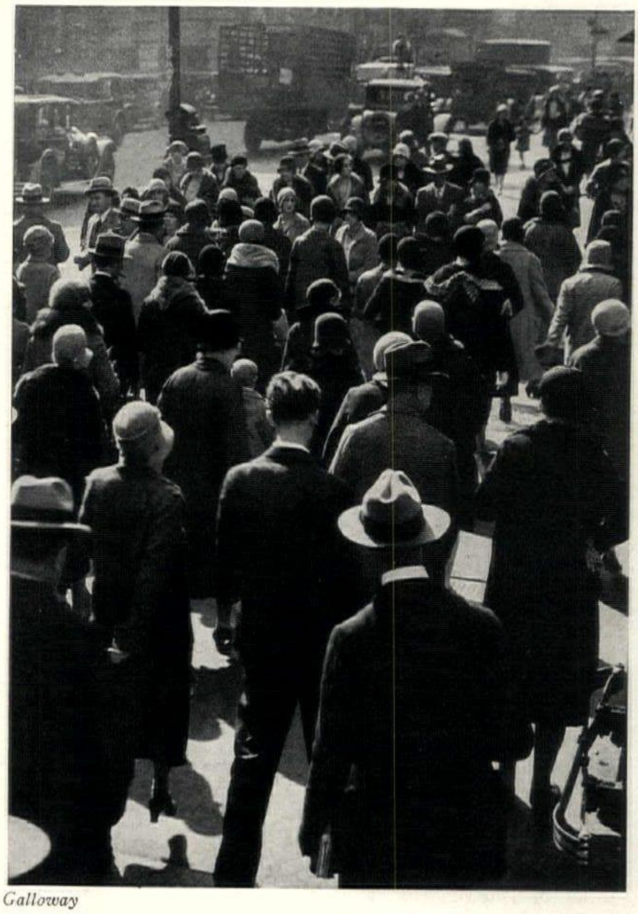
A survey of 250 drug stores located in the metropolitan area of St. Louis indicates that 84 per cent of them have a corner location.

LOCATE STORES FOR HIGHEST TRADE APPEAL.

Advantages of traffic. Transportation convenience. Today, on account of the existence of definite districts for shopping, it is considered desirable to locate near stores of similar character. This is because stores of a similar character attract a uniform type of trade. The element of competition also tends to improve salesmanship and to encourage buying. There is a convenience to the buyer by grouping. Customers desire to compare values. Location passed by the greatest number of people is most valuable for retail store purposes.

CONSIDER CORNER LOCATION.

It is estimated that corner locations are approximately 30 per cent more valuable than locations within a block. The corner location may lose its natural advantages in a crowded area.



Galloway

LOCATION OF STORES IS DETERMINED BY TRAFFIC VOLUME. ANALYSIS SHOULD BE MADE OF PASSING TRAFFIC TO INDICATE NATURE OF TRAFFIC AND TYPE OF GOODS THAT WILL ATTRACT.

CHECK LIST FOR NEW CONSTRUCTION AND MODERNIZATION OF STORES

RETAIL STORE SURVEY

Location .... Type .... Owner ....

This analysis of an architectural problem should be made by the architect with cooperation of owner in order to determine: suitability of store location; need for modernization; desirability of enlarged appeal; possibilities for store enlargement or reduction in size. This study should aid in determining the type of building and character of arrangement and design.*

TRADING AREA AND STORE LOCATION

CHECK AS INDICATED

1. Trading area, kind	Central Business	Smaller Business Area	Mainly residential
2. Has community a neighborhood newspaper?	Yes	No	
3. Main trade expected from	Transients	Mixed	Residents
4. Racial composition of customers	Mainly native white	Mainly native white, negro and foreign born	Mainly negro and/or foreign born
5. Income status of customers	High	Medium	Low
6. Competition	Easy	Bearable	Severe
7. Probable best trade periods	Day and night	Day	Night
8. Barriers blocking trade	River or canal	R. R. yard	Heavy traffic street
	Industrial obstruction	Park	
9. Store located on	Transfer point or terminal	Bus or street car line	Main motor traffic artery
10. Rental levels of stores in area	Low	Satisfactory	High
11. Traffic regulations affecting trade	None	Parking restrictions	One-way street
12. Traffic density { Auto, street car and bus	High	Medium	Low
{ Pedestrian	High	Medium	Low
13. Special influence on type and extent of trade	School	Institution	Theater
	Playground		
14. Surrounding stores { class	High	Middle	Low
{ coverage by kind of stores	Complete	Only partial	Very limited
15. Probable future of area	Growing	Static	Receding

EXTERIOR OF THE STORE

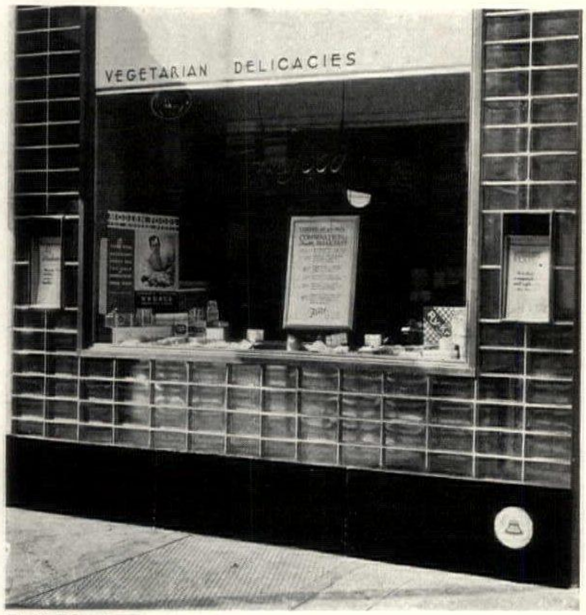
1. Prominence	Prominent		Obscure
2. Exterior lighting, signs or other	Good		Bad
3. City street lighting	Bright		Dim
4. Store located on best side of street?	Yes		No
5. Store located on a corner?	Yes		No
6. Main entrance at corner?	Yes		No
7. Side entrance?	Yes		No
8. Is entrance	At street level?	Up or down ramp?	Up or down steps?
9. Type of door?	Double	Single	Revolving
10. Windows, structure and character	Good		Bad
11. Floor of windows	Too low	Too high	O. K.
12. Window backs	Low	High	Closed
13. Window lighting	Adequate, Indirect	Adequate, Visible Lamps	Inadequate
14. Cellar gratings, trap doors, etc., under windows	No	Yes	

INTERIOR OF THE STORE

1. General arrangement	Open	Satisfactory	Crowded
2. Ceiling height	High	Average	Low
3. Illumination { Artificial light	Excellent	Adequate	Unsatisfactory
{ Daylight	Excellent	Adequate	Unsatisfactory
4. Points of congestion { structure	Good	Fair	Poor
{ arrangement	Good	Fair	Bad
5. Visibility from point to point in store	Good	Fair	Bad
6. Permanent obstructions to interior traffic	Yes	No	
7. Ventilation	Good	Fair	Bad
8. Arrangement of fixtures	Good	Fair	Poor
9. General character of:			
(a) Fixtures { Type	Modern	Satisfactory	Obsolete
{ Quality	Fine	Good	Poor
{ Usefulness	Good	Fair	Poor
(b) Equipment { Type	Modern	Satisfactory	Obsolete
{ Quality	Fine	Good	Poor
{ Usefulness	Good	Fair	Poor

Sketch general shape of floor space showing windows, doors and placement of fixtures with estimated main dimensions. Specifically note structural obstacles such as pillars, pilasters, walls, unequal floor levels, unfortunate angles and elbows.

*Adapted from Chart No. 6, U. S. Department of Commerce.



F. S. Lincoln

GLASS BRICK, USED TO FACE STORE BUILDING, WITH ADVANTAGES OF INCREASED INTERIOR LIGHT AND NO REQUIRED WALL FINISH. GLASS BRICKS ARE DIMENSIONED 5" x 10" x 2¾", 5" x 5" x 2¾"; VACUUM GLASS BRICK ARE 5" x 5" x 2¾"; APPROXIMATE COST, 60¢ PER SQUARE FOOT.

Hedrich-Blessing

A MODERNIZED BAKE SHOP, CHICAGO. GORDON S. GUNDLING, DESIGNER. INTERIOR WALLS ARE PAINTED IN CANARY YELLOW AND WHITE, TRIMMED WITH CHARTREUSE GREEN AND BLACK. LETTERING IS IN BURGUNDY RED.

GENERAL

REPAIR ROOF.

CHECK SKYLIGHTS FOR REFLASHING, REPAINTING, GLAZING.

REPAIR CRACKS AND JOINTS IN MASONRY WALLS.

REMOVE CORNICES, SCROLL WORK, CARVINGS AND OTHER DECORATIVE NON-ESSENTIALS.

INCREASE GLASS AREA OF STORE FRONT.
Permitting view of selling space from sidewalk.

REDUCE EXCESSIVE DEPTH ORDINARILY GIVEN TO WINDOWS.
Depth of show windows varies from 3' for jewelry stores to 4' - 4½' for men's stores.

