VOL · 77 NUMBER 1

1 9 1 3 5

JANUARY

THE

ARCHITECTURAL RECORD

An important phase of the Federal building program is the establishment of subsistence homesteads. Plans for 58 projects have been approved, and the majority of these are already well under way. Proposed as unemployment relief measures, the homesteads depend for their success on a satisfactory integration of industry and agriculture. The 1934 Report (just released) of the Secretary of Agriculture analyzes this problem, and since the section relating to subsistence farming is a pertinent appraisal of the current building program, it is reprinted herewith.

UNEMPLOYMENT AND SUBSISTENCE FARMING

By HENRY A. WALLACE, Secretary of Agriculture

In hard times the unemployed look naturally to the land. They cannot be refused access to it; and yet to admit them into agriculture unconditionally would involve removing certain restraints upon agricultural production. Here is a dilemma. On the one hand, the progress of agriculture absolutely requires a limitation of farm production and therefore of farm employment. On the other hand, national expediency forbids closing the rural country to the urban unemployed.

The Agricultural Adjustment Act creates very little unemployment. Farm owners, and tenants with a reasonably secure tenure, do not become unemployed through crop reductions. Hired labor and certain types of tenants, notably the share-croppers of the South, may occasionally suffer. But the Agricultural Adjustment Administration endeavors to protect these groups. In cotton and tobacco contracts it stipulates that landlords as far as possible shall maintain their normal force of tenants or hired hands. By comparison with other causes of rural unemployment, such as the interruption of the flow of rural population to the towns and the flight of city people to the country, the influence of crop adjustments is negligible. Between 1929 and 1933 nearly 2,000,000 people left the towns.

Six Southern States last spring reported having on their relief rolls from 15,000 to 40,000 farm families per State. For the most part, however, these farm families had been thrown into distress by the depression. Undoubtedly the number would have been greater had the adjustment program not increased the income from cotton in 1933. Moreover, the great majority, perhaps 75 per cent, were still on farms in one capacity or another. They were not entirely without means of self-support. Considering the country as a whole, the crop adjustments relieve far more unemployment than they create. Scores of towns and cities throughout

HOMESTEAD AT CROSSVILLE, TENNESSEE

the country, which 18 months ago were in the depths of depression, have picked up under the influence of restored farm buying.

It is nevertheless true that farm recovery, with its need for restraints on farm production, goes against the natural desires of the urban unemployed to seek refuge on the land. In this matter the agricultural interest—the necessity for farmers to curb their competition—must to some extent give way. There are many millions of unemployed in the United States. Their maintenance is a public charge, which cannot be repudiated. About one-third of the families on relief rolls are already in the country or in country towns. Moving an increased proportion from the congested centers of population doubtless would reduce in many cases the expense of maintaining them. Living costs are much lower in the rural communities, and the country affords a chance for the unemployed to produce some of their own food. To some extent the shift is necessary.

A COUNTERWEIGHT TO FARM RECOVERY

Such a shift tends to deprive commercial farmers of a part of their urban market. Moreover, it tends to increase farm competition. So-called "subsistence farming" cannot be entirely noncommercial. Inevitably it produces something for sale. This is a counterweight to farm recovery which farmers will cheerfully accept in an emergency. But they have a right to urge that its effects be tempered as much as possible. We ought not to adopt a defeatist attitude, and to say the only thing to do with urban unemployment is to push it into the country. That simply means dividing a reduced agricultural income among an increased number of persons. It is far better to push industrial recovery. Meantime, we must handle the situation with the least injury to established agriculture.

Subsistence farming has been suggested as a solution —i. e., farming not for the market but for the home table. This is a difficult aim. Farm families require a cash income to supplement what they can grow for their own use. Unless they can earn money off the farm, they must get it from the farm. Otherwise the subsistence farm does not furnish subsistence.

Established farmers have a right to insist that nonfarm sources of cash income be made available when the country establishes unemployed people on the land. Placing thousands of families on the land, with no other source of income, drives them into commercial farming. They may not produce any great quantity of goods for sale, but what they do produce will be sold at distress prices. Such fostered marginal production can do great harm. So far the movement to put city people on the land has run ahead of the provision for supplementary employment. People have been decentralized faster than industry, and established farming suffers. Part-time nonfarm work must go along with so-called "subsistence farming."

The task is full of difficulties, which must nevertheless be faced. Centralized industry grew up in its present locations in the pursuit of profit. To decentralize it, not primarily for the sake of profit but in order to furnish employment in new locations, should not be attempted hastily. In thus trying to improve the conditions of employment, the profit motive cannot safely be ignored. To do so may do more harm than good. Redistributing labor and industry over the countryside is a delicate operation. Yet not to try it means destroying the essence of the subsistence-farming movement, and turning it into an unregulated and uneconomic eruption of city people into commercial agriculture. Countryward movements of the unemployed should be accompanied by a sufficient expansion of local non-agricultural employment to provide a local interchange of factory and other goods for farm products. To expand farm production for local consumption, without at the same time expanding industrial production or local consumption, would simply displace farm products from other regions. It would aggravate the unbalanced condition of agriculture, and would not work any net improvement.

NATURE OF THE PROBLEM RECOGNIZED

Relief agencies, both Federal and State, have this well in mind. In one State 49 per cent of the unemployed-relief load is rural and 51 per cent urban. The State relief agency will have urban-relief groups produce industrial goods, while rural-relief families produce food. Both types of production will be held within relief channels and a system of exchange will give each person credit for his own production. This method should have wide application, since it furnishes unemployment relief at relatively low cost without seriously complicating farm readjustment. Another State has plans under consideration for establishing manufacturing or processing plants in country communities to furnish part-time employment. These establishments, it is believed, will provide a source of cash income both to urban-relief families newly moved into the areas served and to rural-relief families already there. In yet another State the relief authorities contemplate relocating good families whose adult members were farm-reared. Many such people wish to return to their old neighborhoods but not necessarily to resume farming.

Fundamentally, the question is whether poor folk in town and country should be supported in demoralizing idleness or helped to become self-supporting. Either method involves expense to the rest of the community. Which is the less costly, everything considered? Short-sighted views may prefer straight charity to obviate increasing the intensity of industrial or agricultural competition. But that involves attaching value to work for its own sake, without regard to the destination of the product. It means that the employed elect to work harder, so that the unemployed need not work at all. The other method, whereby urban and rural relief families employ one another through an exchange of services cuts down the relief bill, may have little harmful effect on commercial industry and agriculture and prevents social disaffection. There is nothing wrong with the idea. The danger is that we may not apply it thoroughly; that in practice we may not couple subsistence farming with adequate part-time employment.

ESTABLISHMENT OF SUBSISTENCE HOMESTEADS

The Division of Subsistence Homesteads of the Department of the Interior is promoting the true objective. Section 208 of the National Industrial Recovery Act appropriated $25,000,000 to be used to "aid in the redistribution of the overbalance of population in industrial centers" through assisting in the establishment of subsistence homesteads. Before the close of the fiscal year the Department of the Interior had approved plans for 58 projects, the majority of which are now under way. In each project there are from 25 to 300 homesteads.

Specifically the aim is to help poor families to get a more secure and more satisfactory living through a part-time combination of industrial employment and subsistence agriculture. The homesteads are usually 1 to 5 acres. They are capable of producing a large portion of a family's yearly food supply. The cultivation of vegetables, fruits, truck crops, and the care of poultry, and in many cases a cow, comprise the agricultural operations on most subsistence homesteads.

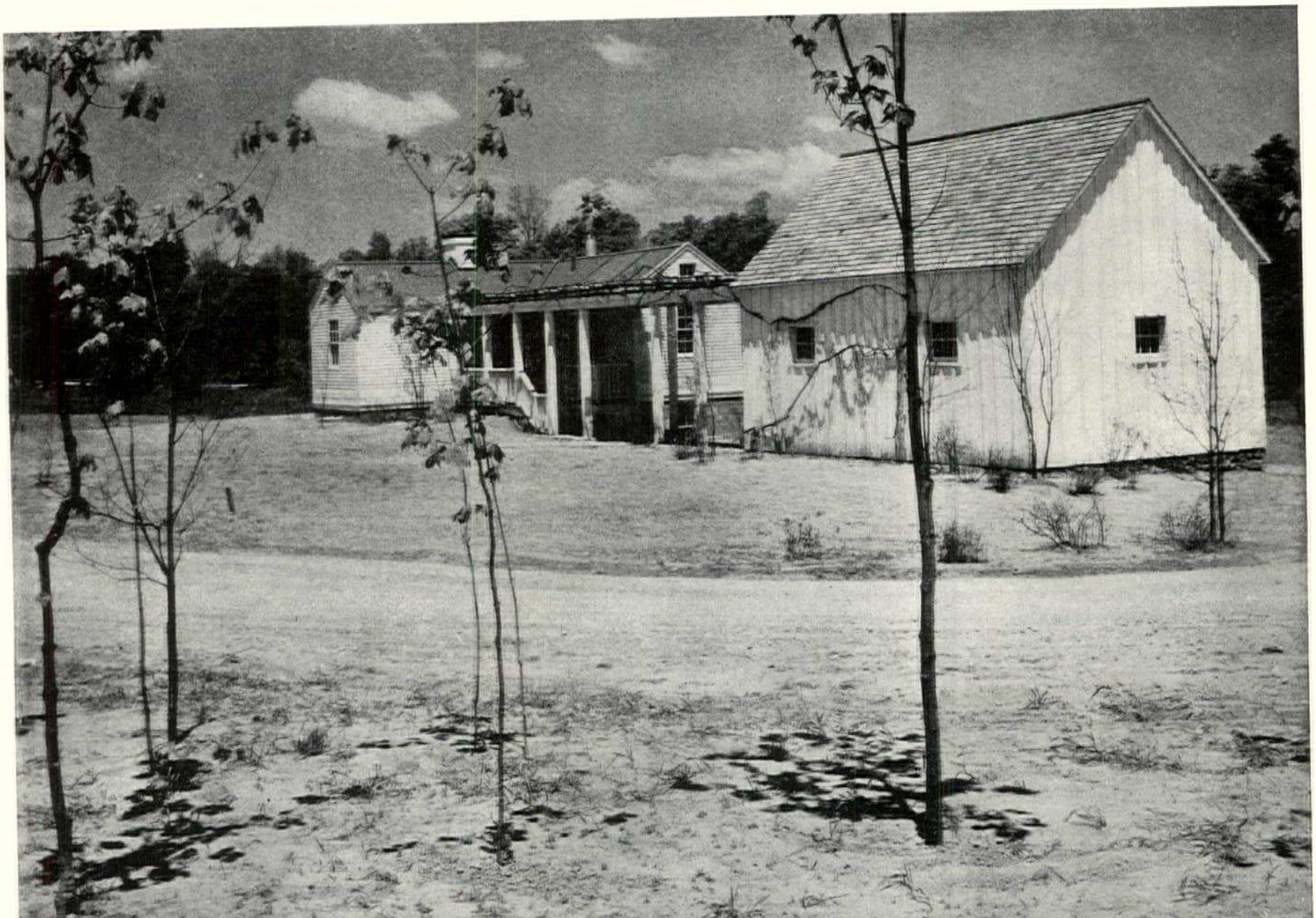
Because the subsistence-homestead plan is a method of aiding in the solution of various social problems, rather than an object in itself, the projects vary considerably. First, there are garden homesteads for industrial workers. Projects of this type are located near industrial towns and cities, where the workers, while living in semi-rural communities are yet able to commute easily to and from their urban jobs. Such projects may tend somewhat to decentralize population and industry. In large urban areas, such as Los Angeles, Chicago, Youngstown, and Birmingham, the decentralizing trend develops within the urban districts through the establishment of suburban areas of subsistence-homestead communities. Small industrial towns, such as Decatur, Ind., Austin, Minn., Taylors, S. C., or Longview, Wash., offer good opportunities under conditions favorable to industrial decentralization.

PROJECTS FOR STRANDED INDUSTRIAL GROUPS

Then there are subsistence-homestead projects for stranded industrial groups. Great numbers of people formerly employed in the exploitation of natural resources have permanently lost their jobs through the exhaustion of the resources, as, for example, in certain abandoned coal fields of West Virginia. With the home production of food and shelter on the subsistence homestead as a basis, and with recourse to part-time employment in forests, newly established industries, or handicrafts, many previously destitute families are becoming self-supporting.

Rural rehabilitation sometimes calls for applying the subsistence-homestead plan to agricultural groups. The submarginal areas of the old Cotton Belt, of the cut-over lands of the Lake States, and of certain dry-farming regions of the northwestern Great Plains have been chosen as demonstration sites. Thus farm families have a chance to move from eroded, worn-out, or drought-stricken sections to subsistence-homestead communities located on good land. Intensive farming, primarily for subsistence, replaces extensive and wasteful cash-crop production. The crops produced for the market are usually not the staples in which surpluses exist. Moreover, the establishment of these new farm homes is offset by the retirement from cultivation of proportional amounts of submarginal land.

HOMESTEAD PROJECT AT REEDSVILLE, WEST VIRGINIA



HOUSING STANDARDS FOR SUBSISTENCE HOMESTEADS

By **BRUCE L. MELVIN,** Division of Subsistence Homesteads, Department of the Interior

The Division of Subsistence Homesteads of the Federal Government is now building low-cost houses on one to five-acre tracts of land in an effort to provide better living than has heretofore been available for fifty per cent or more of our working population.

Three purposes are encompassed in this undertaking:

(1) making possible home ownership for a class who under our economic organization has been unable to attain it;

(2) providing greater security with an improved standard of living for this class in the midst of economic fluctuations; and

(3) assisting this low-income group to better living. The interest of the readers of THE ARCHITECTURAL RECORD is primarily in the third purpose, and particularly in better living as exemplified in terms of better housing.

REQUISITE CONSIDERATIONS

Housing standards may be either relative or absolute. As an amateur, I think of housing standards as consisting of protection against the elements, convenience whereby labor will be saved, provision for sanitation and healthful living, and the form and setting such that the aesthetic quality in both may be clearly perceptible. All these are relative, dependent upon time and place; and, in the development of low-cost housing by the Government, all are subject to limiting factors.

The strongest limiting factor is that the cost of land, house, other buildings and equipment must be sufficiently low so that families of low income can pay for them over a period of thirty years. Since even in good times the average annual earnings of the industrial workers in America were less than $1,000 a year, one realizes that the homestead cannot cost this worker more than $2,000 to $3,000. At the same time the house must be so constructed that it will last through the period of amortization with a minimum required for repairs.

These considerations are ever present when thinking of what to provide. Can a minimum standard house with modern conveniences and utilities be furnished at a cost that can be repaid?

I have before me figures on 631 part-time farmers (owners) in Hennefin County, Minnesota. Of these, 287 have water in the house and 183 have inside toilets. The unskilled workers of this group have an average income of $363; the skilled workers, $480; and the white collar workers, $710. If the subsistence homestead houses were being built in this area for these classes of workers, it does not seem possible that all conveniences could be provided. My position, therefore, would be to build houses that provide a better standard of living than that to which the families are accustomed. If people are to be taken from slums where four or five families have used one toilet, either outside or inside, my position is that a sanitary outside toilet provided at a cost within the means of the homesteader is preferable to complete inside equipment but with the people so burdened by debt that they could not meet their obligations. The best house for which the family can pay is the type that should be built.

THE HOUSE IN RELATION TO THE SITE

In perhaps no other house building program is the location of the house in its relation to its physical environment of greater importance than in establishing homestead communities. The houses should be part of the landscape and at the same time have a harmonious relation to each other. The making of an harmonious whole—whether twenty-five houses or three hundred—is the work of an artist.

Houses also should be so placed in relation to an arterial highway that transportation is easy but the children are protected from speeding automobiles. At the same time auxiliary highways should give the houses easy access to each other. Likewise, the houses should be easily accessible to the neighborhood store, the school and community center, if it is separated from the school.

The architecture, plan, elevation and general appearance should be part of a planned scheme and be based upon the indigenous architecture of the region, unless it is definitely desirable to introduce a completely new plan of construction involving the most modern designs and materials.

STANDARDS FOR THE HOUSE

General standards respecting the houses can here be postulated, but their application rests with the planner of a particular house or group of houses in a project. Houses should be adapted to their special use; they are neither city nor farm homes; they lie midway between the two. These houses are to be used on the land, but by persons working in the town or city. The family will enter the houses with dirt and mud on their feet. There should therefore be an entrance where dirty shoes and clothes may be removed.

The houses are for families who will form family units. Therefore, a room (call it a living room if you care) where the family can associate informally and joyously should be provided.

Storage is essential for fruits and vegetables, either in the house or outside. If it is cheaper, as is true in some parts of the country, for the storage unit to be placed outside the house, this should be done.

The plan and material of the house should be such that the placement of furniture and other equipment will be economical in space and make for low-cost heating, especially in a northern climate. In addition, the rooms should be related to each other, and the arrangement of the kitchen should be such that a minimum number of steps are necessary in doing household work.

It is most important to consider the place and work of the woman in this home, because much of the success of the family in the homestead will depend on the contentment of the wife. Though this is a way of life, it is one that may be exceedingly hard for the wife, part of whose duty will be to oversee the production and preserving of food.

The final standard, as I see it, is that the house, yard and other buildings should be such that the family can have pride in them and joy in working for their improvement. They will be making a family home.

CONCLUSION

The work the Federal Government is doing is experimental, and because of the fact its standards will gradually emerge. These standards will grow out of the opinion and experience of the housing experts; they will be the final judges. The position taken in this paper is personal; it is inconclusive, but predicated on the belief that standards must constantly change and that accumulating information will correct errors in the position here taken.

Facts About the Subsistence Homesteads Program
From Bulletin 1 of the Division of Subsistence Homesteads

The Division of Subsistence Homesteads is a unit of the United States Department of the Interior, subject to such policies and regulations as the Secretary of the Interior may prescribe. The Division was organized pursuant to an executive order dated July 21, 1933, and a subsequent order issued by the Secretary of the Interior on December 2, 1933, creating the Federal Subsistence Homesteads Corporation through which the work of the Division is executed.

The $25,000,000 appropriated for the purpose of carrying out the program of the Division is a revolving fund. Homesteaders' payments, applied against the purchase price of their home, are returned to the fund for use in new projects.

The part of the Federal Government is that of experimenter and demonstrator. Projects are selected with a view to testing varying sets of conditions found in the several parts of the United States and among different types of people.

The Division was originated for one set purpose and can not:

1. Lend money directly to individuals for the purpose of buying farms, livestock, or building homes on individual subsistence homesteads outside of the Division's projects.
2. Make loans to corporations whether limited dividend, nonprofit, or commercial, for the establishment of a subsistence homestead project.
3. Grant funds to aid in the initiation of industrial or commercial enterprises, whether in connection with projects established or otherwise.
4. Purchase land except for specific projects approved and undertaken by the Division.
5. Use any part of the $25,000,000 revolving fund to carry on industry or business by the establishment of Federal enterprises.

POLICIES

To demonstrate what may be done to help distressed citizens win a degree of economic security and a more adequate standard of living, the following policies have been adopted:

1. To conduct this experiment in such a manner that it will demonstrate to private agencies, States or municipalities the desirability of the movement and encourage them to emulate the Federal Government.
2. To attempt to show a remedy for the existing social and economic weakness by selecting families who will benefit by a transfer to a subsistence homestead.
3. To select people capable of buying their own homes and who have had sufficient experience to fit them for farming or gardening work. They must also have the character and will to succeed. Advisory management flexible enough to suit the various groups dealt with and widely administered so as to cooperate with local government will be furnished them.
4. To protect the character of the community by requiring suitable zoning or other regulations.
5. To provide adequate educational facilities for the children of the homesteaders at all projects, either by locating near existing schools or the establishment of the proper facilities.
6. To design and construct houses suitable in appearance and convenience within a cost range between $1,000 and $2,500, so constructed that a minimum of repairs will be required over a twenty-year period.
7. To provide homes sufficiently large to care for the average family, and so planned that they may be expanded with a minimum of changes to the original unit.

PLANNING AND ADMINISTRATION

1. *Location and Type of Projects.*

A "subsistence homestead" denotes a house and outbuildings located upon a plot of land on which can be grown a large portion of the foodstuffs required by the homestead family. It signifies production for home consumption and not for commercial sale. In that it provides for subsistence alone, it carries with it the corollary that cash income must be drawn from some outside source. The central motive of the subsistence homestead program, therefore, is to demonstrate the economic value of a livelihood which combines part-time wage work and part-time gardening or farming.

Projects are located with reference to the principal "problem areas" of the United States. They are established within these areas on the basis of local need, suitability for demonstration purposes, and the presence of various factors essential to the project's success. In conformity with this selective policy, funds are not allotted on a state or other territorial basis. Each project is planned to test out certain special features.

Four major groups of projects are being established as follows:

a. Stranded groups.
b. Special Problem groups.
c. Rural (Open Country Colonization) groups.
d. Industrial (Garden Homes) groups.

2. *Planning Projects.*

Projects are planned and organized in cooperation with the State Agricultural Colleges, Experiment Stations and Extension Services; relief, welfare and other civic agencies; and with State and local agencies whose fields are involved and whose services contribute to the success of the project.

3. *Agricultural Aspects.*

Selection of the site and its soil is subject to approval by agricultural experts. The size of the homestead, its layout, the selection of crops and livestock enterprises, and the agricultural program in general are planned in cooperation with agricultural authorities and with home economics specialists.

Experience shows that a properly guided subsistence homestead unit need not operate adversely to commercial agricultural producers.

4. *Engineering and Architecture.*

The homestead developments are laid out and constructed in accordance with approved architectural and engineering practice. While the structures and other facilities must necessarily be moderate in cost, they conform to standards of convenience, durability, sanitation and attractiveness with sufficient variation to avoid monotony. Availability of highways or other transportation facilities, and proper facilities for health, sanitation, electric light and other essential utility services, are required.

The size of individual homesteads varies from a half acre in the case of garden type projects, to 20 to 30 acres in rural projects. Houses vary in size and cost according to the group to be accommodated. In size, the houses range from 3 to 6 rooms. Three-room houses, however, are not constructed if they cannot be expanded with a minimum of alteration. The cost of houses will be from $2,000 to $3,000.

5. *Management.*

The Federal Subsistence Homesteads Corporation acts as the operating agency of the Division. Supervising each project is a manager who has charge of the construction and administration. It is hoped to secure the cooperation of an interested group of local citizens who will act in an advisory capacity for each project.

Through the Corporation, the Division purchases and improves the land, constructs the dwellings and outbuildings, and sells the completed homesteads to individual families. In addition to the cost of labor,

SUBSISTENCE HOME AT REEDSVILLE, W. VA.

land and materials, the purchase price includes a management cost prorated among the homesteaders of each project.

Amortization schedules are adjusted to the character of the project, prospective earning power of the homesteaders, quality and character of construction, etc. Payments may be made monthly, quarterly, or semi-annually; in most cases a plan of monthly payments extending over twenty years is followed. Deferment of initial payments may be permitted where necessary, but such deferment will not exceed two years. The source of the rquired cash income will ordinarily be employment in nearby industries, sale of products of home industries, in some cases work in nearby forests, or other sources of wage employment off the homestead.

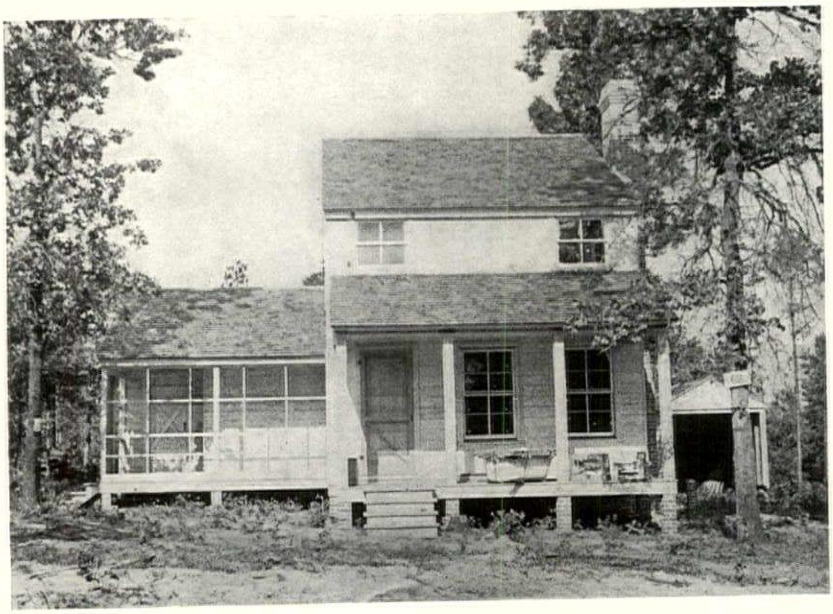
6. *Selection of Families.*

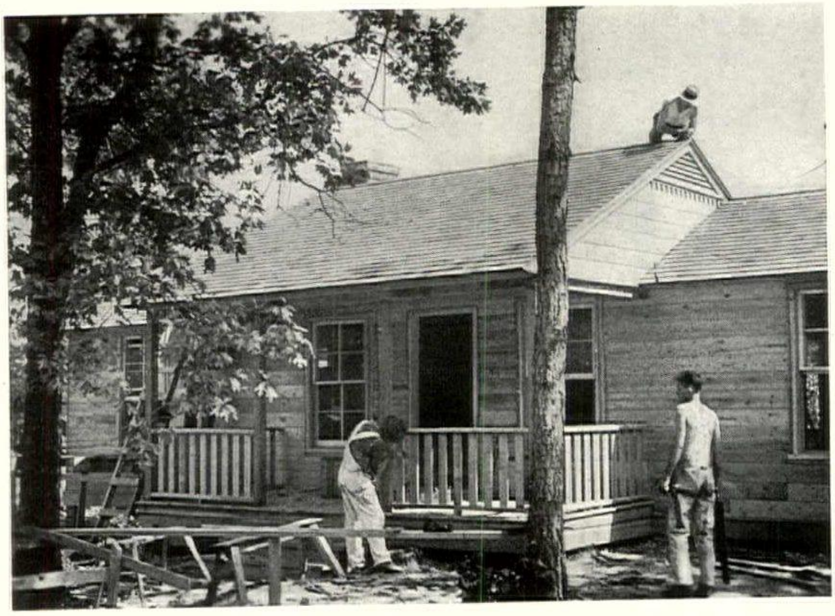
Selection of families for the homesteads is made under the direction of project managers subject to final approval by the Division. Careful inquiry is made into character and ability, past record, interest and fitness for agricultural pursuits, present employment status and prospects for wage-employment off the homestead. Sources of cash income are essential in order that all payments will be met regularly.

7. *Educational and Advisory Facilities.*

The availability of competent local technical advice and guidance, particularly in the fields of agriculture and home economics, is essential for most of the families, at least during the initial transition period. This usually is arranged for through cooperation with existing educational and service agencies such as the State Agricultural Colleges and Experiment Stations and the Agricultural Extension Service.

RURAL-INDUSTRIAL COMMUNITY PROJECT No. 1





WOODLAKE, TEXAS

Woodlake, the first rural-industrial community established under the Federal Emergency Relief Administration, is located in Trinity County, Texas, 100 miles north of Houston in the pine woods section of East Texas. Approximately 90 families live there now. The community has 100 houses, and the remaining 10 will be filled shortly. Ground was broken for the project in January last year. The construction and development was done by heads of the families now living there. The men went out from Houston and lived in improvised barracks, until they built the houses, then began moving their families in during the summer. All of the families were selected from the Houston relief rolls. The community is a project of the Texas Relief Commission and is operated by the Texas Rural Communities, Inc., an agency of the State relief commission.

Woodlake is considered by the FERA and the Texas Relief Commission as a demonstration that needy unemployed workers and their families can become self-supporting in organized rural communities with a moderate amount of supervision, and with a reasonable investment of relief funds.

The houses with three acres of land, barn, etc., range from three to five rooms and were erected at an average cost of $1,490, of which $670 was relief labor, leaving a net cost of $820. They have modern plumbing and brick or stone fireplaces. Each house is on a three-acre tract devoted to a garden, an orchard and vineyard, and a chicken house with 200 chickens. A combination barn, garage, and laundry is also on the plot.

The houses are of native East Texas architecture, designed by David R. Williams, now architect of the FERA Rural Rehabilitation Division. A key plan was used, and rooms were shifted to give variety in design, resulting in prefabrication of all material in units at a mill set up in the community.

A homestead is occupied under a three-year lease at $180 rent a year which is being paid in farm and poultry surpluses delivered to the Texas Rural Communities. On the outskirts of the community are two large community tracts of approximately 600 acres each.

In the center of the community is a park of 255 acres shaded by oaks and elms and containing two lakes. In the park are a school, a community house, a bath house, and a trading post. The community house is used as a church. It is built of native materials, logs for the walls and stone for the large fireplace. The bathing pavilion is of native stone.

RURAL-INDUSTRIAL COMMUNITY PROJECT No. 2

OSCEOLA, ARKANSAS

The second rural industrial community established under the Federal Emergency Relief Administration is located near Osceola, Mississippi County, Arkansas. The initial 100 houses have been completed. The families will come from various counties in the State where they are now receiving relief. Ultimately, according to present plans, the community will include approximately 700 families.

The community is a project of the Arkansas Emergency Relief Administration and is operated under the Arkansas Rural Rehabilitation Corporation, an agency of the Arkansas relief administration. It also is a part of the FERA Rural Rehabilitation program directed by Col. Lawrence Westbrook, Assistant FERA Administrator.

The project is financed by Federal funds granted by the FERA to the State.

The houses follow the native architecture of the region in several different one-story types. Three-, four-, and five-room houses of each type have been built. The largest houses, equipped with plumbing, a barn, and a well, have been completed at a cost of approximately $1,300. The smaller houses, including the same items, cost around $900.

Each house is situated on a tract of from 20 to 40 acres. Every four houses are on adjacent corners of the tract, grouping them conveniently close together, simplifying the layout for roads and light and power lines, and providing neighborliness.

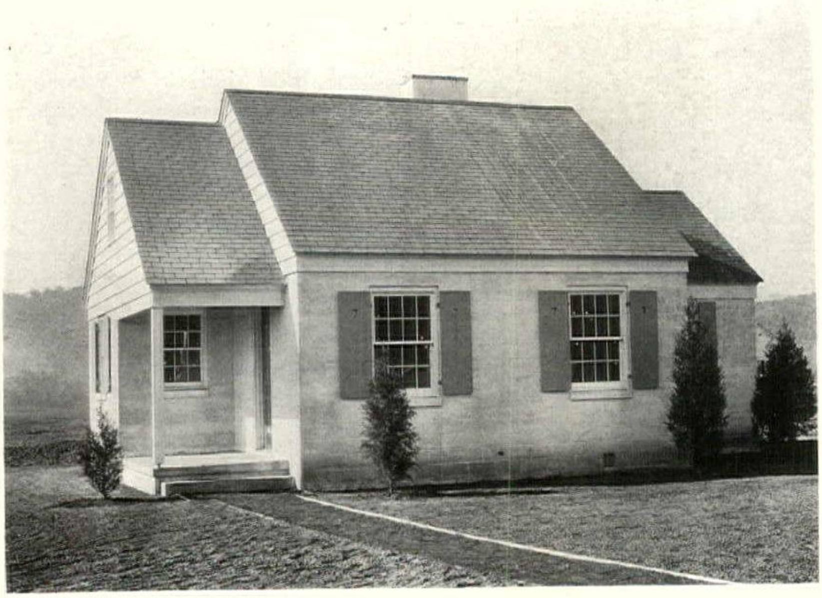
A trading post and a canning center, a park, a recreation hall, and several other community features are included in the plan, but are not yet built.

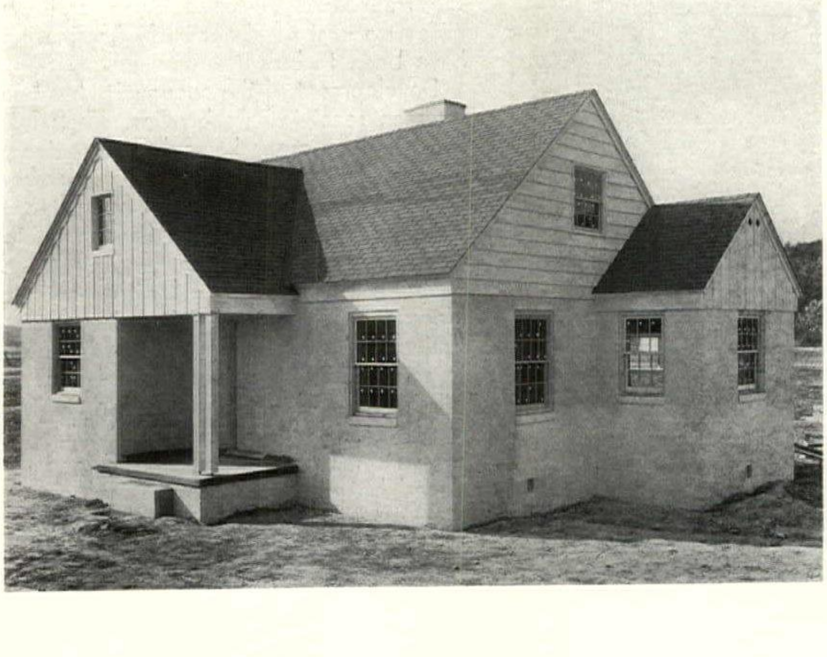
The community, in effect, has been hewn out of a wilderness. Roads and bridges have been constructed, and land cleared. The lumber was cut from trees felled on the tract and produced by several sawmills at a cost of about half what it would have been to buy it.

Development of the community has been by men receiving work relief. They have lived in temporary barracks and eaten in a mess hall. These workers came from nearby communities. Lumbering, road-building, and construction have provided work for about 1,500 men.

The land was bought by the Arkansas Emergency Relief Administration from a drainage district by paying the delinquent taxes of $2.50 an acre. The soil is of the Mississippi Delta type, reputed to rank with the richest in the world. This last season small portions of cleared land produced better than 60 bushels of corn to the acre and as high as two bales of cotton to the acre.

RURAL-INDUSTRIAL COMMUNITY PROJECT No. 3





RED HOUSE, WEST VIRGINIA

The Putnam County Farms project, near Red House, West Virginia, is the third rural-industrial community started with funds of the Federal Emergency Relief Administration. It is 27 miles west of Charleston on the Kanawha River, the New York Central Railroad, and State Highway Number 25.

The project is designed to provide eventual self-support for 150 families now receiving emergency relief. It was planned and is being constructed by the Works Division of the West Virginia Emergency Relief Administration and is financed by Federal emergency relief funds.

The tract for the community comprises 2,200 acres costing approximately $29 an acre. The site of the dwellings and the farm land, comprising about 800 acres, flat, lies in a half-moon-shaped valley. Each house is on a plot of from three-quarters of an acre to an acre. The plot also provides for a barn, a chicken pen, a garden, and a lawn with shrubbery. No work animals, cows, or pigs will be kept on the individual plots.

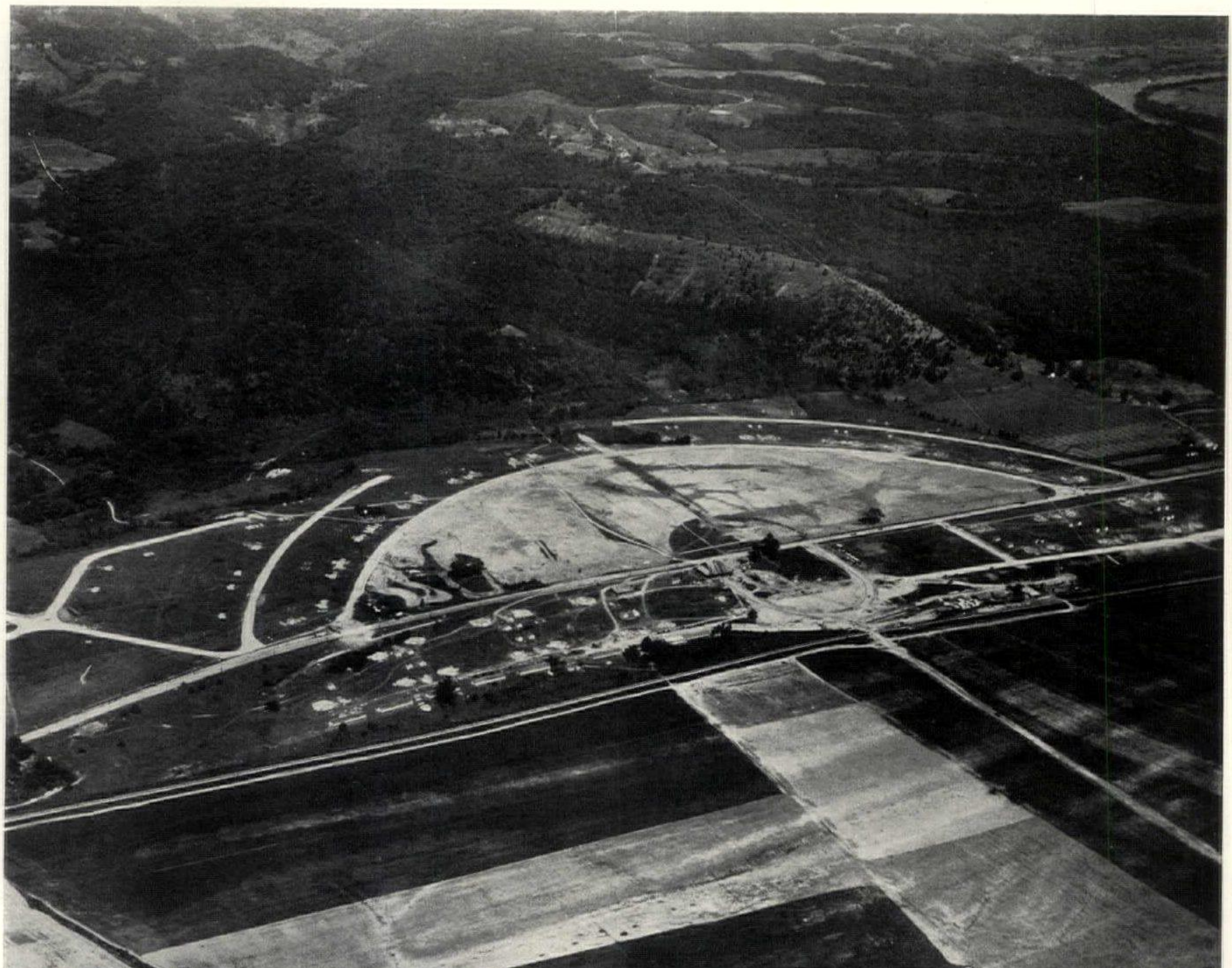
The houses are built chiefly of cinder blocks. Wood is used in the interior, but little on the exterior. The cinder blocks are made for 10 cents apiece in a temporary plant on the place. Lumber is bought at an average of $26.75 a thousand and is fabricated on a mass production system in a shop on the place. It goes to the house locations ready for placing and fastening.

The dwellings range from three to five rooms and are designed in 12 different basic types. By reversing the plans a total of 24 design variations is obtained, with further differences accomplished with colors and porches.

The cost of the homes will range from $1,800 to $2,500, averaging $2,150. This includes the house, barn, chicken pen, the plot of land, initial fertilization, and landscaping. The cost of roads, water systems, sewers, the general farm and the tract of non-farming land belonging to the community will be either pro-rated or placed on a self-liquidating basis.

A three-room house includes front and back porches, a living room, a combination kitchen and dining room, a pantry, a bedroom, a bathroom, a large unfinished attic-room, and a cellar. Larger houses contain more bedrooms.

The living room contains the fireplace and the stairs to the attic, with closet space underneath. The roof is insulated, and the attic is divided for storage and sleeping quarters for children. The cellar is small and provides for fruit and vegetable storage and access to the bathroom and kitchen plumbing. It can be enlarged easily by the occupant, if desired.



Photographs by Bollinger

ILLUSTRATED NEWS

TREASURY DEPARTMENT APPOINTS DESIGN COMMITTEE

To secure the best possible designs for buildings authorized by the recent public building program, the Secretary of the Treasury has created an Advisory Committee on Architectural Design to collaborate with the Public Works Branch of the Procurement Division. The Committee is composed of the following members:

Aymar Embury, II, of New York City, N. Y.

Charles Z. Klauder, of Philadelphia, Pa.

Philip B. Maher, of Chicago, Ill.

This Committee will review the work of the Supervising Architect, that of consulting architects who have been brought to Washington and also the work of private architects having existing contracts for public buildings.

HOUSING ADVISORY COUNCIL APPOINTED

Administrator James A. Moffett of the Federal Housing Administration announces the appointment of a Housing Advisory Council. This council is composed of representative men who are authorities in the seven broad functions of the FHA: architecture, construction, materials, labor, city planning, housing, and finance

Membership in the council consists of twenty-five men. These men are expected to hold full committee meetings on the average of two days a month, with more frequent meetings of the various subcommittees.

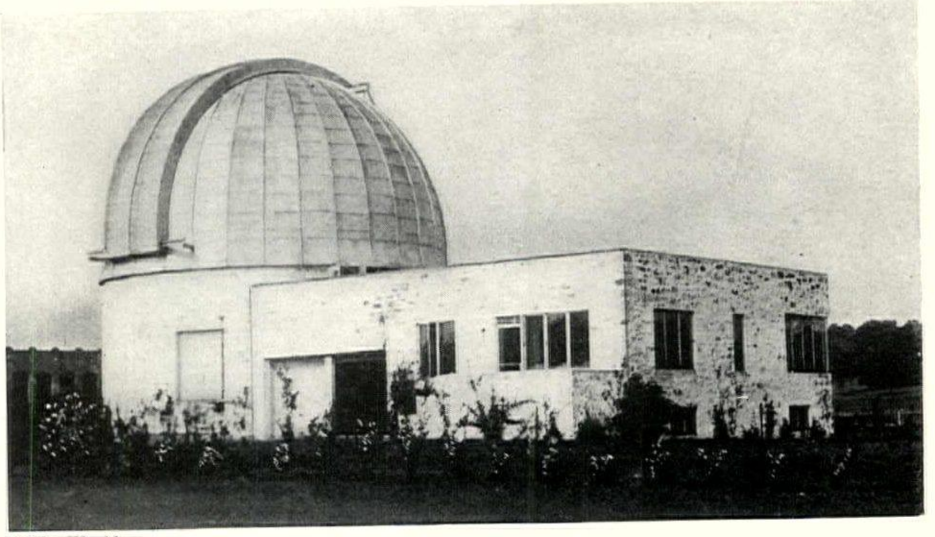
James D. Dusenberry, former President of the United Fireproof Construction Company and now Director of the Construction and Real Estate Division of the Federal Housing Administration, has been named Chairman of the Council.

PROGRESS OF BETTER HOUSING PROGRAM

The Federal Housing Administration reports a constantly increasing volume of additions, alterations and repairs throughout the country, as shown in information supplied to the Bureau of Labor Statistics of the Department of Labor. Figures made public December 26 covering building permits in 772 cities showed modernization work in November of $13,071,000 against $8,110,000 for the same month last year, a gain of 62%. This compares with a 50% gain in October, 27% in September and 18% in August over the same months last year.

All geographical divisions showed gains as follows: East South Central, 136%; South Atlantic, 101%; Mountain, 86%; West North Central, 80%; West South Central, 78%; East North Central, 71%; Pacific, 51%; Middle Atlantic, 45% and New England, 32%.

Many of the cities reporting installations, which also are included in the Federal Housing Administration's modernization program showed a remarkable volume. Cincinnati led in this type of work with $216,645, considerably more than its volume of alterations and repairs. Milwaukee was second with $152,-020. Washington third with $68,370, Philadelphia fourth with $47,430, Des Moines fifth with $52,792 and Indianapolis sixth with $35,106.



Wide World

New Observatory at Princeton University. Features: movable floor and movable 23-inch telescope.

Keystone View

New $9,000,000 Department of Justice Building in Washington. Zantzinger, Borie and Medary, architects.