REMOVE STEPS AT ENTRANCE.
Where there are differences in street level and floor level, gently sloping ramps are preferred.

STUCCO EXISTING EXTERIOR BRICKWORK TO SMOOTH, NON-DUST GATHERING SURFACE.

APPLY NEW AND SMOOTH MATERIALS TO STORE EXTERIOR.
Structural glass; stainless metal; tile.

ADD OR REPLACE STORE SIGN.
Legibility; neon tube type; viewed by traffic.

ADD VENETIAN BLINDS TO SHOW WINDOWS.
Facing South and West.

INSTALL NEW SHOW WINDOWS.
Use low exterior plate glass windows with head not in excess of 8' above sidewalk with regard for vision of passers-by; dual type show window; aluminum, bronze or stainless steel frame.

ADD VENTILATION TO SHOW WINDOWS.

INCREASE PROTECTION OF MERCHANDISE FROM SUNLIGHT AND HEAT.
Awnings hung so as to permit escape of heated air; curtains.

ADD PARKING SPACE.
The idea has been advanced "that every building should provide its occupants with parking space, just as is now done with respect to heat, light, elevator service, drinking water." Parking space for customers is given without charge by many store owners of the middle and far west. A merchant referring to his garage in connection with his store reported 26,000 cars parked during the first year and 43,000 cars during record year—a 65 per cent increase during the record year of its operation.

PROVIDE FOR LOADING OF DELIVERY AUTOS.

STORE INTERIOR

REARRANGE STORE INTERIOR FOR CONVENIENCE TO PURCHASER.

There are three basic principles in modern store arrangement, particularly for the small store. These are: (1) Open display, (2) Keeping related items of merchandise together, and (3) Properly placing impulse and demand merchandise within the store.

REDUCE LENGTH OF STORE TO IMPROVE SUPERVISION.

WIDEN STORE TO PERMIT WIDER OR ADDITIONAL AISLES.

4′ minimum aisle width; 6′ preferable width.

PAINT INTERIOR WALLS WITH LIGHT-REFLECTING SURFACES.

SUBORDINATE DISPLAY FACILITIES TO MERCHANDISE.

Display levels determined by lines of vision, nature of merchandise and ease of handling. Equipment easily moved, not obstructive to view of store.

USE COLOR TO FOCUS ATTENTION ON MERCHANDISE.

Neon signs; color lighting; wall show windows.

LOWER OR RAISE STORE FLOOR TO SIDEWALK LEVEL.

LOCATE WRAPPING COUNTERS AT REAR OF STORE.

RELOCATE DEMAND AND IMPULSE GOODS SO AS TO CONTROL CIRCULATION.

PROVIDE DRINKING FOUNTAIN, TELEPHONE SERVICE, LOCKERS.

USE FLAT DISPLAYS AT CENTER OF STORE, WHEREVER POSSIBLE, TO INCREASE VISIBILITY OF MERCHANDISE.

DISCARD FIXTURES DESIGNED FOR PRODUCT OF A SINGLE MANUFACTURER.

LAY A NEW FLOOR.

Tile, terrazzo, linoleum.

PROVIDE ADDITIONAL STORAGE SPACE.

REFINISH WALLS WITH SMOOTH CEMENT FINISH OR OTHER SANITARY MATERIAL.

Hard plaster painted; washable fabric; plywood; flexwood.

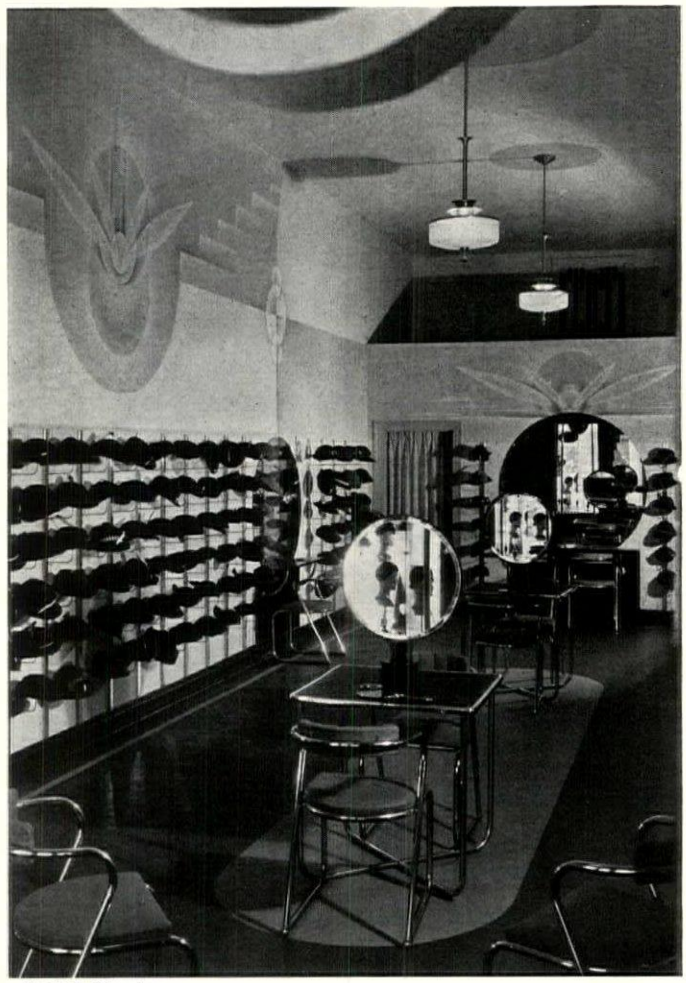
REFINISH CEILING TO IMPROVE LIGHTING.

Flat paint, white or pale shades.

PROVIDE ADDITIONAL BUILT-IN SHELVING.

DAMPPROOF BASEMENT WALLS.

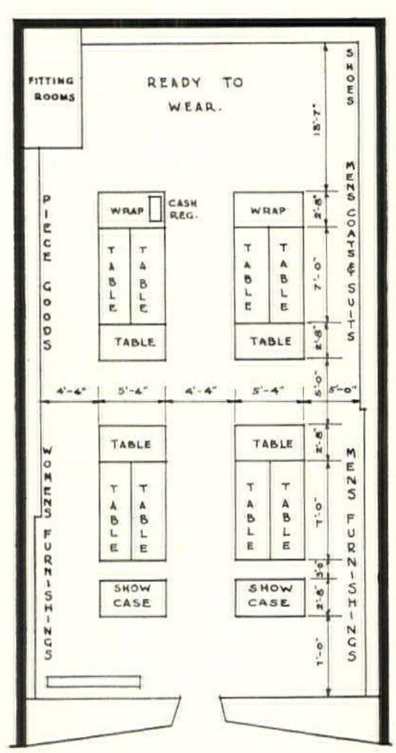
ADD OFFICE WITH LOCATION FOR SUPERVISION.

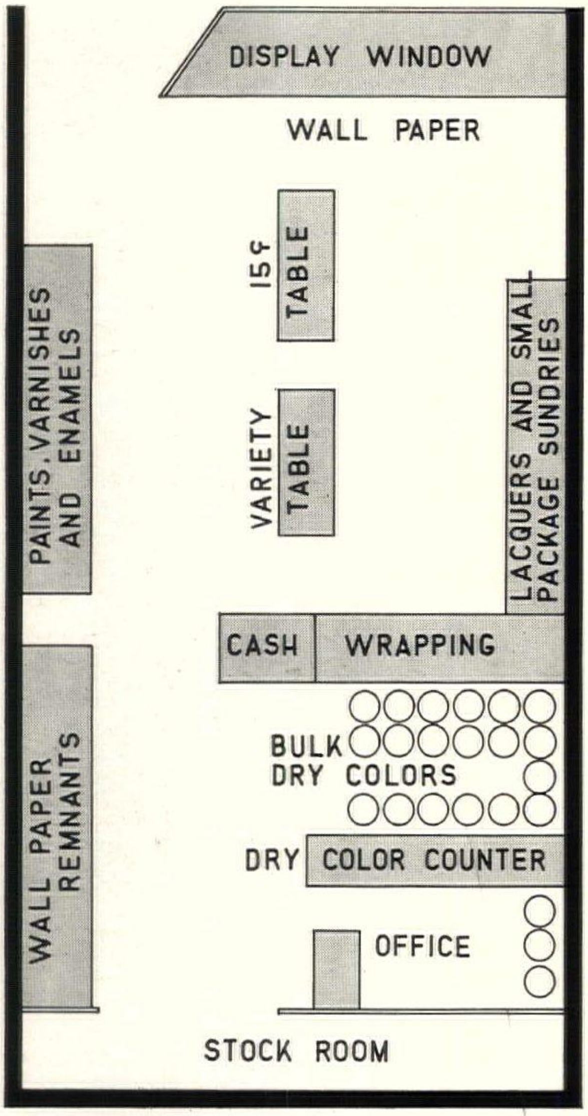


Hedrich-Blessing

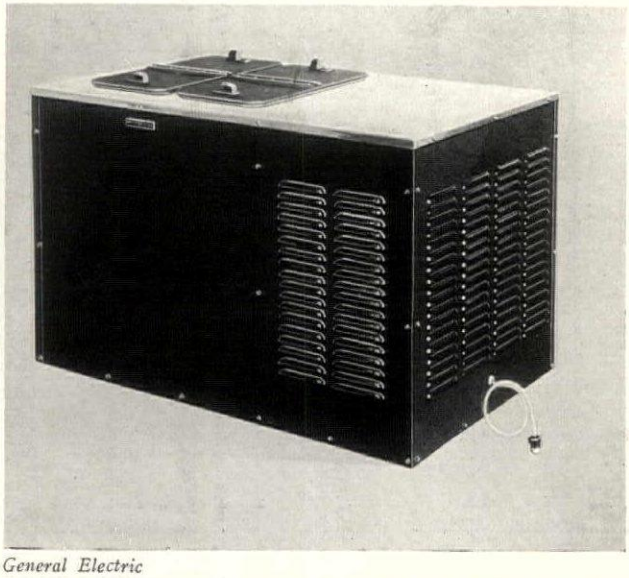
MILLINERY STORE WITH ORDERLY DISPLAY OF HATS ON RACKS CONVENIENT FOR SELF-SERVICE. FITTING STANDS SERVE AS FURNISHING OF INTERIOR. GORDON S. GUNDLING, DESIGNER.

PLAN OF SMALL GENERAL CLOTHING AND DRY GOODS STORE FOR TOWN OF MODERATE SIZE. A. J. LUTHER & CO., CHICAGO.





ARRANGEMENT FOR A SMALL PAINT STORE. FOUR INTERESTING FEATURES: (1) A 15¢ TABLE; (2) A VARIETY TABLE; (3) BULK DRY COLORS IN DEPARTMENT BY ITSELF; (4) WALLPAPER REMNANT DEPARTMENT. THE REGULAR PAINT, VARNISH, AND ENAMEL STOCK IS DISPLAYED ON OPEN SHELVES.



General Electric

COMPACT AND SANITARY ICE CREAM STORAGE UNIT.

STORE INTERIOR

REPLACE OLD PARTITIONS WITH NEW FLUSH TYPE, GLAZED.

ADD FIRE-RESISTANT VAULT.

Protected steel or reinforced concrete frame with reinforced concrete panels 10 inches thick; brick or plain concrete panels 12 inches thick for six hours heat-resistance.

INCLOSE ALL SHAFTS.

Concrete; 8″ brick; 4″ tile.

REMOVE WALL SHELVING THAT IS OUT OF REACH.

Upper deck wall shelving is of doubtful value, as the merchandise cannot be clearly seen or reached by either the customer or the clerk. Merchandise displayed on open shelving invites more attention than that which is inclosed.

SURFACE FLOOR WITH SANITARY MATERIAL.

Terrazzo, marble, travertine, tile, linoleum. Space behind counters and in offices may be cement covered with linoleum. Where fixtures are placed on flooring which requires washing all bases to cases should be of material to withstand this treatment.

INSTALL PAPER AND TRASH CHUTES.

Provide space below for accumulation; provision for salvaging by shredding, baling; also burning of all trash.

INSTALL THERMOSTATIC CONTROL FOR HEATING.

PROVIDE REST ROOM FOR CUSTOMERS.

Washroom facilities; telephone; radio.

INSTALL ADEQUATE SPRINKLER AND STAND-PIPE PROTECTION.

PROVIDE OTHER FIRE-FIGHTING EQUIPMENT.

Sand, buckets, fire extinguishers, axes, etc., placed in hall with stand-pipe in glazed cabinet. Consult requirements of the National Board of Fire Underwriters.

PROVIDE FIRE EXITS AT REMOTE SIDES OF BUILDING.

Doorways at least 3′ wide.

ADD WASHROOM FOR EMPLOYEES.

Usually placed in back of the utilities where noise and confusion can be kept away from the selling area. The number of fixtures provided for employees determined on basis of allowing one water-closet for every eight persons; one wash basin for every ten persons.

PROVIDE LOCKER ROOM AND LOCKERS FOR EMPLOYEES.

Usually placed in basement.

PROVIDE NURSERY AND PLAYROOM FOR CHILDREN OF CUSTOMERS. (DEPARTMENT STORES.)

Provisions for slides, swings, sand piles, merry-go-round. Roof space preferred.

BASIC DIMENSIONS FOR STORES

CEILING HEIGHTS FOR STORE BUILDINGS ARE NOT SUFFICIENTLY STUDIED AND NUMEROUS FAILURES ARE DUE TO THIS FAULT. THE HEIGHTS INDICATED BELOW, WITH SLIGHT MODIFICATIONS, WILL PROVE SATISFACTORY.

Basement: 10 to 14 feet clear.

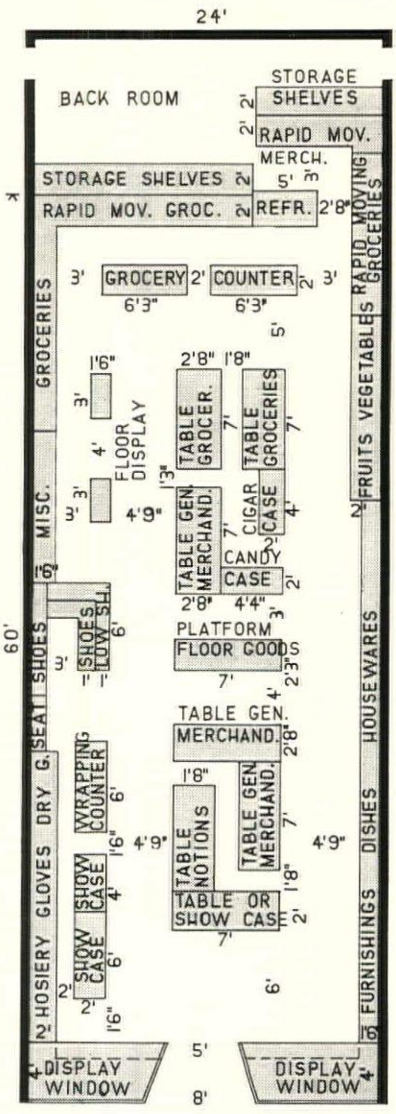
Main selling floor: 12 to 14 feet clear; in the case where mezzanines are installed, 18 to 20 feet in clear.

THE SKETCH ON PAGE 442 SHOWS A TYPICAL SCHEME OF FIRST FLOOR FIXTURES.

Back fixtures take up the space B, and the show cases and counters, the space C. The clerk only has access to the stock-carrying back fixture and works entirely in the aisle designated at D, the customer being confined to the aisle A. The back fixture varies in depth, depending upon the merchandise carried, from 18″ to 33″, the tendency being to use, where possible, a shallower fixture. The aisle between the back fixture and the counter (space C), should be a minimum of 22″ and a maximum of 27″, depending upon (1) whether drawers or shelving are used, (2) the number of clerks in a given section, and (3) the merchandise carried.

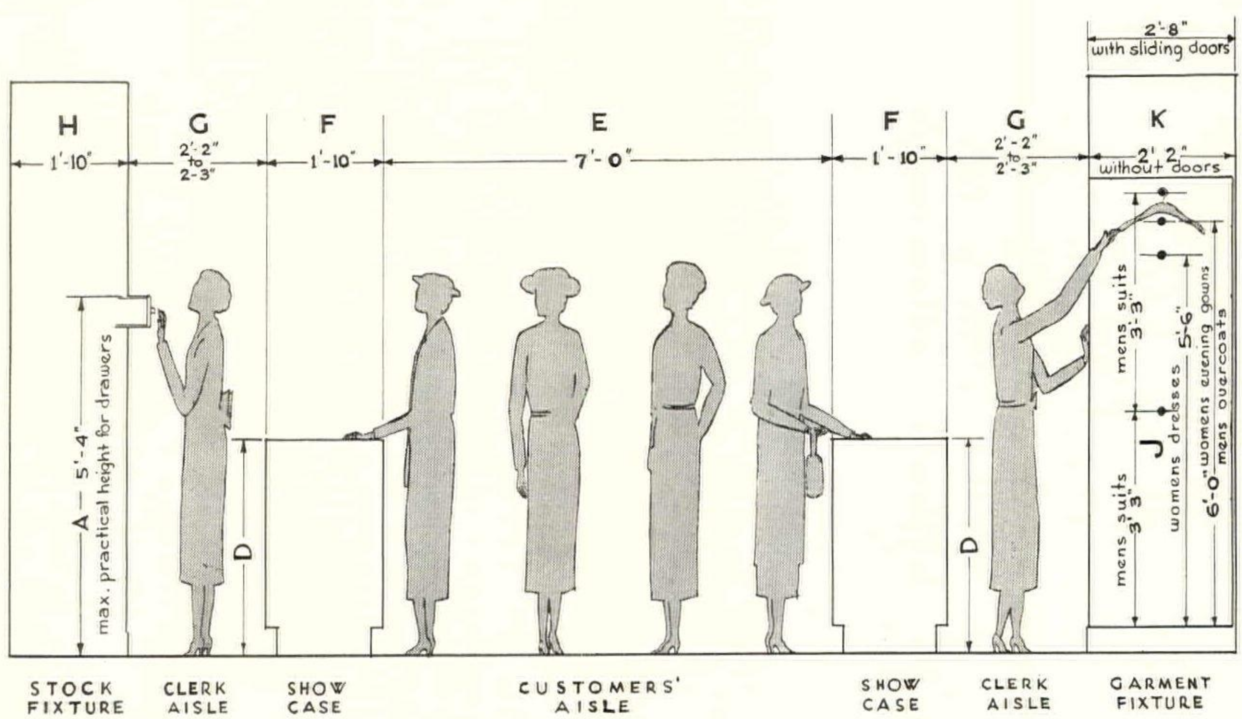
The depth of the counter, dimension C, as a rule varies from 18″ to 30″, but 24″ is the usual size. The deeper counters are occasionally used in piece goods. The height of the counter will vary from 34″ (if customers are to be seated) up to a maximum height of 40″; 38″ being the average height. There are certain sections,