HOUSING REPORT SENT TO ROOSEVELT

Recommendations have been submitted to President Roosevelt by the National Association of Housing Officials to serve as a basis for a long-range low-cost housing program in the United States. The recommendations were drafted by a group of international authorities on housing, including several Americans, following a six-weeks tour of fourteen American cities. They were discussed and modified at a housing conference attended by nearly a hundred American housing leaders in Baltimore in October.

Establishment of a permanent Federal housing agency coordinating all sections dealing with housing activities is among the important recommendations of the document, which was transmitted by Ernest J. Bohn, president of the National Association of Housing Officials.

The report is signed by three European housing experts — Sir Raymond Unwin and Miss Alice Samuel of England and Dr. Ernst Kahn, formerly of Germany—and by a large number of leaders in the American housing field, among them Col. Horatio B. Hackett, director of the housing division of the PWA.

WINDOW CLEANING CODE

Window washers are now given security by the Window Cleaning Safety Code, recently approved by the American Standards Association. The code was designed to be used by window washing concerns, manufacturers of equipment used for this purpose, building owners and managers, and to guide state and municipal authorities in writing regulations.

Hundreds of window washers are killed or injured yearly in the United States. Insurance rates range from $2 per $100 pay roll in Washington, to $19.88 in Nebraska and a minimum of $305 per man in New York.

The Code Committee, finding that a great deal of evidence pointed to defective equipment used by the window washers in their work, has written standards for safety belts, swinging scaffolds, boatswain's chairs, portable and sectional ladders, and anchors fastened to window sills to which belts are hooked. As in all industrial occupations, the negligence of the worker plays an important part in window-washing hazards. This safety code calls attention to this fact and calls upon the employees to exercise caution.

Ewing Galloway

Progress photograph of Boulevard Gardens housing project in Queens, New York, being erected with aid of PWA funds by Dick-Meyer Corporation. Theo. Engelhardt, architect.

Wide World

Left: James A. Moffett, Federal Housing Administrator, starting renovation of tumble-down Chicago dwelling. Right: Three hours later, the same shack is being modernized into a Cape Cod cottage.

CONSTRUCTION INDUSTRY MEETINGS

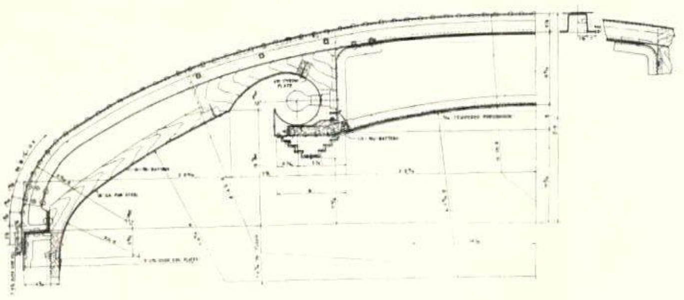
That the Construction Code Authority is getting past its initial organization difficulties and that the Construction League of the United States is about to strengthen itself as the independent spokesman of the entire industry seemed to be the sense of the joint meeting of the two bodies held at Knoxville, Tenn., December 5 to 8.

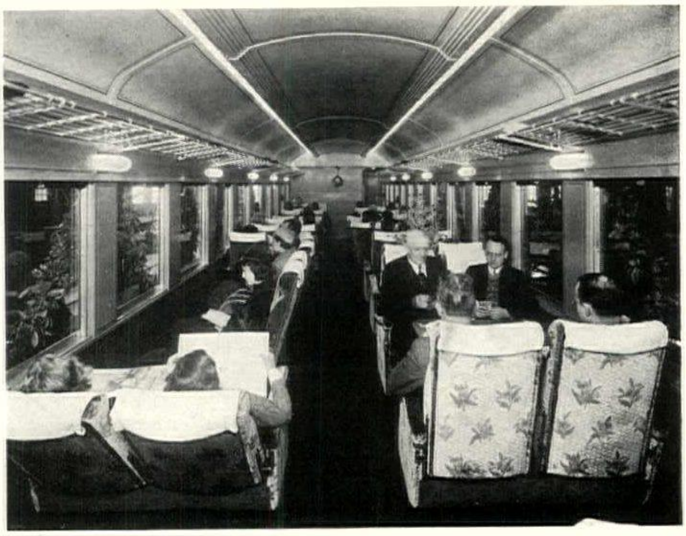
The Construction Code Authority held its open meeting at Knoxville as part of a plan to bring the code to the industry, instead of requiring the industry to come to Washington. Besides industry and divisional code authority members there were in attendance general and special contractors from all parts of the South. The Code Authority discussed a tentative plan for securing code compliance by organizing local code compliance councils, which would bring in local representatives of divisional code authorities and representatives of allied interests not operating under the Construction Industry Code. They would be chartered by the Construction Code Authority, make their own by-laws and elect their own officers. The plan, if adopted, would not only merge existing code compliance boards, but also contract-registration offices and bid-depositories. Prominent in the code authority proceedings were the three architect and engineer members, Chairman Stephen F. Voorhees, Vice-Chairman John F. Hogan, and William Stanley Parker, code authority representative of he A.I.A. Divisional codes for the architects and the engineers were among those reported as still pending before the NRA.

The Construction League elected Col. John F. Hogan chairman to succeed Mr. Alonzo J. Hammond. It presented a platform, or program for future action. The League's functions were defined as those of an independent spokesman for the entire construction industry before the public and public officials, coordinator of construction industry interests with others allied to construction, promoter, educator and legislative representative of the industry. The League will attempt to secure an adequate budget to employ an executive director and staff, whose duty it will be to organize educational and promotional work and to organize state and local leagues.

Concurrent with the meetings of the two general industry organizations were meetings of the National Planning and Adjustment Board, the industry's labor relations board, whose chairman, appointed by President Roosevelt, is Sullivan W. Jones, architect. Visitors to the meeting had the opportunity to visit the offices of the T.V.A., the Norris Dam and the town of Norris, and to see the football game beween the University of Tennessee and Louisiana State University.

Among those who addressed the several meetings were Arthur D. Whiteside, of the National Industrial Recovery Board; William L. Mitchell, Regional Compliance Director of the NRA; Willard R. Chevalier, Vice-President of McGraw-Hill Publishing Company; M. J. Bevine, Vice-President of American Radiator and Standard Sanitary Corporation; Major George L. Berry, Divisional Administrator of NRA; James A. Moffett, Federal Housing Administrator; and Carl A. Bock, Assistant Chief Engineer of the Tennessee Valley Authority.





Above: Lighting detail and interior view of new Norfolk & Western Railway day coach. Chairs can be tilted or revolved. Car is air conditioned.

Below: Interior views of new streamlined coaches of the New York, New Haven & Hartford, designed by Walter Dorwin Teague. Cork floor covering. Movable seats. Air conditioned interiors.

Wyatt Davis

GENERAL ELECTRIC SPONSORS COMPETITION

Cooperating with the Federal Housing Administration and to stimulate interest in small home building, Gerard Swope, president of the General Electric Company, has announced that his company will sponsor a national competition, beginning January 1, among architects for designs of small homes that will provide the utmost in modern convenience and livability.

A total of 54 prizes, aggregating $21,000, will be offered to architects and designers. It will be possible for one architect to win awards amounting to $5,000. Demonstration homes will later be constructed in various parts of the country.

"This competition will enable the public to get a new vision of what an inexpensive home can be like in this new era of our national development," Mr. Swope said. "Science has made great strides in home electrification even through the depression years. There is no longer any need for the homemaker to tire herself out with household labor. Most of it can be done more simply, efficiently, and less expensively by electrical servants. Washing, ironing, sweeping, cooking, and washing the dishes, can be done electrically at little cost. Great improvements have taken place in home lighting. The toilsome, troublesome heating problem has been solved, and air conditioning has arrived to make the home healthier, cleaner, more comfortable the year around.

"All of the new advances in the art of living should be made available to everybody, and we are confident the architects of the country will be able to show in their designs just how this is to be done in the small homes."

The project has been approved by the Federal Housing Administration and the Bureau of Home Economics of the U. S. Department of Agriculture, the American Institute of Architects, and the National Association of Real Estate Boards will cooperate in its conduct. J. F. Quinlan, General Electric Company, New York, has been named as director of the competition, with Kenneth K. Stowell, Editor of the **Architectural Forum**, as professional adviser.

NEW FABRICS EXPECTED

Check for future watching three new fabrics, advises **Science Service:** one woven of copper wire and conventional textile fibers, another which is creaseproof, and a third water-repellent.

In the first, copper wire is inter-spun with cotton, silk, wool or rayon into threads which can be woven or knitted without special machinery. The fine copper wire is lacquered before spinning. List as advantages: prevention of stretching and shrinking and conduction of electrical current.

Fabric which will conduct electricity should find wide use. A rug might be "plugged into" the nearest socket and heated to warm a room. The fabric in airplane wings would be warmed to prevent ice formation. Heated clothing might become a commercial instead of an experimental fact.

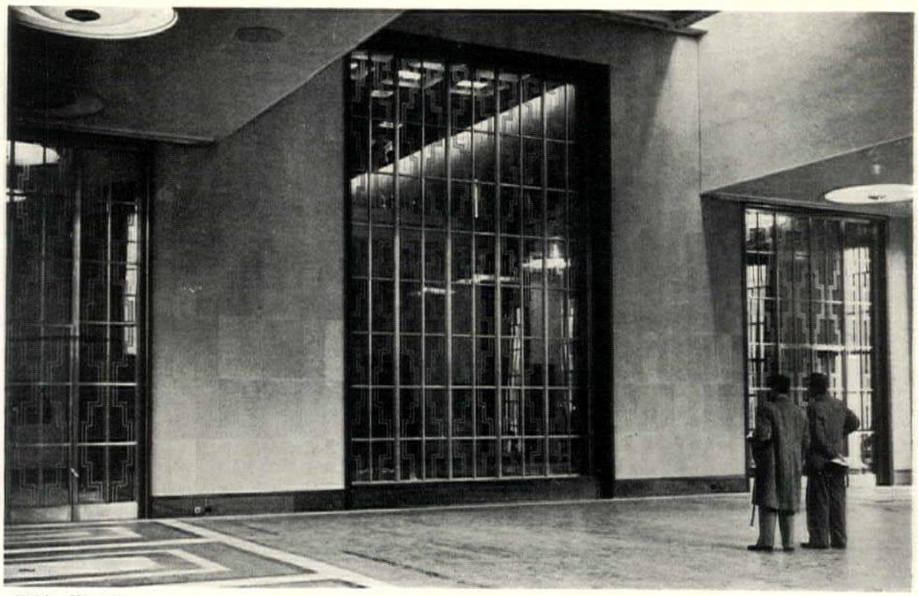
Creaseproof fabric is an English invention available in America through license. The **Technology Review** in reporting the production of the fabric states that in the finishing stage the textile is treated with a type of resin.

Water-repellent treatment may be applied to almost any fabric from silk stocking to an overcoat. It consists of applying colloidal wax in a water solution which lasts between washings. The waterproof wax coating is transparent and may be applied in home or commercial laundries without injury to the fabric in a manner, presumably, like starching.

RADIO SETS OUTNUMBER TELEPHONES

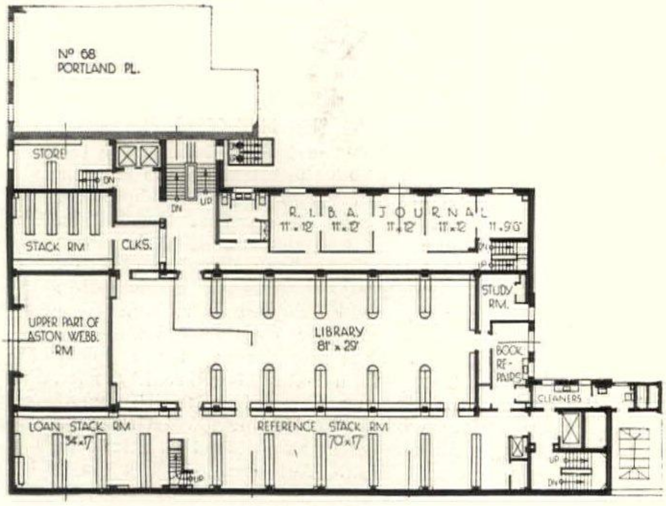
A banner crop of radios was produced by the radio industry in 1934. Four and one-half million new sets were added to those already in use to bring the total for the nation up to 19,000,000. This is 8,000,000 more radios than there are home telephones. The 19,000,000 sets do not include those in homes having two and three sets, nor some 2,000,000 sets now installed in automobiles, according to the trade journal **Electronics.**

Interior view of the new headquarters of the Royal Institute of British Architects at Portland Place, London, opened formally on November 21. At the Institute's Centenary Banquet the Prince of Wales congratulated the architect, G. Grey Wornum, "on his fine conception of modern design," and urged his listeners "to carry the principle of mass production over to architecture and the building trades."
D. Everett Waid, chairman of the A. I. A. Building Committee, was invited but unable to attend the dedication ceremonies. Mr. Waid reports that his committee is making progress toward achieving a new building for the American Institute of Architects. The general design, prepared by Mr. Waid and the late Charles Platt, has been officially approved and construction awaits satisfactory financial arrangements now being furthered.

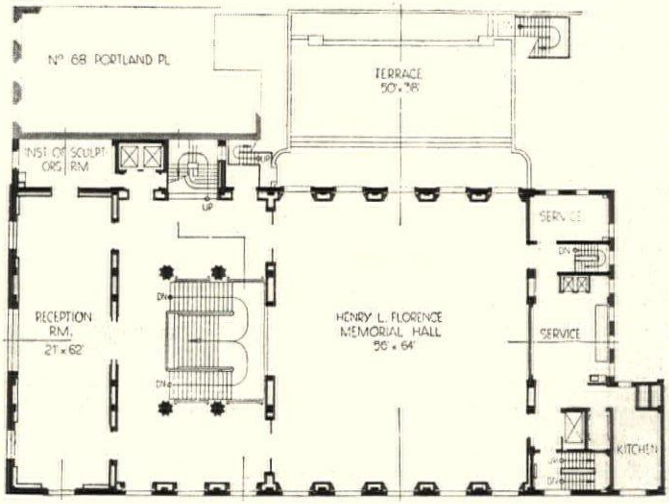


Wide World

THIRD FLOOR PLAN



FIRST FLOOR PLAN



HOUSES, INC.

Business Week, in its December 15 issue, reports the development of a new prefabricated home built in standardized sections, easily assembled and easily extended, with full electrical equipment.

It is being shown to selected visitors by Houses, Inc., New York. The sample house (one has been erected in New York's Grand Central Palace) is the outcome of under-cover experiments carried on for several years. Sales will begin in February after final tests of heating equipment in units to be built near New York and occupied by observing engineers. First of the 4-room-and-bath houses will sell (erected) for $3,900 cash. Later the mass market will be entered with installment selling at something under $40 per month. This will pay for the structure in 15 years, includes life insurance to the amount of the buyer's liability and fire insurance on contents.

The 4-room unit can be used as the nucleus of a structure including other standardized rooms or additions on the ground level. A 6-room cottage will cost around $5,000.

Full electrical equipment is built-in and is included in the cost. Items are heater, air conditioner, radio, kitchen range, refrigerator, clothes washer, percolator, toaster, iron, etc.

Frame of the house is of steel. Wall panels are of cement and asbestos between which is 2 inches of special insulation. The roof is almost flat and is Barrett specification. Pilasters are a special metal with an aluminum base. The entire house may be painted but only the doors and jambs require it. Window frames are metal. Screens and storm windows are standard equipment. A special paper that can be washed covers the inner walls. Ceilings are of a sound-deadening composition. Floors are of wood composition which is fire-resistant.

Houses, Inc., is a holding company under which other units (such as financing and construction) will later be organized. Foster Gunnison, president, announces that his organization is independent of all manufacturers; nearly all the electrical appliances and equipment in the New York sample house, however, are from General Electric, according to **Business Week.**

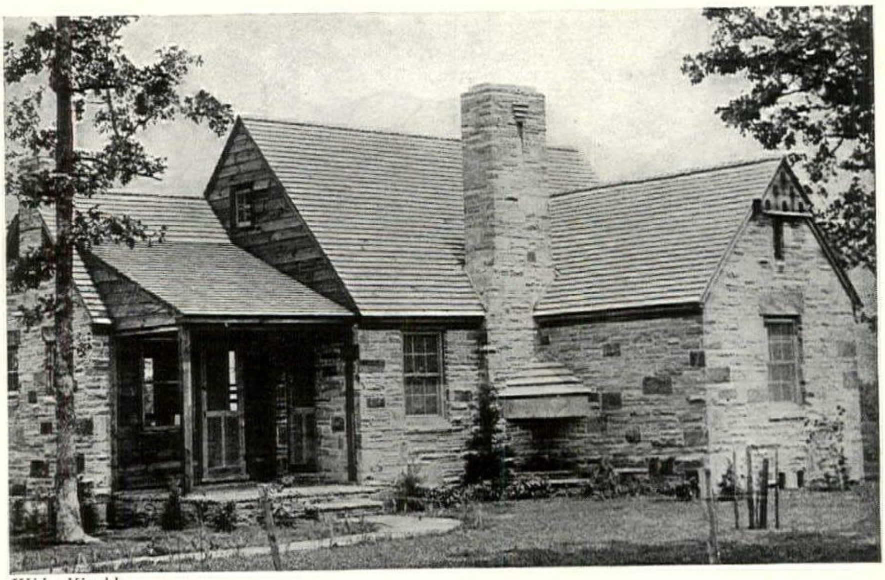
$6,000,000 POST OFFICE LACKS LETTER DROP

Newspapers in December carried a story that Pittsburgh's new $6,000,000 post office has a troublesome defect. There are shiny, gilded depositories bearing bronze signs, "Special Delivery," "Air Mail" and "Letters in Bulk," but none apparently designed for the person who has only one letter to mail. The plain truth, says Postmaster Turner, is that the architects forgot all about it.

INDIVIDUALS HAVE VARYING RESISTANCE TO ELECTRIC SHOCK

Danger of death from electric shock from the ordinary household current is stressed in a report to the New York Electrical Society by Dr. W. B. Kouwenhoven, Johns Hopkins University electrical engineering professor. He and his associates have found that alternating current is much more dangerous at low voltages than at high voltages. On high voltages the muscle contraction may be severe enough to throw the person away from the contact with the electricity, while on low voltage circuits it is often impossible for him to let go. Low voltage direct current is not nearly so dangerous as low voltage alternating current. There is only one authentic record of a man being killed by 110 volts from a direct current circuit, but there are many such deaths from the 110-volt alternating circuits. The danger from households circuits is particularly great in bathrooms, cellars, garages and other damp places.

Never reach for an electric device while in the bathtub or while still wet from the bath, Dr. Kouwenhoven warned. Don't use an electric curling iron in the bathroom. He noted with approval the Massachusetts law which forbids placing electric switches inside the bathroom. Neither switchplates nor pull sockets should be within reach of the bathtub, and there should be no electric heaters in the bathroom, in his opinion.



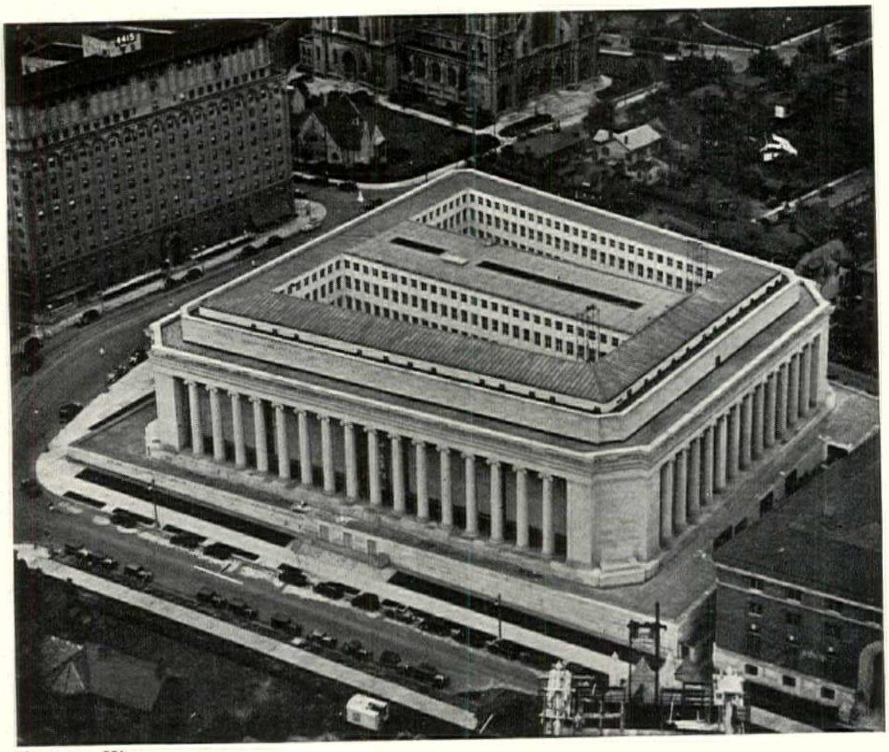
Wide World

This view of a subsistence homestead at Crossville, Tennessee, appeared in the October 1934 issue with a caption stating the cost of the house to be $2,000. Inquiries from readers as to the plausibility of such a low cost were passed on to the Subsistence Homesteads Division. The explanation, according to the Division's reply, is that it was the cash cost of the house which was under $2,000. The reply continues:

"At our Crossville project, which is for a so-called 'stranded' group of former miners and lumbermen, the self-help work method is used. Homesteaders, themselves, are improving the land and building the houses, being paid partly in cash and partly in credit against the purchasing price of their homestead.

"The house in question cost approximately $1,800 in cash for materials and cash labor, and the homesteaders who worked on it received approximately $800 worth of credit, making the total cash plus credit cost approximately $2,600. The house contains six rooms with a bathroom, but is without a cellar or central heating plant, dependence being had on the fireplace and range.

"The Crossville project has been particularly fortunate in having available on the place a supply of crab-orchard stone and plenty of timber, including oak and pine. Due largely to the initiative of the project manager, a second-hand sawmill was purchased very cheaply and the project has been turning out its own timber. We have, therefore, these houses constructed with some of the country's finest building stone, with hand-hewn oak beams, and knotty pine paneling, constructed at the remarkably low cost given above."



Keystone View

The new building of the Mellon Institute of Industrial Research in Pittsburgh. Janssen and Cocken, architects

TURKEY GOES PRE-TURKISH

Istanbul, one of the truly glamorous cities of the Old World, is being remade, according to **Science Service.** It is to reappear as it was before the Turkish invasion in 1453, Mustapha Kemal Pasha, president of the Republic of Turkey, has decided. Plans are under way. To show what the city called Constantinople was like in the Middle Ages, a professor of the history of architecture at the Academy of Fine Arts has prepared maps based on old charts and records of different periods before the Turkish invasion.

With certain modern buildings torn down and historic structures restored, Istanbul will have back many long-lost vistas and skylines. The famous Mosque of Saint Sophia is undergoing extensive repairs. Gardens of Byzantine emperors are to bloom again. Parks, palaces, and religious structures are being refurbished or otherwise restored.

In recent years, Rome has been busy resurrecting ancient grandeurs. The United States has its restoration of a colonial town at Williamsburg. By restoring medieval Constantinople, the **Science Service** writer remarks, Turkey is showing in one more way her determination to keep up with the times.

ELECTRIFYING THE HOUSEHOLD

Demand for electrical appliances for the home, of which the kitchen stove and the refrigerator are two of the most popular, has been growing steadily, the Edison Electric Institute reports. Electric power output, too, has been growing steadily, more because of domestic consumption than because of any other reason.

The thoroughly electrified home—for quite a while the dream of the power industry—is a housewives' reality now, although not that of a multitude of housewives. In the new Westinghouse model home is exhibited the extent of electrification. Automatic sliding doors open and close without being touched. There is radio control for the garbage can. Infrared and ultra-violet lamps give light; the bathrooms dry their own towels; the dishwasher both washes and dries the dishes, and there is, of course, the electric eggbeater. The weather is artificially controlled by electricity. The "thermotemp" keeps the temperature the same winter and summer.

Many of the new electric devices are not classed as luxury goods; manufacturers in the last year have been able to produce, for example, ranges at half the price of the ranges of not long ago. That is true, too, of refrigerators.

WINDOWLESS FACTORY PLANNED

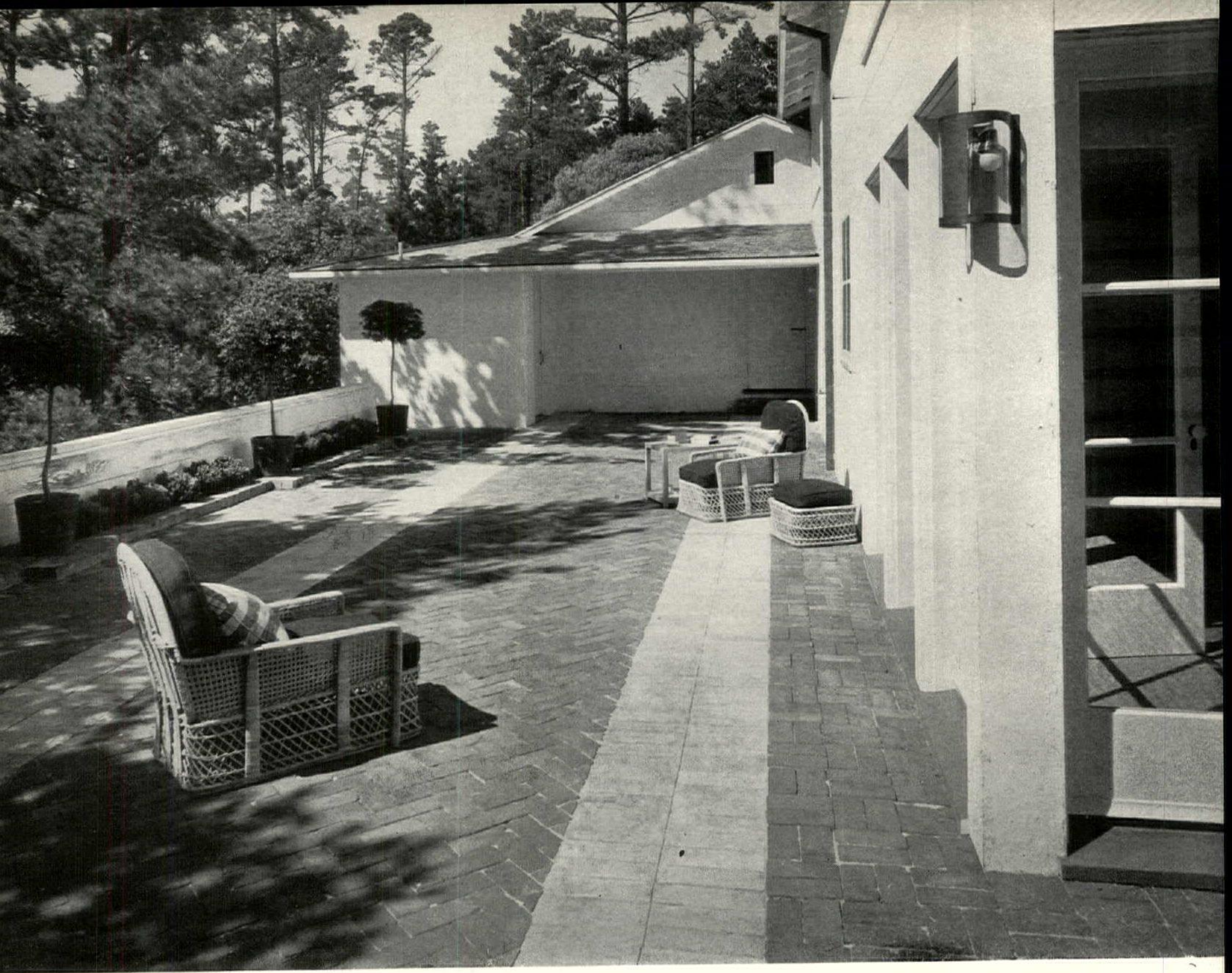
The Wallingford Steel Company has awarded to the C. F. Wooding Company the general contract for construction of a windowless office building which will contain a complete air conditioning system for both summer and winter use. The building is planned to be soundproof and will be illuminated by both incandescent and mercury vapor lamps.

The steel company's plant at Wallingford, Conn., is located on sandy terrain, from which clouds of dust are constantly stirred up, and switch-engines on nearby sidings create a smoke nuisance. These local conditions led to the decision to erect a building without windows in which ventilation with conditioned air would be possible.

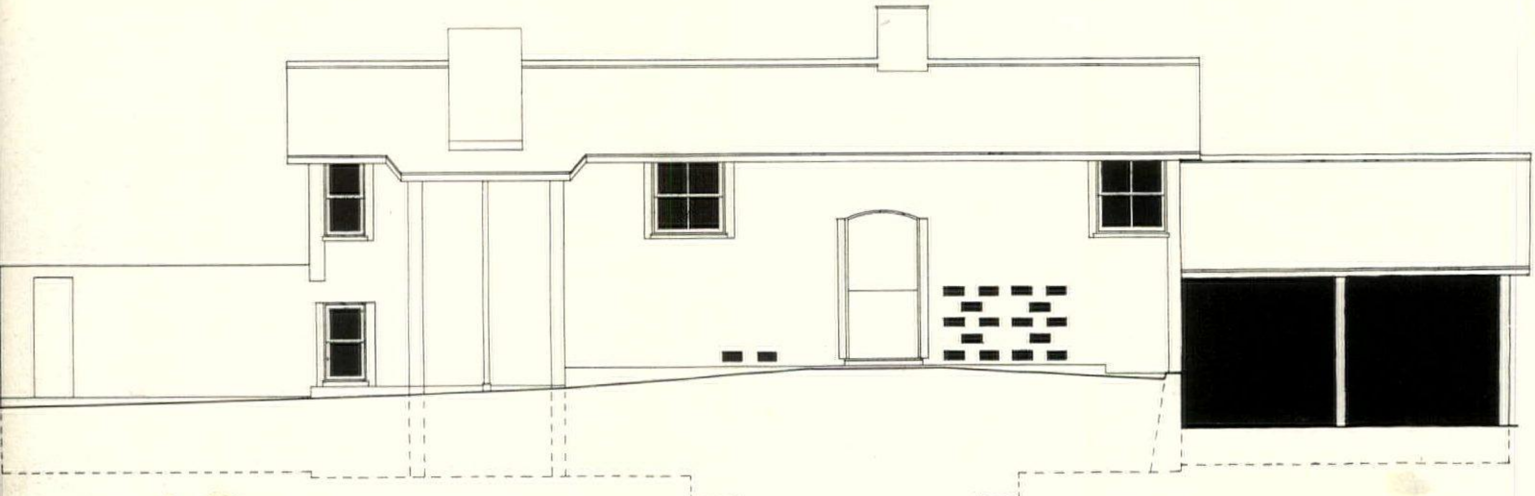
PORTFOLIO OF HOUSES

HOUSE OF MRS. E. C. CONVERSE
CARMEL - BY - THE - SEA, CALIFORNIA
WILLIAM WILSON WURSTER, ARCHITECT

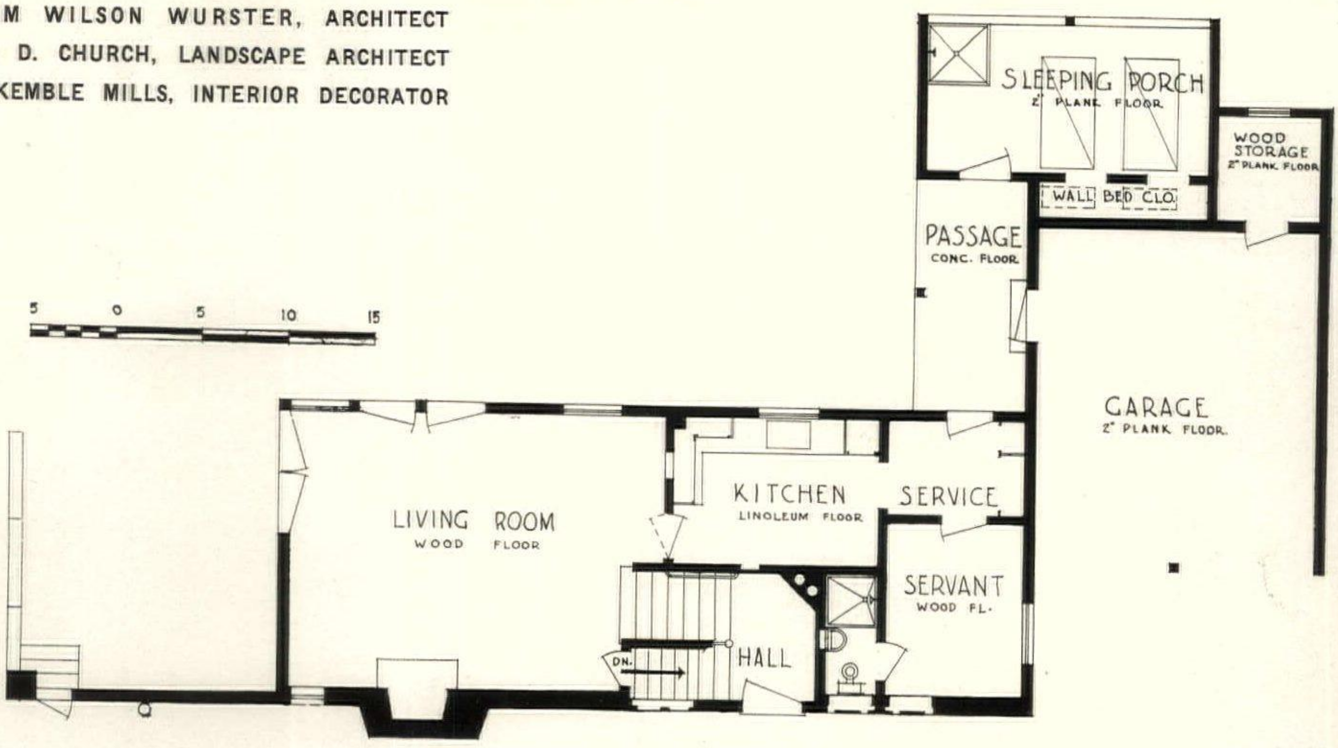
Photograph by Roger Sturtevant



HOUSE OF MRS. E. C. CONVERSE, CARMEL-BY-THE-SEA, CALIFORNIA

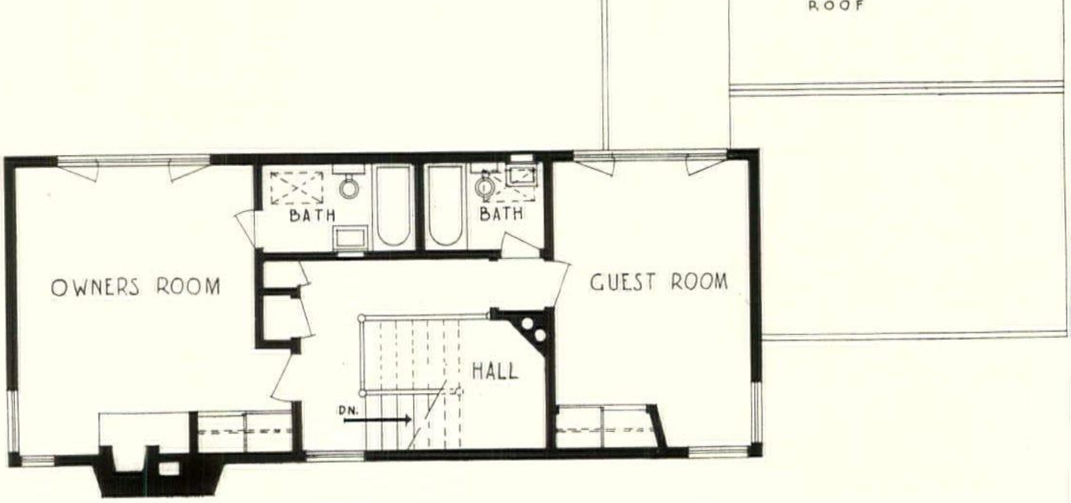


WILLIAM WILSON WURSTER, ARCHITECT
THOMAS D. CHURCH, LANDSCAPE ARCHITECT
JAMES KEMBLE MILLS, INTERIOR DECORATOR

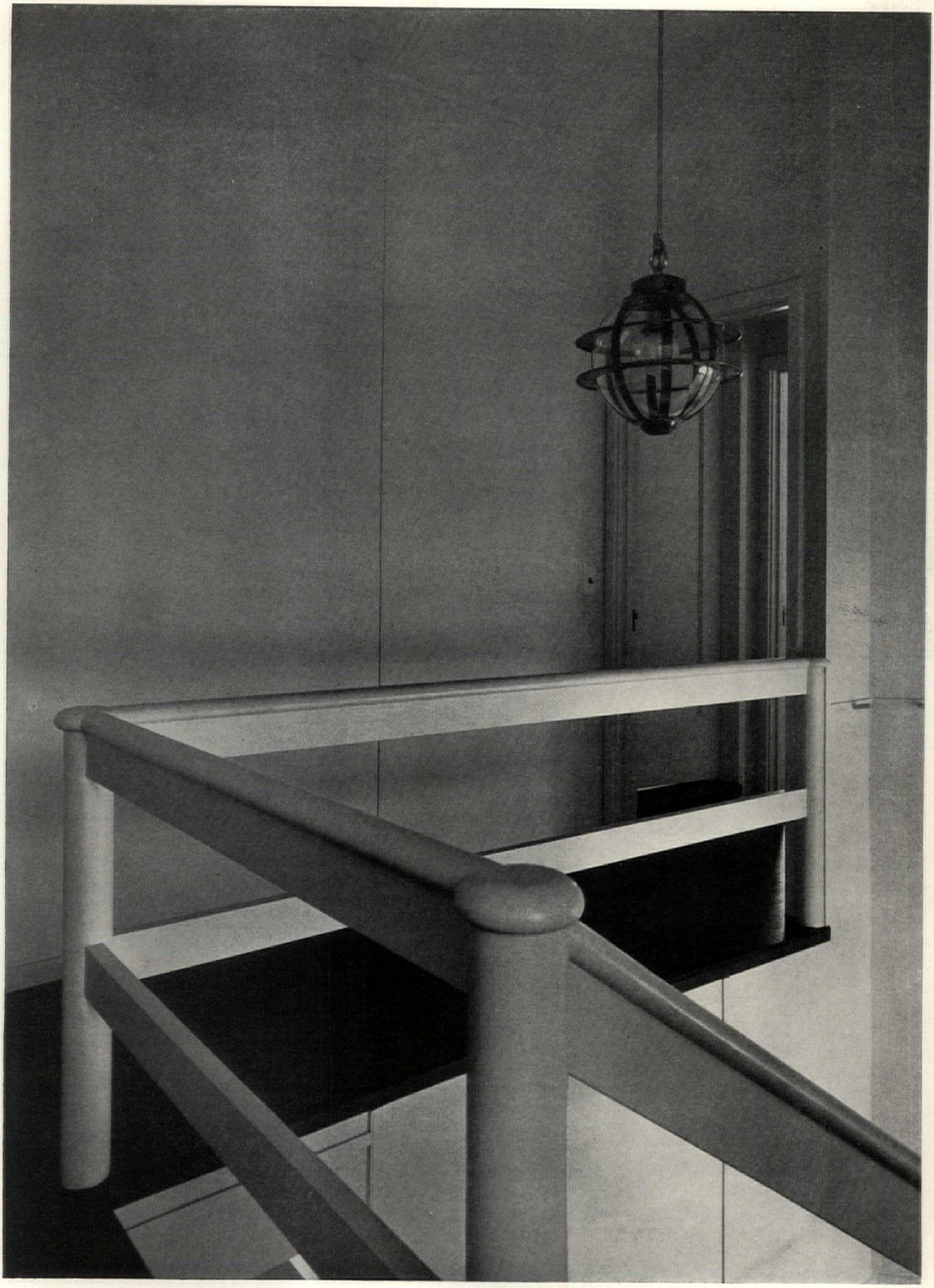


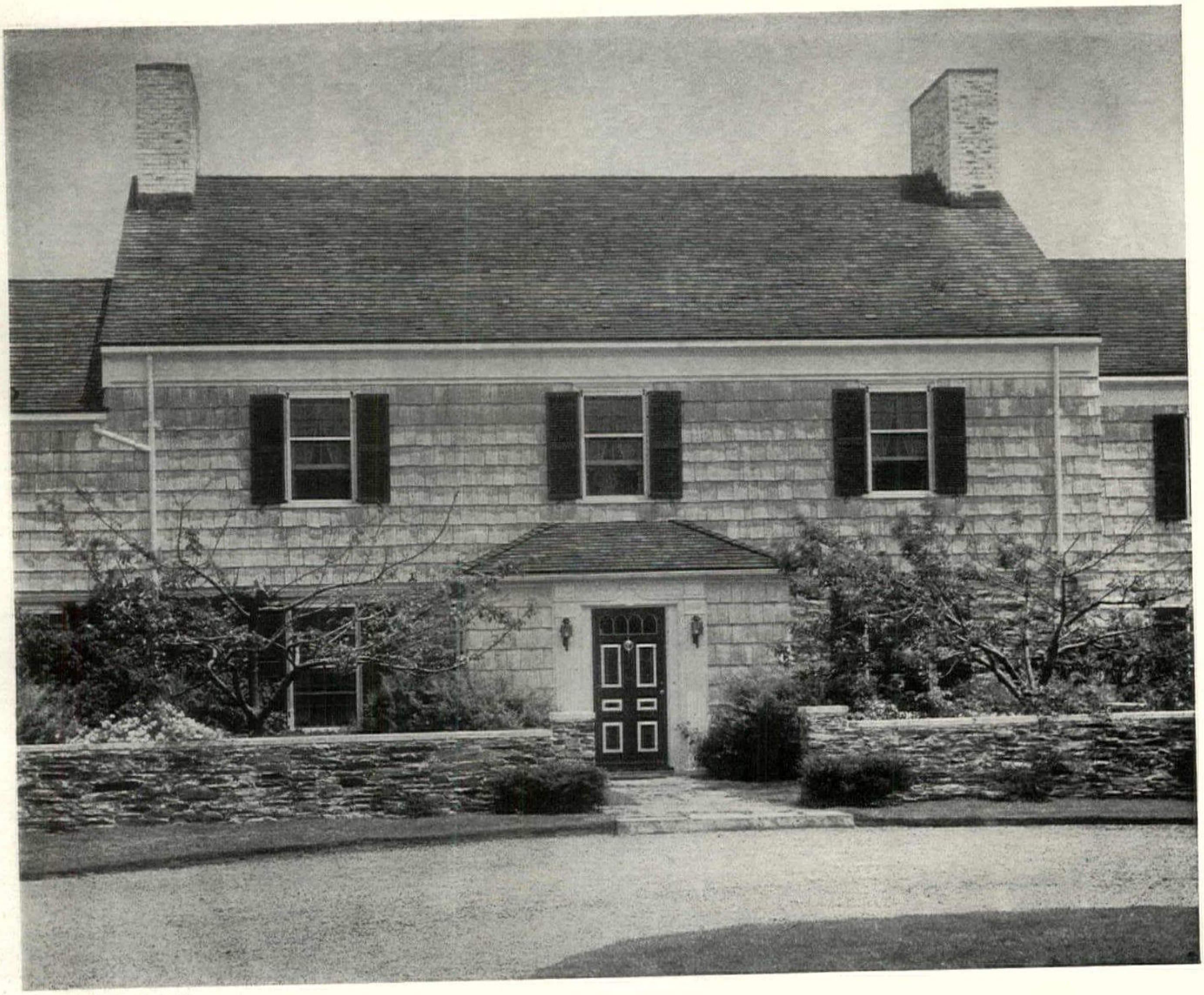
Photographs by Roger Sturtevant

HOUSE OR MRS. E. C. CONVERSE
CARMEL - BY - THE - SEA, CALIFORNIA

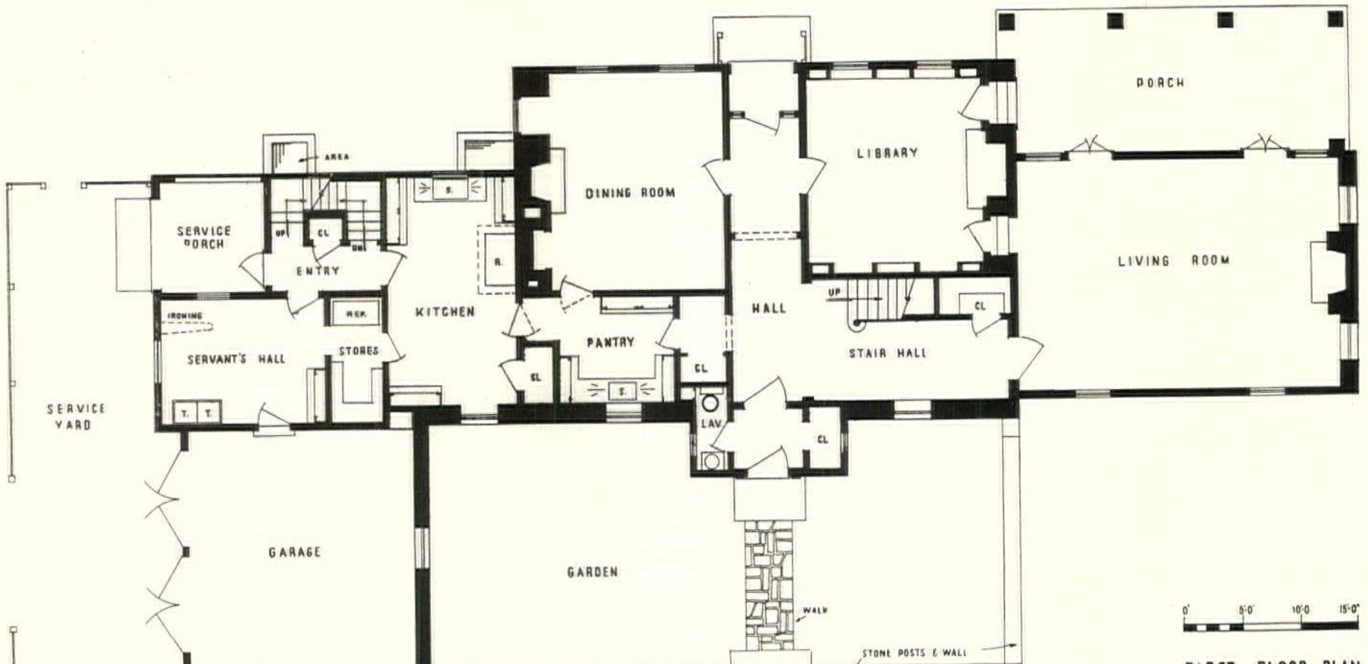


Photographs by Roger Sturtevant





Photographs by R. Tebbs



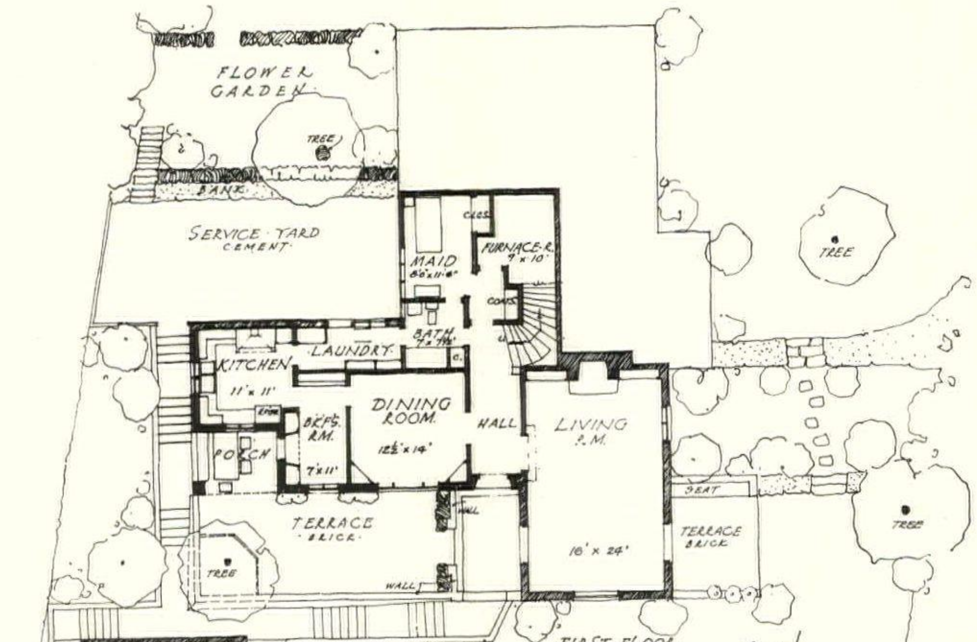
FIRST FLOOR PLAN

HOUSE OF JOHN J. O'DONNELL
NEWPORT, RHODE ISLAND
TREANOR AND FATIO, ARCHITECTS

Photographs by R. Tebbs

HOUSE OF M. L. PRINDLE
BRONXVILLE, NEW YORK
PENROSE V. STOUT, ARCHITECT

HOUSE OF MAURICE SAETA AT LOS ANGELES
WINCHTON LEAMON RISLEY, ARCHITECT



"Painting, sculpture, all furnishing and decoration, are the escaped subsidiaries of architecture, and may return very largely to their old dependence."
—From *The Work, Health and Happiness of Mankind*, by H. G. Wells.