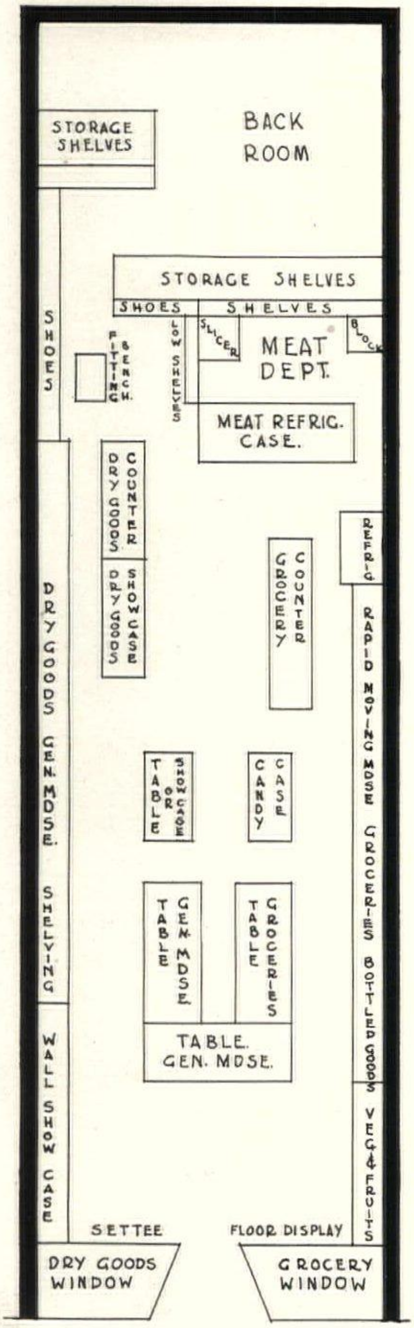
PLAN OF SMALL DEPARTMENT STORE FOR RURAL COMMUNITY. BECAUSE OF LOW TABLE THERE IS CLEAR DISPLAY VISIBILITY AND THE INVITATION TO EXAMINE GOODS BY CUSTOMER. BY CARL W. DIPMAN OF "THE PROGRESSIVE GROCER."



BELOW

BASIC DIMENSIONS FOR AISLES, CABINETS, COUNTER AND STORAGE HEIGHTS DESIRABLE FOR STORES. COURTESY, GRAND RAPIDS STORE EQUIPMENT CO





PLAN OF STORE, 18'-0" WIDE, FOR SALE OF GROCERIES AND GENERAL MERCHANDISE. NOTE ALMOST COMPLETE ABSENCE OF COUNTER SPACE.

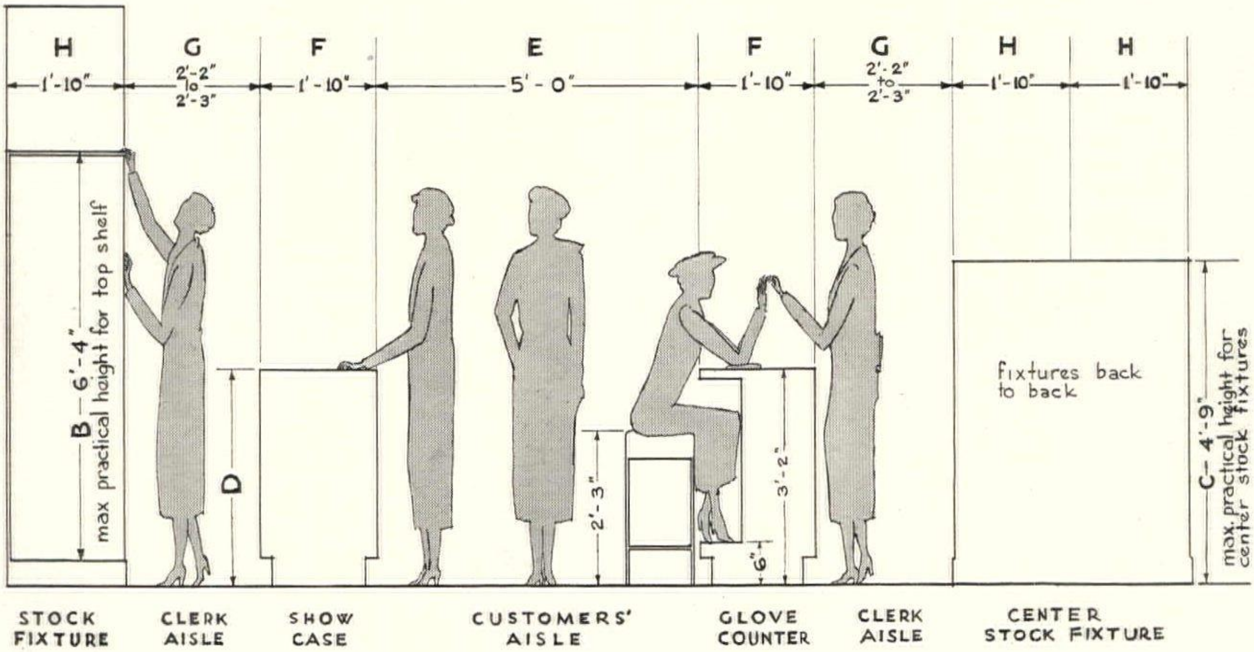
however, which require a special type of equipment; for example, the glove department where the clerk has to fit the glove on the customer's hand.

The back fixture, when placed against the wall, is usually carried to a height of from seven feet to as high as ten or twelve feet; the upper part being used purely for display features. The 7-foot maximum height for shelving is preferred as the trend is definitely away from high shelving. When placed in the center of the floor it is usually kept below five feet in height to permit of visibility over the whole floor. In the center islands, two such back fixtures are placed back to back, which with their counters form an island, of a type we will call X (figure I). The over-all width of such an island (dimension E) will vary from a minimum of ten feet to a maximum of thirteen feet, the wall fixtures over-all being half of this dimension in depth.

TABLES FOR DRY GOODS AND ACCESSORIES.

The standard display table recommended by the Wholesale Dry Goods Institute is 30"-32" x 7' 0". These sizes are recommended because they are adaptable to a varied island arrangement. The table of 30" width allows slightly more room in which the clerk operates. The Institute favors the table with an open back, sliding door front and removable rub rail (sometimes called bargain-rail) because it can be used for displaying any type of merchandise and can be used either in the island arrangement or with tables placed flush against the wall (Grant Stores principle).

Two types of glass table dividers are procurable—bulb edge glass and crystal edge glass. Dividers are kept in place by use of metal clips.



EQUIPMENT FOR STORES

REPLACE EXISTING WOOD COUNTERS AND SHOW CASES WITH NEW AND SANITARY EQUIPMENT.

Enameled steel; white or pastel shades. Full salvage value.

INSTALL COMPACT LOCKERS FOR STORAGE OF GARMENTS FOR CLERKS AND FOR STORAGE OF OFFICE SUNDRIES.

HAVE ALL EQUIPMENT IN STORE CONFORM AS TO FINISH AND COLOR.

INSTALL CASES WITH BUILT-IN REFRIGERATION.

For meats, fish, fruits and vegetables.

ELIMINATE ALL UNNECESSARY PROJECTING SURFACES, MOLDINGS, ETC.

HEATING AND PLUMBING

CONVERT RADIATING HEATING INTO CONVECTION SYSTEM WITH BUILT-IN CABINETS.

INSTALL HOT WATER HEATING SYSTEM.

Coal, gas or electric.

ADD FORCED CIRCULATION TO AN OLD WARM AIR SYSTEM.

Silent electric blower.

INSTALL AUTOMATIC FEED SYSTEM OR OIL BURNER.

Silent oil burner; gas or electric ignition.

REPAIR OR REPLACE BOILER WITH MORE EFFICIENT TYPE.

Flush enamel insulated casing; automatic damper; fuel economy; ample fuel capacity; convenient clean-out.

INSULATE BOILER.

Asbestos-cement coats; magnesia blocks; asbestos felt.

REPAIR INSULATION OF HEATING PIPES.

Corrugated asbestos paper; asbestos felt.

FIREPROOF WALLS AND CEILING OF HEATER ROOM.