THE ARCHITECT AS DESIGN AUTHORITY

BY JOHN GLOAG

There is nothing so powerful in the world today as the hatred the architect has for his client, said Alexander Woollcott as we discussed at breakfast some of the American peculiarities of the profession. There was profound observation behind that remark; which certainly applies to England, and, unless the architects I met during my stay in America were exceptional men, to America also. I knew it existed, but until Mr. Woolcott suddenly isolated it, and labeled it as a force, its significance as a symptom of the immense dissatisfaction that pervades the architectural profession did not strike me.

Why does this hatred exist? It has not always existed. There have been difficulties, such as those Vanbrugh experienced with the impossible Sarah, the mean, spiteful first Duchess of Marlborough, when he built Blenheim Palace; or those endured by Wren when he encountered the timidities and pettifogging policies of the Commissioners of St. Paul's; but from 1660 to 1820 or thereabouts the relations of the architect with his client were not clouded by conflict and terminated in ill-will. The architect then was dealing with educated patronage. He had principles of design, and the client understood them; and they were universally applicable, so that the architect was the master authority on design, and would be delighted to devise any little trinket for his client, or to create patterns for carpets, chair coverings and curtains, or shapes for lamps or door knockers. His control of design was recognized and encouraged, and within a century he lost nearly all of that wide authority, and is now engaged in an intermittent battle to preserve the remnant, for even in building his authority is now questioned by the client.

The situation today is that the architect has principles: he knows what is right. The client has prejudices: he knows what he wants. The result is stalemate, and there is nothing to be done about it but to upset the board and the pieces and for the architect to start in on a new game, and to say goodbye to all the squabbling that must arise when patronage is educated in the wrong way. For patronage is educated in America; far more than it is in England, where a carefully-cultivated brutality of outlook about anything connected with art makes it as difficult to explain to the average Englishman what is meant by design as it would be to expound the theory of relativity to a palaeolithic savage. Patronage for design in America has been oriented by tradition. The "charm" of the Colonial house and home and interior has been exploited with all the allure of fine color printing in magazines and advertisements from Canada to Mexico for so long, that the taste of cultivated people who care for their surroundings has ossified, and their imaginations are unrefreshed by experiments that would bring them into their own century.

The "styling" of industrial design so often means the application of this conventional "good taste," which is good only in the sense that it tolerates no uncomely thing, unless the sentimental or historical associations prove irresistible. This form of taste enables its exponents to select from the past American and European things that are good to look at and pleasant enough in use. It often degenerates into mere collecting, and from that into a squalid accumulation of objects that may or may not have any merit of design. It is when this form of taste touches the characteristic products of the commercial machine age that it becomes ridiculous.

That masterpiece of luxury and efficient transportation, "The Twentieth Century Limited," which brought me from Chicago to New York, is a sleek and lovely train of steel. But the ceiling of the observation car has imitation beams pressed out of the metal, and is decorated with writhing flowers and fruit; while the club car has its steel sides painted to imitate the grain of walnut, with lines painted to imitate satinwood and other colored inlays. And it is the innumerable men and women with "good taste" who are responsible; for they demand and get associations, sentimental and traditional; and although they live in tall, airy and spacious modern buildings, they make therein little caves full of antique plunder; loot from the seventeenth and eighteenth centuries, cunningly arranged, elegant, comfortable or heartily old world, according to temperament.

As patrons, are they worth bothering about? Can't the architect who wants to mean something to his own century leave them to the decorators? Design can't concern itself only with stage scenery; and awaiting the architect is a new field of patronage, promising abundant opportunities for experiment, which may enable him to regain his position as *the* authority on every branch of design, the position he has been losing for a hundred years. In that field he can become quickly established; but to enter it means admitting to his own professional self that architecture in the machine age means more than building. His responsibility for design, once valid and far-reaching, and today tentative and shaken, must extend beyond building to the products of organized industry; and he must accept the industrialist as a patron, and see to it that the industrialist accepts him as an authority.

The architect has more qualifications for assuming this responsibility than he probably suspects, and they are exactly the sort of qualifications the industrialist understands and desires. Here is a short but impressive list:

1. The architect understands the nature of materials, and can grasp their character readily and comprehend their limitations and has the imagination that will lead him to explore new ways of handling them.

2. His training in the handling of materials of the most diverse kind enables him to grasp the essentials of various industrial processes by which those materials are manufactured and manipulated.

3. He is familiar with the technique of standardization. He respects the value of standard units.

4. With the possible exception of people engaged in scientific research work, the architect is the only type of professional man whose whole training has familiarized him with planning in its widest and most comprehensive sense. Like an industrial engineer planning a sequence of machine production, he has to foresee the working of his plans in all their ultimate ramifications of detail, and he has to imagine all manner of contingencies and provide reserves of labor, power, material and money to cover them. He has to erect with every job he plans an economic structure which will carry it through to completion. And this leads to his next qualification.

5. He understands the meaning of costs.

6. Finally, he can produce the not unimportant qualification of having passed an examination which permits him to practice as a designer.

No artist or free-lance designer could possibly assemble such an array of arguments for the wooing of industrial patronage. I suspect that industrial administrators are as shy in America as they are in England of the artist; that they distrust the man who talks to them about "design," but are prepared to accept good design if it is presented to them almost as a technical process. Designers are being employed, and are securing adequate fees for bringing civilized coherence to the form of such things as vacuum cleaners, water heaters, refrigerators, radio sets, scales, cameras, alarm clocks, kitchen and bathroom units, and washing machines—the typical products of the machine age; even as the eighteenth century designer (who was the architect) gave to the typical products of his age the forms acceptable to the canons of good taste.

The architect must break down the idea that he is an "artistic luxury." There is a danger that the industrialist might put that label on him, unless he makes the whole business of design seem, as indeed it is, a highly skilled technical operation. In England the designer has been the missing technician in industry since the beginning of the industrial revolution; in America his place has been usurped by the stylizer who is often somebody who merely "applies" some touch of ornament or imposes some refinement of shape that will accord with what is thought to be modish. But it is to the credit of American industry that it has recognized that its products should be "styled." England for generations has been afflicted with what can only be described as engineer's art: products mutilated and disguised by men who were urged to hide the work of the machine with an "arty" touch.

The architect has the power, if he will cultivate it, to kill the notion that a designer can be called in to operate a separate process called "styling." He can teach industry that design is the initial process. He has at the moment perhaps his greatest opportunity for educating industry in design; for except in advertising technique, American industry is uneducated; and the function of the designer is still confused with all kinds of inherited ideas about people with a talent for "drawing" or decoration or ringing the changes on old patterns. When Norman Bel Geddes created a highly successful standardized stove unit for the Standard Gas Equipment Corporation, he not only swept away the older types of apparatus, with their untidy agglomeration of gadgets and their tops and sizes of imitation marble—he swept away an accumulation of misconceptions about the nature of design and the character of the designer. If only architects would give their talents and the advantages of their training to industry, they could, through this close association with machine production, so affect the form of things in everyday use, that America and the rest of the world would wake up to discover that the machine age had found itself, and that they were living in a new renaissance of design that made the conventional "good taste" of the architect's clients today look as haggard and pathetic as old world fancy dress the morning after the party.

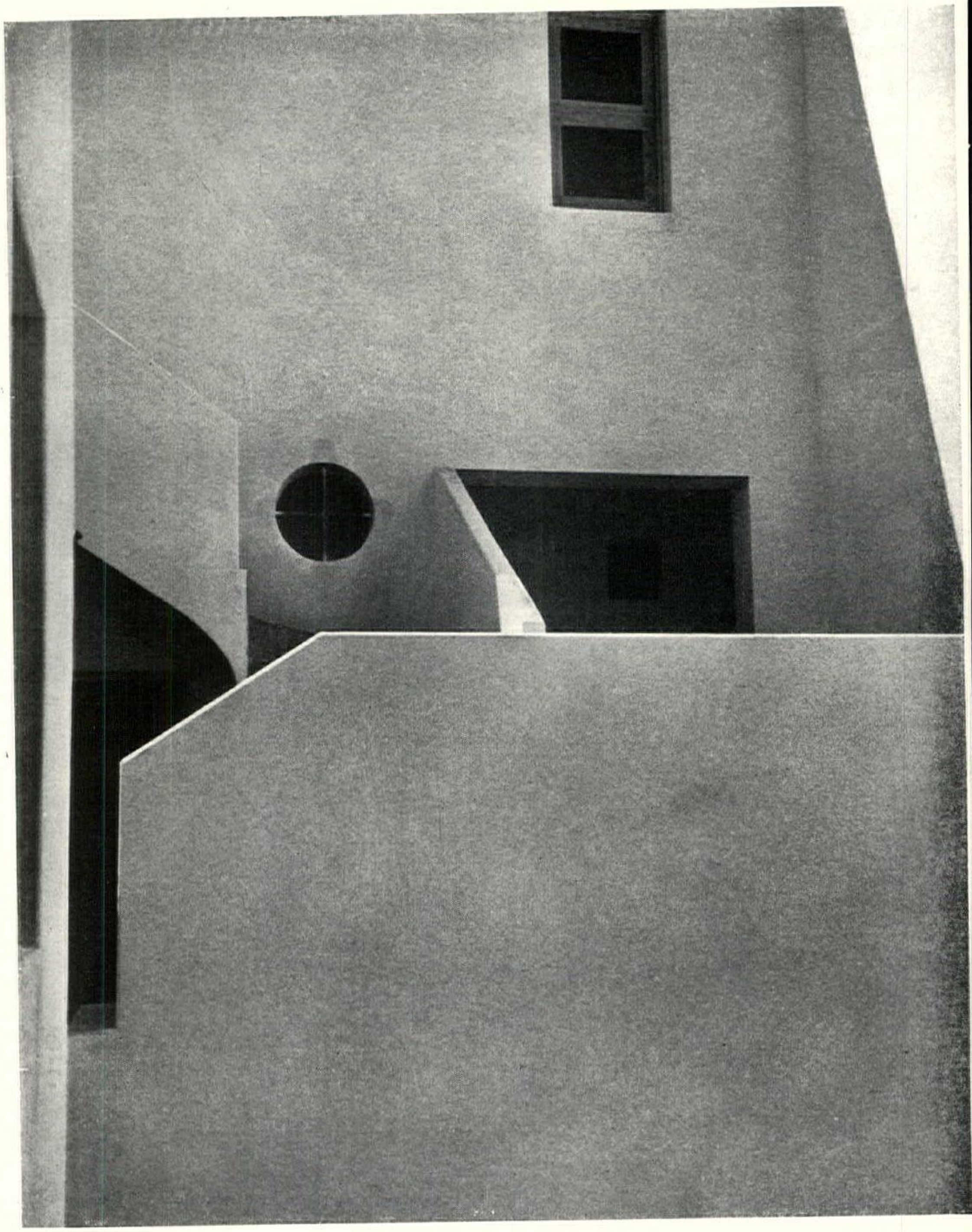
Architects have a deeper responsibility to contemporary civilization than most people. Their work exposes the quality and fiber of their civilization to the future. In the commercial machine age their work must cover every branch of design. They cannot wait for taste to change: they must change it, and they can, through industry. And as industrial design improves, becomes more lucid and sane and orderly, the lovers of the old Colonial home may begin to think that great hulking tables from the seventeenth century, and wood condemned to perpetuate the shapes that were so felicitous and suitable for eighteenth century rooms, clothes and manners, are as out of place in a tower of steel and glass as the bronze sconces, enameled candles, and glass lamps imitating flames, that illuminate the observation car of "The Twentieth Century Limited."

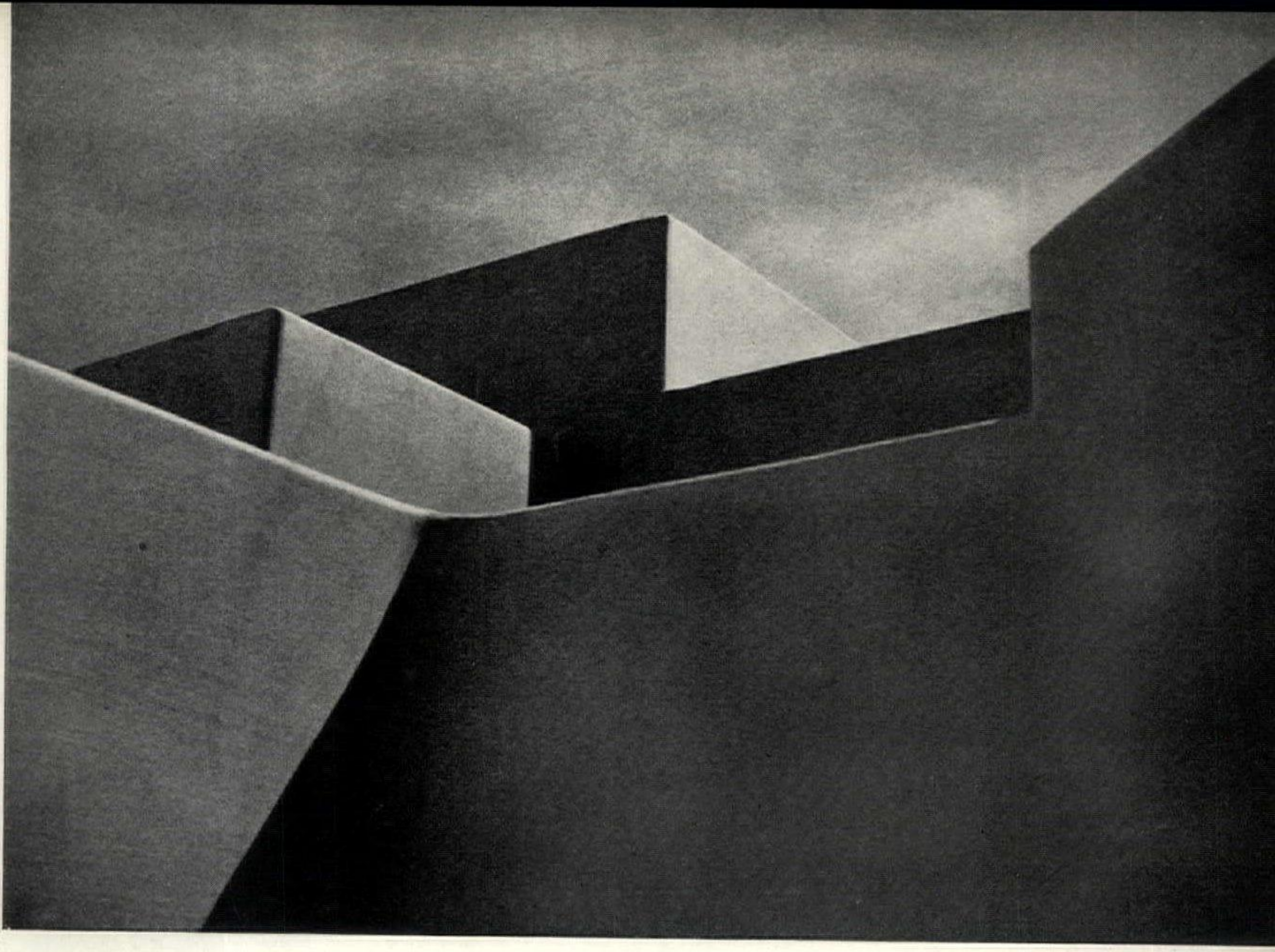
RECENT WORK OF A MEXICAN ARCHITECT— LUIS BARRAGAN

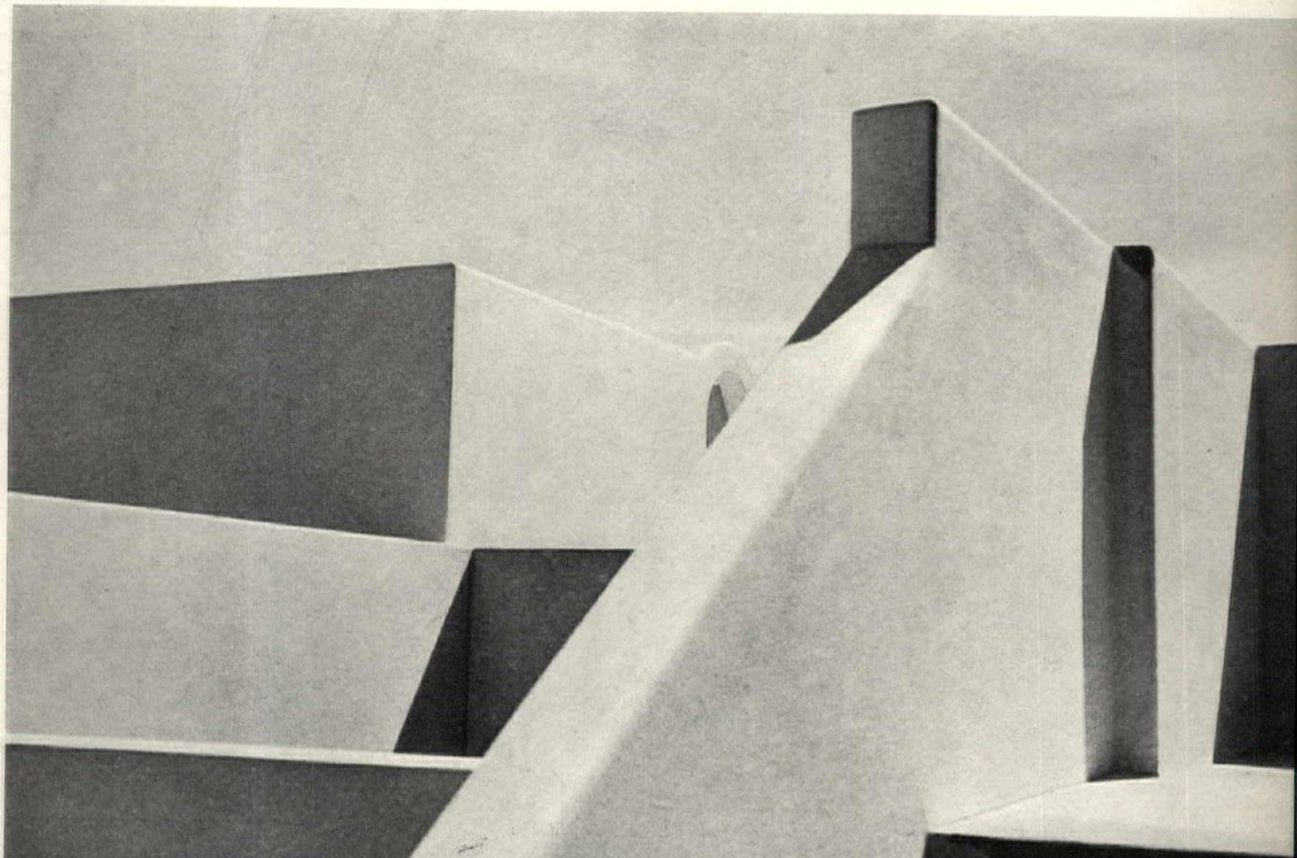
THE ARCHITECT'S OWN HOUSE (REMODELED) AT CHAPALA, A LAKE RESORT IN MEXICO

HE ARCHITECT'S OWN HOUSE (REMODELED) AT CHAPALA, MEXICO

REMODELED HOUSE AT GUADALAJARA, MEXICO
LUIS BARRAGAN, ARCHITECT
JUAN PALOMAR, ENGINEER







Photographs by R. Salcedo Magaña

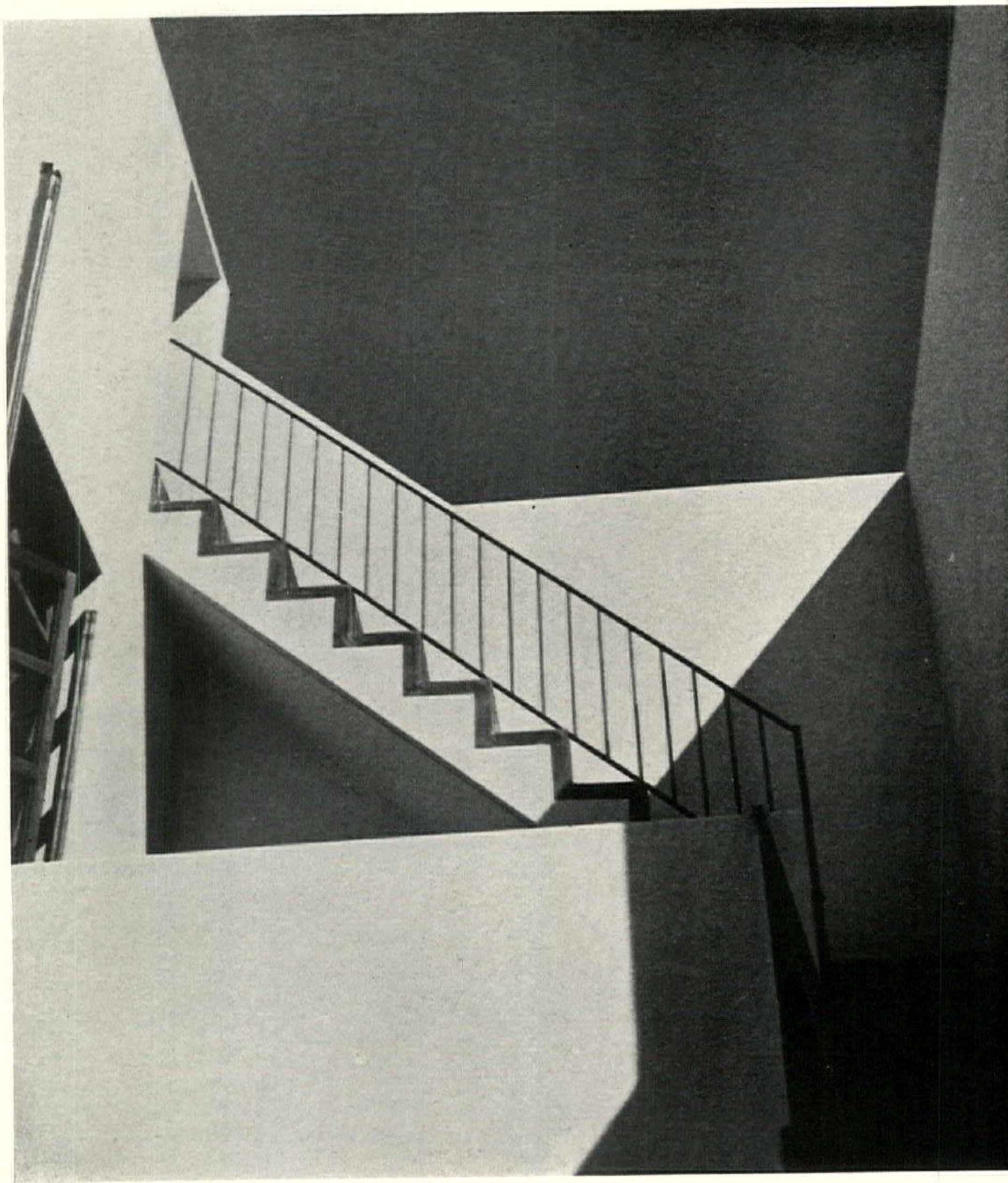
Photographs by R. Salcedo Magaña

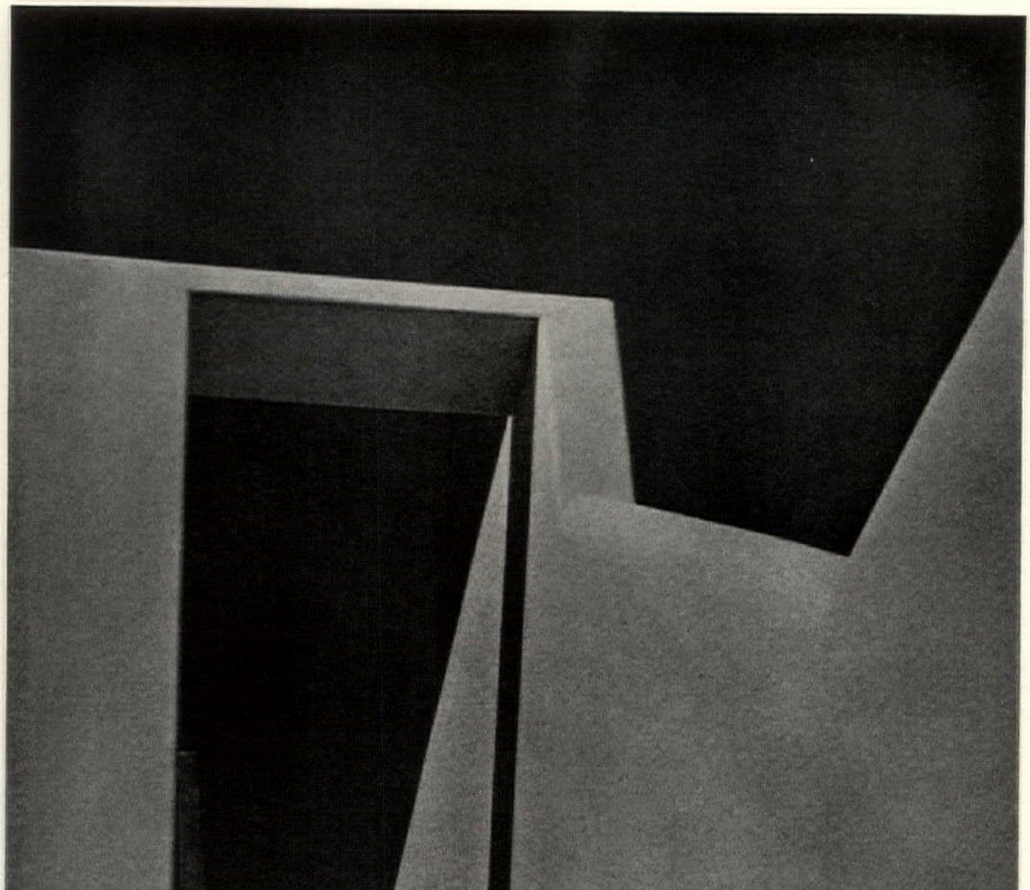
REMODELED HOUSE AT GUADALAJARA

LUIS BARRAGAN, ARCHITECT

HOUSE OF MRS. HARPPER de GARIBI AT GUADALAJARA

LUIS BARRAGAN, ARCHITECT
RAMON HERMONSILLO, ENGINEER

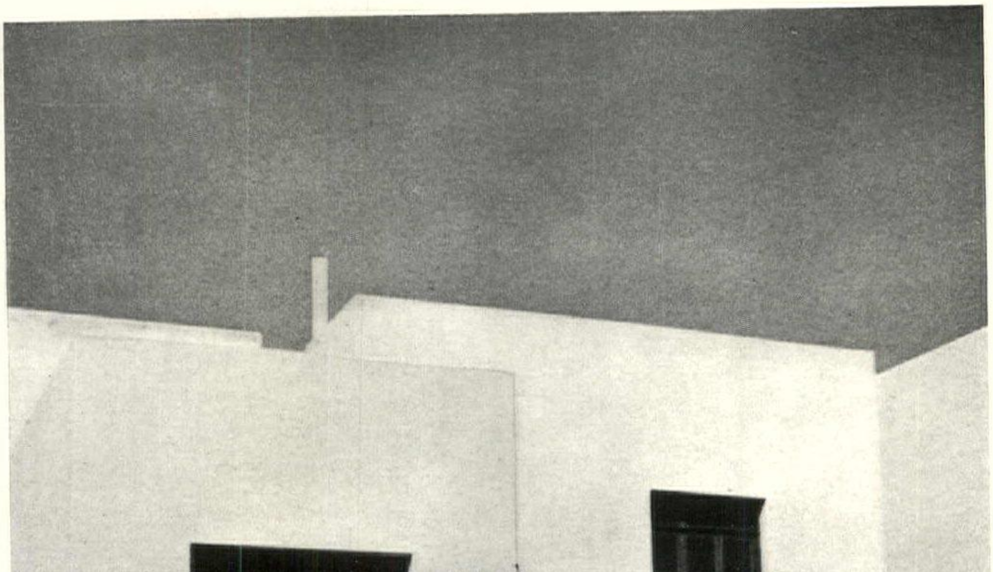


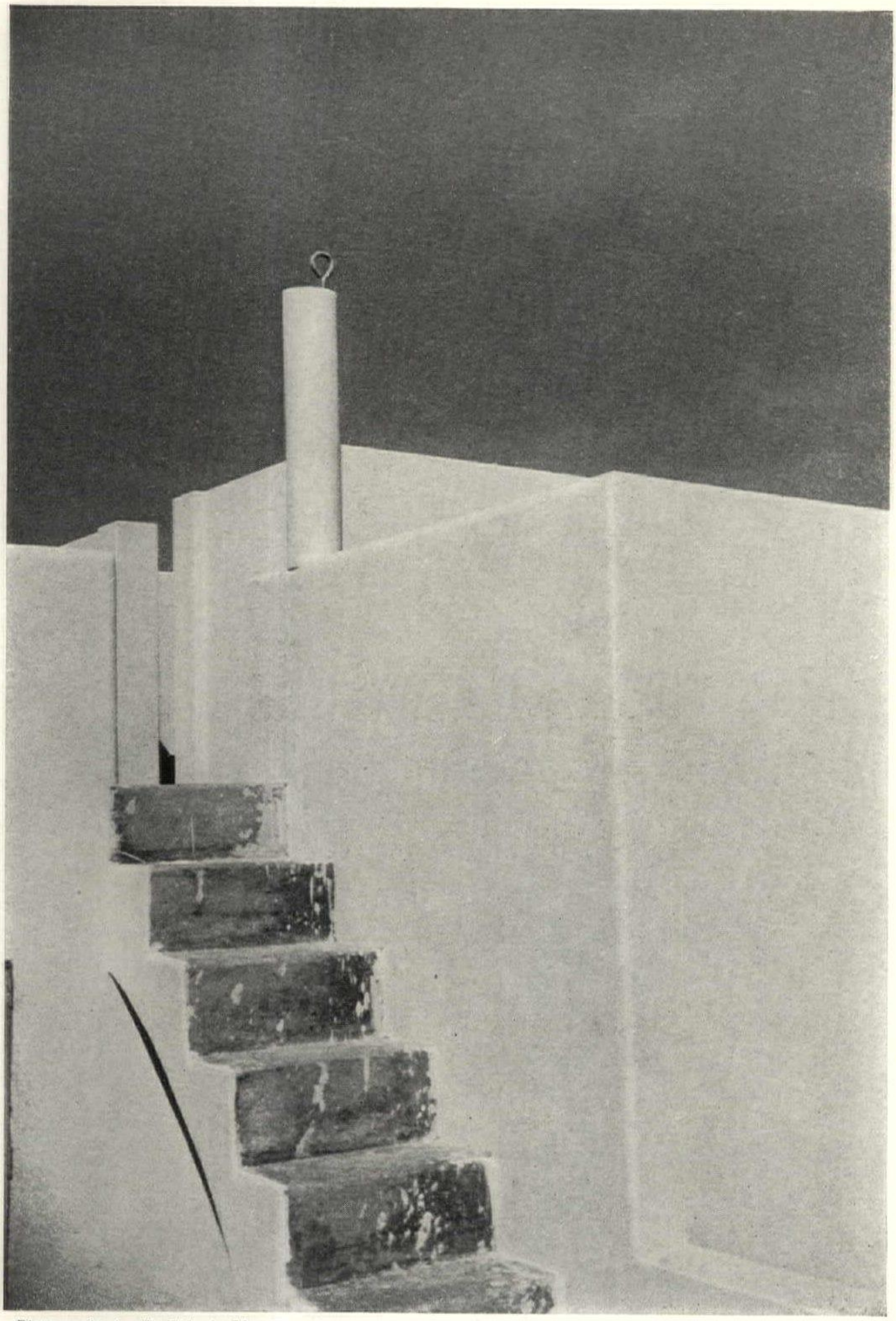


Photographs by R. Salcedo Magaña

HOUSE OF LIE. E. ROBLES LEON AT GUADALAJARA

LUIS BARRAGAN, ARCHITECT
RAMON HERMONSILLO, ENGINEER

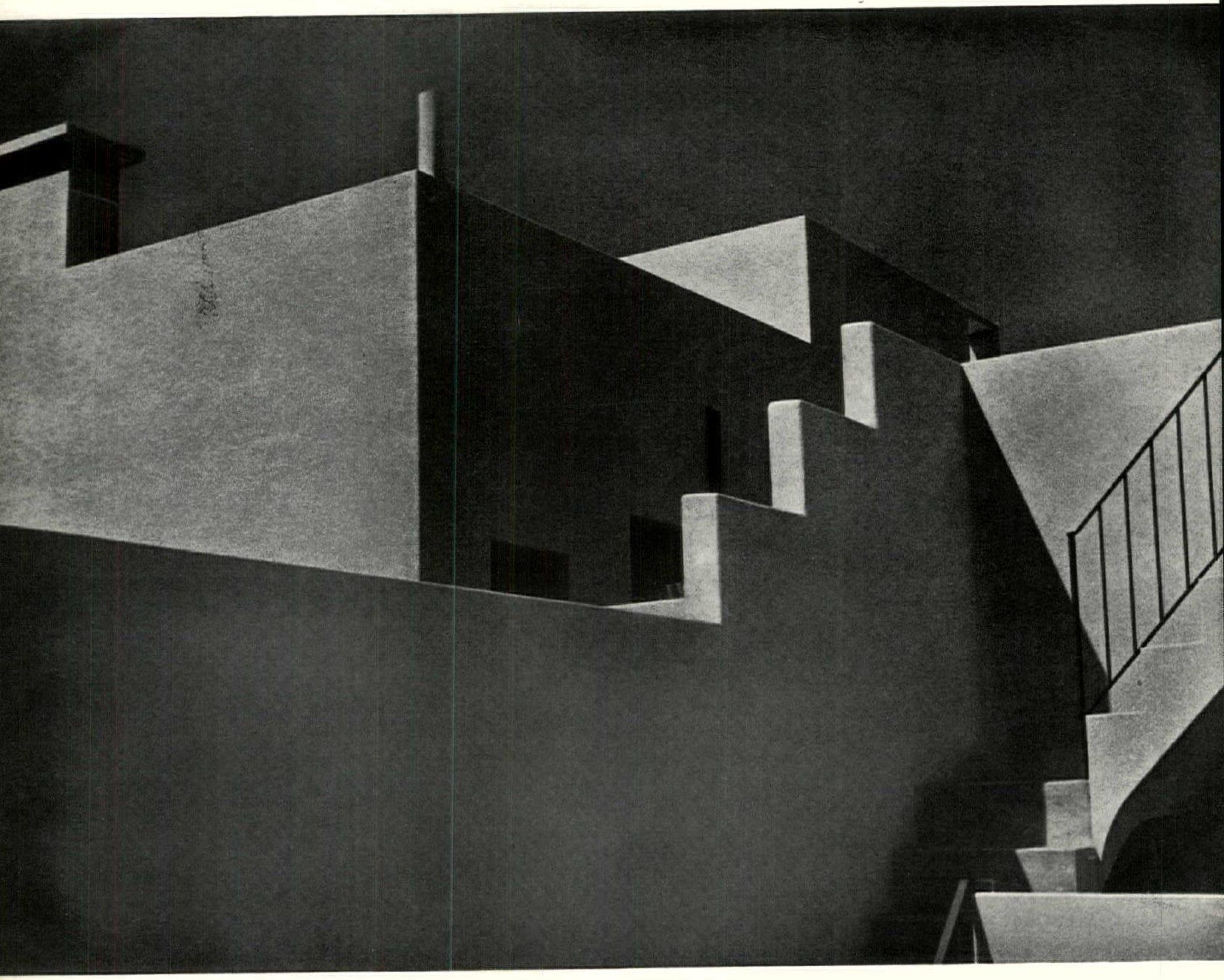




Photographs by R. Salcedo Magaña

HOUSE OF LIE. E. ROBLES LEON, GUADALAJARA

LUIS BARRAGAN, ARCHITECT



Photographs by R. Salcedo Magaña

Photograph by R. Salcedo Magaña

HOUSE OF LIE. E. ROBLES LEON—LUIS BARRAGAN, ARCHITECT

THE ARCHITECT IN THE HOME

A TRUE TALE OF LABOR AMONG THE LOVED ONES

BY GEORGE S. CHAPPELL

I met my old friend and fellow-architect, Horace Bradford, on the street the other day. I was both shocked and surprised at his haggard appearance, particularly as I had heard, within the fairly recent past, that he had been busy with a real job, news of which had spread like wildfire through our fraternity, being greeted with loud cries of "The lucky bum!," "How does he get that way!," et cetera.

And yet, as I say, in spite of his good fortune my friend's expression was so woebegone that when he suggested lunching together I hesitated. However, having no excuse ready I felt myself caught. There was, moreover, an unspoken but poignant appeal in his eyes. I sensed that his heart was charged with a heavy burden which he felt that some one must share. With a slight sinking sensation I murmured my assent and we were soon seated at a quiet table in a near-by restaurant. There, over our coffee, Bradford unfolded his tragic tale.

"Yes, yes," he said in reply to a casual remark of mine, "I have had a job but for the love of Mike don't congratulate me or I shall break down. I'm so fed up on congratulations that I couldn't stand another one."

Noting my tactful silence and recipient expression he proceeded rapidly. "It was a good job, too—a big house up in Connecticut. I wasn't bothered with financial difficulties. There was plenty of money and my clients throughout were amiability itself. There was no trouble about anything so far as they were concerned. In fact, in many ways, as you can see, the set-up was ideal. And yet it has almost killed me. Let me make myself clear. I did the job alone . . . *and I did it at home."*

Bradford paused solemnly to let these words sink in before continuing.

"I don't know, George, whether you have ever tried working at home but if you haven't, let me warn you . . . don't. You remember my office in the old days, don't you? It was small but about as convenient a joint as I can imagine, with a place for everything. I had a nice reception room, a small private office with a big desk, and space in the drafting room for three tables with all the necessary filing cases for correspondence, racks for plans, drawers for instruments, bookshelves, cubby-holes. . . Gee whiz!"—he heaved a long sigh—"how little I appreciated them!"

"Of course I'm not kicking because I had to give up the place. A lot of guys have been in the same boat and when I stored my furniture and carted the absolutely necessary stuff out to the country—a table and board, my typewriter, tracing paper and so on—I thought I was darn lucky to get rid of the overhead. But trouble met me practically on the doorstep. When my wife saw what I was unloading from the car she said, 'Where do you think all that is going?' You know how helpful wives can be at times? I hastily assured her that everything was going to be all right and finally got my junk installed in a third-floor bedroom that used to be used for maids when we had such things, and that was that.

"I didn't go into the room for some time after that because I had nothing to do. Then this job came along, 'way last fall, and I started the home-office going. It worked pretty well at first. It was good to get back to the old drawing-board and I sang merrily at my work. This was while I was making the sketches, at eighth scale. They didn't take up much room and every evening I tidied up the table, laid the drawings neatly under a T-square and left the room looking ship-shape. But O, boy! when I hiked her up to quarter-scale, what a change!

"I'd forgotten how much room drawings can take, particularly if you never get rid of any. A lot of them were studies, tossed aside in the fine frenzy of creation as soon as they were finished. In the old days a boy or a charwoman or some one gathered up this sort of thing, but no more. At the end of a week I was up to my neck in tracing paper. The bed, which was still in the room, was covered with a two-foot drift. Over in one corner was an iron washstand on and under which I kept my stationery and ever so often I had to dig my way over to it.

"In the general confusion I discovered that everything I particularly wanted promptly got lost. If I turned away from my triangle for the fraction of a second it disappeared. Drawings that were urgently needed rolled themselves up and sneaked into the middle of the pile or, somehow or other, got inside of other drawings. My T-square developed an uncanny way of sliding back of things and my dividers simply walked off by themselves. They *must* have. It didn't help much when my wife, who heard me cursing, looked in the door and said, 'Good heavens, how can you work in such a mess!'

"In order to keep her out of the room I began making daily trips to the cellar carrying armfuls of discarded material. I knew that if I didn't do this she would sneak in and tidy up on me.

"Often I was alone in the house, the wife having gone to do her daily marketing or what not. Do you know what being alone in a house does to you? It makes you cuckoo. I found I was getting so terribly aware of things that it was actually painful. The telephone . . . or was it the doorbell? . . . would ring and automatically I would sprint for the stairs. Usually it would be the Fuller brush man or an old lady selling soap or, worst of all, some cackling female acquaintance who would say gaily, 'My, aren't you lucky not to have to go to work!' I got so jumpy and alert that I sprang to attention when any bell within half a mile rang and if a kid went by on a bicycle I used to rush down and open the front door.

"All this while, mark you, the job was getting more complicated and the drawings more unwieldy. The contract was let and I had to keep up with the builder. That meant details and O man! did I find out how much I'd forgotten! . . . how much, in fact, I'd never known. For a week I struggled with a chimney detail in which the flues apparently passed through each other or burst into the fireplaces above. All my formulas for flue sizes and throat openings vanished into thin air and I had to spend long hours weeding out the data.

"Submitting my details to the contractor was an agony. I used to watch him carefully to see if he'd burst out laughing but, bless his great human heart, he never did. Sometimes he looked puzzled, staring at the drawing, and then he'd say, 'I think I see what you mean,' . . . which was certainly letting me down easy. And he built the job perfectly. Everything worked like a charm. The chimneys drew, the stairs landed where they were supposed to, the windows opened and shut . . . it was wonderful! God's gift to architects is a good contractor, I say.

"However, my home troubles weren't over, not by a jugful. As winter came on my third-floor room became uninhabitable. I began to realize why maids, in the past, had been so fleeting. Out of the one small register, which was on the north wall, of course, came the cold breath of an ice-box, this in spite of the furnace stoking that filled my leisure moments. The wind blew through the windows as if they weren't there. Even my faithful dog, who used to bury himself under a pile of tracings, deserted me, shivering as he went and looking back reproachfully.

"Perforce I worked my way downward through our establishment, fighting my way, until at last I had our living room in complete disarray and my wife and family in hysterical revolt. The fact that I spent an hour every afternoon trying to clean up was totally unappreciated. '*Look* at this room!' my wife would shriek. I thought it looked very nice. My tracings, tucked in over the tops of the books made a rather neat effect and the T-squares went very well with the fire irons. In spite of which I was a reproach.

"The climax came when my daughter's favorite suitor, whose attentions I had consistently encouraged, sat down not on one but on *three* thumbtacks, which is some sort of a record, isn't it? I know it was the end of a beautiful friendship.

"Well, I finally muddled through, battling every inch of the way. The house was finished and my tools of trade were stowed away. Peace was restored. But now, George. . . " Bradford's voice broke and his hand trembled as he nervously fussed with his coffee cup . . . "I am faced with a terrible ordeal. I have just got another job . . . and we have moved into an apartment! Isn't it horrible!"

MODERNIZING THE SIOUX CITY SCHOOLS

A MODERNIZATION PROGRAM UNDERTAKEN AS A FEDERAL PUBLIC WORKS PROJECT

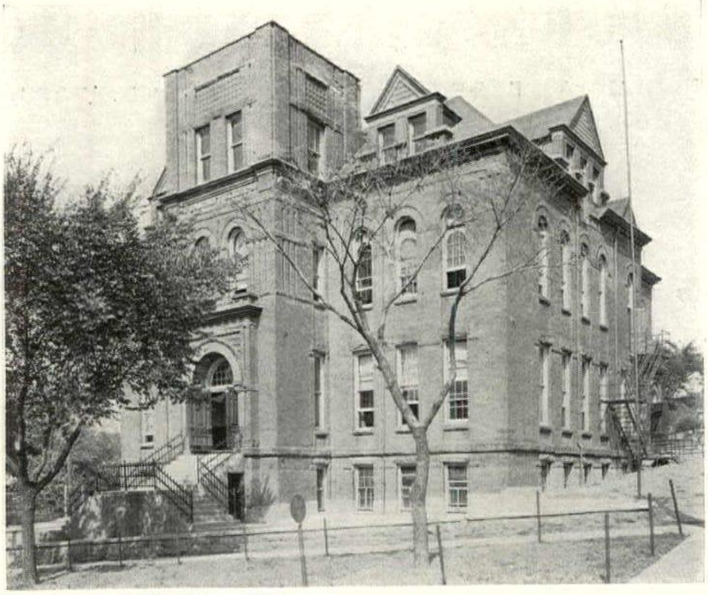
BEUTTLER & ARNOLD
SUPERVISING ARCHITECTS

GEORGE B. HILGERS
PAUL R. RUDOLPH
ASSOCIATE ARCHITECTS

ORIGINAL BUILDING: 1891

HAWTHORNE SCHOOL (REMODELED)

Photographs by N. N. Woodworth

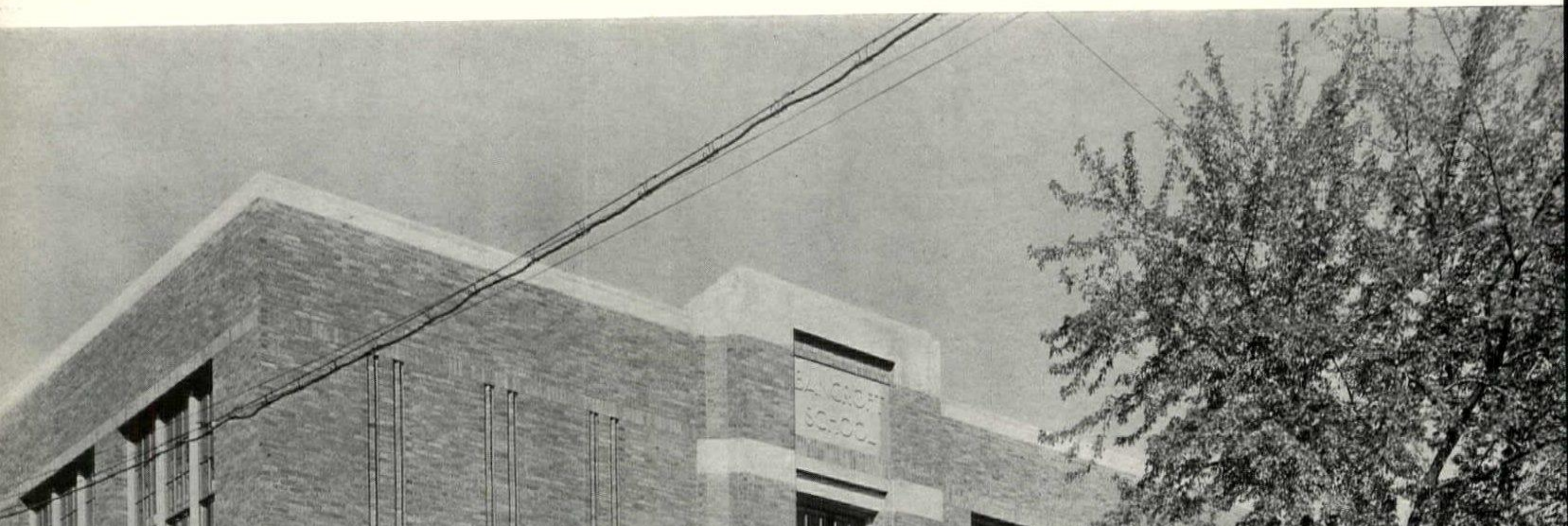


ORIGINAL BUILDING: 1888

BEUTTLER & ARNOLD
SUPERVISING ARCHITECTS

WILLIAM A. JENKINSON
ASSOCIATE ARCHITECT

BANCROFT SCHOOL (NEW BUILDING REPLACING OLD)



Photographs by N. N. Woodworth

MODERNIZING THE SIOUX CITY SCHOOLS

By RALPH ARNOLD

The Sioux City Board of Education, through a policy adopted several years ago, has been carrying forward a program of modernizing public school buildings. Thirteen projects were completed during the years 1927 to 1933 under this initial program.

Following the organization of the Federal Administration of Public Works, a survey was made by Beutler and Arnold, architects, for the Sioux City Board of Education, and application then was made to the Federal Administration for a 70% loan and 30% grant totaling approximately $550,000 to modernize and improve thirteen more of the remaining public school buildings. The application was accompanied by sketches and estimates of cost and recited the physical changes to be made and the advantages to be gained in each project.

The application was granted. School district bonds to the amount of $390,000 were issued, but inasmuch as other interests were willing to purchase at a lower interest rate than the 4% offered by the government, the bonds were sold privately and the application was revised to consist of a request only for a grant of approximately 30% of the building cost which was approved by the Administration.

TYPES OF PROJECTS

It was necessary to group the projects in two groups: (1) those consisting largely of additions to existing buildings and of such a nature that they could be begun and carried on without interfering with regular school activities; (2) those in which it would be necessary to vacate completely buildings during the period of construction. Construction contracts for group one were awarded as early as April 1, 1934, with the privilege of starting work immediately and with completion date of July 15, 1934. Construction contracts for group two were awarded prior to June 1, but with the restriction that actual construction work should not begin until after the closing of the school year, June 8, and with completion date of August 25, 1934. With the exception of minor items not materially interfering with school activities, the contracts were completed on time and active school work began in all of these buildings on the school schedule, September 4.

The thirteen projects may be further subdivided into the following: one entirely new building replacing one antiquated structure; five major complete remodeling and modernizing projects; five minor projects of remodeling and modernizing; two projects consisting of fireproof additions to existing modern buildings.

NATURE OF ALTERATIONS

The major group included buildings of ancient construction and design. The arrangements of these old buildings were studied and new plans developed with the following considerations in mind:

Location, type of residential district, need for permanent school, probable enrollment decreases owing to encroachment of business area, or probable increases by virtue of nearby undeveloped housing areas were analyzed.

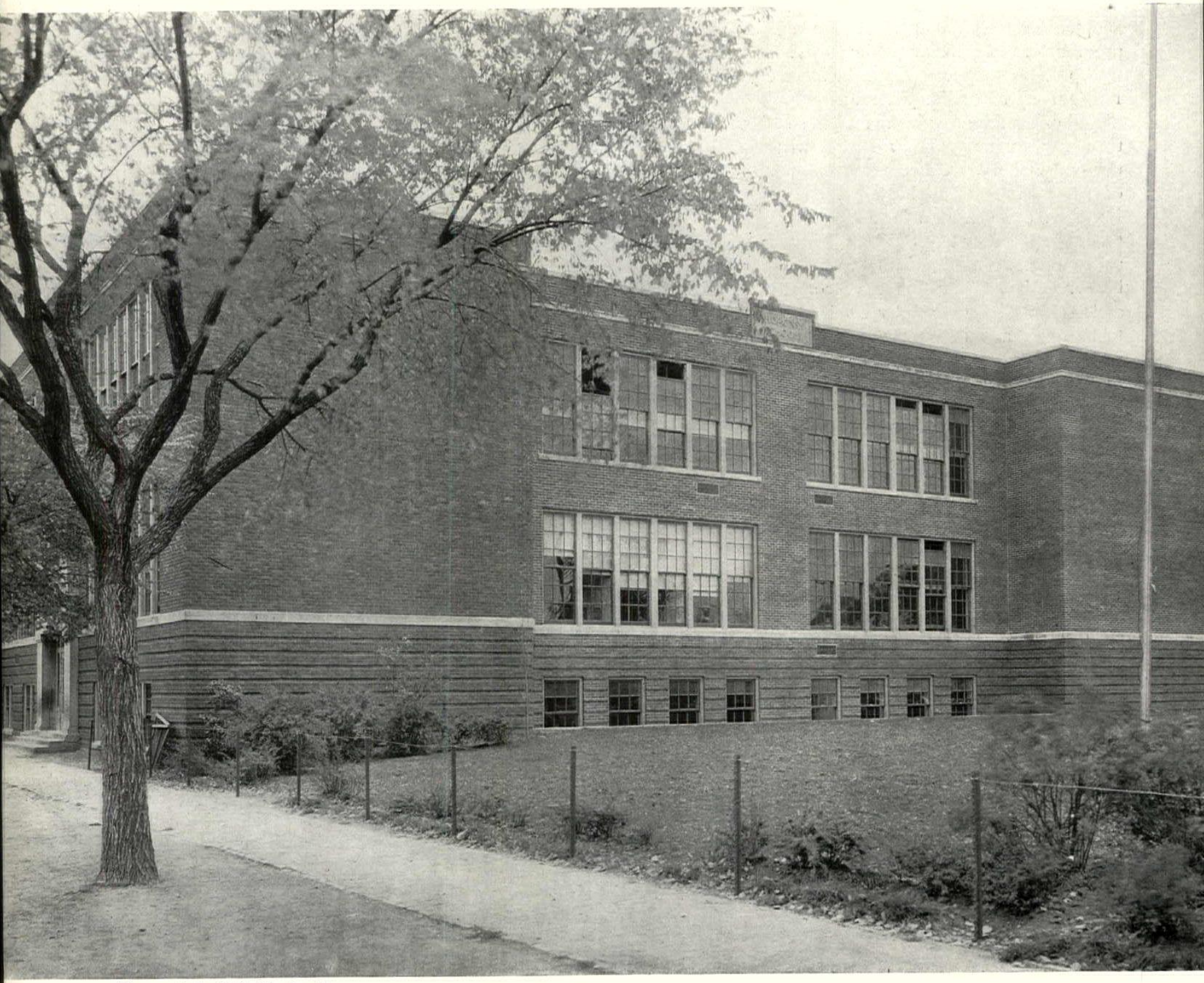
Size and age of building, physical condition and general adaptability of plan to a successful rearrangement were ascertained.

Old sloping type roofs supported by ancient wooden trusses, were removed; these were covered in most cases by wooden shingles, and having projecting type gutters with exterior downspouts, all in a bad state of repair and expensive to maintain. The new flat roofs were covered with pitch and gravel roofing, with proper fall to new inside wrought-iron downspouts, run to basement and connected to storm water sewers under ground. Exterior parapet walls were extended and new flashings installed, replacing old cornices and gutters.

Exterior brick facings of inferior soft brick laid in old lime mortar were removed and new vitrified face brick laid in cement lime mortar placed on the exterior walls and properly bonded with rows of blind headers. The old walls were carefully gone over and all defective brickwork replaced or repaired. During the process of refacing, the relocation of window and door openings was a simple matter.

ORIGINAL BUILDING: 1887

HOPKINS SCHOOL (REMODELED)



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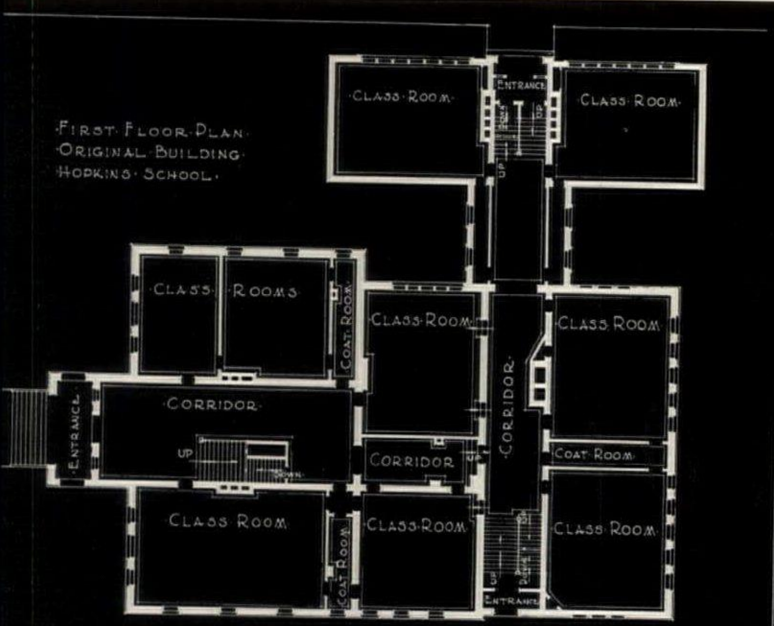
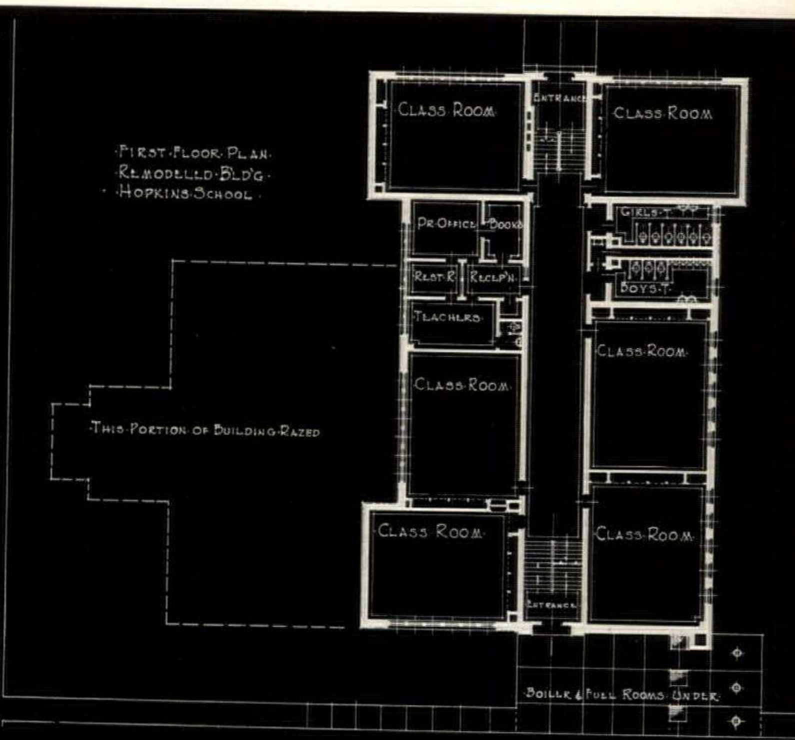




BEUTTLER AND ARNOLD, ARCHITECTS

The administrative needs of each building were considered and principals' offices, teachers' rooms, restrooms, and the like, provided, filling requirements that had been entirely neglected in most of the original building plans.

Where a building was so constructed that the ground floor had ceilings of satisfactory height, and could be properly lighted and ventilated, it was possible in several cases to finish some desirable rooms for instruction purposes that would otherwise have been waste spaces. In most of the projects, one to four rooms have been gained by this method.

Day-lighting in the older buildings was contrary to contemporary standards, both as to quantity and location. This deficiency was corrected by closing all windows in the end walls of corner rooms and installing new windows properly located.

The old foul-smelling, poorly ventilated, poorly lighted toilets, located in some far corner of the basement, were abandoned. Modern light and mechanically ventilated toilets were installed on each floor for boys and girls, and private toilets were provided adjoining the kindergarten rooms for the use of smaller children, and also in connection with the restrooms, and administrative offices.

Mechanical ventilation was provided for all classrooms and toilets. In some instances entirely new systems were installed, owing to the obsolescence of the existing system or to the lack of any system at all. Air filters were provided in connection with the ventilating systems.

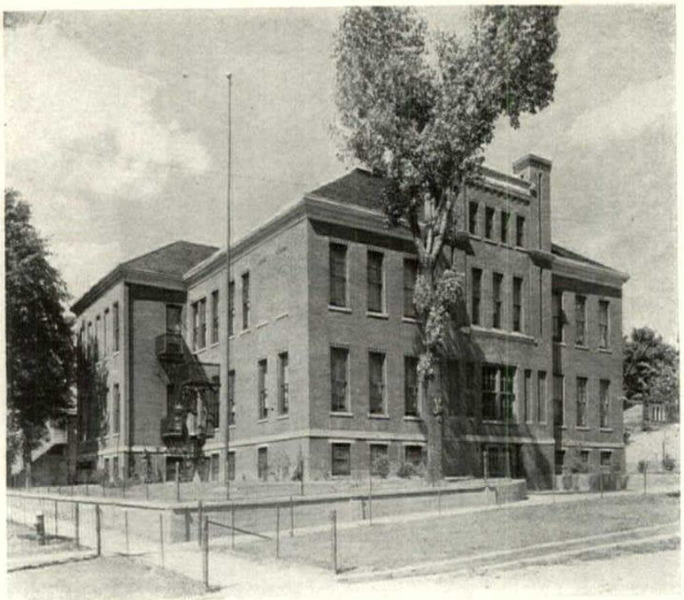
Wood studding, lath and plaster partitions surrounding all corridors and stair halls were removed and replaced with solid brick-bearing walls, placed on concrete footings. Wood floors in corridors and wood stairs were removed and replaced with reinforced concrete construction and terrazzo finish. Woodwork was refinished, and walls and ceilings repainted throughout the buildings. Soft wood floors in classrooms were removed and replaced with hard maple finish flooring.

Old plastering that was loose or in bad condition was removed and replaced with plaster on metal lath, or by fire-resisting composition board. Antiquated plumbing fixtures were removed and replaced with modern fixtures.

Heating plants and fuel storage rooms located in basements, and directly beneath combustible floors, were removed and placed in fireproof rooms outside the building lines and below grade so as to expedite the handling of fuel and to remove this fire hazard from inside the building.

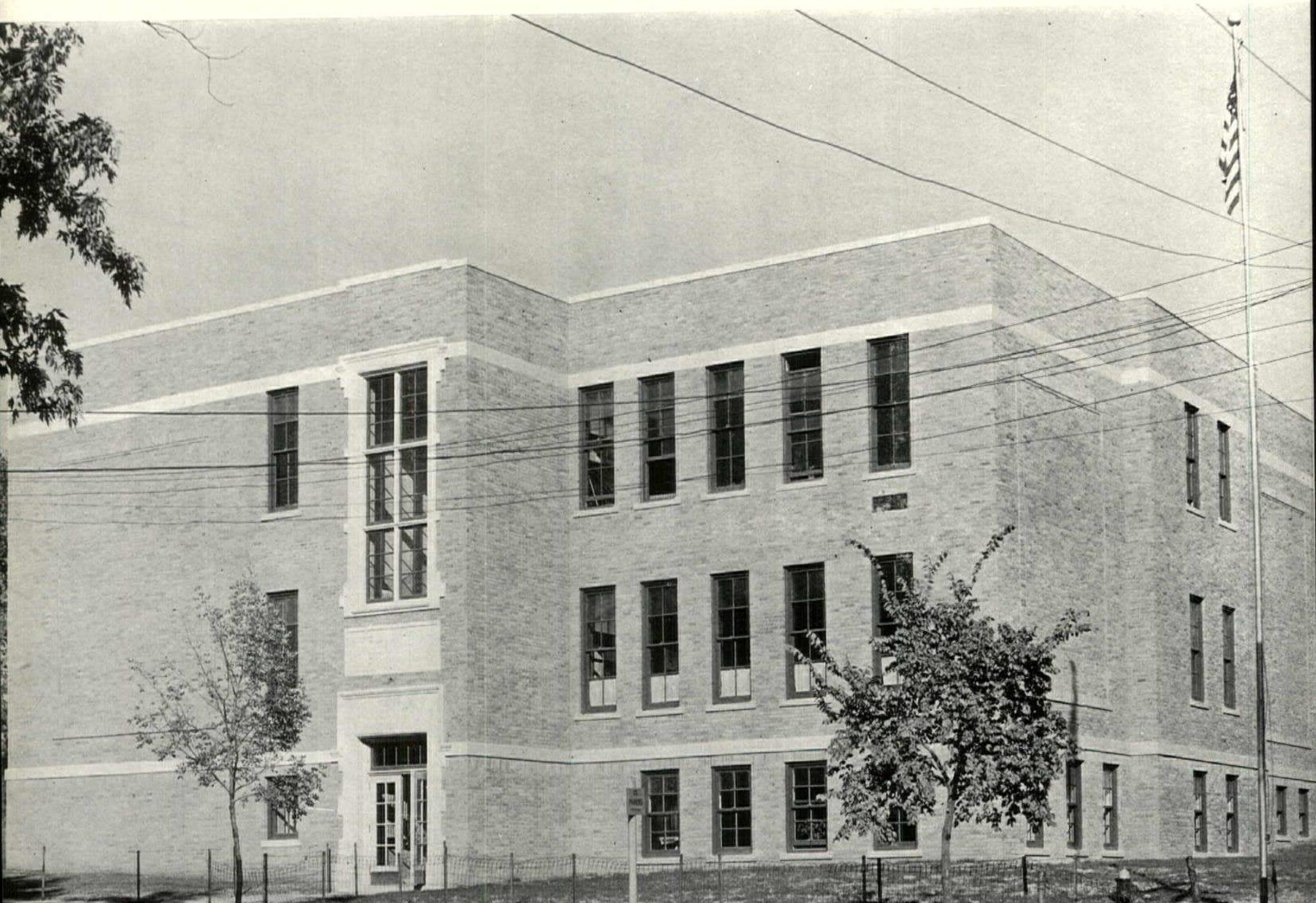
Inefficient heating plants were rebuilt and repaired, and when the boilers were in bad condition, because of old age, or were inadequate, they were replaced with new equipment. All boiler plants were equipped with automatic coal-burning machines best adapted to the requirements.

The old knob and tube wiring was replaced with new wiring in conduit or in metal-covered cable. Rooms having only one or two outlets were given from four to six outlets for lighting, and extra convenience outlets. Concealed aerial wires were installed with out-



ORIGINAL BUILDING: 1887

FRANKLIN SCHOOL (REMODELED)



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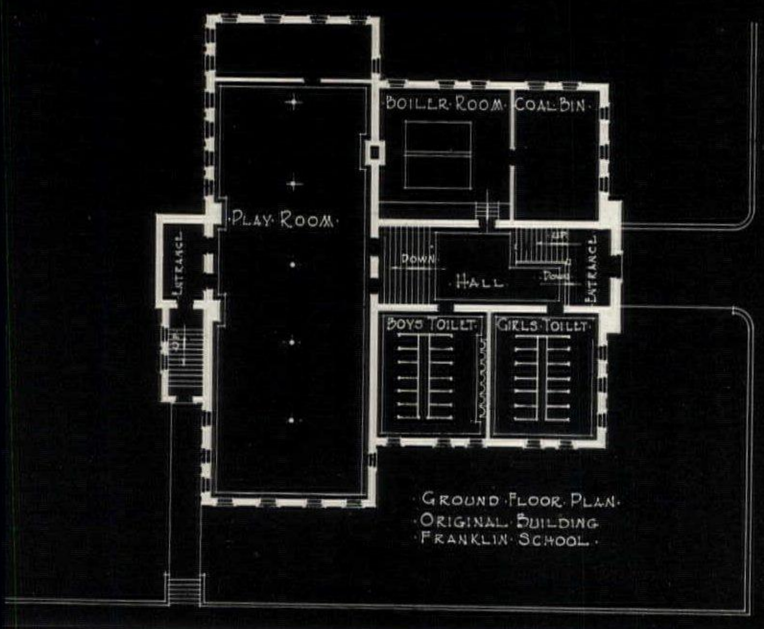
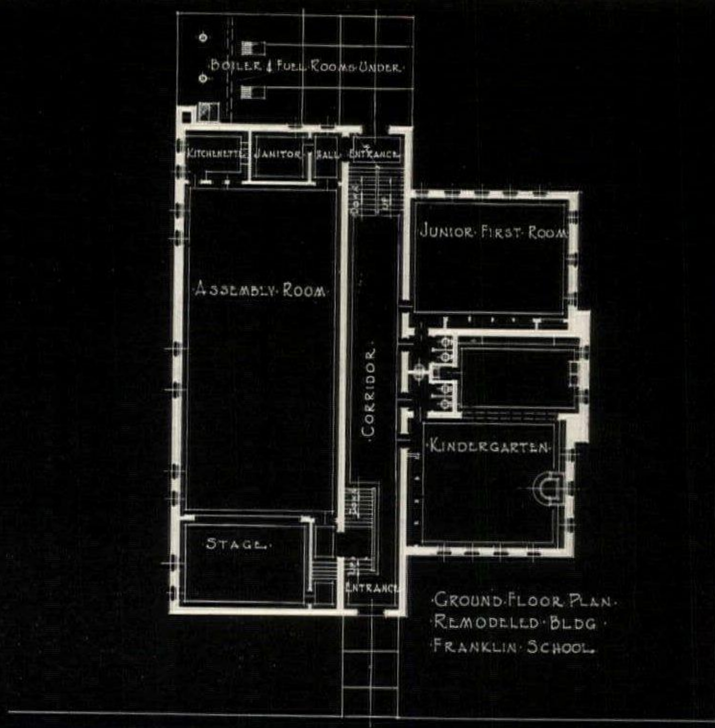


GROUND FLOOR PLAN
ORIGINAL BUILDING
FRANKLIN SCHOOL



GROUND FLOOR PLAN
REMODELLED BLDG
FRANKLIN SCHOOL

BEUTTLER & ARNOLD, ARCHITECTS

lets for radio plug-ins for each room. Electric clocks were provided in classrooms and offices.

Partitions were relocated where advisable to provide better corridor lines and better room sizes. In many instances the old-style coatrooms were replaced with the more modern, more easily supervised and compact wardrobes in each room.

Ceiling surfaces in all accessible attic spaces were insulated with the equivalent of 2 pounds of rock wool per square foot.

Exterior windows were repaired where necessary, and the large lights of glass divided to produce stronger sash with a greater reduction in the usual breakage loss.

Where entrances were approached by exterior steps, these steps were removed, the entrances brought down to grade level, and the stairways rearranged on the interior, thus reducing the risk of accidents and effecting easier maintenance.

In practically every building, because of utilization of otherwise wasted space, it has been possible to provide a room for community meeting purposes, and school assemblies adequate in size for the individual buildings.

Grounds are being landscaped with planting areas and playground areas defined and fenced.

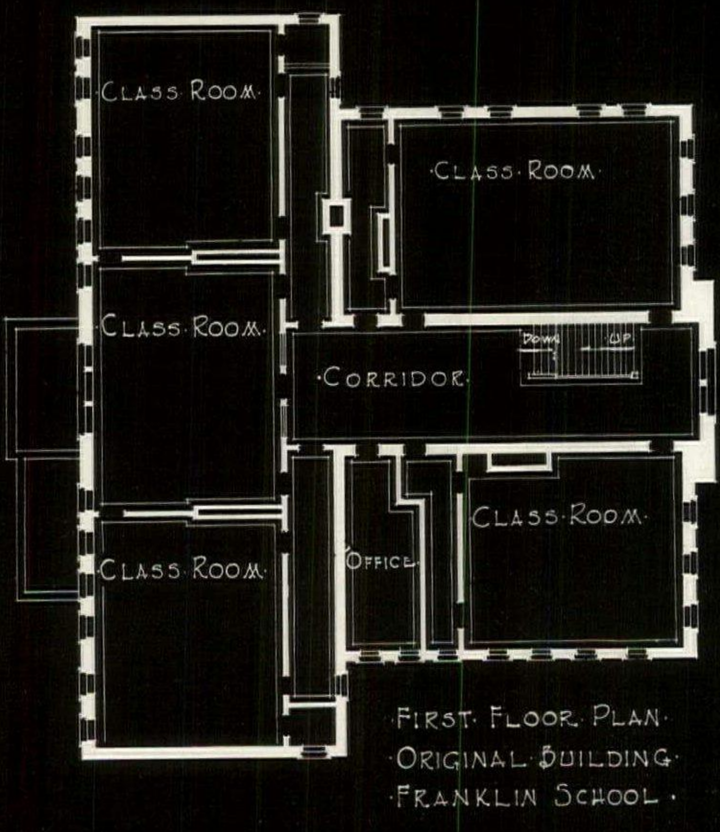
Through the reduced fire hazards, removal of heating plants and fuel storage from the buildings, removal of woodtruss roofs and shingle roof covering, new electric wiring and revamped ventilating systems, the insurance rates have been materially reduced. In some cases as much as 30% reduction was effected.

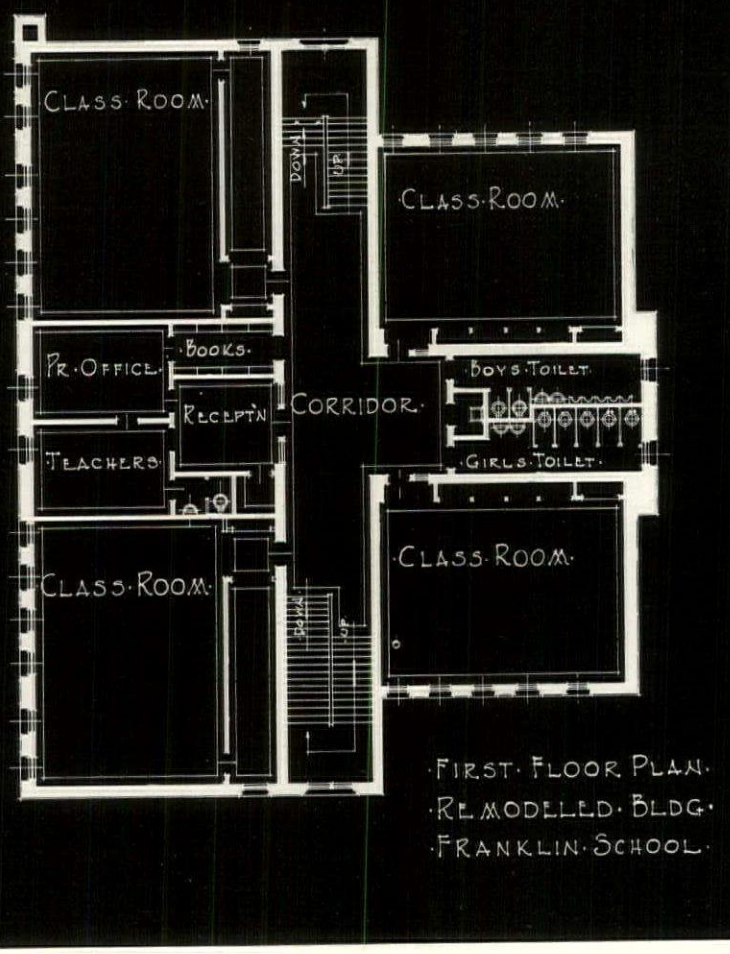
Through improvements in construction, the life of the buildings has materially increased. These 40 to 45 year-old buildings are believed to have an additional period of 30 to 40 years of safe and efficient usefulness. By interior rearrangements, additional classrooms are gained to increase the pupil capacity considerably.

COSTS

Because of the varied building types and their special and individual requirements, it is difficult to give figures as to cost other than to state that in the case of projects in which the maximum amount of work was done, the expense was approximately from one half to two thirds the cost of a new building of the same type. However, it would have been difficult, and in this particular case impossible, to have financed this amount of totally new construction. Likewise, it would have been impossible to have built totally new buildings on the sites of the old buildings within the limit of less than three months.

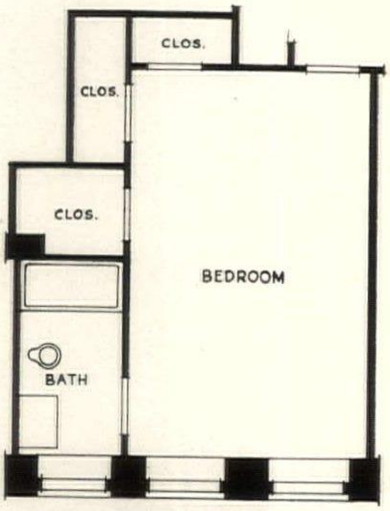
As a public works project, the principal function was to provide employment for labor and to make a market for materials produced by labor. Naturally, there are no figures available as to the amount of labor entering into the production and fabrication of materials before delivery at the building sites. However, 213,000 man hours of labor were provided at the building sites and of the total cost of approximately $550,000, $172,000 was paid to labor employed directly on the building construction.



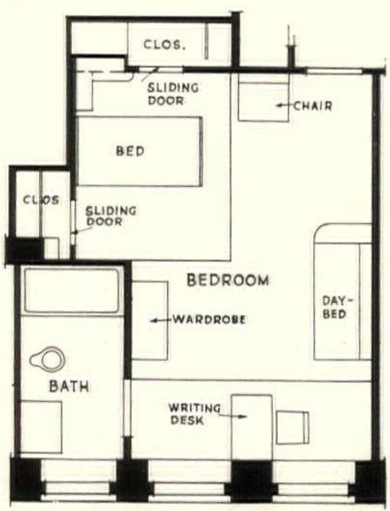


BEUTTLER AND ARNOLD, ARCHITECTS

MODERNIZATION



PLAN BEFORE ALTERATION

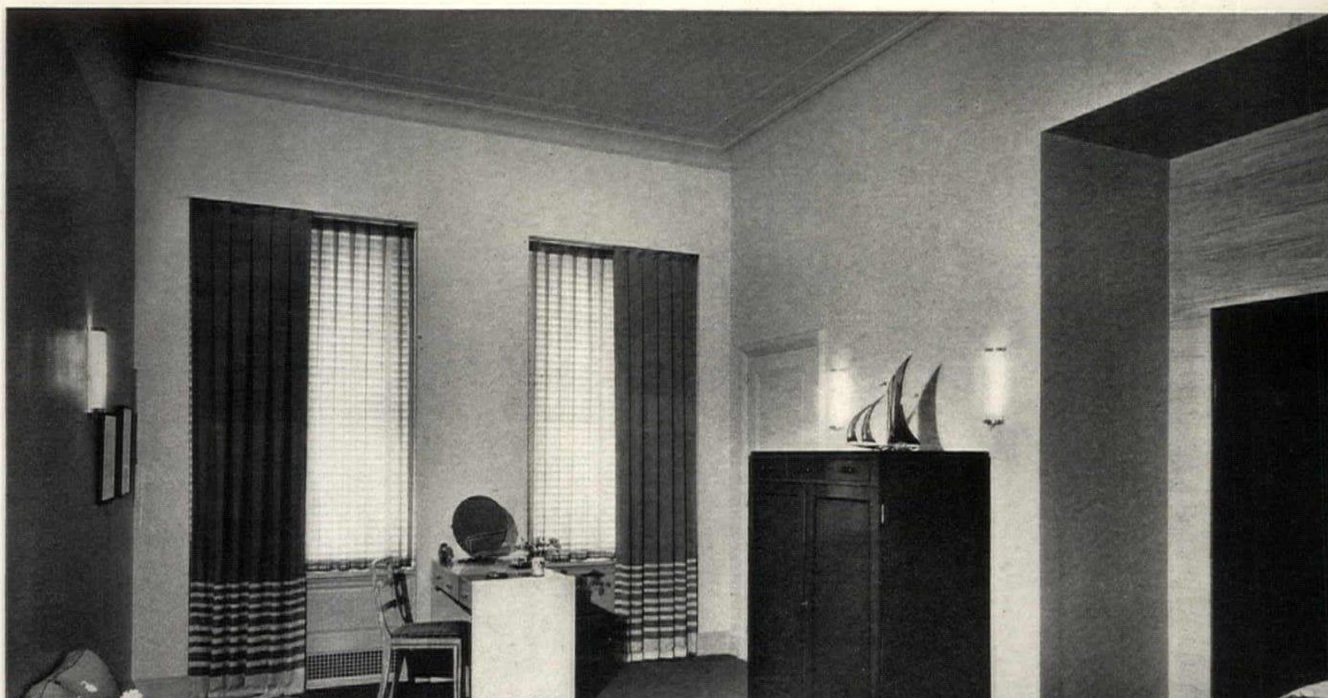


PLAN AFTER ALTERATION

REMODELED BEDROOM
FOR CLARENCE J. SHEARN
NEW YORK CITY

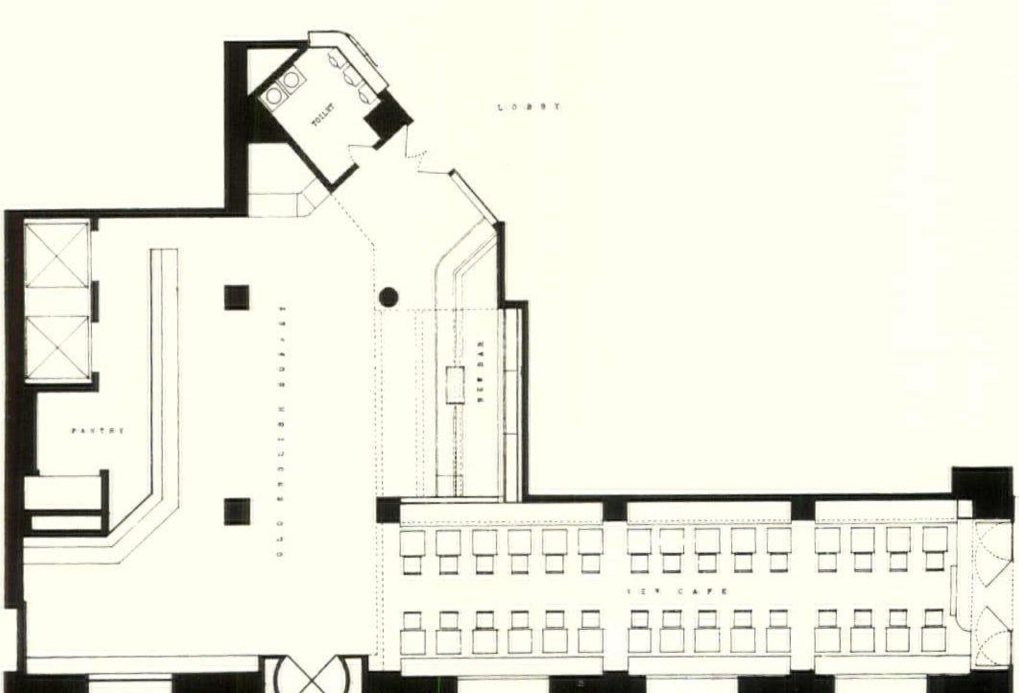
ELEANOR LEMAIRE, DESIGNER

Wall treatment: yellow, white and gray; upper wall painted gray to reduce ceiling height. Soffet of niche: deep blue. Door: vermilion and gun metal lacquer. Paneled wall of niche: prima vera; narrow horizontal lines, gun metal lacquer. Bookcase: vermilion line. Carpet: light blue and dark blue. Over draperies: gray, white embroidered bands. Under curtains: light red. Bed and writing desk: gray and yellow lacquer. Wardrobe: gun metal lacquer. Slipper chair: greige. Day bed: prima vera lacquer, blue upholstery.