Asbestos-cement board; sheet metal; stucco on metal lath.

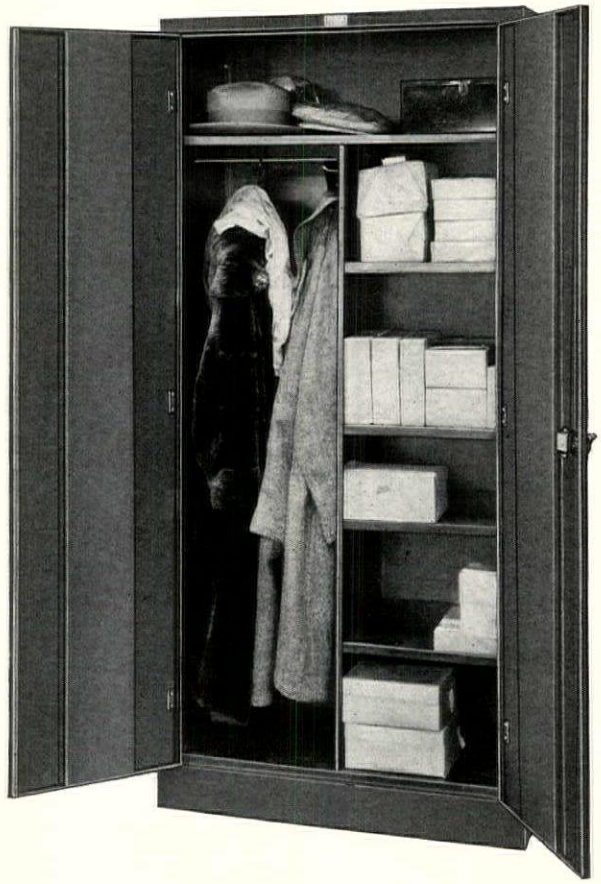
ADD NEW RADIATORS OR REPLACE OLD ONES.

Re-estimate amount of radiation with consideration of exposure, window area, wall insulation.

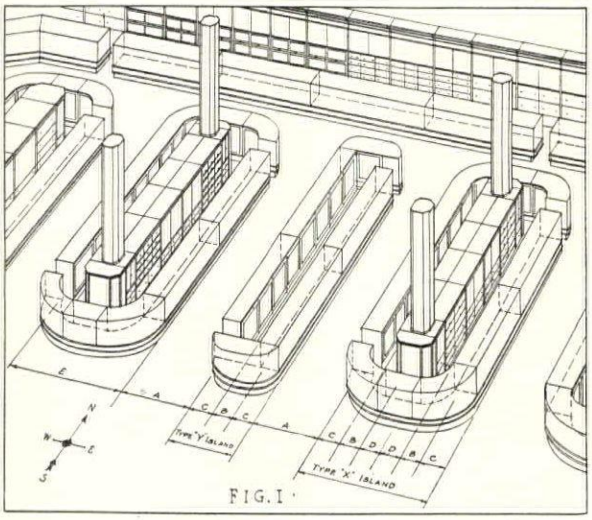
INSTALL CENTRAL OR INDEPENDENT AIR CONDITIONING.

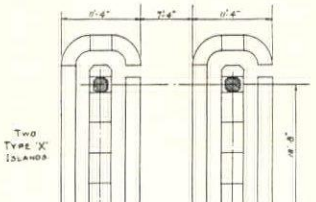
REPLACE CORRODED PIPING WITH MODERN, DURABLE TYPE.

Copper or brass pipe; flexible copper tubing.



COMBINATION LOCKER AND STORAGE CABINET. 36" x 18" x 78". DOORS LATCH SECURELY AT TOP, CENTER AND BOTTOM. ALL-STEEL EQUIPMENT COMPANY.





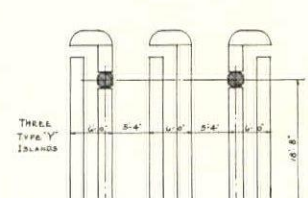


FIG. I, TYPICAL SCHEME OF FIRST FLOOR FIXTURES FOR A DEPARTMENT STORE. FIGS. II AND III, PLANS OF FIXTURES SHOWING RELATION TO COLUMN SPACING. GRAND RAPIDS STORE EQUIPMENT CORP.

Hedrich-Blessing

WIDEN'S BAKERY, CHICAGO, ILLINOIS.
GORDON S. GUNDLING, DESIGNER.

GENERAL COLOR SCHEME OF THE INTERIOR: CANARY YELLOW AND WHITE TRIMMED WITH CHARTREUSE GREEN AND BLACK; LINOLEUM ON FLOORS IS IVORY AND GREEN; THE UPHOLSTERY SEAT IS COVERED IN AN IVORY SHADE. SPILLED RING LIGHTING WAS USED FOR ILLUMINATION OF ALL OF THE CASES. A UNIT HEATER WAS SUBSTITUTED FOR DIRECT RADIATION.

STORE LIGHTING

PREPARE PLAN FOR LIGHTING WITH ASSISTANCE OF COMPETENT ILLUMINATION ENGINEER.

INSTALL CONTROLLED DIRECT LIGHTING.

Level of illumination as high as 50-foot candles is justified in the area near the entrance. This high intensity need not be carried out throughout the store. Most stores require illumination on vertical surfaces rather than horizontal.

ARRANGE LIGHTING EQUIPMENT WITH DIRECT REFERENCE TO THE LINES OF DISPLAY ON EACH SIDE OF STORE AND LINES OF DISPLAY EQUIPMENT DOWN THE CENTER OF THE STORE.

Two rows of units preferred, parallel to sides of the store, primarily illuminating the display fixtures and their contents on their respective sides. Where central aisles occur, the lighting units can be arranged over the aisles to spread their light on the display fixtures and merchandise on each side.

PROVIDE ADEQUATE LIGHTING AT BACK OF STORE.

At least 20-foot candles.

INCREASE UTILIZATION OF DAYLIGHT.

Skylights for ventilation and lighting.

PROVIDE ADEQUATE ILLUMINATION, INCLUDING A GREATER USE OF DAYLGHT.

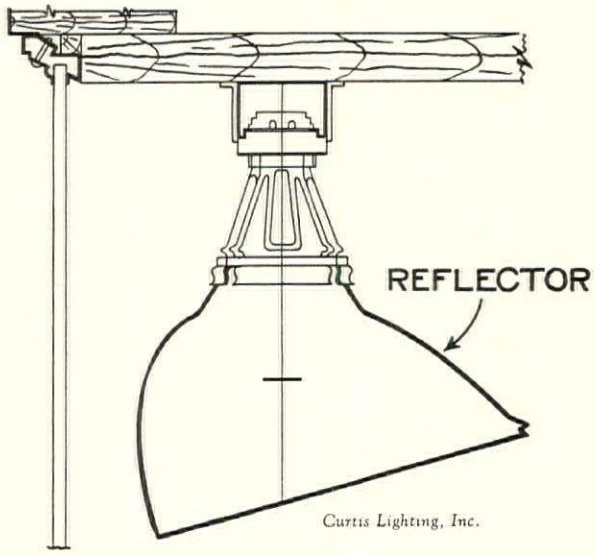
Illumination on light colored displays should be above 30-foot candles and on dark colored displays above 100-foot candles. However, competition by neighboring windows is usually the governing factor.

REPLACE ANTIQUATED LIGHTING OF SHOW WINDOWS BY IMPROVED TYPES OF EQUIPMENT.

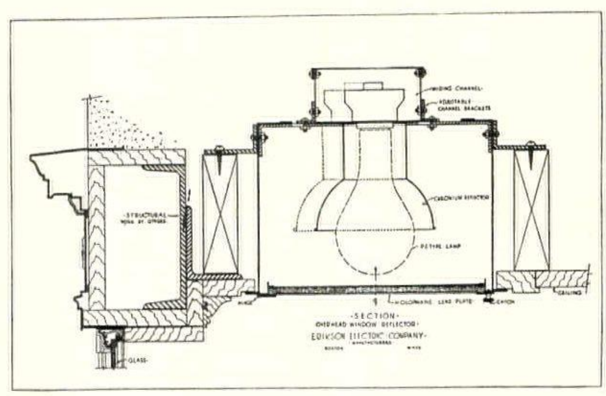
Reflector spacing, 12 to 15 inches; 150-200 wattage for lamps. In general it is better to use many reflectors and smaller lamps than the reverse practice. Light source concealed from spectators; deep windows require light thrown at higher angles to compensate for their greater depth; dark background requires more light than one trimmed in black. Drug stores require vertical illumination; furniture stores, horizontal; stores with spread display all over the window need uniform illumination.

USE FOOTLIGHTS TO SUPPLEMENT OVERHEAD LIGHTING.

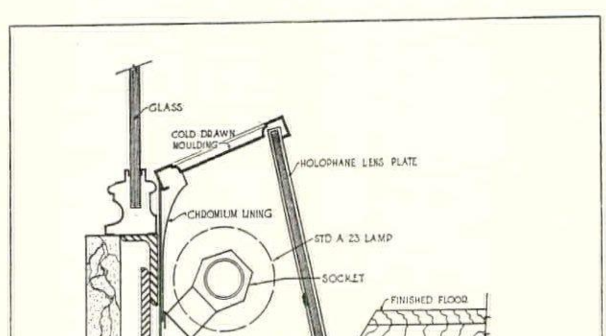
The wattage should be not more than one-third and preferably one-fourth that of overhead lighting per running foot.