Photograph by F. S. Lincoln

Photographs by F. S. Lincoln



ASTOR CAFE IN HOTEL ASTOR, NEW YORK CITY

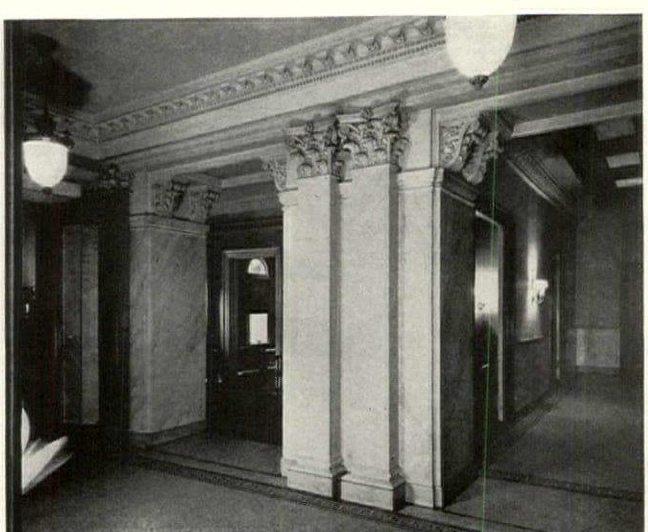
WILLIAM MUSCHENHEIM, ARCHITECT

PEABODY, WILSON AND BROWN

ASSOCIATE ARCHITECTS

MODERNIZING THE STONELEIGH COURT

Corridor in front of office and reception rooms on lobby floor before alterations



Stoneleigh Court Apartments, an eight-story-and-basement fireproof, brick, stone and concrete and steel building, was built in 1903, and at that time was considered one of the best equipped apartment houses in Washington. Its site, at the southeast corner of Connecticut Avenue and L Streets, Northwest, then an exclusive residential section, is now a high-class shopping district. Within easy walking distance are the main downtown shopping and financial disricts, as well as the theaters and Government buildings; within three squares is the White House.

As may be noted on the accompanying plans, the building consisted mainly of large apartment units, the demand for which gradually slackened until it became difficult to rent any of the apartments. In addition, the finish and mechanical equipment of the building were in extremely bad condition when the present owners (The Metropolitan Life Insurance Co.) came into possession slightly more than a year ago. It was eft:

he new lounge which re-
laces the old reception rooms.

ight:

typical new living room.

JARRETT C. WHITE
ARCHITECT

Photograph by Frances Benjamin Johnston

PARTMENTS IN WASHINGTON, D. C.

decided to divide the building into smaller apartments, to cut through the public corridor so that all sections of all floors would be connected, to install new mechanical equipment and a new lobby and office on the ground floor.

The James Baird Company, Inc., of New York and Washington were general contractors for the work which was started in January, 1933. Completion was delayed until this time because of labor strikes which retarded the construction by approximately three months.

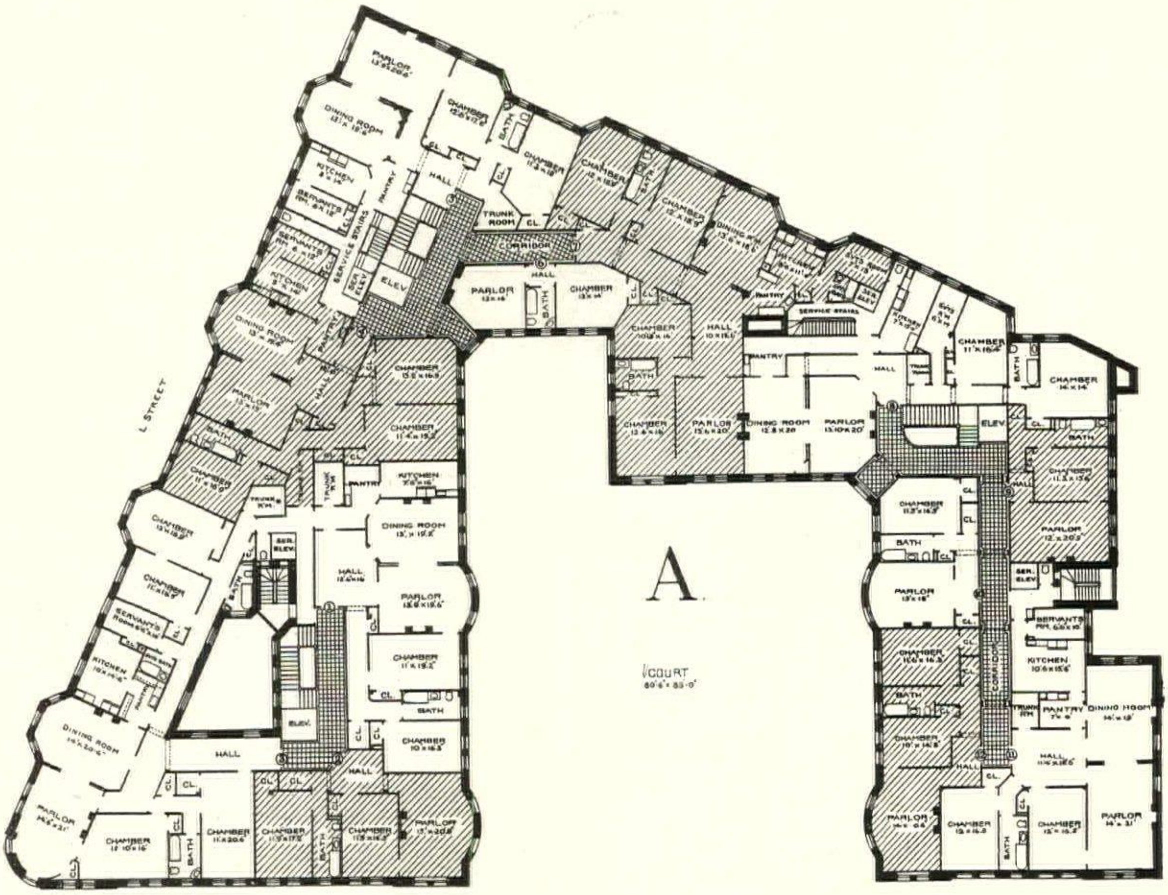
As an experiment, it was decided to remodel the middle section of the building, i.e. that section of the building included in the dotted line on the plan marked "B." This consisted of taking four old apartments on each floor and converting them into seven, making a total of forty-nine apartments, where there had formerly been twenty-eight; also, installing a connecting corridor through this portion, a new lobby on the ground floor, and new mechanical work in this section. The elevators in this as well as in the other sections were completely modernized, and a new roof was installed over the entire building.

The heating boilers were in good condition, but a new hot-water heating system was installed with a new steel boiler, stoker, and new tanks and converters. All plumbing lines and electrical wiring throughout the remodeled section were removed, and new seamless brass tubing was installed for all hot and cold-water lines. New electrical wiring was installed, together with a radio antenna system with outlets in each apartment. All new bathrooms have tile floors and "Arco" steel panels with tub and lavatory units. Speakman "Si-flo" closets with Speakman flush valves. The new plumbing fixtures were supplied by the Standard Sanitary Manufacturing Company.

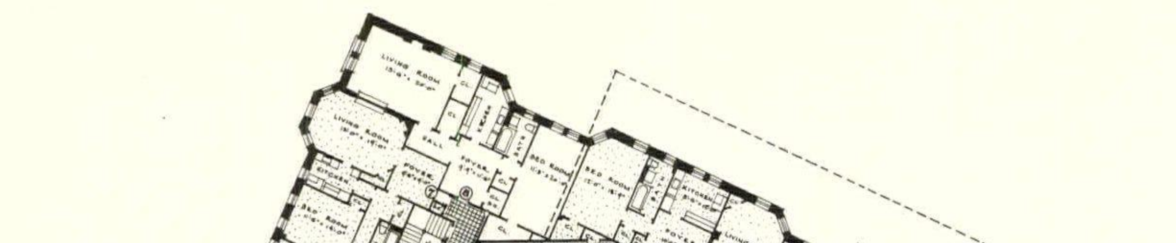
As far as possible the old radiators were reused, but where new radiators were installed, the cast-iron con-

THE STONELEIGH COURT APARTMENTS IN WASHINGTON D. C.

JARRETT C. WHITE, ARCHITECT



PLAN BEFORE ALTERATIONS



PLAN AFTER ALTERATIONS

Photograph by Frances Benjamin Johnston

A TYPICAL BEDROOM

vection type was used, and all radiators, both old and new, were covered with inclosures.

All kitchens are equipped with ventilating fans, insulated-oven gas stoves, and General Electric refrigerators, as well as acid-proof, double drainboard, enameled-iron sinks. The small efficiency type kitchen has cabinet-size sinks of the same material. It also has a small gas stove and ice box.

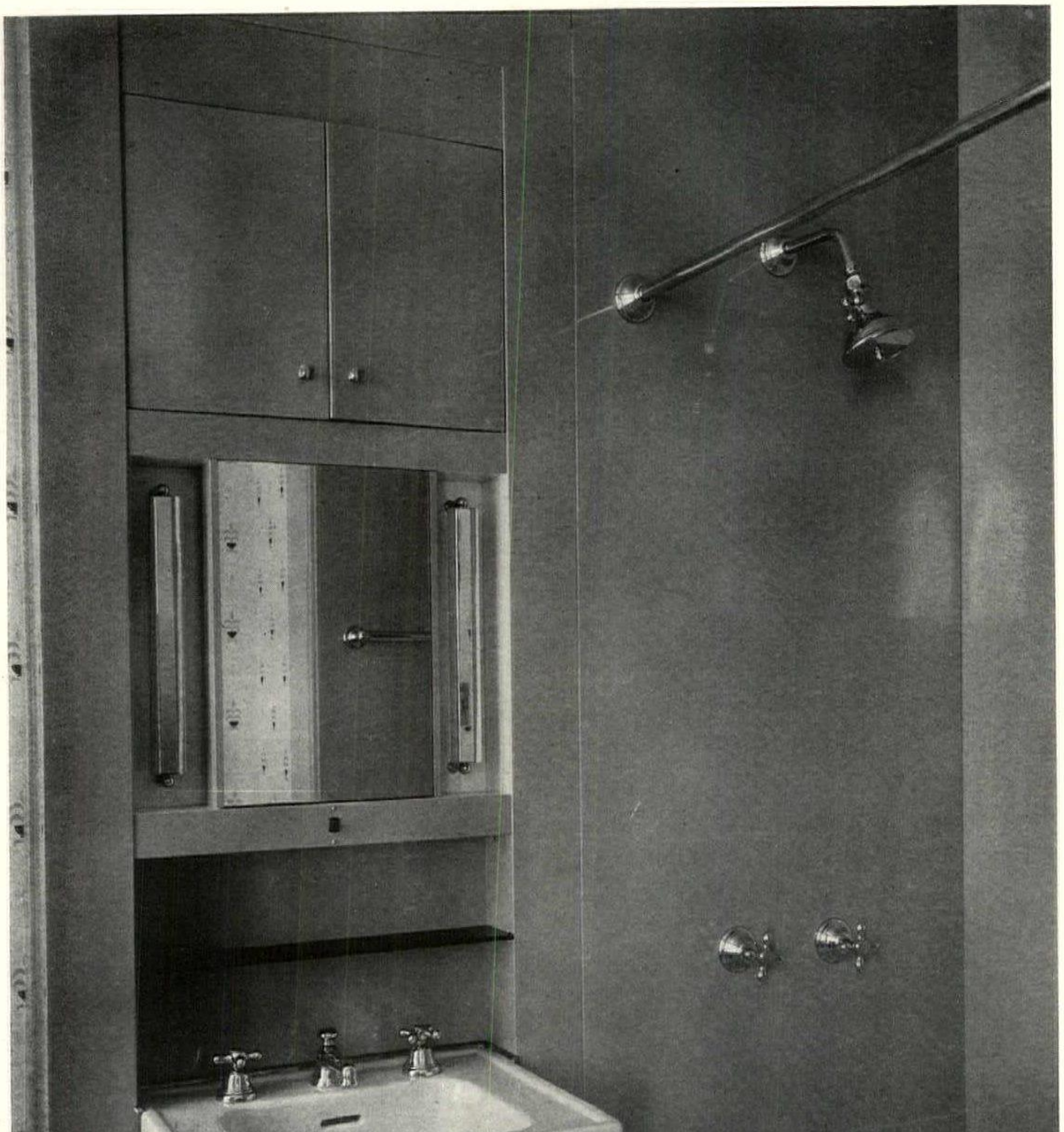
All windows in all rooms in all apartments, as well as the windows in the public hall, were fitted with venetian blinds and extruded aluminum fly screens.

The public halls and the entire public space on the first floor have been carpeted. The walls of all living rooms, bedrooms, bathrooms and foyers have been covered with washable and sun-fast wall paper, no two rooms having the same color or pattern; all papers were supplied by the Imperial Wall Paper Company. All lighting fixtures were supplied by the Chase Brass and Copper Company. Telephones in all apartments are hand-set phones installed in flush cabinets in the wall.

The new lobby is paneled from floor to ceiling in genuine American walnut selected for vertical grain. The structural columns in the lobby were faced with fluted, extruded bronze. The mirrors are gold-plated and are indirectly lighted from the top behind the draperies. This room, as well as the small lobby front of the new lobby, is indirectly lighted from a concealed overhead cove in the ceiling panels.

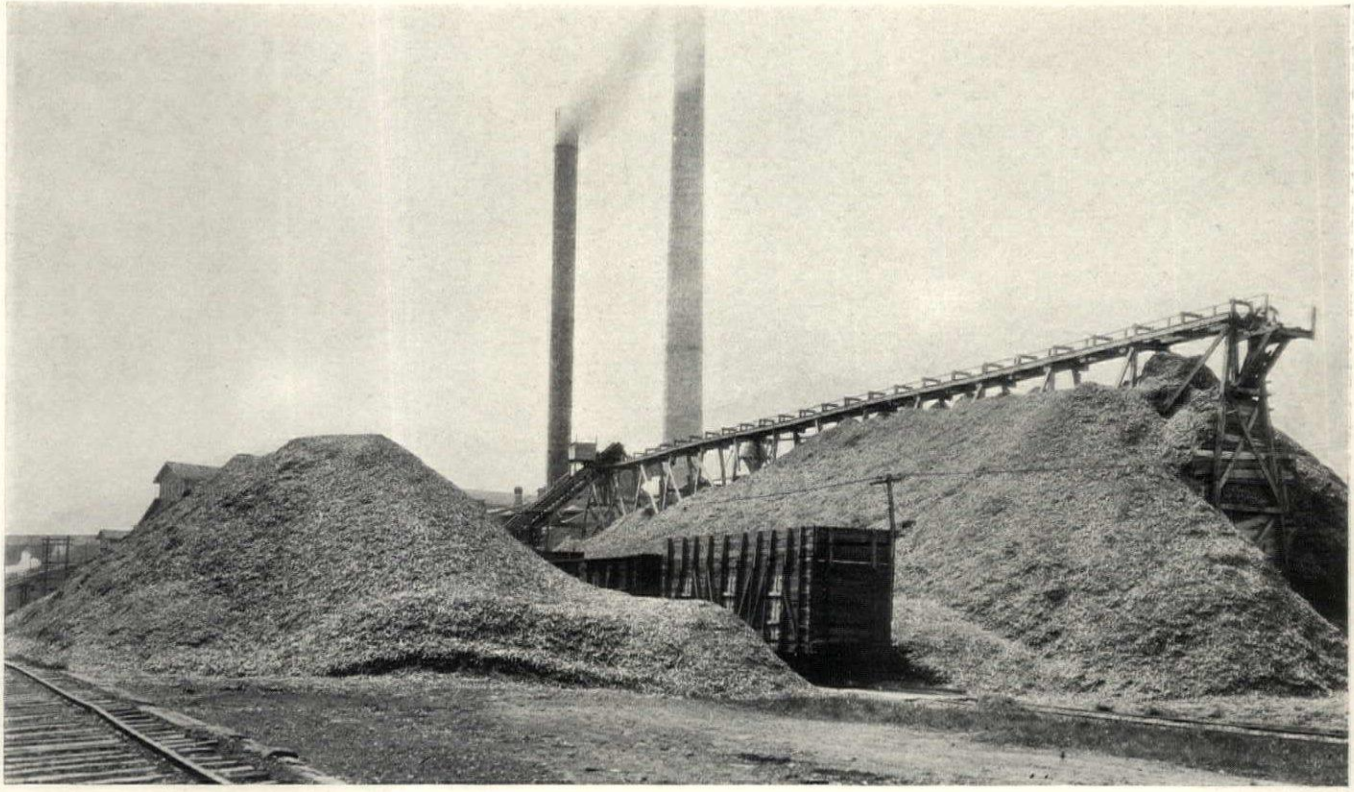
All partitions are of gypsum block. All ceilings on the seven typical floors were furred down below the old ceiling in order to provide space for the installation of new piping, and to add to the sound-proofing qualities.

The work in this remodeled section, including the equipment for the kitchens, carpets, the furnishings and draperies in the lounge, is costing slightly in excess of $200,000.



Photograph by Frances Benjamin Johnston

BATHROOM (SECTIONAL STEEL WALLS) IN THE STONELEIGH COURT APARTMENTS IN WASHINGTON, D. C. JARRETT C. WHITE, ARCHITECT



Stocks of waste wood and wood chips, ready for fabrication into insulating materials, at plant of Wood Conversion Company, Cloquet, Minnesota.

FACTS ABOUT HEAT INSULATION

By J. L. FINCK,

director, The J. L. Finck Laboratories;

physicist, specialist on heat insulation;

formerly with U. S. Bureau of Standards,

Heat Transfer Section

Within recent years the application of heat-insulating materials to buildings and other structures has attained major economic importance for several reasons. First: insulating materials like the fiber boards serve as a substitute for sheathing and lath, and at the same time offer more insulation than would otherwise be obtained. Fiber boards, to a large extent, are made of materials which were formerly considered waste, as for example, sugar cane fibers or bagasse, corn stalks, wheat straw, waste wood, and the like. In this way there is a twofold advantage—the utilization of waste products, and the saving of lumber and indirectly our forest resources.

A second reason is the great economy that is realized in fuel, and comfort from insulated homes both in winter and summer. In almost all cases where insulation is applied the additional cost of the installation is more than covered within the first few years by the saving in fuel. A well-insulated home offers a more uniform inside temperature and therefore eliminates the sudden chills and suffocating heat which is experienced by those living in poorly constructed homes.

PROCESSING ROCK WOOL AT JOHNS-MANVILLE PLANT

1

(1) The molten rock as it flows from the cupola and is blown into wool which is carried into the blow chamber at the right.

(2) The opposite end of the blow chamber with the rock wool emerging in a felted sheet.

(3) The rock as it is carried up a conveyor for further processing.

2

3

with cotton in the ratio of 1 to 2; rock wool (fibrous limestone rock) is almost equal to cotton. Wood is shredded into fibers and fabricated into fine insulating boards and blankets.

Thus we see that the material itself does not play as important a part as its structure—if judged solely on the basis of insulating value. In forming a fibrous material, we are really utilizing the air as an insulator —the fibrous material serves to prevent convection (natural air currents) and radiation. (We shall consider the latter in more detail later.) The theoretical limit in insulation which can be attained with such materials is that of still air through which no radiation occurs. Since the fibers conduct heat somewhat, and some fibers conduct more than others, we do have differences in the insulating properties of various fibrous materials. Such differences may in extreme cases amount to one or twofold, whereas differences in solid materials may amount to from 60 to 400-fold, as already shown.

INSULATION VALUES OF VARIOUS MATERIALS

On the market one finds insulating material in the form of rigid boards, blankets, loose fills, and what is of recent origin—metallic reflecting surfaces. The prospective buyer has such a wide variety of choice that he is actually at a loss as to what to select for his particular needs and must be guided by those familiar with the technical and engineering phases of the subject. However, there are a few basic facts about heat insulation which are of value when discussing insulation in general.

Let us compare various materials such as steel, stone, wood, and cotton. As heat insulators they may be arranged in the approximate relative proportion of 1 to 60 to 400 to 1,200, meaning that stone is about 60 times as good as steel, as a heat insulator, wood about 400 times that of steel, and cotton about 1,200 times as good as steel. In spite of these facts, it is possible to make a material out of steel, stone, or wood, which will compare favorably with cotton as a heat insulator. In fact, steel wool as a heat insulator compares

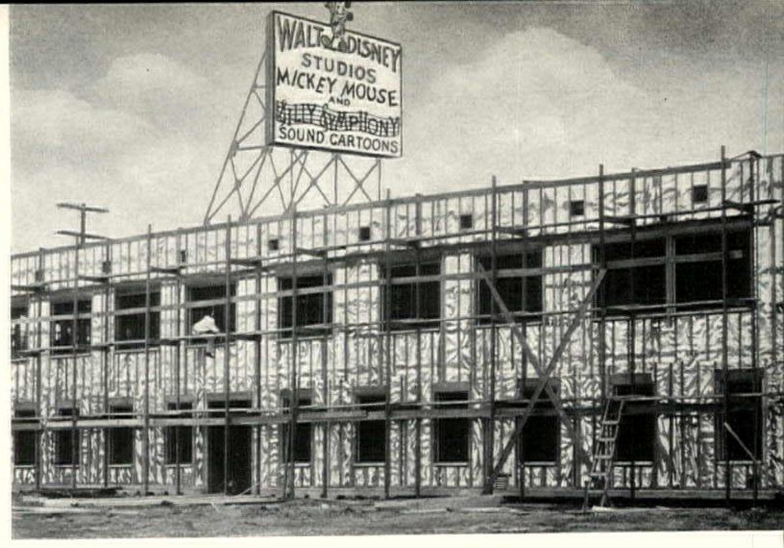
EFFECTS OF FABRICATION ON INSULATION VALUES

Differences in the insulating value of fibrous materials will depend on the method of fabrication. It is possible to make two materials out of the same fibers which may have large differences in insulating value. Much depends on how the fibers are arranged, on the character of the binder used (rosin, asphalt, etc.), and the density of packing. The writer has succeeded in forming two specimens out of fine flax fibers, both having the same density; in one specimen the fibers were arranged in a direction perpendicular to the flow of heat, and in the second the fibers were arranged parallel to the direction of the flow of heat. In the first case, the material was somewhat better than the best insulating materials on the market. In the second case, the material conducted as much heat as ordinary wood—the difference between the two specimens was about 250 per cent.* The reason for this large difference is due to the fact that in the second specimen the fibers served as a direct path for heat flow, while in the first case the poor contacts between the fibers offered considerable resistance to the flow of heat. Any chemical which may be added to protect the fibers from moisture, or to make them fireproof or vermin-proof, will tend to bond the fibers more or less and thus serve as a path for heat flow. Any such treatment in itself will usually reduce the insulating value of a material. The insulation of a fibrous material depends also on the density of packing—as a rule, the lower the density the better the insulation. There is, however, a limit to this—an optimum density is reached, beyond which the material again begins to conduct more heat.

INSULATION WITH AIR SPACES

Consider another phase of heat insulation, and take as an example a solid brick wall. The heat transferred through this wall is by a method known as conduction. All solid materials (including loose powders) convey heat by conduction. Should we remove part of the interior of this brick wall, we actually replace the solid brick by an air space. If we fill this air space with a material such as sawdust, for example, we improve the insulation of the wall as compared to that of solid

*See Research Paper No. 243, Bureau of Standards Journal of Research.



Installation of aluminum foil insulation (Reynolds Metallation) at new Mickey Mouse Studios in Los Angeles. R. V. Derrah, architect.

brick. The reason is that the conductivity of sawdust is less than that of brick. Obviously, if we should fill the air spaces with solid metal we will not improve the insulation of the wall. As a rule, the lower the conductivity of this loose fill, the better will be the insulation of the wall.

Suppose we do not fill the air spaces within the wall, but leave them hollow. Such hollow walls are better than solid brick as insulators. The question is, are they better than hollow walls filled with loose material? To consider this, more must be known about the behavior of air spaces as insulators—for air spaces have a law all their own. There is one characteristic of an air space which makes it different from solid or loose materials. In the case of the latter, the thicker the layer, the more insulation it will offer. In an air space, this is not always true. Starting with very narrow air spaces, we obtain more insulation by widening the space until a width of about ¾ inches is reached. Beyond that, say to 2 or 3 or 4 inches, the increase in insulation is very slight.

The reason is as follows: heat is transferred across an air space by conduction, convection (natural air currents) and radiation. The first is exactly like that transferred through a solid, and therefore the wider the air space the less heat is conducted. The second, being due to air currents, will transfer more heat as the space is widened—within certain limits. The first and second work in more or less opposing manner and at and beyond a width of about ¾ inches reach a steady condition. The third—radiation—is independent of the width of the air space, and in fact is practically the same whether there is air present or the space be evacuated. (More will be said about this last mode of transfer below.) All three effects operate simultaneously.

It can readily be seen why an air space is so anomalous, and we may now attempt to answer the question whether it is desirable to fill air spaces with loose materials. On the basis of data on the heat transfer through air spaces, we can state that in narrow air spaces (up to about 1 inch, say,) the filling of the air space with a material whose conductivity is less than 0.6 (B.t.u. per hour, per square foot area, per temperature gradient of one degree F. per inch) a gain in insulation will be obtained. For an air space of, say, 3 inches in width, a gain in insulation is obtained if it is filled with a material whose conductivity is even as high as 2.0 (in the same units as expressed above). Naturally, the lower the conductivity of the fill, the greater will be the gain in insulation in both cases.

INSULATION BY HEAT REFLECTION

Within the last few years the use of metallic reflectors as insulators has become increasingly popular. The paradox wherein an excellent conductor of heat is used as a heat insulator can be readily explained if we know what takes place within an air space. As mentioned above, of the three modes of transfer of heat across an air space, one is by radiation. This radiation is not visible light, nor is it X-rays, nor radio-waves, but in general characteristics it is very much like all three. It is known as infra-red radiation—a radiation not visible to the human eye, but which may be detected by an instrument such as a bolometer or thermopile. In everyday experience we speak of a "black" surface as one which absorbs all visible light. The surface of this magazine page, for instance, is "black" as far as infra-red rays are concerned. We mean by this term that the paper, which is white or reflecting to visible rays, is highly absorbent to infra-red rays. As a matter of fact, practically all materials used in building construction—brick, stone, wood, paper, and so on—regardless of their color to visible light, are over 90 per cent black for infra-red radiation. Therefore, air spaces within building walls are bounded by materials which are good absorbers of the radiation which impinges upon them.

Bright metallic surfaces are very good reflectors (poor absorbers) not only of the visible rays, but also of the infra-red rays. Therefore by coating any of these surfaces with bright metal (metal foil or bright metallic paint), there will be almost complete reflection of the infra-red radiation. The only heat then that is transferred across the air space is by conduction and convection.

Even so, it may be questioned whether by such metallic shielding we achieve much, since the two other facts are still in effect. It is an experimental fact that, of the total heat transferred across an air space, from 50 to 80 per cent is transferred by radiation. Therefore, by eliminating this very important mode of transfer, we actually do achieve considerable insulation. As a matter of fact, if one side of a stud air space is bounded by aluminum foil, the increase in insulation will be equivalent to that of the addition of about 0.6 inch of fiber insulating board. By inserting a sheet of paper, covered on both sides with aluminum foil, within the center of a stud space, the increase in insulation will be equivalent to that of the addition of about 1½ inches of fiber board.

HEATING A BUILDING WITH COLD WATER

Reversible air conditioning equipment, which may be adapted to either heating or cooling, depending on the season, is now in operation in the new building of the Atlantic City Electric Company at Salem, N. J. Engineers of the General Electric Company and the American Gas and Electric Company installed the equipment, which is the reversible-cycle refrigerating type, commonly known to engineers as a heat pump. Reversing the cycle of the ordinary household refrigerator, electrically-driven compressors absorb heat from a low temperature source, raise it to a higher level of temperature by mechanical compression of the refrigerant gas, and discharge it at high enough temperature to heat the building in cold weather.

In the summer the process is reversed. Both heat and moisture are withdrawn from the air of the building, and the heat is raised by the compressor to a high enough temperature level to be dissipated outside.

Outside air, the engineers point out, has an unlimited supply of heat even when the temperature is zero, but it is not available. The heat pump is essentially a device in which heat at a low temperature is absorbed and raised to a high temperature at which it can be utilized. The total heat made available by this means is not only that represented by the work of the compressor but also the heat from the outside source. Thus it is possible for an expenditure in electrical energy equivalent to 100 heat units to obtain a total of 400 or 500 heat units for heating, an efficient use of electricity.

Although installations of this general type have already been made, most of them have depended on outdoor air as the heat source. These have had the lowest heating capacity in winter, when a maximum was needed.

At Salem, the heat is drawn from a well of water readily available which maintains a natural temperature of at least 56 degrees in the coldest weather. Hence the equipment is able to deliver its maximum capacity without regard to outdoor weather conditions. The heat is transferred from the water to the refrigerant in a large water cooler, the water leaving the cooler at about 40 degrees. In the compression cycle, the temperature of the refrigerant is raised to 135 degrees and gives up its heat to the air within the building by passing through a condenser over which the air is circulating. In summer, this condenser will act as a cooling surface to cool and dehumidify the air, and the heat thus absorbed will be dissipated by the water cooler, which may then serve as a water heater. Humidifiers for winter use, air filters, and a high velocity fan and air circulating system complete the air conditioning apparatus, maintaining close automatic control of both temperature and humidity within the building summer and winter.

The building in which this equipment is installed is a two-story and basement brick and steel reinforced concrete structure, well insulated and of modern design. Engineering and planning for the project was done jointly by the two companies, and the equipment was built and installed by General Electric.

While unwilling to claim the development revolutionary, engineers point out that if performances bear out predictions, it will have a stimulating effect on the development of electric heating and air conditioning, not only by reducing the amount of electricity required but in making it possible to use the same equipment for heating and cooling.

FARMING FOR BUILDING MATERIALS

Chemurgy brings out in relief the correct interpretation of agriculture. No longer a pursuit to supply man with food and raiment, but a pursuit that shall bring into existence a vast array of chemical compounds to fit a myriad of ends. . . .

Even the crudest type of natural organic waste may find service in some connection. The impregnation of wood flour with phenol-formaldehyde condensation intermediates leads directly to plastics that admirably replace old-time wooden combustible material. Now the lamination of synthetic plastics leads to sheeting of unusual strength. When again this lamination includes a layer of thinly rolled metal between the laminae of synthetic plastic, we come to sheeting of tremendous strength and durability. In this we have the future of automobile body structure, and likewise of interior finish in homes. This is only one of a thousand instances that can be cited to show the drift from wholly inorganic material to organic material either alone or carrying a bit of the old-fashioned inorganic make-up.

Both the lignin and cellulose, out of wood, admirably fit into this picture of supplying organic raw products for fireproof and resistant materials of construction. Ordinary glucose or grape sugar offers another and interesting possibility in this direction. Just because our grandparents entertained the notion that sugar was just a food, is certainly no reason for us in following a notion now thoroughly disproved. Sugar is an excellent building material; in the near future we should be constructing water mains of plastics from this source.

From The Farm Chemurgic, by William J. Hale, Ph.D.; published by the Stratford Company, Boston, Mass.

PROTECTIVE COATINGS

A paper on protective coatings for metal which was read at the September 1933 meeting of the Electrochemical Society in Chicago, has been given wide publicity in technical magazines throughout the United States. This paper referred specifically to tests made over a period of years in England, the results of which fall under four headings:

1. Nature of the metal.
2. Presence of separating materials between metal and paint, such as mill-scale, rust, water or salt.
3. Character of paint as determined by the nature and quantity of the pigment, the oil, the thinner and the dryer.
4. Character of the atmosphere, water or soil to which the painted metal is exposed.

The metal prime coat seemingly evolves around red lead, red oxide, linseed oil and turpentine with a proportionate amount of dryer. This combination has been in use, and apparently an accepted fact, for a period of over fifty years, but during all this time statistics compiled by the Department of Commerce inform us that the wastage due to rust and corrosion reaches a figure of over $300,000,000 a year. This enormous annual destruction from rust and corrosion is steadily increasing in proportion to the amount of steel and concrete used in building.

Paint technicians who have carefully studied the problem agree that the various types of steel and iron, ranging from superior copper steel and electrolytic iron to a steel containing a high percentage of carbon and manganese, in their turn have different reactions on prime coating. The reactions in regard to moisture, humidity, acids, gases and salt spray have also been carefully noted.

RESULTS OF RECENT CORROSION TESTS

During the last few years chemists have investigated and made exhaustive tests to find the reason why the proverbial red lead has fallen short of the mark as a rust preventive. Experiments along these and other lines are well worth citing.

In Test 1 several pieces of steel were cut from angles, shapes and plates. The metal was thoroughly wire-brushed and in some instances sand-blasted. A good coating of red lead and linseed oil with turpentine was then applied, and the metal was exposed to the elements on the roof of a building in the heart of an industrial area and near salt water. After a period of two years, it was found that the linseed oil had completely decomposed, leaving a film of red lead and lead soaps containing a high percentage of moisture. The moisture in the red lead acted as an electrolyte, wherein electrolysis of the exposed molecules took place, causing rust and corrosion. It was further found that the lead soaps emulsified and became soluble in water and washed off, leaving the surface of the metal exposed to the atmosphere.

Test 2 used the combination of red lead and iron oxide (Indian) with linseed oil. This combination proved to be superior both chemically and mechanically to straight red lead with linseed oil. Microphotographs revealed that the small particles of red oxide in combination with the red lead materially helped to seal the open pores left in the linsed oil. An examination two years later demonstrated that moisture had penetrated to the metal and corrosion was taking place, but considerably less than with the straight red lead.

In Test 3 a number of metal pieces were coated with red oxide used with a nonporous vehicle. The surface of this metal had previously been allowed to oxidize and had a thin film of rust. A suitable type of thinner was used to carry the vehicle and to penetrate into the film of rust. This combination of red oxide, the nonporous vehicle and the thinner on oxidation formed an insulation around the particles of rust, which were bonded to the metal, thereby excluding any further attack of oxygen, and eliminating any possibility of rust or corrosion. Consequently, when an examination was made of this test two years later, the coating was found to be in perfect condition with no breaks or traces of moisture, in spite of the outside exposure to extreme heat and cold and the sun. The results of this test proved so satisfactory that several thousand gallons of this combination were manufactured and sold both in the industrial and marine fields; this further proved the practicability of the coating inasmuch as it was subjected to abrasion and general hard working conditions.

Chromates and linseed oil were combined in Test 4. The results this time were much the same as in the case of red lead and linseed oil, except that the former seemed to have slightly more lasting qualities.

Test 5 dealt with metallic zinc dust, 99% pure, and linseed oil. This combination when applied to metal gave an unsatisfactory result, owing to the porosity of the linseed oil vehicle.

Test 6 was made with a combination of metallic zinc dust and vegetable gums on pieces of clean steel and iron. The result of this test was highly satisfactory. It was noted that the vehicle formed a nonporous film and that the metallic zinc dust became homogeneous with the metal. This combination was tried on several ocean-going vessels where the exposed metal had been wire-brushed and apparently all previous paint coatings had been removed. However, after a period of approximately six months the coating began to peel off

FOR METAL WORK

By E. A. HURST,

President, Artic Chemical & Combustion Engineering Corp.

in places and on microscopic examination small particles of old paint were found to be in the pit holes, thereby preventing adhesion between the metallic zinc coating and the metal to which it was applied.

METALLIC ZINC PAINT TESTS

Test 7 was performed with metallic zinc paint. Sandblasted steel test panels were given one or two coats—brush applied. No trouble or difficulty was found in the brushing qualities and the coverage was very good. A high-power mercury quartz lamp was used in this test, and it was noted that chalking and crazing were absent. The test was not carried to completion owing to lamp trouble, but the zinc paint showed up superior to red lead.

A salt spray test was also applied, a 20% sodium chloride solution being employed. Test pieces were kept in cycles consisting of 8 hours spray and then 16 hours saturated damp salt atmosphere. Under this treatment the samples stood up over 350 hours of spray plus 1,050 hours of dampness, the difference in ratio being due to weekend periods, without any indication of failure. There was no indication of rust creeping under the coat from the unprotected edges. Blisters, cracks, checking, crazing and chalking were entirely absent. On the other hand, red lead coats have failed in 24 hours of spray, and 200 hours is a good life for a top coat.

A test piece was subjected to weathering cycles, a cycle here consisting of

16 hours—damp dark atmosphere @ 100° F.
1 hour —ice water
7 hours—salt spray (20% sol.)
16 hours—cool damp dark atmosphere
1 hour —dry ultraviolet light
7 hours—moist ultraviolet light.

Under this treatment, the piece in question stood up for 25 cycles, there being no indication of failure, with the exception of a slight uniform lightening of color.

In an abrasion test, Gardner Emery abrasion apparatus was used and the life of the zinc coating was far superior to anything previously tested.

These exhaustive tests were continued for some time in order to prove further the efficacy of the metallic zinc paint in question. After the sample had been in salt spray 900 hours and in damp salt atmosphere about 2,700 hours, an examination under the microscope showed that the center of the panel was in very good condition. There was a tendency of the rust to creep *over* the paint at the edge of the panel. With the exception of a few spots at which the top coat of paint had shrunk away from the bottom coat, the panel was in good condition.

After the test piece had undergone 56 weathering cycles in all, the condition of the sample was as follows: The central portion of the panel showed a few cracks but did not exhibit any rust coming from these cracks. The edges were considerably discolored because of rust creeping *over* the paint, but when the rust was scraped away, a fair coating of paint was still seen protecting the metal. This sample was deeply scratched in the early part of the test, to allow the coating to disintegrate and the rust to creep under the coating if possible. An examination of this scratch showed it to be filled up with a rather high ridge of rust. The coating did not disintegrate around the scratch.

A portion of the panel was subjected to the light and water test. It was placed under water so that the ultraviolet light would play upon it. This test was continued for 180 hours and the coating stood up very well under this severe treatment. It cracked but slightly and only exhibited blisters because of the second coat separating in spots from the first coat.

CONCLUSIONS

There is no doubt, as a result of thorough tests of this kind, that combinations of technical coatings can be manufactured and applied that will eliminate rust and corrosion for a period at least twice as long as that of red lead, even though red lead has in the past been used as a prime coating for all types of metal.

It is obvious that the paint manufacturer is not in a position to dictate to the steel manufacturer the component parts of the steel. Protective coatings therefore have become a paint manufacturers' problem, in the same way that the lubricating problem is being solved by the oil refiners and not necessarily by the automotive engineers. Much has already been accomplished, because *technical coatings can be built to suit any purpose from a food-processing plant to a steel bridge.* This includes prime coatings such as are used in the automotive industry.

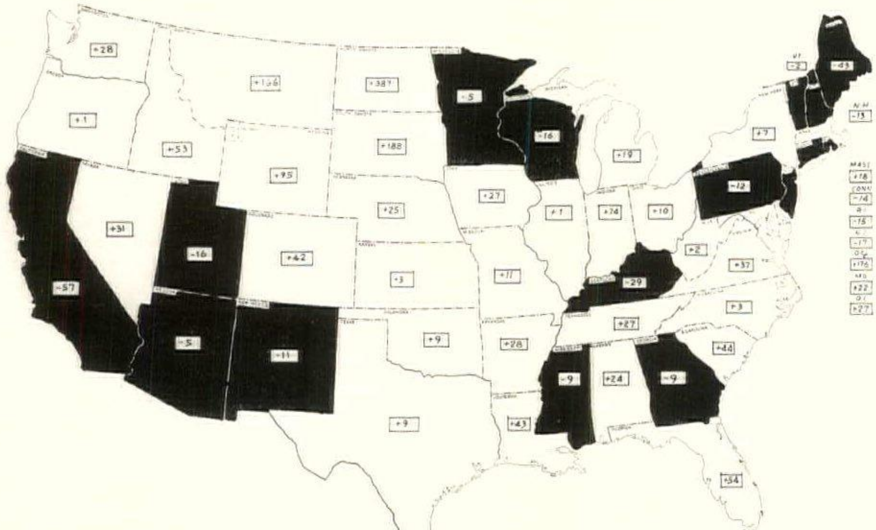
Tests have demonstrated that the time to prime coat steel is soon after oxidation takes place and loose mill scale has been removed. This should be done at the point where steel is manufactured, or as soon as it arrives on the ground for erection. This is especially necessary in the case of box girders or in parts of steel structures that are inaccessible after fabrication.

Many instances have come to light where poor prime coats have caused and accelerated rust and corrosion. It is therefore essential to apply a prime coat of the finest quality and *the proper one for the specific purpose to which the metal will be put.*

Improper undercoatings are the most expensive.

BUILDING TRENDS AND OUTLOOK

BY L. SETH SCHNITMAN
CHIEF STATISTICIAN
F. W. DODGE CORPORATION



BUILDING DURING 12 MONTHS — December, 1933 - November, 1934, INCLUSIVE. Corresponding twelve months ended November, 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.

GAINS IN ALTERATIONS TO INCOME BUILDINGS AFFORD LARGER OPPORTUNITIES FOR ARCHITECTS

During the year 1934 alterations and repairs to existing buildings and structures approximated \$350,000,000 in the 37 eastern states. Thus alteration projects accounted for about 22½ per cent of the value of all reported construction work in the area east of the Rocky Mountains, which, with the contract total for December, 1934, partly estimated, totaled about \$1,544,000,000 for the year.

Alterations to buildings alone, as apart from engineering projects, approximated \$270 million in the 37 eastern states; this represented a gain of about 64 per cent over the value of such work shown for 1933. Against the total for alteration and modernization jobs on existing buildings in 1934 in the 37 states is the contract total for new buildings in the same area of approximately \$530 million; the gain in new building contracts over 1933 was thus only about 16 per cent.

An improvement in alteration and rehabilitation work between 1933 and 1934 in excess of 60 per cent was shown in commercial buildings; in fact, of all private buildings commercial structures accounted for the largest total amount of alterations that were undertaken in 1934. The reason is not hard to find, since most commercial buildings are income-producing properties which require more or less continuous alteration to insure a continuing income. In this field the architect has an expanding opportunity.

It is probable that 1935 will witness a further extension of the improvement in alteration and modernization jobs which will broaden to embrace other income-producing classes, chiefly apartment houses, which shared only too modestly in the general gains in alteration work reported during 1934.

MATERIAL PRICE MEASURING ROD

F. W. DODGE CORPORATION COMPOSITE PRICES

MATERIAL	This Month	Month Ago	Year Ago
Portland Cement	\$2.20	\$2.20	\$2.20
Common Brick	14.78	14.80	13.09
Structural Steel	1.65	1.65	1.65
Lumber	16.23	16.25	16.44

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.

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FEBRUARY

THE

ARCHITECTURAL RECORD

WHAT DO SLUMS COST?

FACTS UNCOVERED IN A BOSTON SURVEY

BY WILLIAM STANLEY PARKER

Vice-Chairman, Boston City Planning Board

The studies made in Cleveland of the tax income and costs assessable against a specific slum area, and its broader studies of real property, gave a definite impulse to similar studies in other cities. The Department of Commerce developed a Real Property Inventory in some sixty cities as a CWA project and subsequently other cities carried out similar studies either as CWA or ERA projects.

One of the latter projects is now being carried on in Boston under the supervision of the City Planning Board and it includes some additional special studies not a direct part of but clearly related to a Real Property Inventory.

One of these studies relates to the tax income and cost of six selected areas and was suggested by the earlier study of that sort in Cleveland. That one, however, dealt solely with one selected slum area, which prevented any conclusions of a comparative nature. The "cost" of a slum area was indicated but no information was given as to similar "costs" or "profits" in other types of residential areas or in business and industrial areas. The Boston study was developed in order to provide comparative data.

Six districts were selected, each comprising a single census tract except in two cases where the census divisions of the business and industrial areas did not seem practical for such use. The aim was to develop the facts concerning a cross section of the city by as few examples as would seem to give a true indication, and by as many as the duration of the ERA project seemed to permit us to complete. The six districts selected were (1) a high-grade business section; (2) a high-grade industrial area; (3) a high-rental residential area; (4) a "miscellaneous district" which included some good residences, various institutions, some retail trade frontages, with a principal core of densely built three-, four-, and five-story apartment buildings of medium rentals; (5) a good one- and two-family residence district, suburban in character yet within the city limits; (6) a low-rental area containing a substantial amount of depreciated and obsolete construction, not the most dense in population but actually five times

TABLE I	CITY				BUSINESS G-1				INDUSTRIAL M-4			
	ENTIRE CITY	Per Cap.	PER ACRE Gross	PER ACRE Net	For District	Per Cap.	PER ACRE Gross	PER ACRE Net	For District	Per Cap.	PER ACRE Gross	PER ACRE Net
INCOME—Table V	$ 59,166,150	$ 74.4	$ 1,933.7	$ 3,256.5	$ 2,359,200	—	$ 76,349.5	$ 126,160.4	$ 701,100	—	$ 5,447.6	$ 6,271.0
COST—Tables III and IV	61,939,298	77.8	2,024.7	3,409.8	321,406	—	9,682.4	16,013.5	104,722	—	814.3	936.5
NET INCOME					2,037,794		66,667.1	110,146.9	596,378		4,633.3	5,334.5
NET COST	2,773,148	3.4	91.0	153.3								

BOSTON CITY PLANNING BOARD—1934 ERA PROJECT X2235-F2-U46

as dense as the suburban area and twice as dense as the miscellaneous apartment area.

Obviously other business and industrial districts as well as several other types of residential areas could have been studied, if time had permitted, that would have added several other intermediate points on our cross section and also added further interest to the study. Perhaps they can be done later. For the present we must base our conclusions or our questions on the six sets of facts now available and so far as I am aware they constitute the first comparative study of this sort.

With this brief comment are printed tables showing the principal results in terms of "income and cost," "area and population," and "cost of County Courts—civil and criminal." I shall not attempt here to lay down any quick conclusions. There is meat here to be well chewed before swallowing. It is well, however, to explain briefly how the costs were allocated and certain items that need to be kept clearly in mind in interpreting the results.

The city budget was allocated in each major item, such as Public Welfare, Park Department, Fire Department, etc., after consultation with the heads of the departments, all of whom gave the fullest cooperation. In some cases the department total was broken down into its component parts, each of which was then allocated to the six districts on the most equitable practicable basis. This was true particularly of the Public Works Department in which the costs of paving, cleaning and snow removal were apportioned by street "area," the costs of lighting, garbage and ash removal by street "length," and the remaining items on a per capita basis.

Public Welfare cost was apportioned in part according to the actual sums spent in each district, as for dependent aid, mothers' aid, and old age assistance, but the major item of unemployment relief and certain other items were distributed on a per capita basis; no other basis appeared practicable although such a distribution is obviously unfavorable to the more prosperous districts.

In some cases the distribution was based upon a combined per capita and assessed value basis, as for the

TABLE II	City	Business G-1		Industrial M-4		High Rental K-3		Suburban W-5		Miscel. Dist. J-5		Low Rental M-3	
	For City	For District	% City	For District	% City	For District	% City	For District	% City	For District	% City	For District	% City
Gross Area by Acres	30,598	30.9	0.1	128.7	.42	169.6	.55	365.9	1.2	142.7	.47	27.4	.09
Net Area Available for Use	18,168.5	18.7	0.1	111.8	.62	41.4	.23	237.9	1.3	76.4	.42	17.6	.09
Population, 1934	795,256	—	—	—	—	2,978	.37	9,299	1.2	7,145	.90	3,366	.42
Persons (1934) Per Acre Gross Area	26.0	—	—	—	—	17.5	—	25.1	—	50.1	—	122.8	—
Persons (1934) Per Acre Net Area	43.8	—	—	—	—	71.9	—	39.2	—	93.7	—	191.2	—

HIGH RENTAL K-3				SUBURBAN W-5				MISCEL. DIST. J-5				LOW RENTAL M-3			
For District	Per Cap.	PER ACRE		For District	Per Cap.	PER ACRE		For District	Per Cap.	PER ACRE		For District	Per Cap.	PER ACRE	
		Gross	Net			Gross	Net			Gross	Net			Gross	Net
$ 931,600	$ 312.8	$ 5,492.9	$ 22,502.4	$ 388,900	$ 41.8	$ 1,062.8	$ 1,634.7	$ 816,400	$ 114.4	$ 5,721.1	$ 10,686.0	$ 44,800	$ 13.3	$ 1,635.0	$ 2,545.0
221,390	73.8	1,304.6	5,347.5	579,321	62.3	1,582.7	2,437.8	469,178	65.1	3,287.7	6,141.5	310,624	92.3	11,336.0	17,649.6
710,210	239.0	4,188.3	17,154.9					347,222	49.3	2,433.4	4,544.5				
				190,421	20.5	519.9	803.1					265,824	79.0	9,701.0	15,104.6

city debts, the Park Department, and the general administrative costs of the city departments, and in certain cases on a per capita basis solely, as in the case of the Health, Hospital and Institutions Departments.

Where possible, as with the Retirement Board, Police Department, Fire Department and Public Schools, costs were distributed according to the actual service rendered to each district.

In studying the resultant figures the method of distribution referred to above should also be studied and each individual is entitled to make such mental adjustments as he deems wise to offset what he may feel to be inequities in the methods of distribution employed. The method used in each case was the result of many debates by the ten architects, engineers, and real estate men who, as a group, directed the study, and who arrived by agreement at the best method to use in view of the cost data available in the department concerned.

One outstanding group of items justifies special mention in view of the comparisons set up between the residential areas and the business and industrial areas. Certain items were distributed, as noted above, on a per capita basis and the schools on a basis of the residence of the pupils. The census shows no population for business and industrial properties and all these items are, therefore, assessed against the residential areas and the total of these items is 55% of the total costs. On the other hand, there is a large concentration of property value in the business area which has an income *per net acre* more than five times that of the high-rental residence area and fifty times that of the low-rental residence area. This disparity does not appear in the industrial area which has an income per net acre only 60% of that in the miscellaneous residence district and only 30% of that in the high-rental area.

From the above it is clear that this method of distribution tends substantially towards a favorable balance in the business and industrial areas and an unfavorable balance in the residence districts. In view of this perhaps the wonder is that the residence districts show up as well as they do, only one, the low-rental area, showing a substantial net deficit.

It is an interesting problem to find a fairer distribution of this 55% of costs so that a proper proportion can be assessed against business and industrial properties. This brief commentary concerns itself solely with a presentation of the statistics resulting from this study and I do not, therefore, attempt here any analysis of the figures or any readjustments of them that might provide fairer comparisons. It is hoped that many individuals, city officials and others, will make their contribution to the subject matter by careful critical analyses and suggestions regarding conclusions indicated by these present figures and other methods of allocation of costs that may offer a clearer basis for determining which districts of a city pay their own way and which appear to be "in the red," which, of course, means that the latter are in effect subsidized by the former.

This fact, even if established, may not constitute a valid indictment of the district, but if the deficit is markedly excessive it is certainly a warning signal that suggests careful thought as to the underlying causes and the true significance of the result.

In closing, attention is called to a few facts that appear in the figures for the low-rental residence district. Its net acreage is less than one-tenth of one per cent of that of the city. Its population is nearly one-half of one per cent of the city total. Its income per capita is $13.30, quite naturally less than the $74.40 for the city. Its cost per net acre, $17,649, is five times the average cost per net acre for the city, three times the cost in the high-rental and miscellaneous districts and seven times the cost in the suburban district.

The costs of the county courts also present some interesting figures for the low-rental district, although not shown in the accompanying table. The cost of the civil courts in this district is, curiously enough, negligible but the cost of the criminal courts is $3.10 per capita against $2.60 for the city, $1.97 for the high rental, and $1.08 for the suburban, with the miscellaneous district showing the highest per capita cost of $6.42, more than double the low-rental district. Also the cost of criminal court work per net acre is equally high for the miscellaneous and low-rental areas ($600 and $593 respectively) compared to $176 for the high rental and $42 for the suburban areas.

LIMITED DIVIDEND CORPORATIONS UNDER THE NATIONAL HOUSING ACT

BY EUGENE H. KLABER, A.I.A.

The enactment of the New York State Housing Law brought the limited dividend housing corporation forcibly to the attention of those interested in American housing. Although comparatively new to America, this type of corporation was well known in England where, under the name of "Public Utility Society," it had existed for many years and enjoyed a moderate success as a producer of low-rental housing. Back of such societies and corporations lies the idea that private funds can be obtained for investment in the shares of an enterprise having a social purpose and limited as to rentals, returns and method of operation. The subscriber makes a long-term investment giving no prospect of large gains but supposedly assuring a moderate and safe return on the money invested.

The conditions surrounding such corporations are different in detail in England and America. It is not proposed to deal with these differences; this discussion is confined to American practice. On the score of differences, suffice it to say that, whereas a reasonably assured prospect of a 4% or 5% return on invested money may be attractive to the British public, it does not appeal strongly to the American investor; even a possible 6% has never evoked any considerable flow of capital into such investments.

The New York State Housing Law and the state laws which followed were enacted as a stimulus to the construction of low-rental housing; it was recognized that this is the great potential field for building construction and represents a pressing need, not likely to be satisfied by the operations of the customary processes of commercial building. The National Industrial Recovery Act recognized the need and made provision for Government loans to limited dividend housing corporations. It provided that they might receive loans of as much as 85% of the appraisal value of their projects, with an interest rate of 4% and an amortization period of as much as 33 years. It was provided that payments of interest plus amortization should be a fixed annual amount; thus, as annual interest decreased, amortization increased, until the debt was paid. No charge was made for making the loan. It was hoped that under these terms, so much more generous than could be obtained from private lending institutions, a considerable program of low-rental housing could be initiated, under private auspices.

The program was in the jurisdiction of the Public Works Administration and applications were presented to and passed upon by the Housing Division of that body. The Division was organized in the latter part of July 1933 and considered applications of proposed limited dividend corporations until the middle of January 1934 when it was advised that no further funds were available for allocation to private corporations. During that period, approximately four hundred proposals were received. Of these, there were only twenty-one which had sufficient merit to warrant an allocation of funds and, of these twenty-one, a large majority failed of final approval. It was found that with rare exceptions, the promoters of projects offered no substantial equity. Most frequently the only equity was a parcel of land put into the financial set-up at many times its possible valuation on any rational basis for any use.

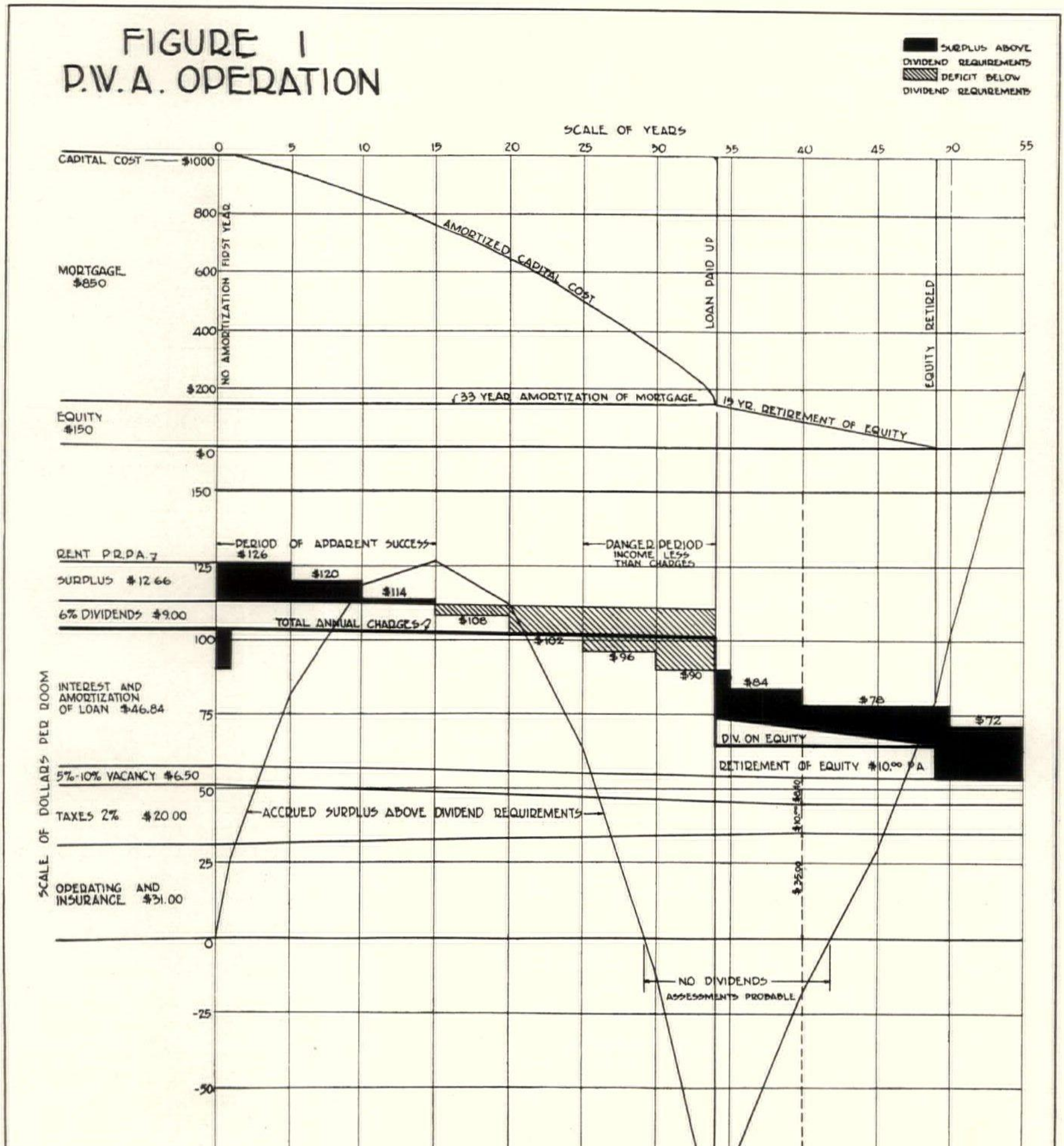
Let us examine some of the factors that militated against the success of a proposed limited dividend corporation.

The first element of risk was the smallness of the equity. In ordinary lending procedure an equity of about 40% is required. The object of permitting a smaller equity was, of course, to stimulate construction. With a required equity of only 15%, the stockholders of a limited dividend corporation were "out on the end of the limb." If the project were to go sour, they would lose their entire stake with the appearance of the first curds. Had there been a corresponding chance of gain, there would have been a greater incentive to invest, but the maximum return ordinarily allowed was 6%. It is gradually being recognized that this is a very good return if the safety of the invested capital and the dividend are reasonably assured, but we shall see that this was not the case. Further, the investor was usually faced by the requirement that, when the loan was retired, the fee to the property must be vested in the state, or that the Federal Government might take it at any time, in cases where it made a mortgage loan. Such a provision may be socially desirable, but it can hardly be pretended that it offered what is known as a "business proposition."

On top of these restrictions was the requirement that the loan be retired by equal annual payments of interest plus amortization. This provision means either good luck or no dividend and possible bankruptcy. Figure 1 shows graphically why this is the case. Note that the annual charges, other than the service of the loan, do not vary greatly; if anything, they err in showing a slight decrease instead of an increase. If we add a constant annual payment of interest plus amortization, the line of total annual charges runs approximately level. The corollary is that rentals must stay at about the same level during the entire period of the mortgage. With good luck this may happen, but the conservative investor must presume that over a long period of years the rents will perforce be reduced on account of obsolescence, no matter how much the project may be in advance of current practice. The moment that we assume a periodically decreasing rental, as shown in the figure, the time comes soon when the annual receipts permit no dividends, and later deficits appear which threaten bankruptcy.

This method of retiring a loan may have been derived from the practice of the building and loan associations, whose requirement of equal monthly payments

The National Industrial Recovery Act made provision for Government loans to limited dividend housing corporations. Execution of the provision was entrusted to the Public Works Administration and applications for loans were passed upon by the Housing Division of that body. The Housing Division functioned from the latter part of July, 1933, until the middle of January, 1934, by which time it had become apparent that private capital was unwilling to accept the risks involved in supplying equities under the loan terms offered. Mr. Klaber, after explaining what the risks were, points out the improvement in the position of equity holders in limited dividend corporations authorized by the mortgage insurance title of the National Housing Act. The insurable loans in question are of course from private sources, including life insurance companies and the like.

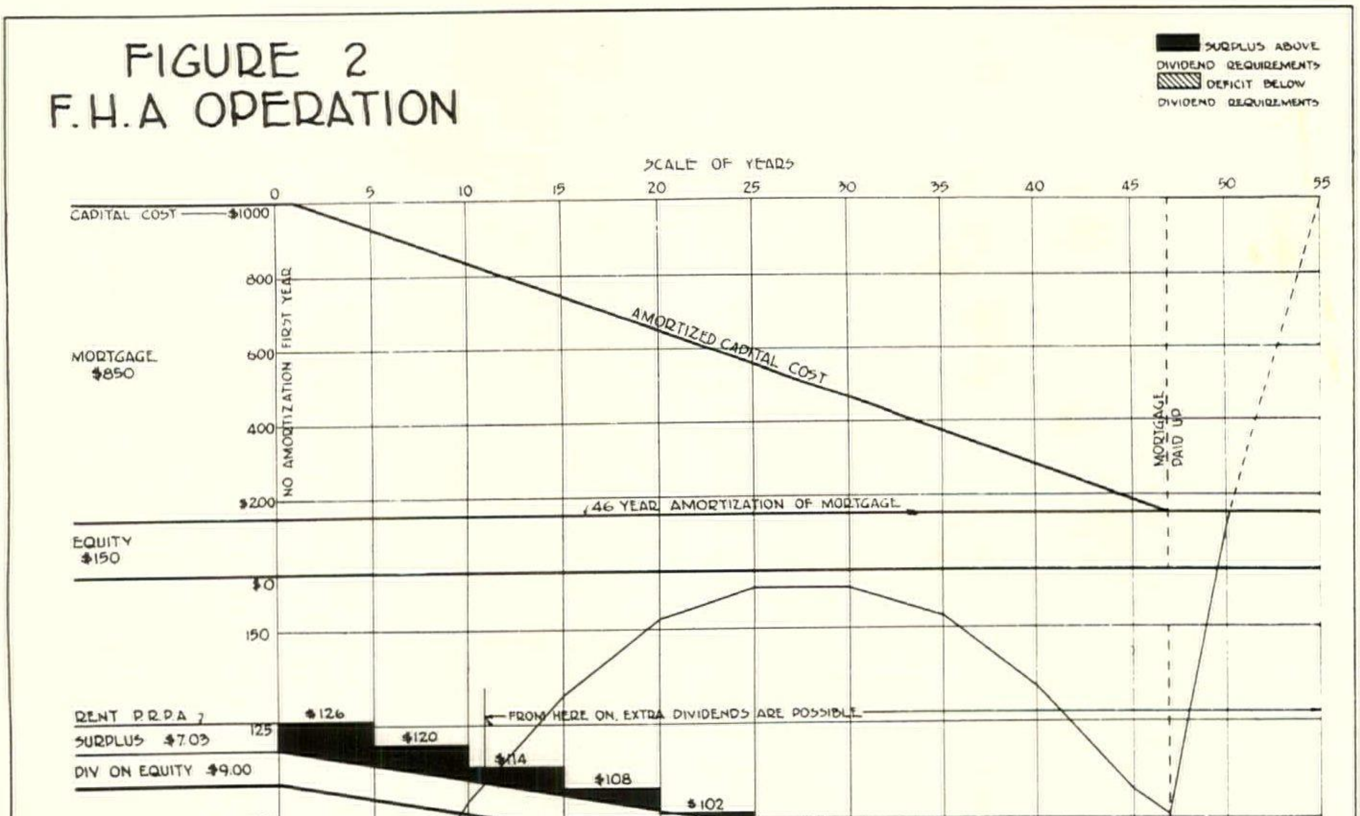


ASSUMPTIONS: A—85% loan, 15% equity; B—no amortization first year; C—equal payments interest plus amortization—33 years @ 5.51%; D—mortgage interest 4%; E—vacancies 5% first year, 10% at 40th year; F—capital cost per room, $1,000; G—operating, insurance and taxes same as figure 2; H—dividend on equity 6%; I—initial working capital and interest on accrued surplus ignored; J—no charge for mortgage insurance; K—equity retired in 15 equal installments after loan is paid.

obligated a home buyer to set aside a constant amount from his monthly pay to pay his debt on the home. To afford this, his income had to be reasonably assured during the period of the loan. Time was when a man could feel that his job was secure for eleven years and seven months and the scheme worked well enough. But neither then nor now could a man assume a constant earning power for thirty or forty years to come. The same is true of buildings; both human beings and structures are subject to obsolescence and depreciation. Buildings do not undergo final dissolution at three score and ten, but most of them ought to. It is not surprising, then, that such a set-up failed to attract the careful investor.

Although the experience of the Public Works Administration with limited dividend corporations had not been encouraging, provision was again made for aid to them through Governmental insurance of mortgages under the National Housing Act. The Federal

(*Continued on page 32, advertising section*)



PREPARED BY EUGENE H. KLABER, DEC 15 1934

ASSUMPTIONS: A—85% loan, 15% equity; B—no amortization first year; C—straight line amortization 46 years; D—mortgage interest 4%; E—vacancies 5% first year, 10% at 40th year; F—capital cost per room, $1,000; G—operating, insurance and taxes same as figure 1; H—dividend on equity 6%; I—initial working capital and interest on accrued surplus ignored; J—no charge for mortgage insurance included; K—equity not retired.

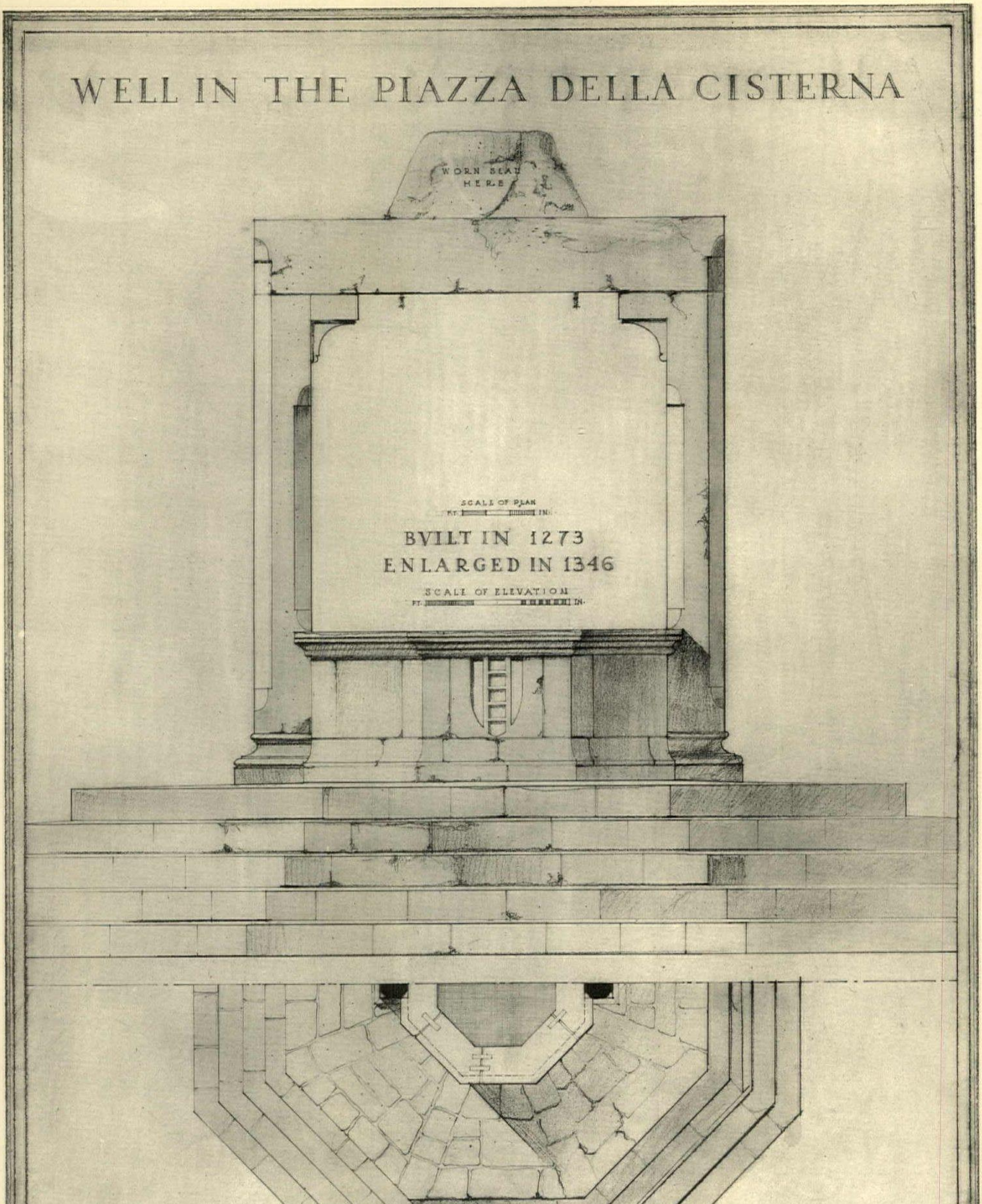
MEASURED DETAILS FROM SAN GIMIGNANO, ITALY

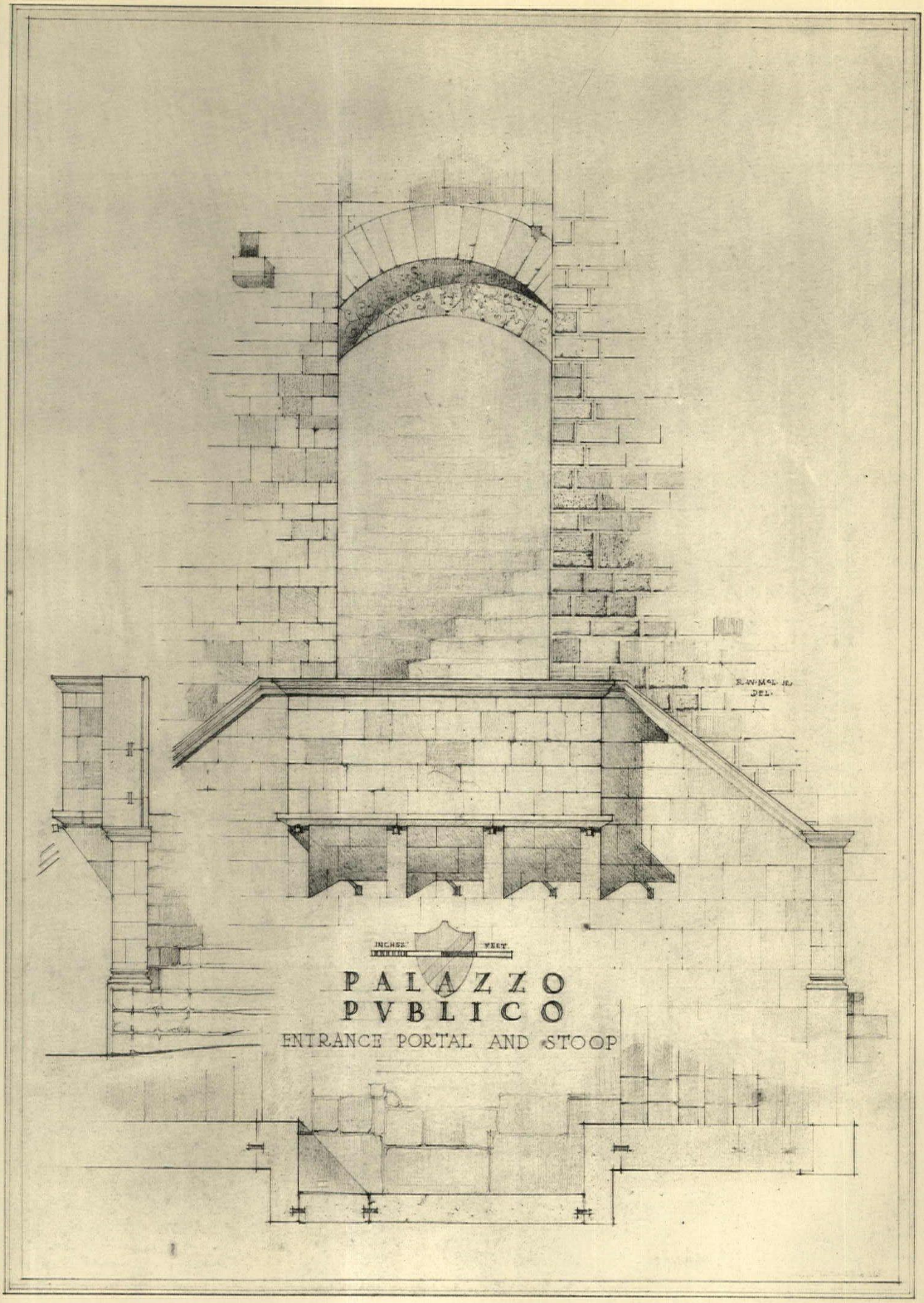
By IVES VAN DER GRACHT
and ROBERT W. McLAUGHLIN, JR.

THE PIAZZA DELLA CISTERNA: From the principal approach to the town, passing the façade of San Francesco, the narrow street mounts sharply through two ancient VII or VIII century gateways toward the Piazza della Cisterna, or "of the Taverns." Here, in front of the Palazzo Cugnanesi, were held in 1227 some memorable wedding feasts—gaudia nuptiarum—with tournaments, games, dances and every sort of convivial pastime in which all the inhabitants of the Territory took part, and which lasted through several days and nights. The large well in the center was constructed in 1273; the shield which decorates it is that of Guccio de' Malevolti, Podestá in 1346, at which time it was probably enlarged and embellished with the sculptures on top of the lintel. These, however, are too weathered to permit of much interpretation. On its broad base of steps, the well harmonizes in its simplicity with the severity of the Piazza, surrounded by a number of fairly well preserved XV and XVI century palaces.

Photograph by Alinari

WELL IN THE PIAZZA DELLA CISTERNA

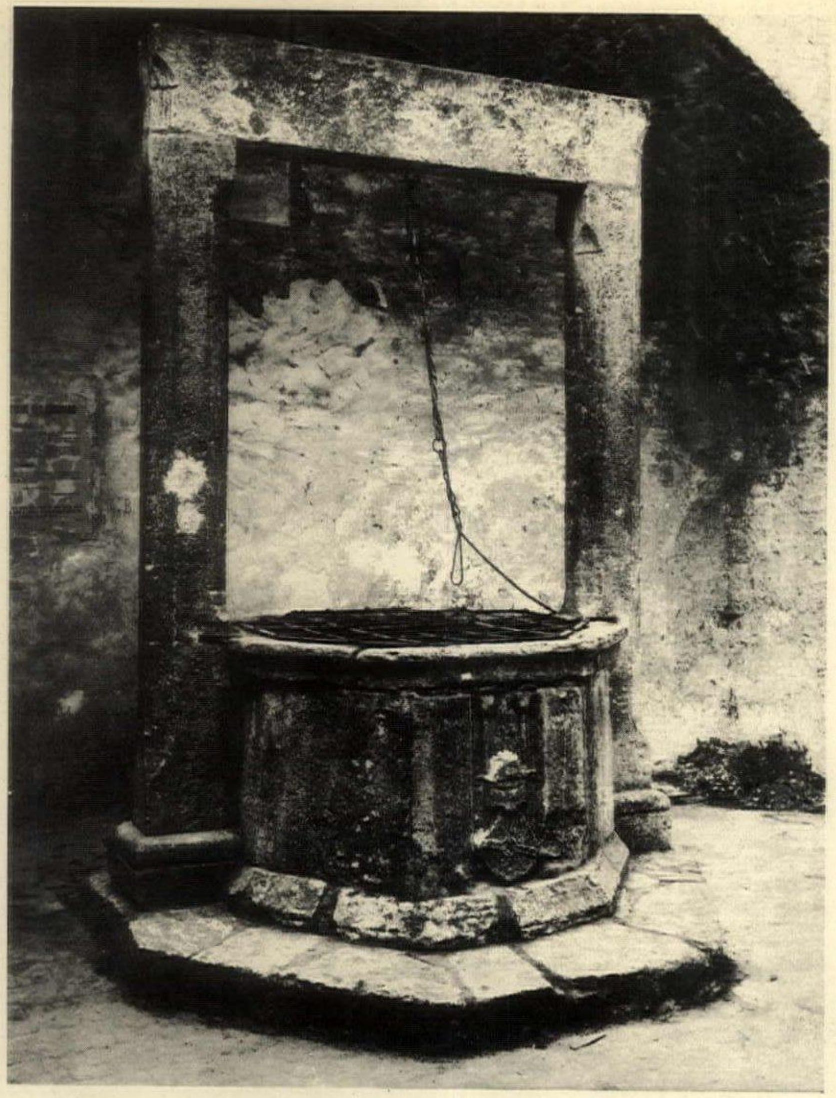

WELL IN THE PIAZZA DELLA CISTERNA
WORN SEAT HERE
SCALE OF PLAN
BVILT IN 1273
ENLARGED IN 1346
SCALE OF ELEVATION
R. W. McL. JR. DEL.



BY IVES VAN DER GRACHT AND ROBERT W. McLAUGHLIN, JR.

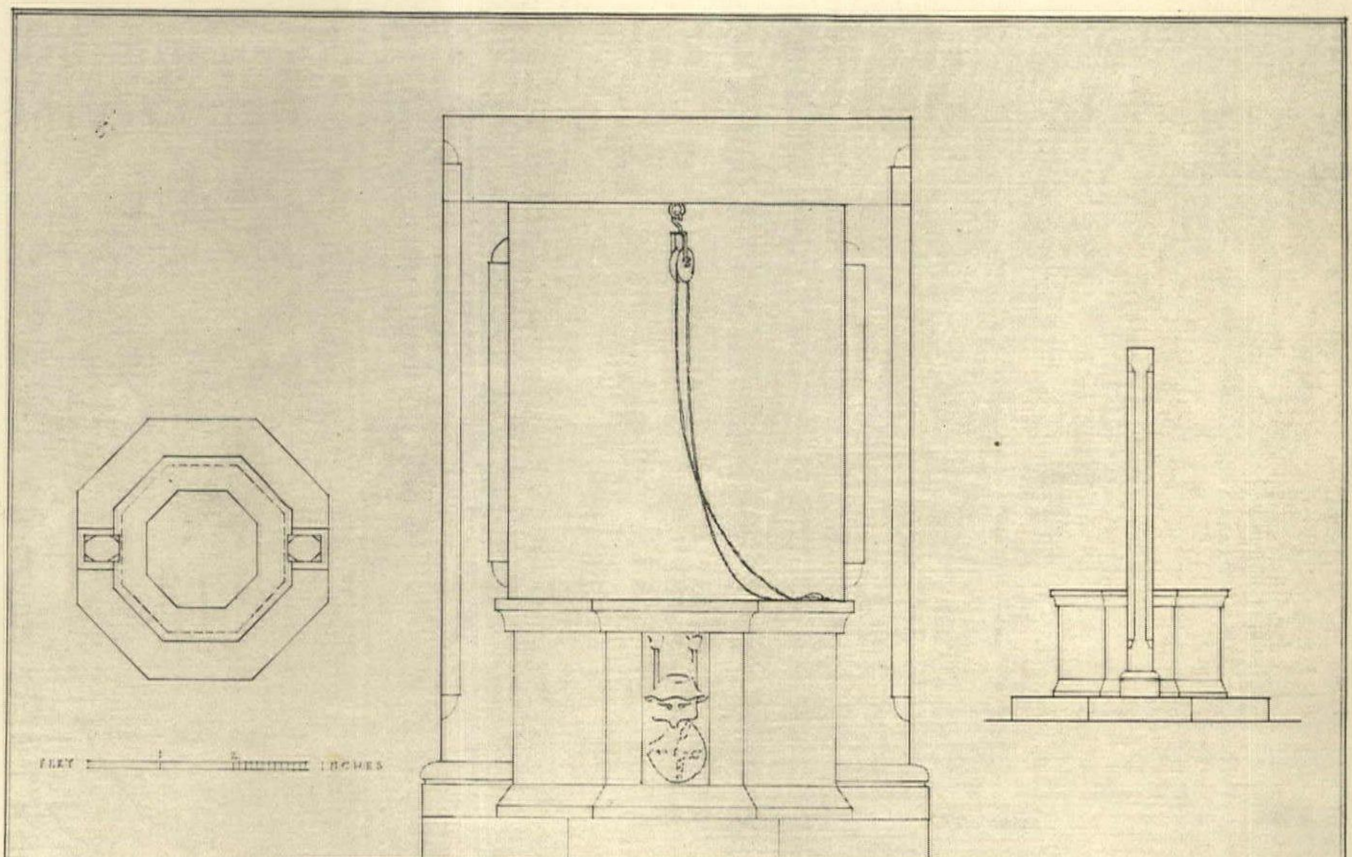
Photograph by Alinari

BALCONY OF THE PALAZZO PUBLICO IN SAN GIMIGNANO



MEASURED DETAILS from SAN GIMIGNANO

By IVES VAN DER GRACHT and
ROBERT W. McLAUGHLIN, JR.

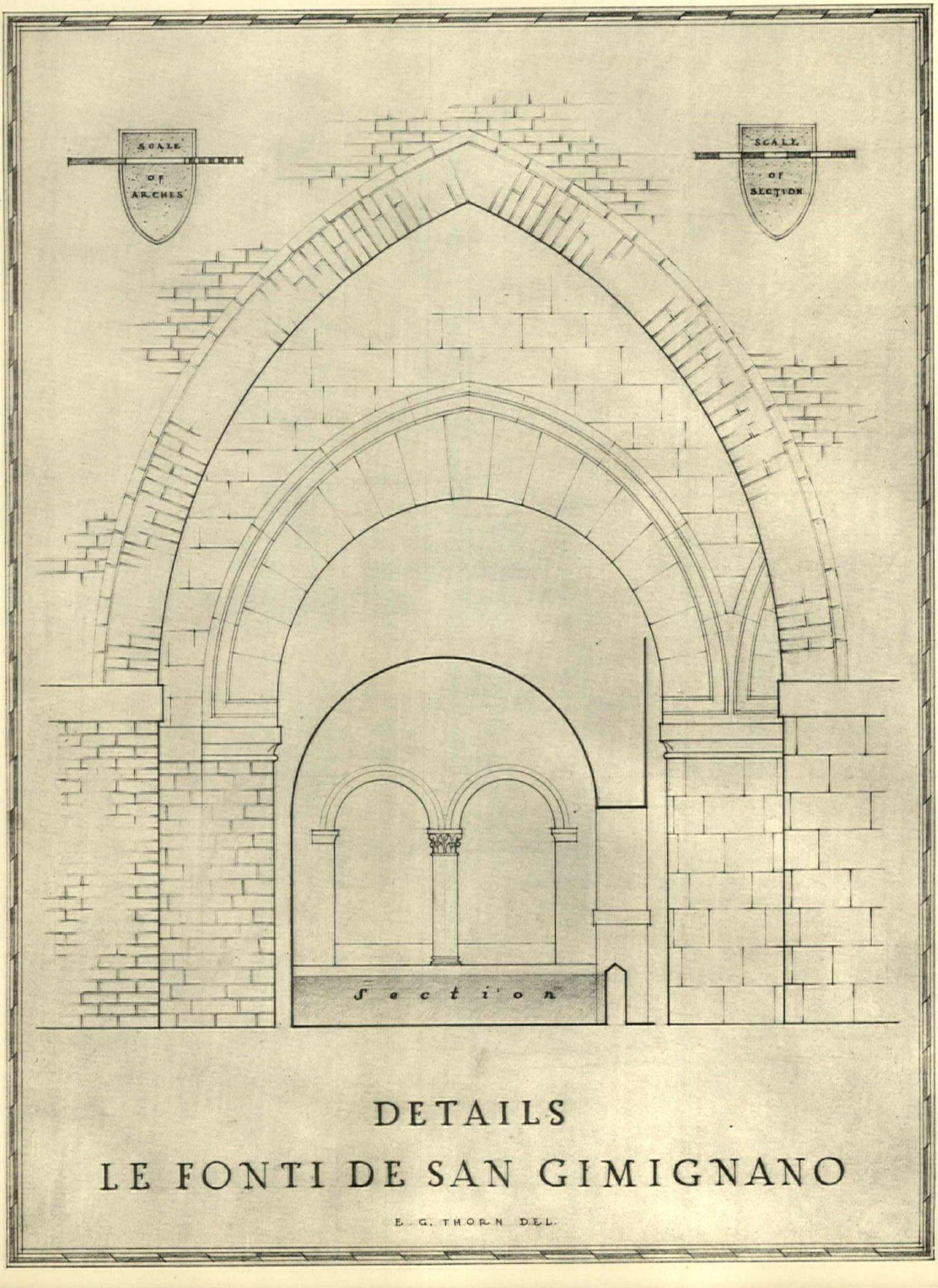


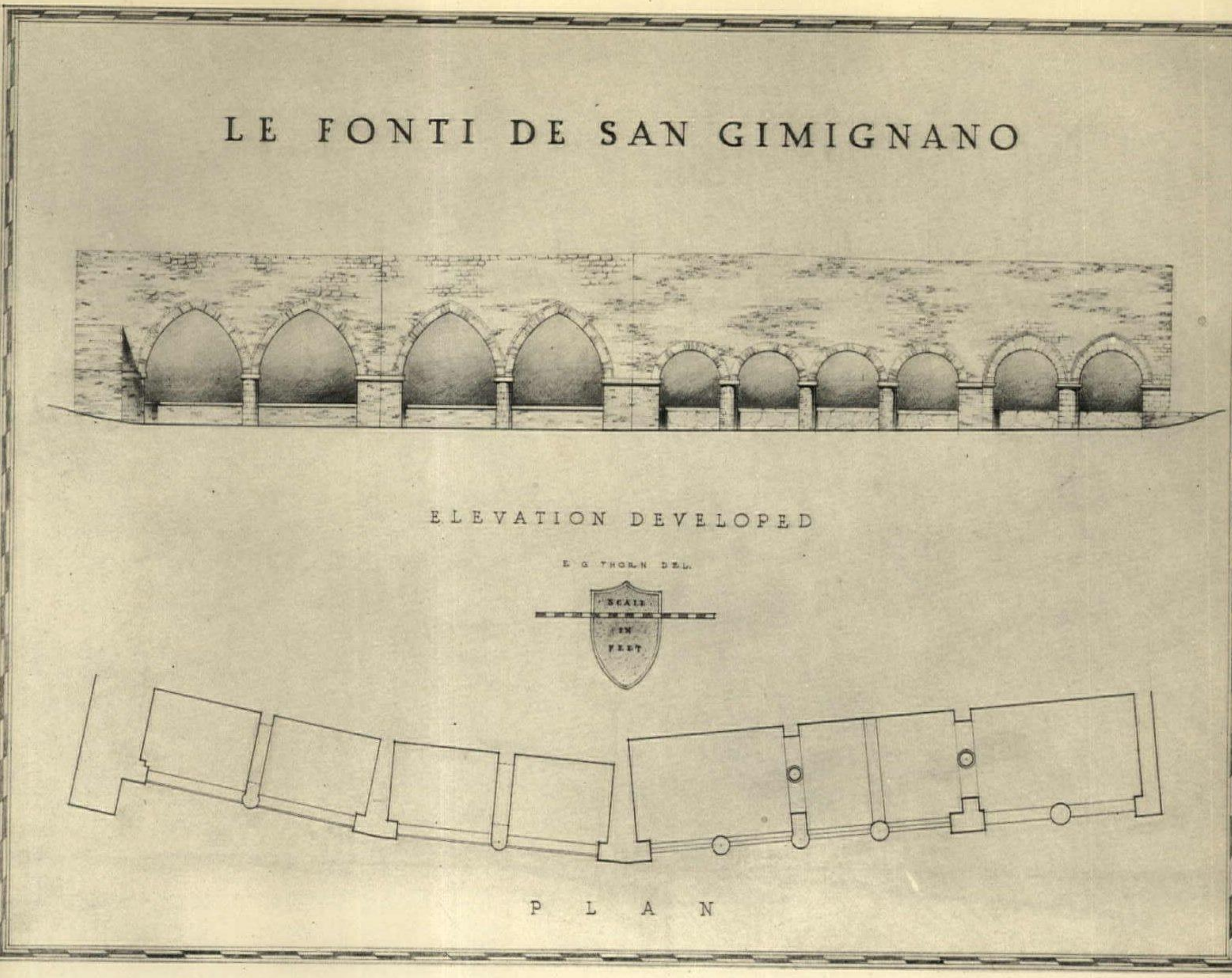
WELL HEAD IN THE CORTILE · PALAZZO PVBLICO

MEASURED DETAILS FROM SAN GIMIGNANO, ITALY

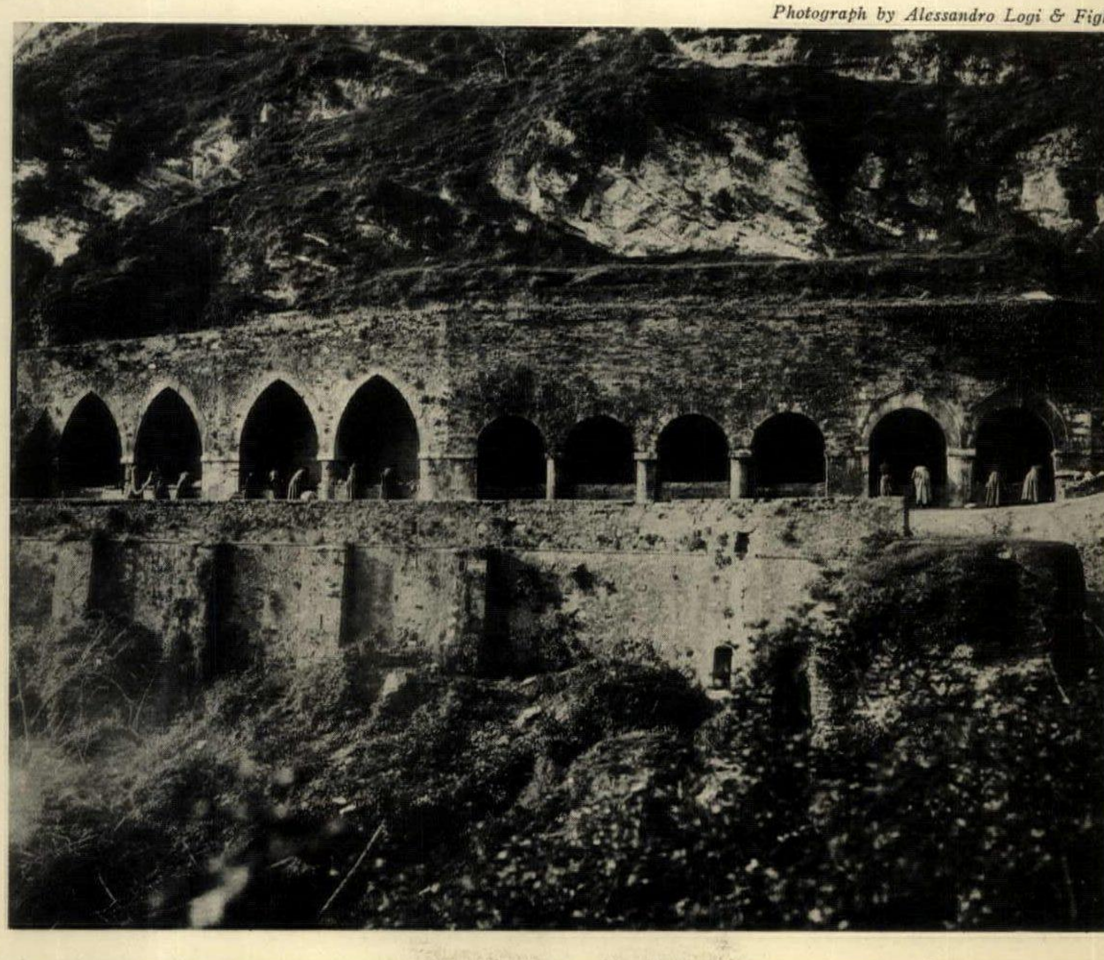
THE PUBLIC FOUNTAINS: Beyond the Gate of the Fountains, ornamented with a small statue of San Gimignano to commemorate an unsuccessful attempt of the Ardinghelli to penetrate into the town after one of their periodic exiles, a steep path leads down to the public wells. These, with the various wells in the town, were its sole water supply until quite recently, and to this day the women of San Gimignano gather here to do the weekly washing. The first two arches are of cut stone, supported by a heavy pillar of gray stone, and date from the XII century. The others were added subsequently, especially during the period when the wool industry flourished.