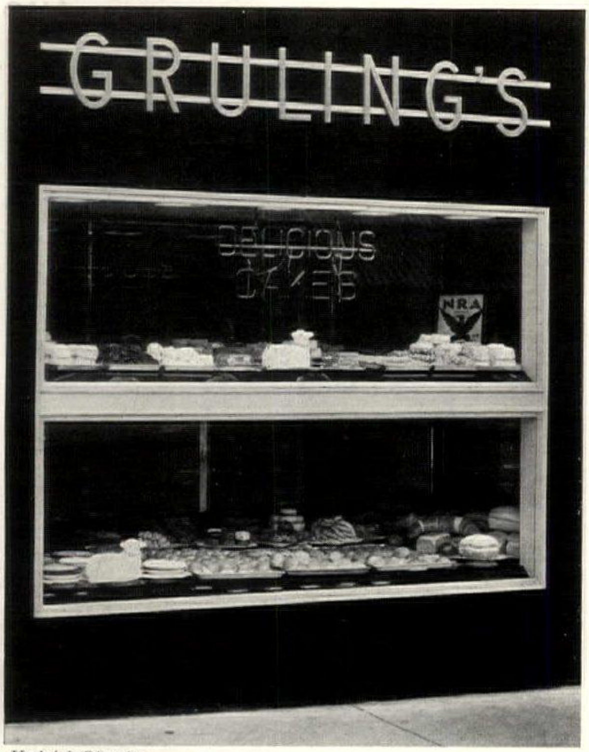
REFLECTOR FOR SHOW CASE LIGHTING. THIS TYPE OF REFLECTOR IS DESIGNED TO ENTIRELY CONCEAL THE LAMP, BOTH FROM THE CUSTOMER AND CLERK, AND DOES NOT OBSTRUCT VIEW OF MERCHANDISE.



OVERHEAD LIGHTING EQUIPMENT. CONTINUOUS HOUSING CONTAINS THE REFLECTOR AND LENS EQUIPMENT. PRISMATIC LENS GLASS AT BOTTOM AFFORDS EFFICIENT LIGHT UTILIZATION AND PREVENTS GLARE. NO VALANCE REQUIRED.



FOOTLIGHT REFLECTOR FOR WINDOWS, USED FOR SPECTACULAR EFFECTS BY EMPHASIZING CERTAIN OBJECTS IN CONTRAST WITH THEIR SURROUNDINGS.



Hedrich-Blessing

STORE LIGHTING

INSTALL COLOR LIGHTING BY AUXILIARY EQUIPMENT.

More economical than by use of screens on main equipment.

ILLUMINATE PARKING AREA.

Floodlight on steel standards or from roof; neon tube lighting can be used to direct traffic. Automatic time switches and photo-electric cell control.

ADD BURGLAR ALARM SYSTEM.

Alarm sounded when circuit is broken by intruder; photo-electric cell.

INSTALL FIRE ALARM SYSTEM.

PROVIDE NEW POWER LINE.

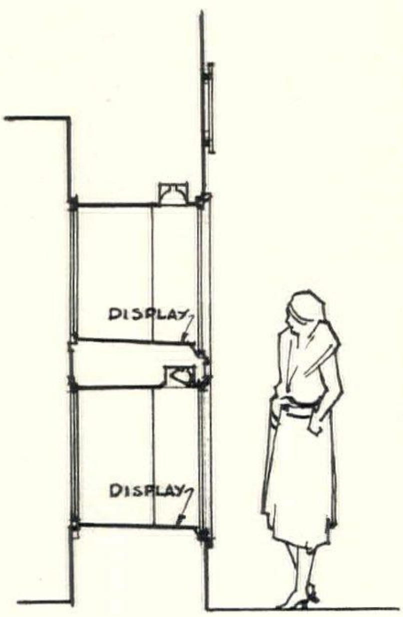
Consult local utility company for its requirements.

INSTALL SPECIAL OUTLETS FOR

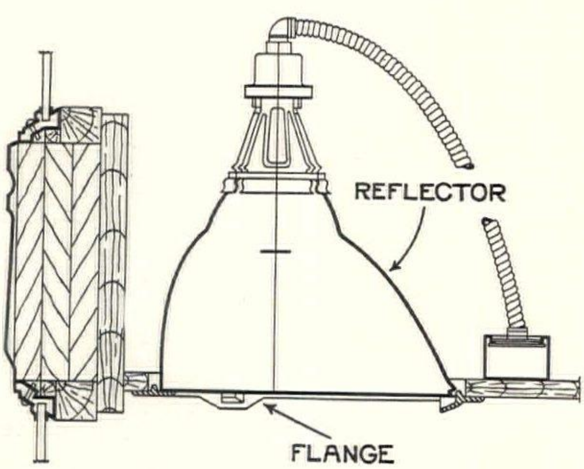
Fans, ventilators, supplementary lighting.

INSTALL LIGHTING OF HIGH INTENSITY TO REDUCE GLARE OF SUN.

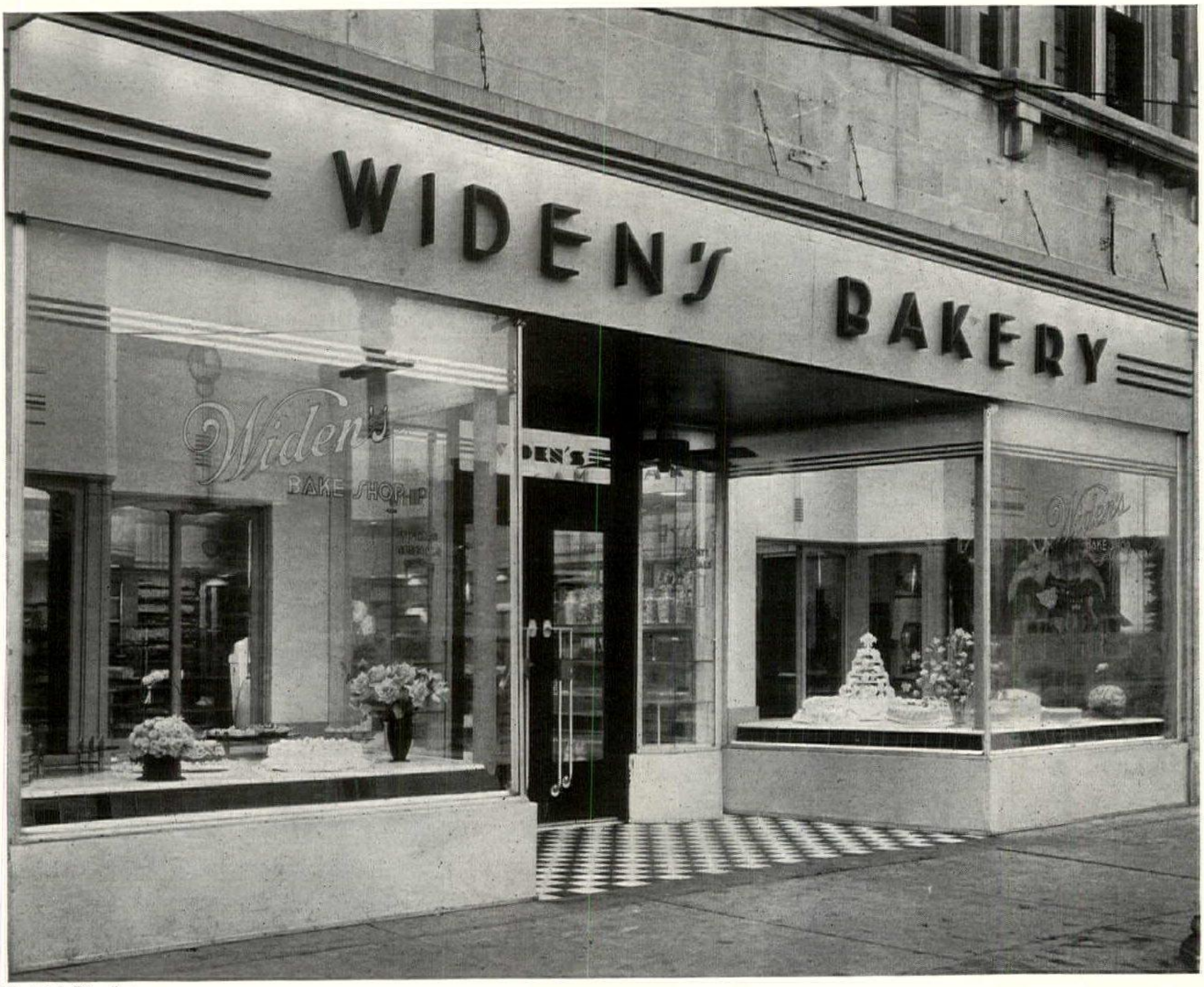
Polished plate glass. Separate circuits; superlighting of from 200 to 1,000-foot candles intensity is employed to overcome daylight reflections; 500 watts per running foot of show window is recommended.