A little further down the hill, three-quarters buried in the ground and overhung with vines, is a primitive well, built of brick in the Lombard manner, which might go back to the VIII or IX century. From here there is a splendid view not only of the rolling countryside with its weathered stone farms and half ruined castles, but also of the towers of San Gimignano which rise above the huge masses of tufa stone upon which the town is built.



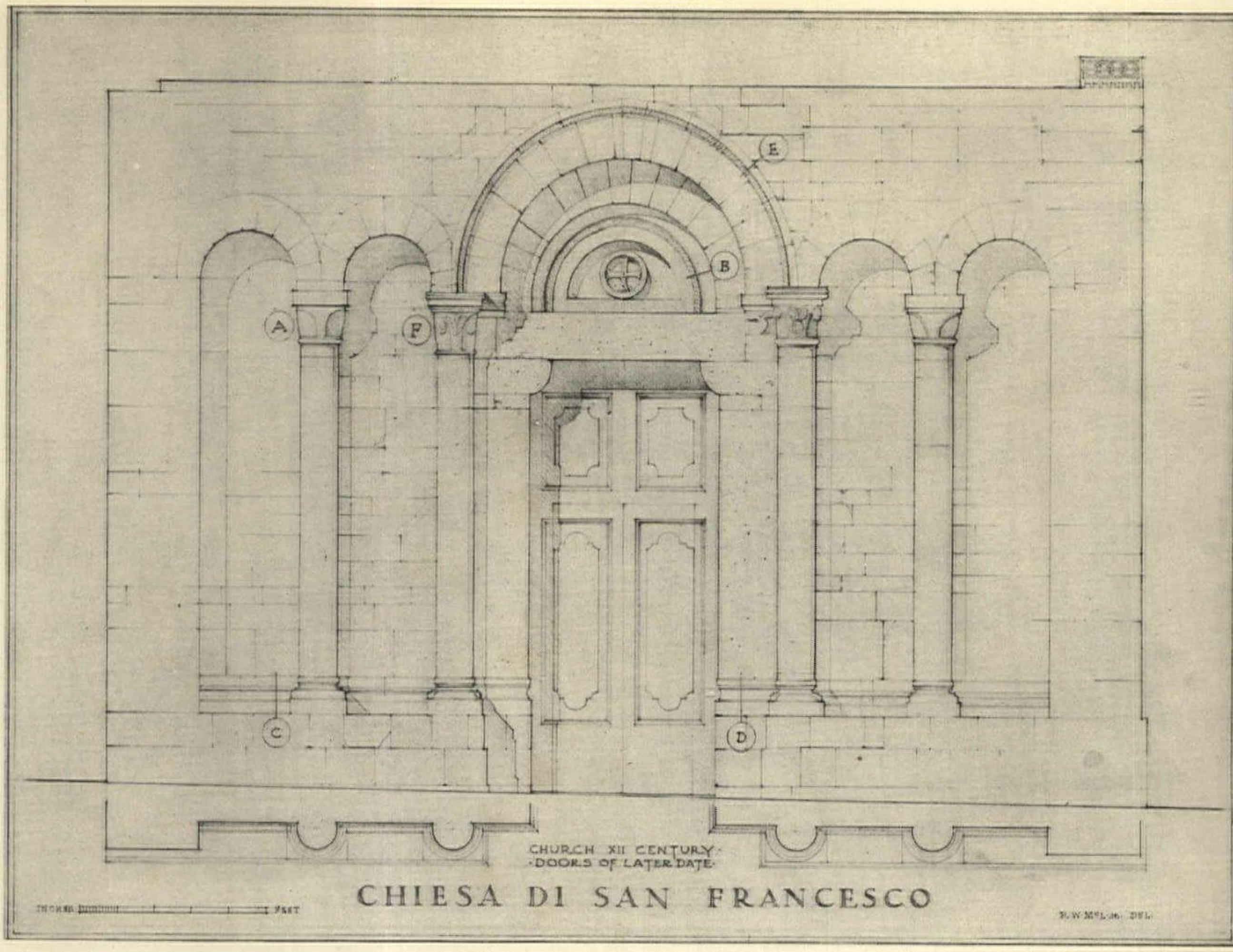


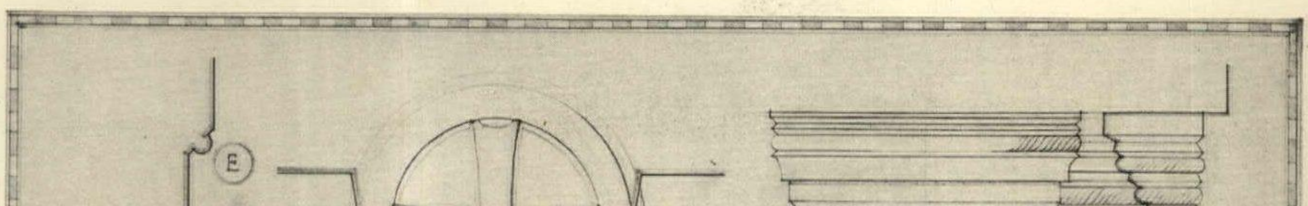
Photograph by Alessandro Logi & Figli



Photograph by Alinari

THE BASIN INSIDE THE PUBLIC FOUNTAINS OF SAN GIMIGNANO





CHURCH OF S. FRANCESCO IN SAN GIMIGNANO, ITALY

MEASURED BY I. VAN DER GRACHT
AND ROBERT W. McLAUGHLIN, JR.

TYMPANUM OVER ENTRANCE DOOR

CHURCH OF S. FRANCESCO

SAN GIMIGNANO TUSCANY, ITALY

FRAGMENT OF CHURCH FACADE

MEASURED BY IVES VAN DER GRACHT R. W. McLAUGHLIN, JR.

PORTFOLIO

SPECIAL BUILDING TYPES

A HOUSE AND SCHOOL OF ARTS AND CRAFTS IN MUSIC FOR DAVID DUSHKIN, WINNETKA, ILLINOIS. DESIGNED BY PAUL SCHWEIKHER.

CINNAMON MARKET AT HIGHLAND PARK, MICHIGAN. ALBERT KAHN, INC., ARCHITECTS.

THEATER EXCELSIOR IN MILAN, ITALY. EUGENIO FALUDI, ARCHITECT.

BELLEVUE BEACH IN DENMARK. ARNE JACOBSEN, ARCHITECT.

AUDITORIUM AND CHAPEL FOR WOMEN'S CHRISTIAN COLLEGE IN TOKYO, JAPAN. ANTONIN RAYMOND, ARCHITECT.

A SLIDE AND SMALL POOL AT WIESBADEN, GERMANY. FRANZ SCHUSTER, EDMUND FABRY AND WILHELM HIRSCH, DESIGNERS.

TOURIST CABINS AT WILTON, CONNECTICUT. DESIGNED BY JULIAN WHITTELSEY.

TOURIST VILLAGE DESIGNED BY EARL G. VON STORCH.

CUMBERLAND GARAGE AND CAR PARK, LONDON, ENGLAND. SIR OWEN WILLIAMS, DESIGNER AND ENGINEER.

BRYAN MEMORIAL TOWN HALL AT WASHINGTON, CONNECTICUT. CAMERON CLARK, ARCHITECT.

FIRE STATION AND TOWN GARAGE AT WASHINGTON, CONNECTICUT. CAMERON CLARK, ARCHITECT.

GREENPOINT BRANCH, NATIONAL CITY BANK OF NEW YORK. AARON G. ALEXANDER, ARCHITECT.

PENGUIN POND IN ZOOLOGICAL GARDENS, REGENT'S PARK, LONDON, ENGLAND. LUBETKIN, DRAKE AND TECTON, ARCHITECTS.

GORILLA HOUSE IN ZOOLOGICAL GARDENS, REGENT'S PARK, LONDON, ENGLAND. TECTON, ARCHITECTS.

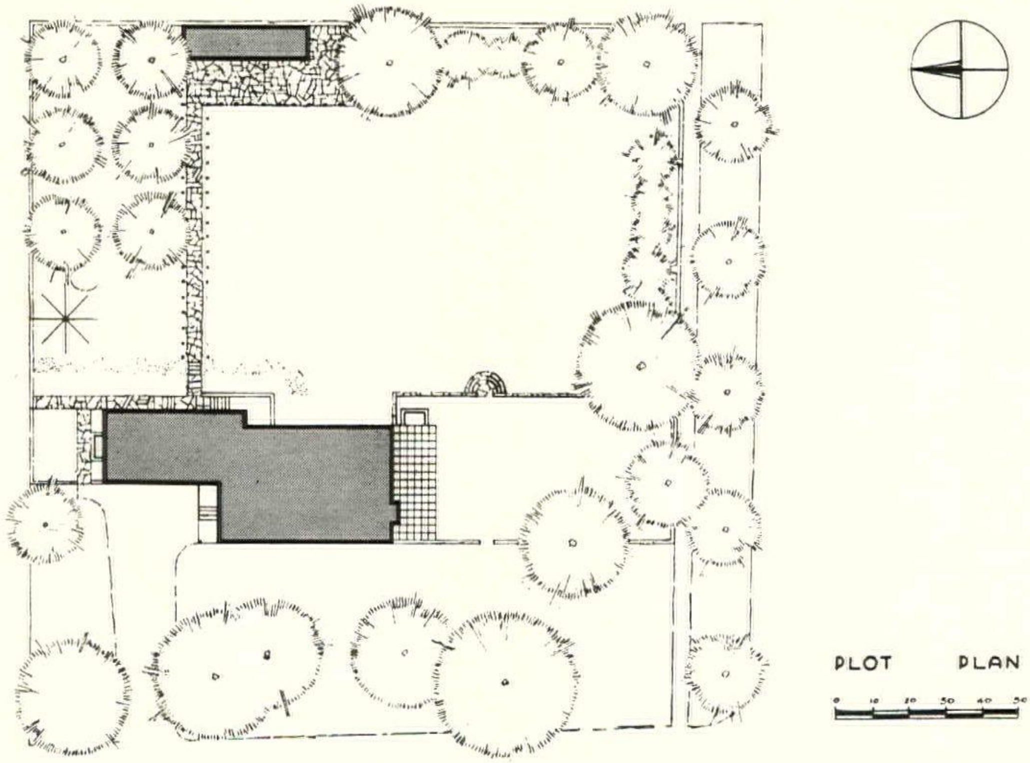
REMODELED BUILDINGS:

SCHWARTZ'S RESTAURANT, NEW YORK CITY. CHARLES SHILOWITZ, ARCHITECT.

LANTIERI BEAUTY SALON, NEW YORK CITY. VAHAN HAGOPIAN, ARCHITECT.

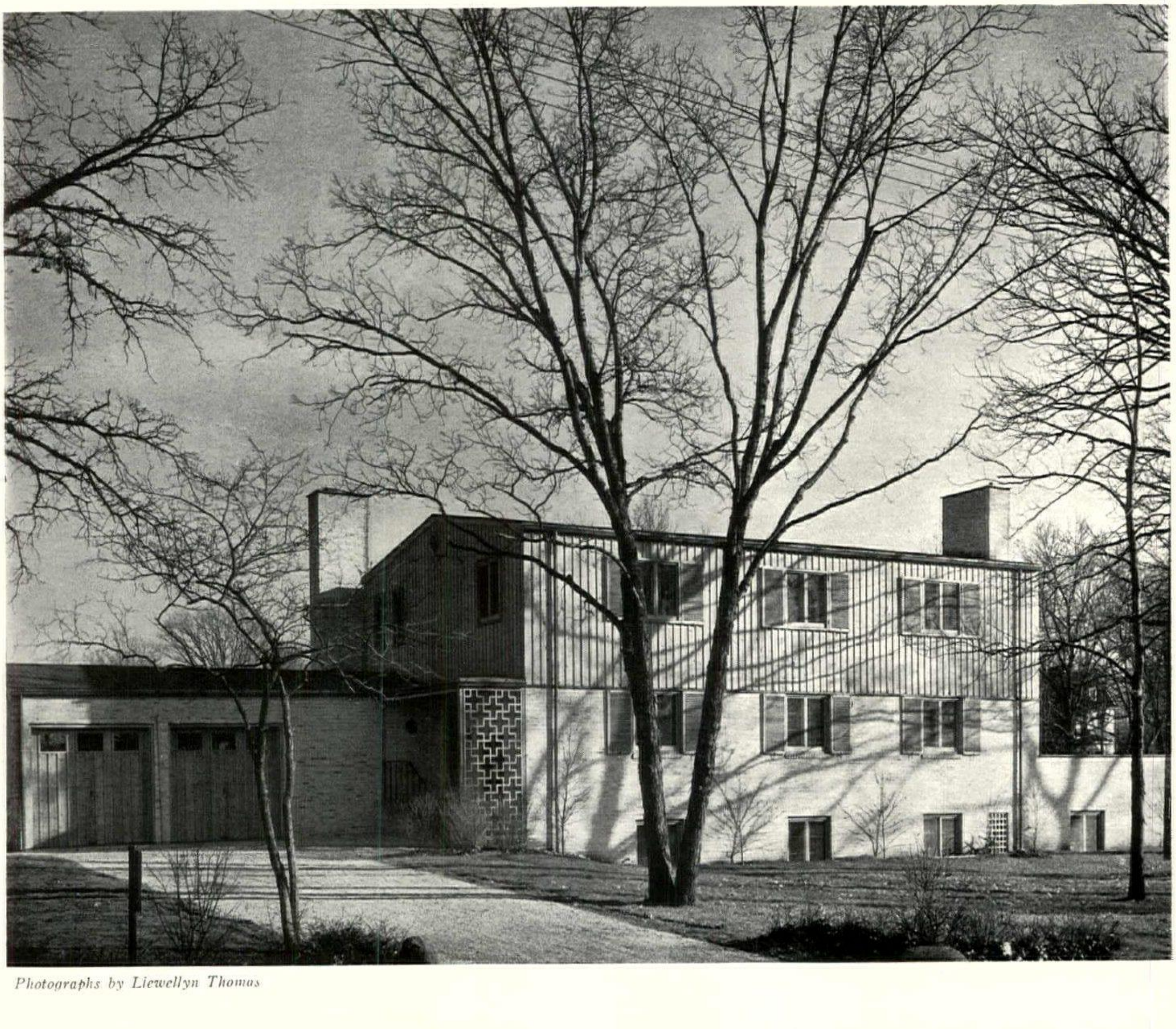
THEATER OLIMPIA IN MILAN, ITALY. EUGENIO FALUDI, ARCHITECT.

THEATER LIRICO, MILAN, ITALY. EUGENIO FALUDI, ARCHITECT.



DESIGNED BY
PAUL SCHWEIKHER

WEST ELEVATION



Photographs by Llewellyn Thomas

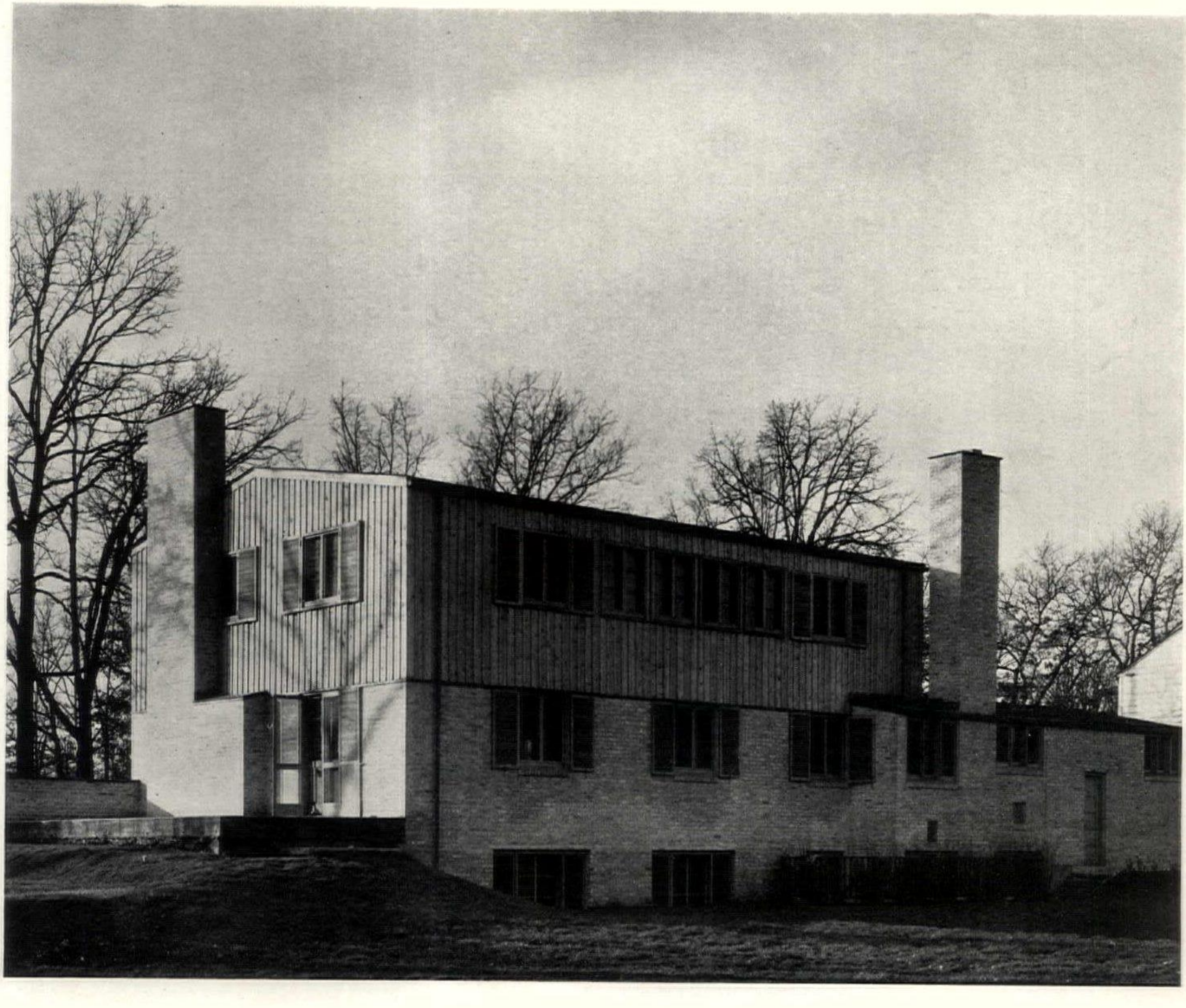
MUSIC SCHOOL

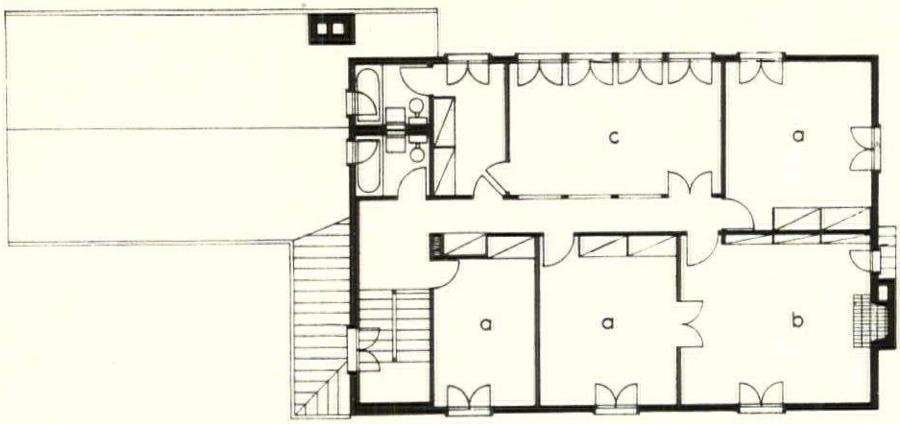
A HOUSE AND SCHOOL OF ARTS AND CRAFTS IN MUSIC FOR DAVID DUSHKIN . . . . . WINNETKA, ILLINOIS

Students are instructed in the construction and technique of musical instruments as well as in history, theory and practice. One resident teacher is provided with a studio and adjoining bath. The living room on the first floor is furnished for dining and library space; it also serves as a recital hall seating more than two hundred persons.

Walls from footing to grade are concrete (waterproofed); grade to first floor common brick. Concrete and brick are whitewashed on interior only. Walls from first to second floors are common brick veneer and wood stud (2 x 6) construction, diagonal sheathing; interior faced, in living room with plywood, remainder Celotex. Walls second floor to roof are wood stud diagonally sheathed and faced on exterior with vertical wood siding (1 x 8) and battens (1 x 2). All exterior walls are insulated with one inch of Sprayo-Flake between studs. All interior walls are wood stud faced both sides with Celotex, except ground floor partitions which are faced with Celotex but are further soundproofed by 2 inches of Sprayo-Flake on a brick core. The ground floor is concrete, stained; the first floor is maple insulated on underside with Sprayo-Flake; second floor is maple. Ceilings throughout are Celotex. Roof is covered with red asphalt shingles. The unit cost of the building, including air conditioning plant, was 29.8¢ a cubic foot.

EAST ELEVATION

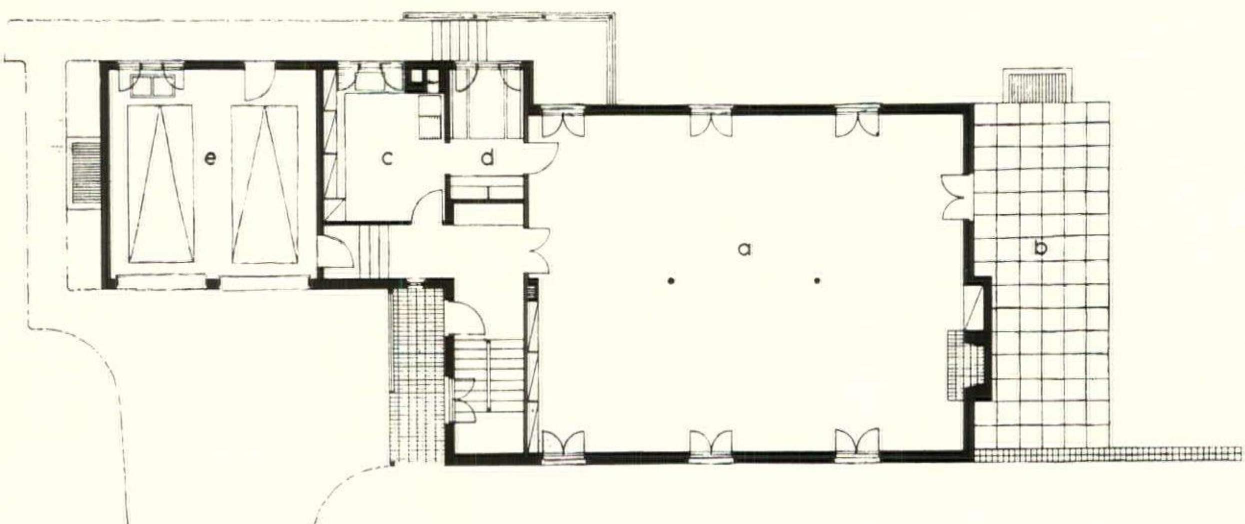




SECOND FLOOR PLAN

a BED ROOM
b SITTING ROOM
c NURSERY

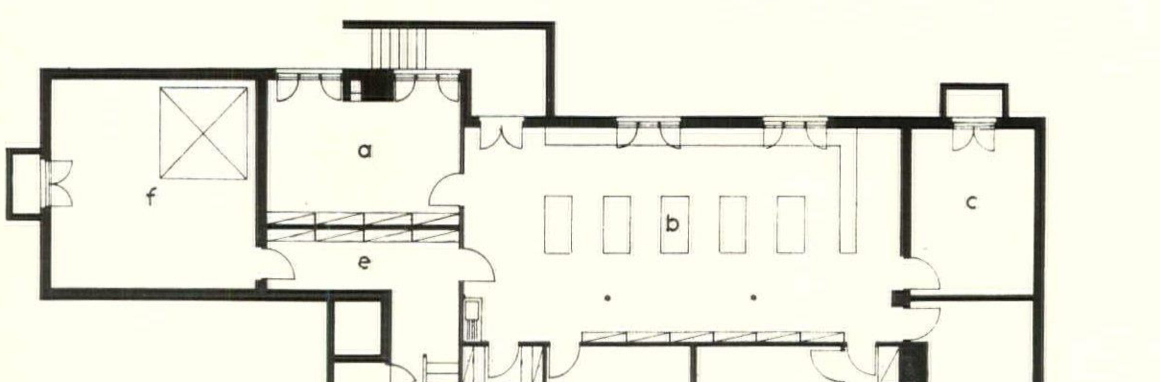
SCALE IN FEET 0 5 10 15 20



FIRST FLOOR PLAN

a LIVING ROOM & RECITAL HALL
b OPEN TERRACE
c KITCHEN
d BREAKFAST ROOM
e GARAGE

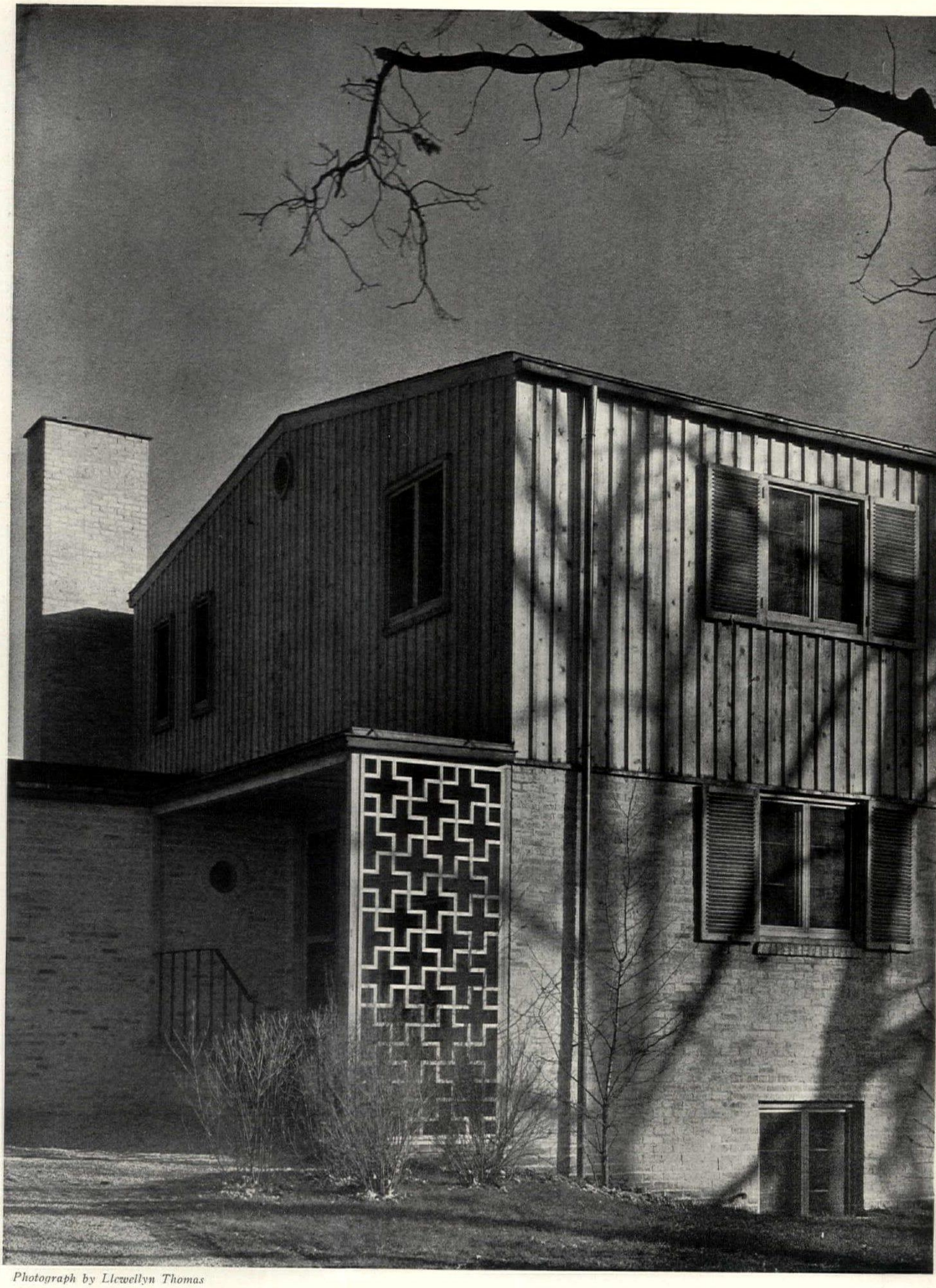
SCALE IN FEET 0 5 10 15 20



GROUND FLOOR PLAN

a OFFICE
b INSTRUMENT SHOP
c STUDIO
d PAINT ROOM
e CLOAK ROOM
f AIR CONDITIONING EQUIPMENT
g STORAGE

SCALE IN FEET: 0 5 10 15 20



Photograph by Llewellyn Thomas

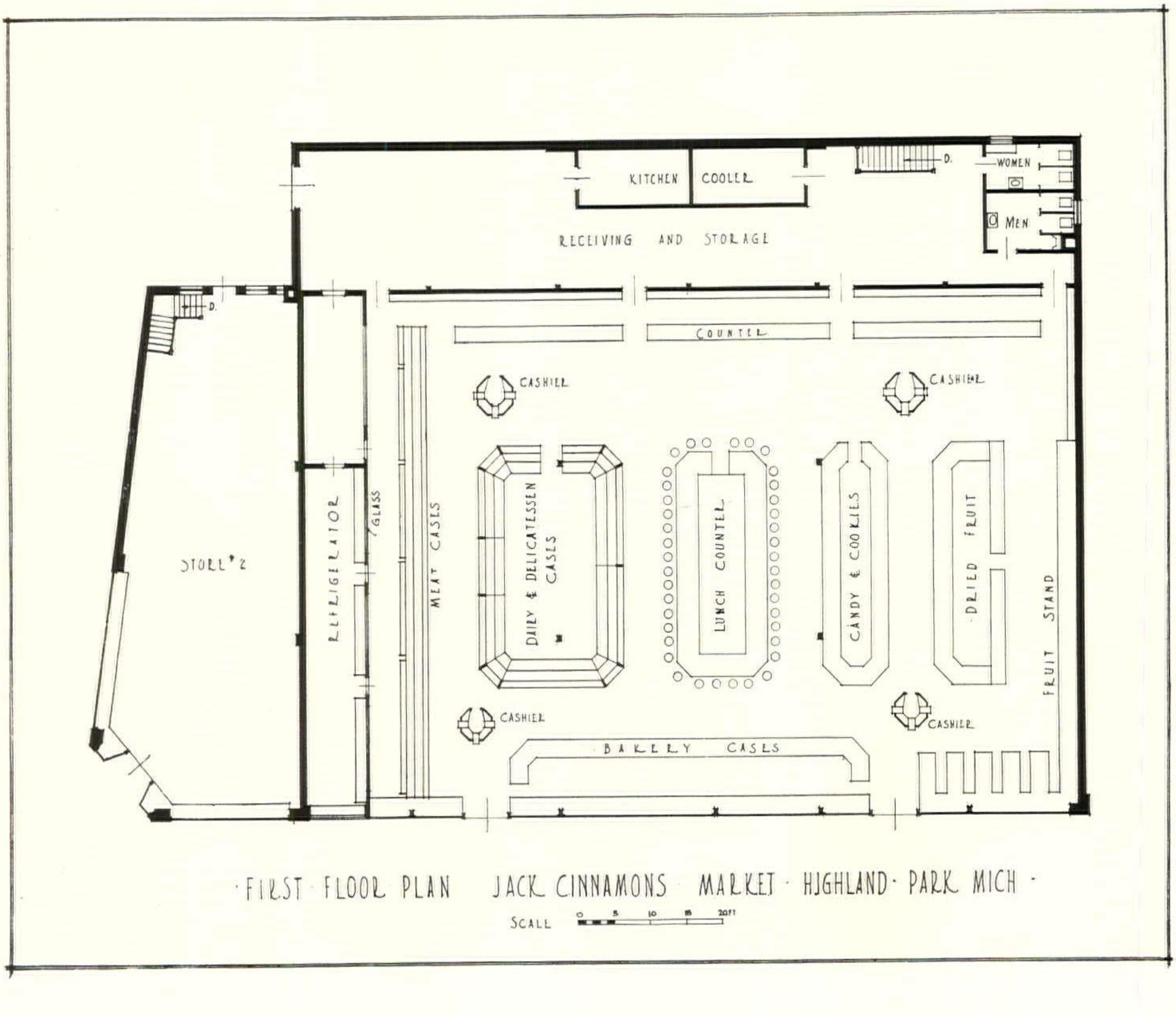
A HOUSE AND SCHOOL OF ARTS AND CRAFTS IN MUSIC

FOR DAVID DUSHKIN, WINNETKA, ILLINOIS — DESIGNED BY PAUL SCHWEIKHER

RETAIL STORE

The exterior of the building (actually a tax-payer) is stainless steel in conjunction with black Carrara glass. The lower sign is flashed opalite glass with mazda lamps in back; letters are silhouetted in black enameled metal. The larger sign is stainless steel illuminated with neon tubes.