DOUBLE-TIER SHOW WINDOW SUITED TO DISPLAY FOR BAKERY, DELICATESSEN AND OF STATIONERY, NOTIONS. BELOW: STANDARD REFLECTOR FOR HEAD OF SHOW WINDOW. REFLECTORS ARE OFTEN INSTALLED ON TWO CIRCUITS SO AS TO ATTAIN TWO INTENSITIES.



BELOW:
A REMODELED HOTEL IN WHICH SHOW WINDOW IS LIGHTED AT APPROXIMATELY 8-FOOT HEIGHT. THERE IS ALSO OVERHEAD LIGHTING, COUNTERSUNK IN OVERHANG OF CORNICE. F. BECKER AND E. KUTZNER, ARCHITECTS.



Hedrich-Blessing

REMODELED BAKERY SHOP, CHICAGO. GORDON S. GUNDLING, DESIGNER. THE VESTIBULE WAS SHORTENED, BRINGING DOORS CLOSER TO STORE. ON EITHER SIDE OF THE VESTIBULE THERE IS A FEATURE CASE IN WHICH "DAILY SPECIALS" ARE PUT.

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Photograph by Hedrich-Blessing Studio

SALLY FROCK SHOP IN KANSAS CITY, MISSOURI

SOBEL AND DRIELSMA, ARCHITECTS

The store front is a frame of Carrara glass held in place by aluminum supports. The bulkhead facing as well as the grilles at the top of the plate glass are of sheet aluminum. The ribbon aluminum sign in the middle of the vestibule has a backing of flashed opal glass. The simple plaster ceiling of the vestibule is designed so as not to detract from the display windows. The plaster adjoining the mirrors is divided horizontally into several sections by solid brass stripping on the same contour as the wall itself. The entrance doors are of wood covered with sheet aluminum; the hardware is aluminum tubing. The floor is of terrazzo in simple design in three colors. The openings to the store have only Venetian blinds matching the decoration in the window space. The window lighting consists of reflectors concealed in the ceiling with concentric louvers on the bottom in order to prevent glare.

Photographs by Hedrick-Blessing Studio

FELTMAN & CURME STORE EVANSTON ILLINOIS

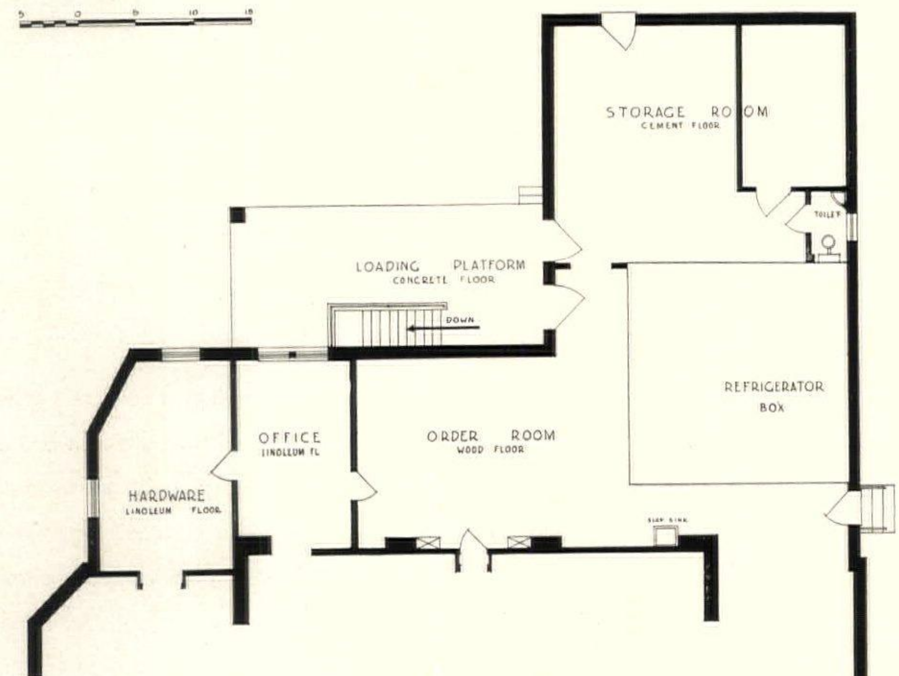
KOENIGSBERG & WEISFELD ARCHITECTS

A cast iron column in a corner of the building was removed in remodeling in order to obtain more window space. The store is 19' wide. Above the show windows is a Carrara glass spandrel; the sign is cast aluminum, 2' 6" high and 6" deep. The backing for the show windows is light in tone in order to display the merchandise effectively. The interior is designed to focus attention on the hosiery department. A canopy over the hose and bag section has, on its underside, flesh lights with opal glass directing a soft light on the counter. All trimmings and the frames of all lighting fixtures are chromium.

Photograph by Cole and Co.

HINTELMANN STORE IN RUMSON, NEW JERSEY

MYERS AND SHANLEY, ARCHITECTS



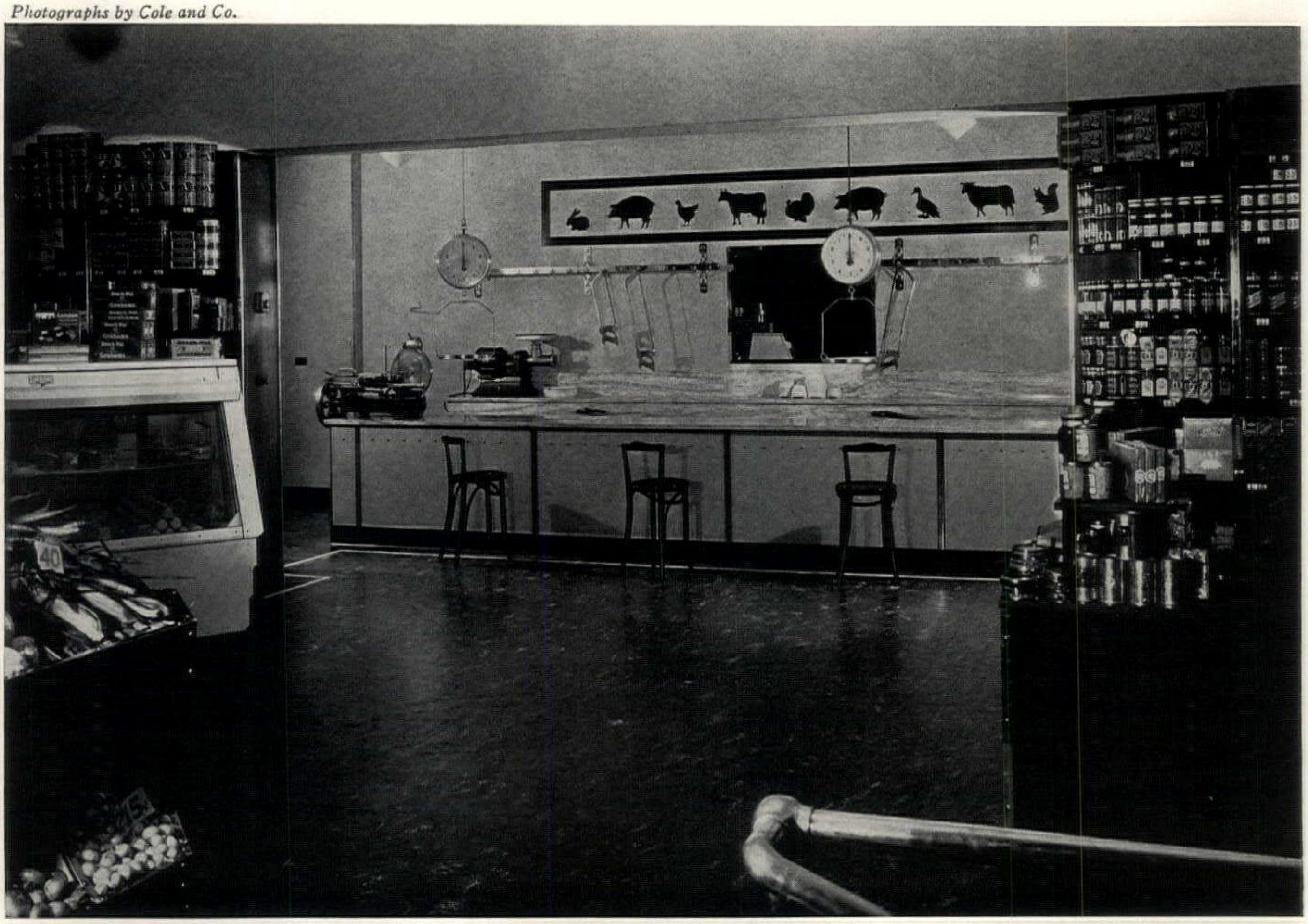
The store is of brick veneer construction with exterior walls whitewashed. The shingled roof is weathered gray. The parapet copings, the lettering, and the wood trim are painted black. The awnings and shutters are blue. An important feature of the plan is the order room, which is apart from the main part of the store. Here, all orders received by telephone or from visiting customers are made up. This prevents the cluttering and disorder which the order end of the business usually causes. The cashier's booth and the business office are located so that they control the various departments and the order room as well as the landing stage in the rear of the store where trucks are loaded.

HINTELMANN STORE IN RUMSON, NEW JERSEY

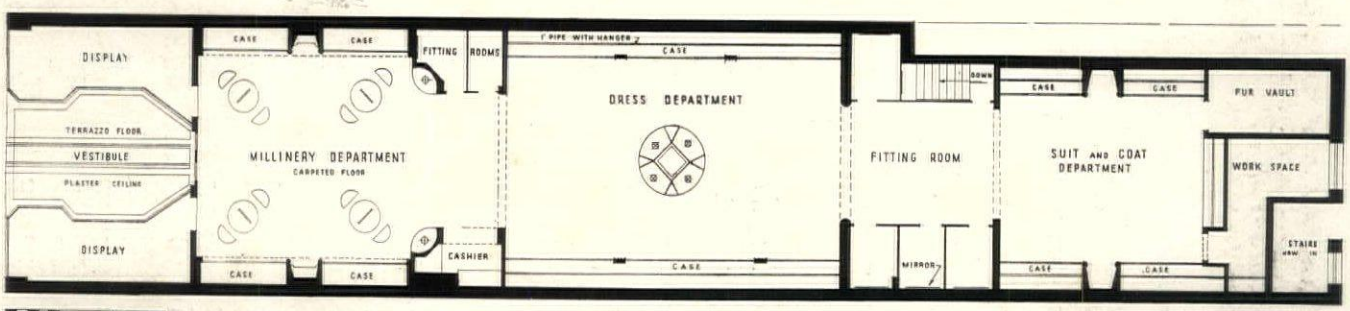
The store has four distinct departments: (1) liquor department; (2) vegetable and grocery department; (3) meat department; (4) hardware department. • In the liquor department the woodwork is stained and waxed a rich brown; counters, shelving and walls are covered with a dark blue linoleum and the shelving is blue, trimmed with white metal bands. In the meat department the walls and counters are covered with white linoleum which is trimmed with white metal strips; black silhouetted figures are inlaid in the walls. • A large meat box with freezer, also a separate vegetable box and butter and egg box are all cooled by an ammonia refrigerating system. The water for circulating in this system is obtained from a well under the building. This was done for economy in operation. A two-pipe vacuum heating system is augmented by a unit blower. The blower fan is also used as a means of circulating the air in the store during the hot summer months. • To the rear of the ice box department is a large storage room. This is in addition to storage lockers in the basement. The fenced area at the rear of the store, where the empty crates and boxes may be accumulated out of sight, is a very necessary arrangement because the adjoining properties are all summer homes.

MYERS AND SHANLEY, ARCHITECTS

Photographs by Cole and Co.



Photographs by Hedrich-Blessing Studio

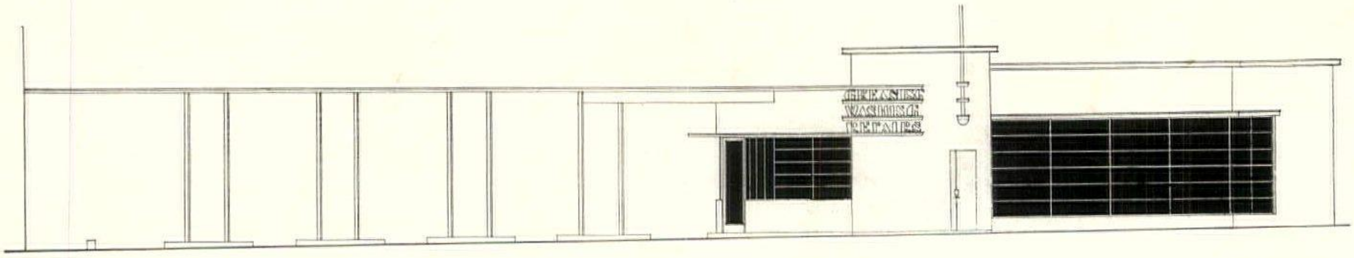


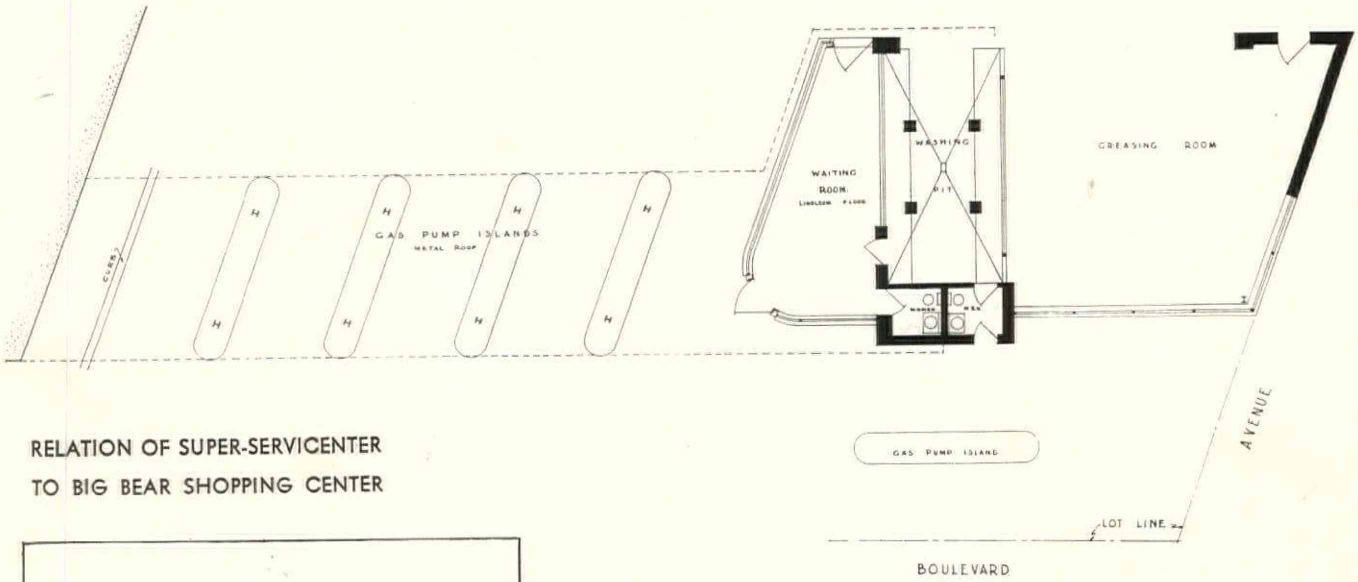
FIRST FLOOR PLAN

BARNETT'S, INC. APPAREL SHOP IN GARY, INDIANA

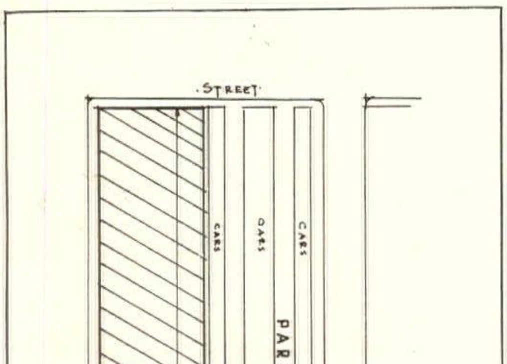
GORDON S. GUNDLING, DESIGNER

Ivory and black Carrara glass are used on this store front. The sign is also black and ivory. • The millinery department is decorated in shades of pastel pink and ivory. The stripping is of deep vermilion. The cases are burgundy red, the furniture canary yellow and chrome. • Overhead is indirect lighting. To gain additional wall space, triplicate mirrors are grouped in the center of the dress salon. The top of this feature has a cornice for indirect lighting of the ceiling. The colors throughout the dress salon are peach and salmon with modern stripping in contrasting shades. The chrome furniture is upholstered in chartreuse green. All carpeting is burgundy red.





RELATION OF SUPER-SERVICENTER TO BIG BEAR SHOPPING CENTER



"SUPER-SERVICENTER" FOR JERSEY CITY SHOPPING CENTER

B. SUMNER GRUZEN, ARCHITECT

Large numbers of shoppers come in automobiles to such shopping centers as the Big Bear Market. The design problem consequently includes consideration of means of assisting the passage of shoppers with packages to their cars. In this case, since it was impractical to cover the parking area, a combination waiting room and marquee was developed as shown by the drawings. Gasoline sales, greasing, washing and repairing are accessory services evolving from the primary requirements; it is expected that shoppers will use the opportunity to have their cars greased and washed while shopping. All cars enter as shown, and exit through the Super-Servicenter. The shopper stays in the waiting room until the car is delivered from the parking lot. The station is to be white with colored canopies. Supporting columns are to be H-forms of stainless steel. Sign lettering is to be black, silhouetted against lights in back.

THE

ARCHITECTURAL RECORD

INDEX TO VOLUME 76

JULY-DEC. 1934

PUBLISHED BY F.W. DODGE CORPORATION, 115-119 W. 40th ST., N.Y.

THE ARCHITECTURAL RECORD

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