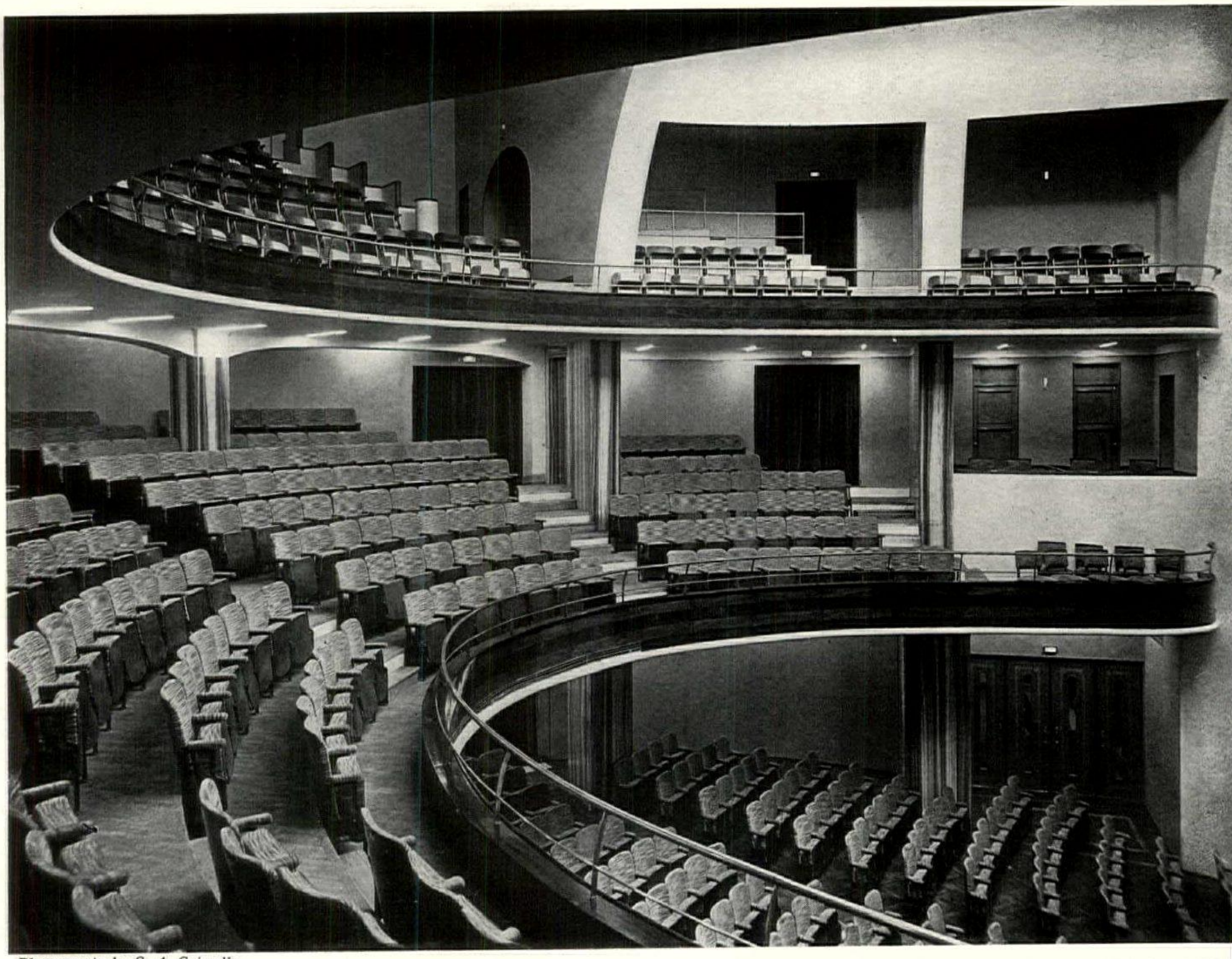
MARKET AT HIGHLAND PARK, MICH.
ALBERT KAHN, INC., ARCHITECTS



A THEATER

THEATER EXCELSIOR IN MILAN, ITALY
EUGENIO FALUDI, ARCHITECT

Photograph by S. A. Crimella

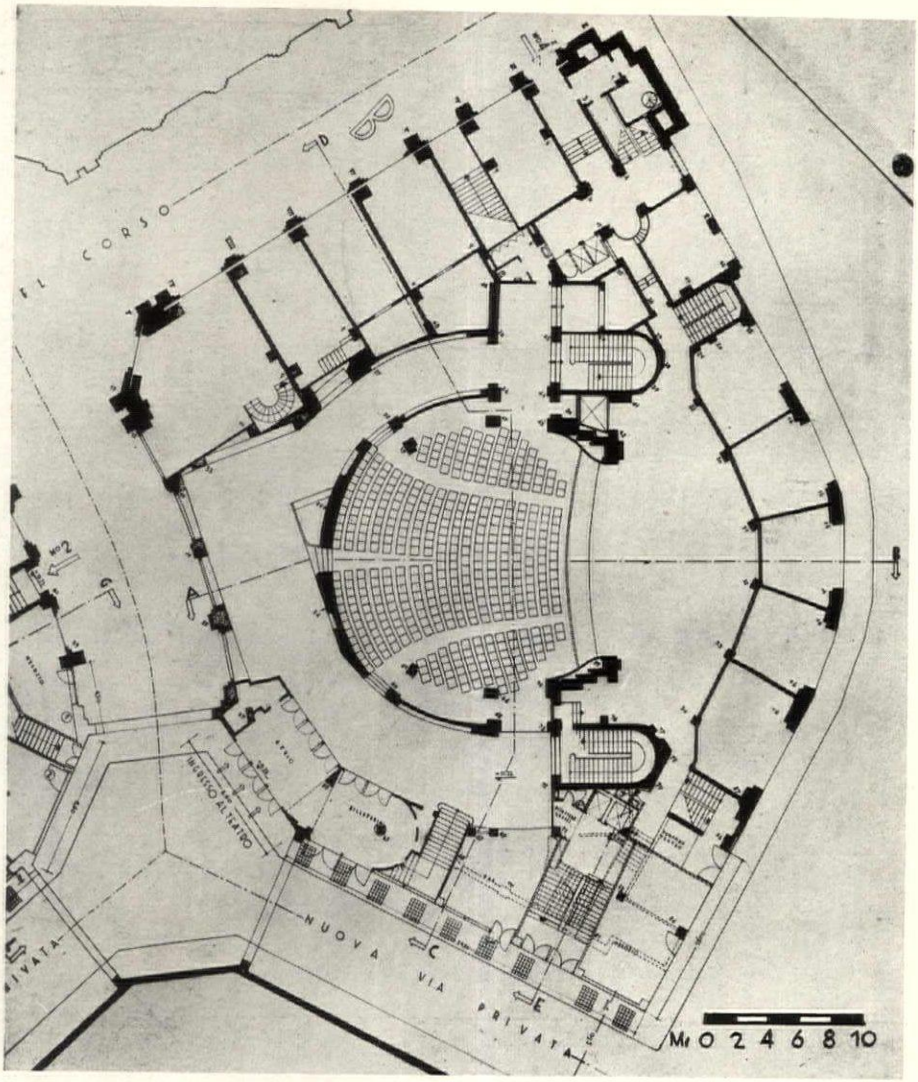


Photographs by S. A. Crimella

UPPER GALLERIES

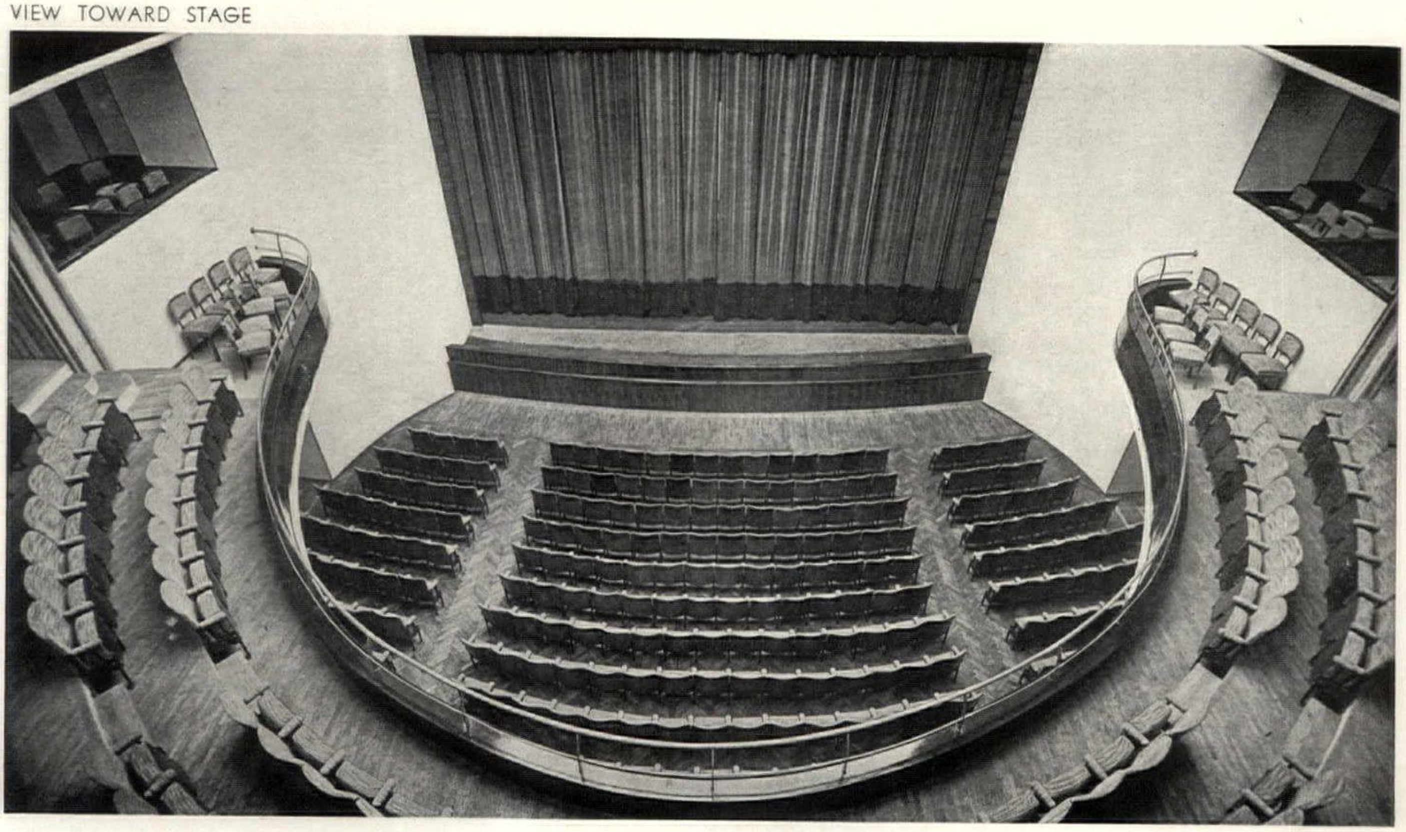
A THEATER IN ITALY

ENTRANCE HALL

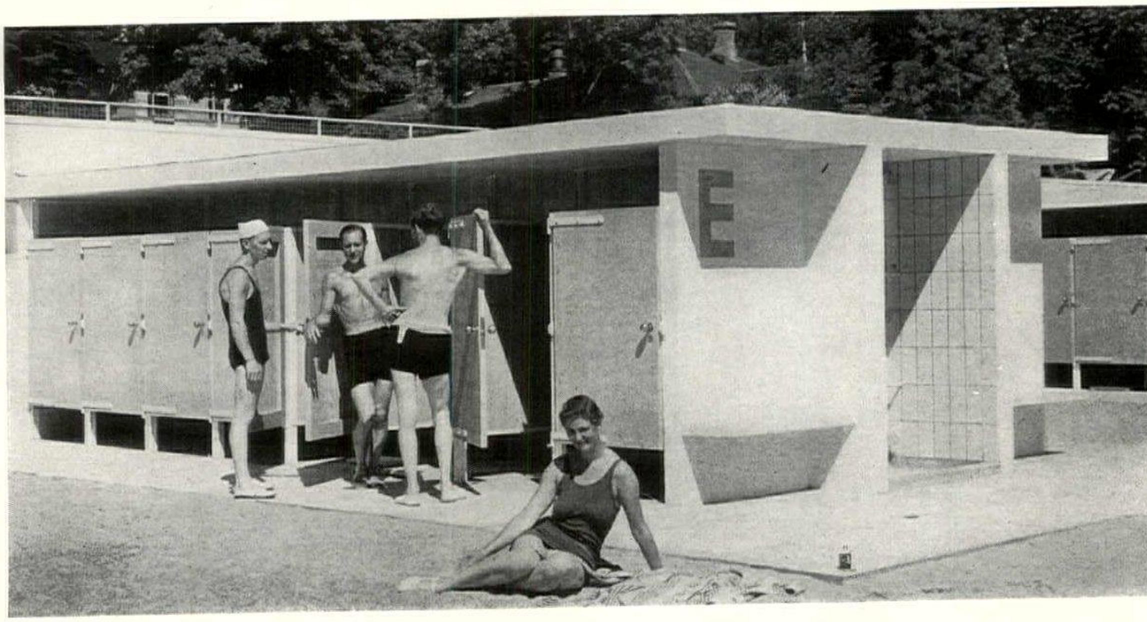


THEATER EXCELSIOR IN MILAN
EUGENIO FALUDI, ARCHITECT

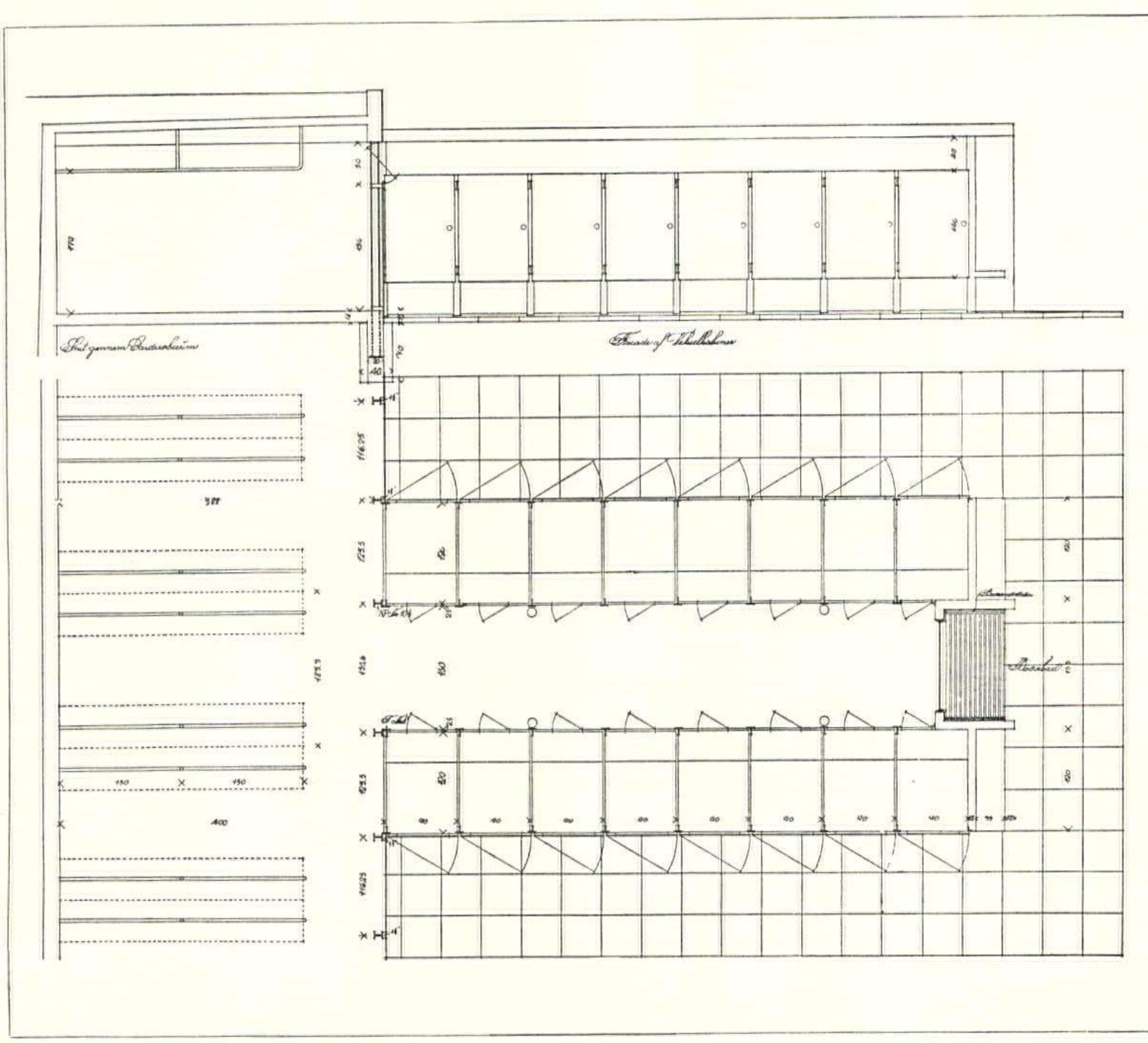
VIEW TOWARD STAGE



BEACH HOUSE



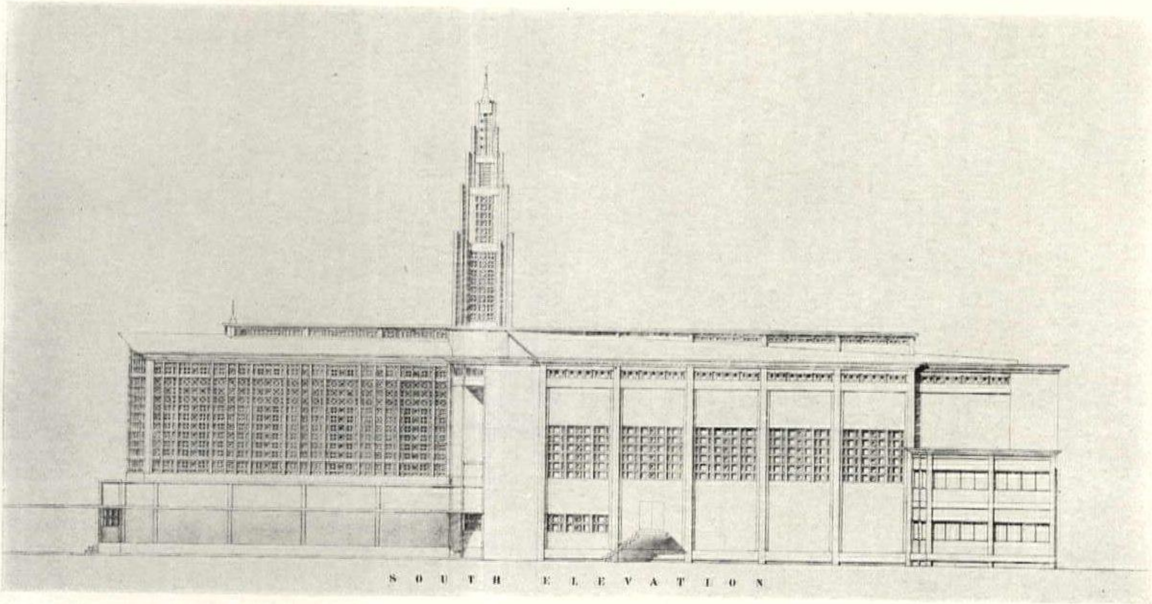
Photograph by Jonals Co.



BELLEVUE BEACH
IN DENMARK

ARNE JACOBSEN
ARCHITECT

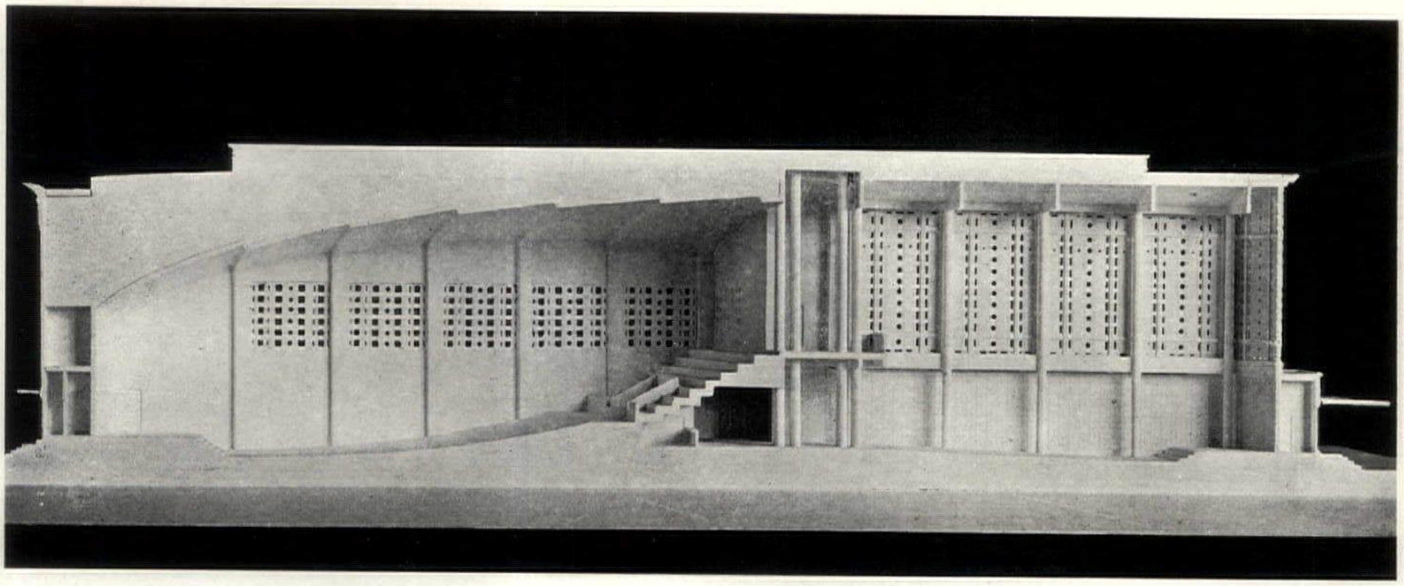
COLLEGE AUDITORIUM

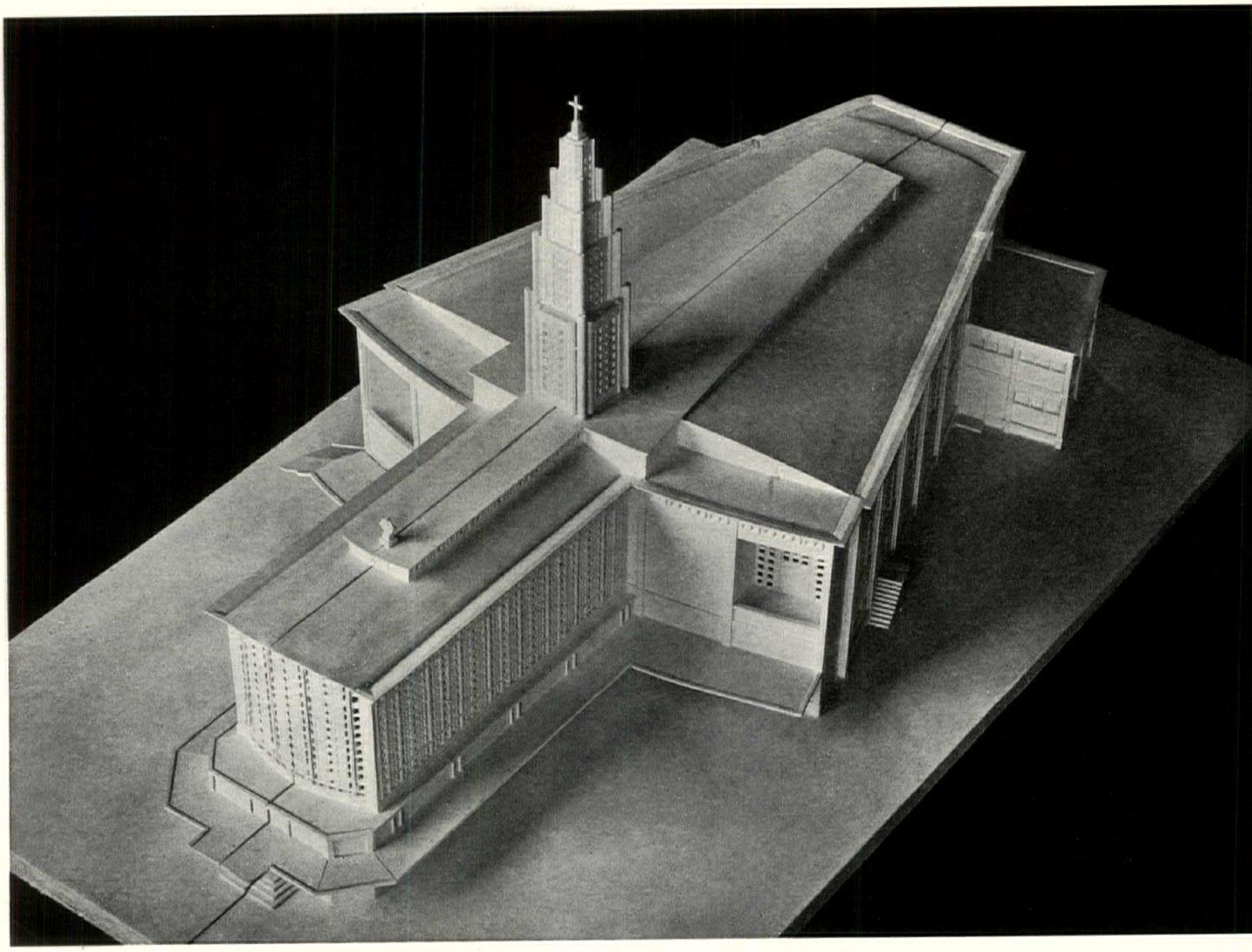


AUDITORIUM AND CHAPEL FOR WOMEN'S CHRISTIAN COLLEGE IN TOKYO, JAPAN
ANTONIN RAYMOND, ARCHITECT

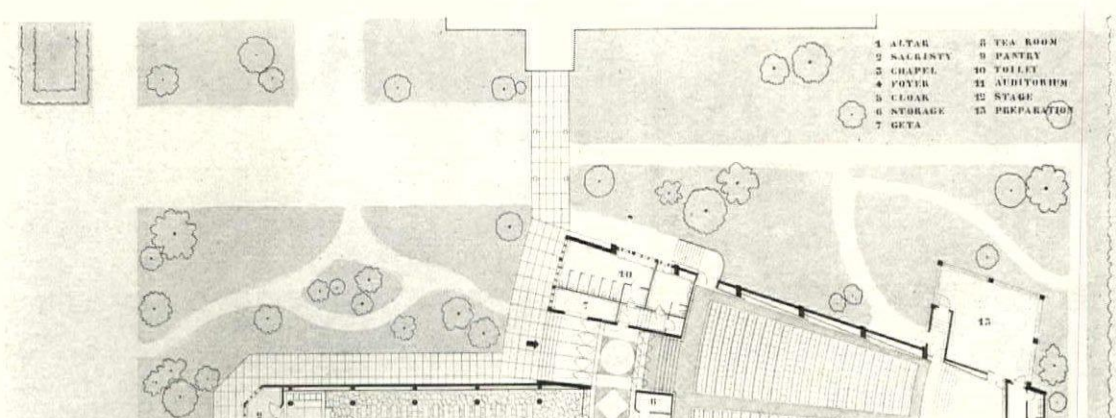
The Auditorium seats 1,200 and has a common foyer with the Chapel. The shape of the Auditorium is the result of study of visibility, acoustics and lighting. The Chapel, conventional in general arrangement, has a reinforced concrete ornamental screen instead of walls and windows on three sides. The organ loft is a balcony in the tower and screens will be provided allowing the organ to be used in Chapel only or in Auditorium only.

The whole building is a combination of steel and reinforced concrete. The Auditorium is spanned lengthwise by four half bridges of steel resting on four long columns forming the wall behind the stage and on four similar columns, two placed on each side of the tower and one each in the north and south corner, respectively. Secondary trusses perpendicular to the main bridge trusses rest on reinforced concrete columns.

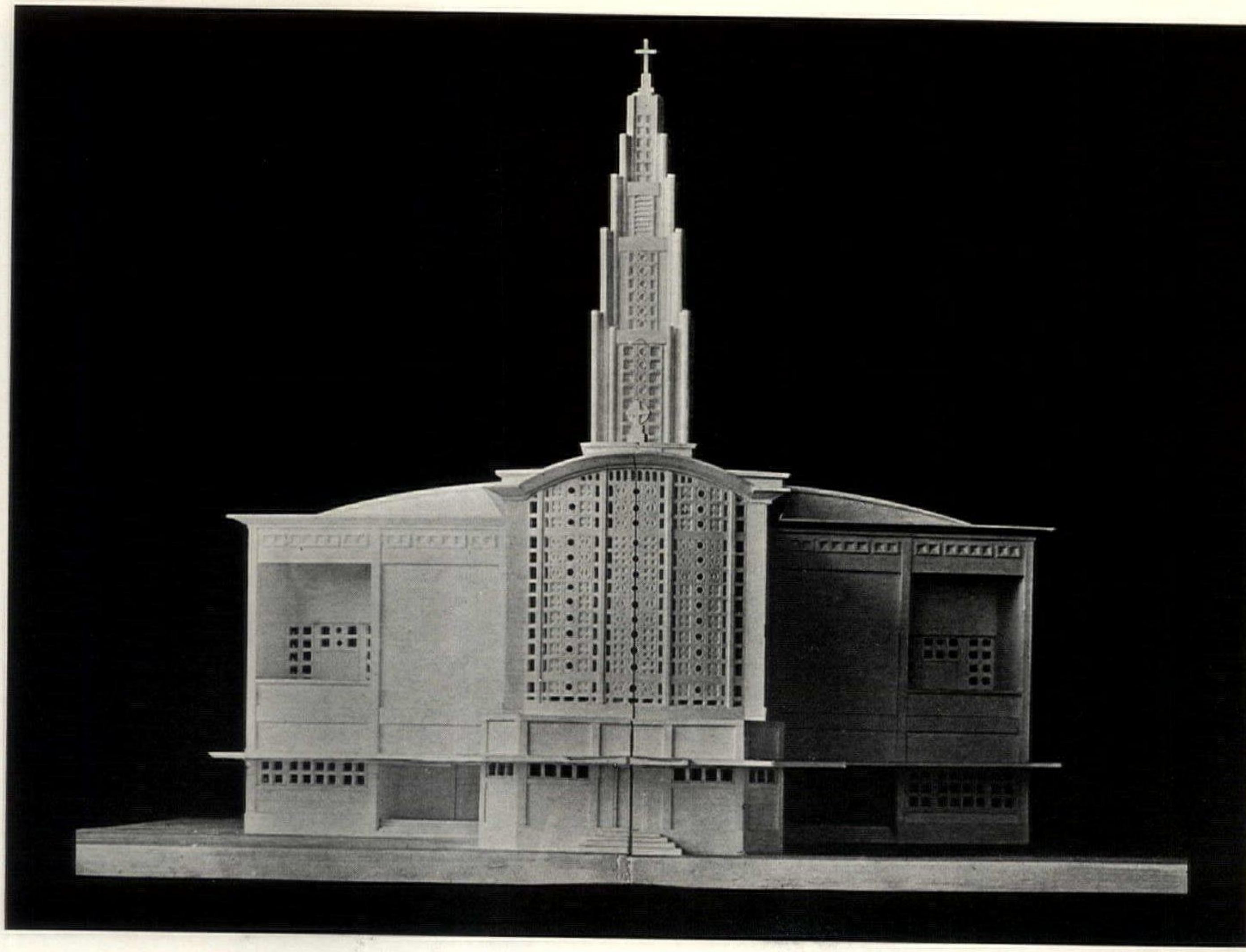




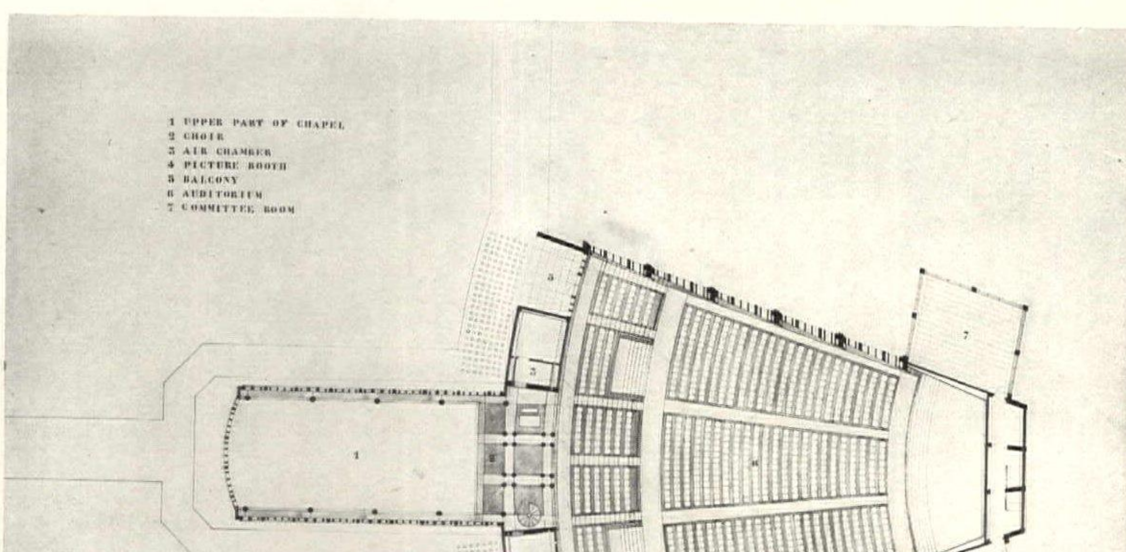
WOMEN'S CHRISTIAN COLLEGE IN TOKYO, JAPAN



AUDITORIUM AND CHAPEL OF WCC IN TOKYO



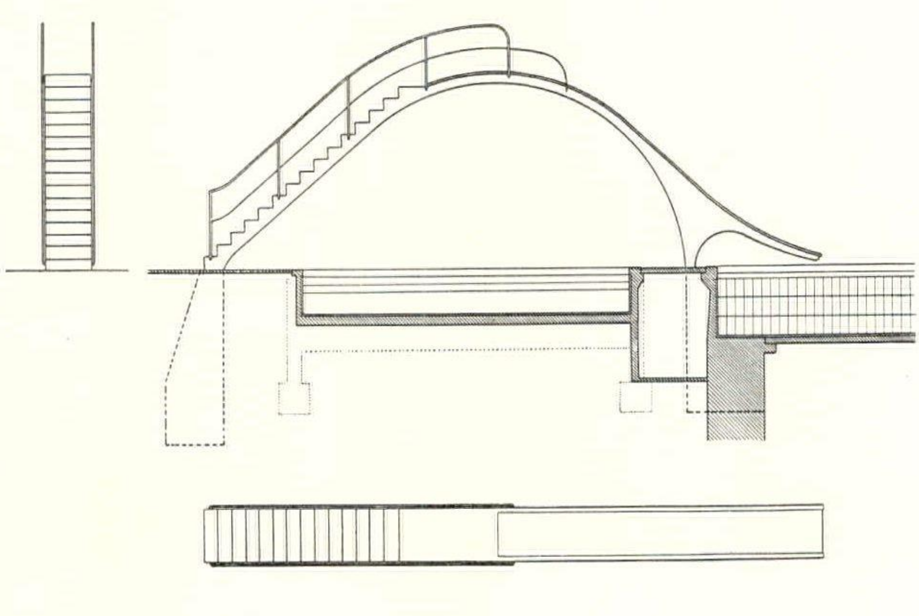
ANTONIN RAYMOND, ARCHITECT



AUDITORIUM AND CHAPEL OF W.C.C. IN TOKYO

A WATER-SLIDE

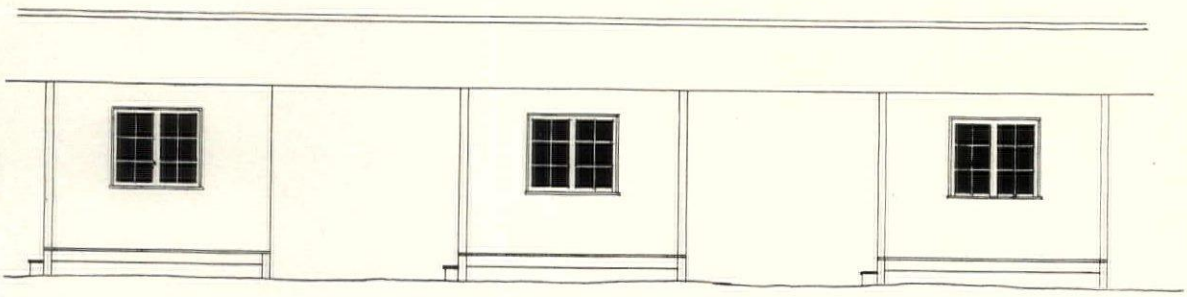
Courtesy of Baugilde

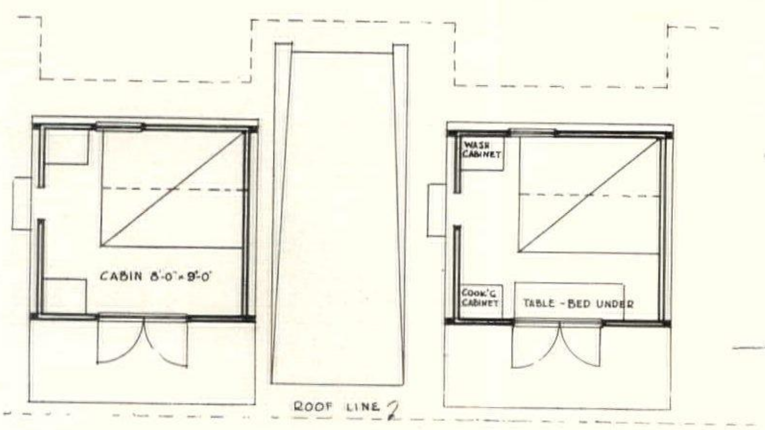


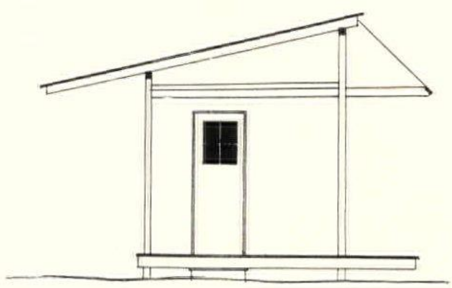
A SLIDE AND SMALL POOL
AT WIESBADEN, GERMANY

FRANZ SCHUSTER, EDMUND FABRY
AND WILHELM HIRSCH, DESIGNERS

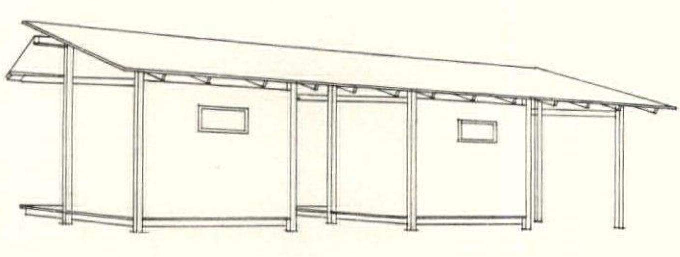
TOURIST CABINS

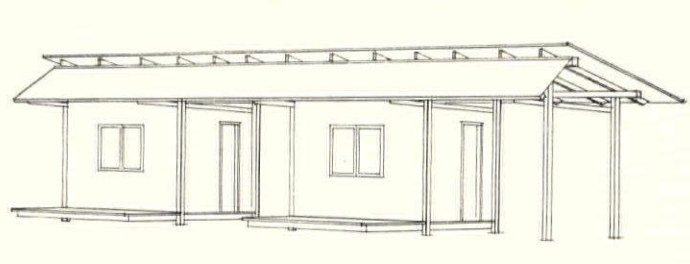




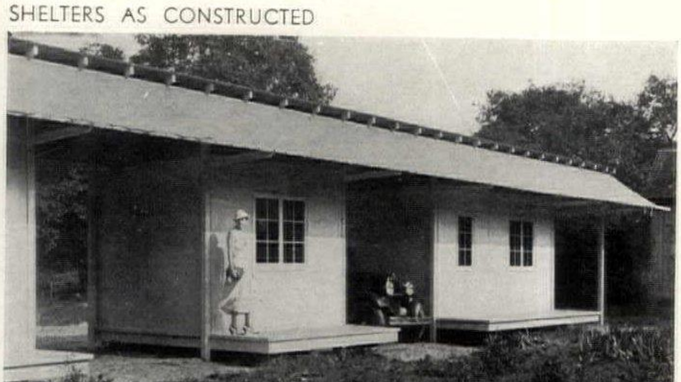


TOURIST CABINS AT WILTON, CONNECTICUT — DESIGNED BY JULIAN WHITTELSEY

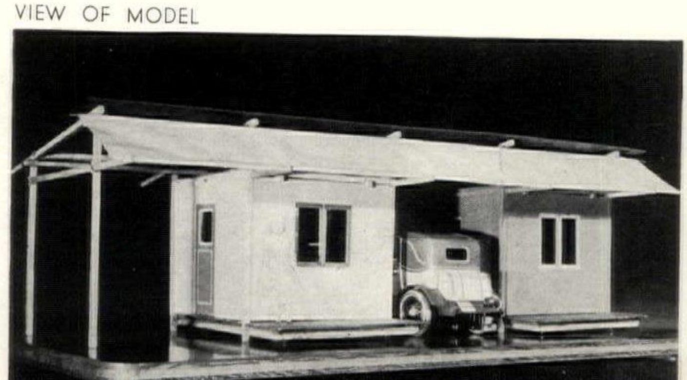


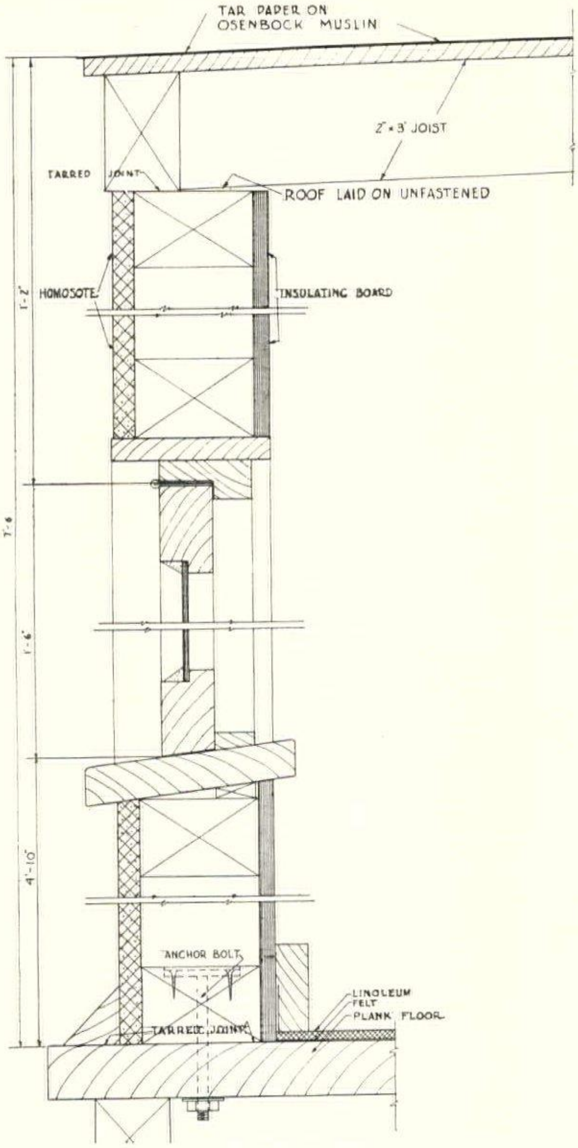


SHELTERS AS CONSTRUCTED

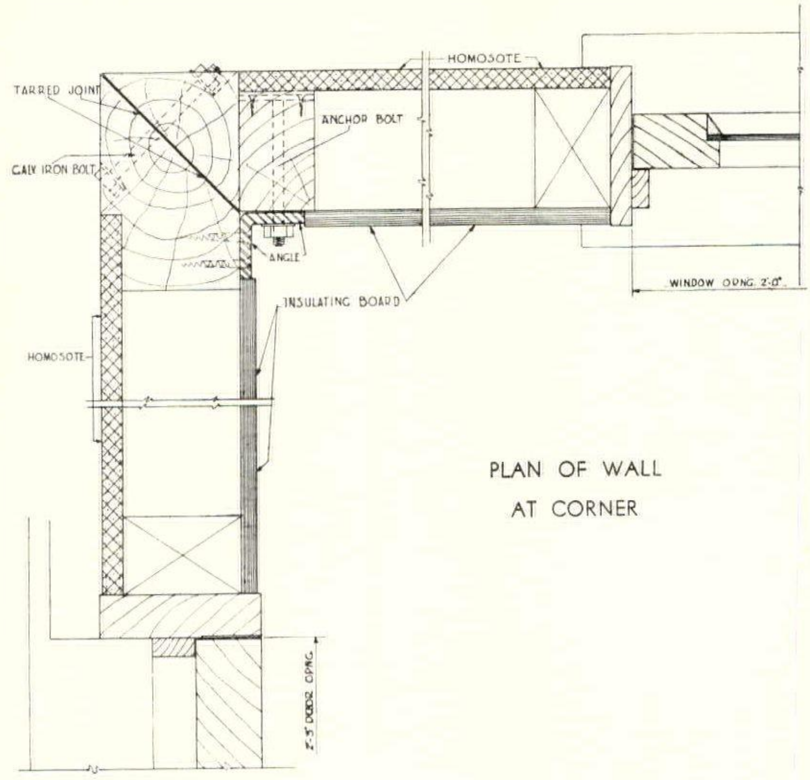


VIEW OF MODEL

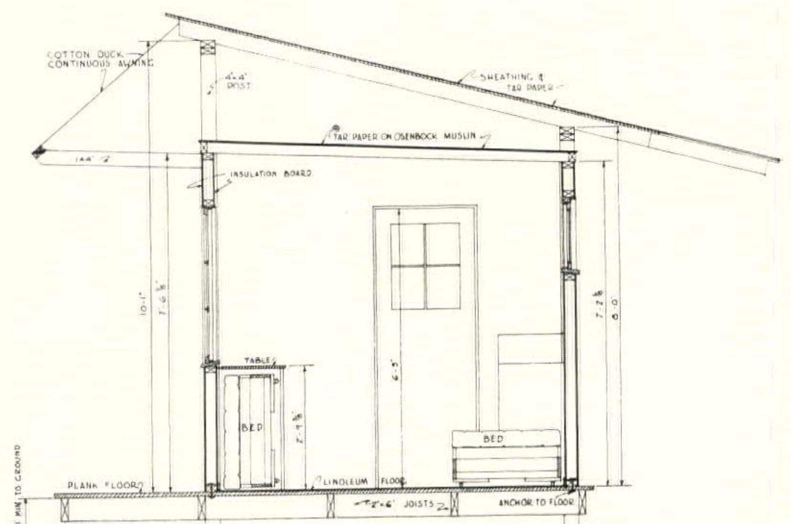




VERTICAL WALL SECTION



PLAN OF WALL
AT CORNER

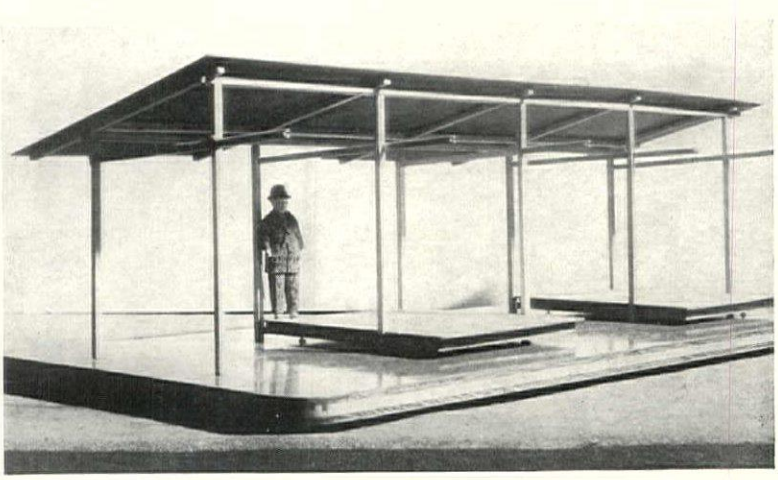


Floor and framework of wood posts supporting roof were erected at the site. Wall sections were shop-assembled, delivered to site and fastened to structural frame. The ceiling section of tar paper on muslin was slid into place and left unfastened. Open air space between roof and ceiling has been successful insulation against sun heat.

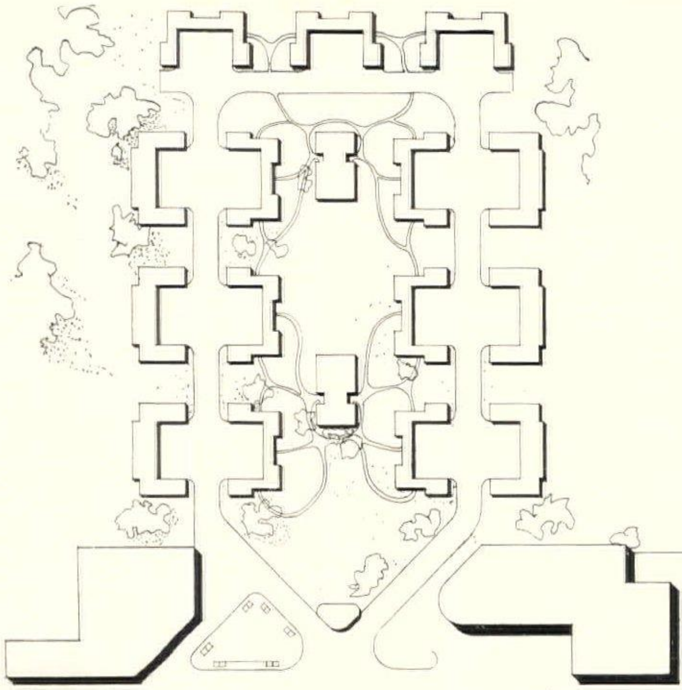
Cost without plumbing, cooking units and lights was approximately $100 a cabin. The covered car space is often used as an outdoor sitting and dining space and leads to visits of several days. A restaurant is operated in connection with the camp.

TOURIST CABINS AT WILTON, CONNECTICUT
DESIGNED BY JULIAN WHITTELSEY

VIEW OF MODEL . . . . . SHOWING METHOD OF ERECTION



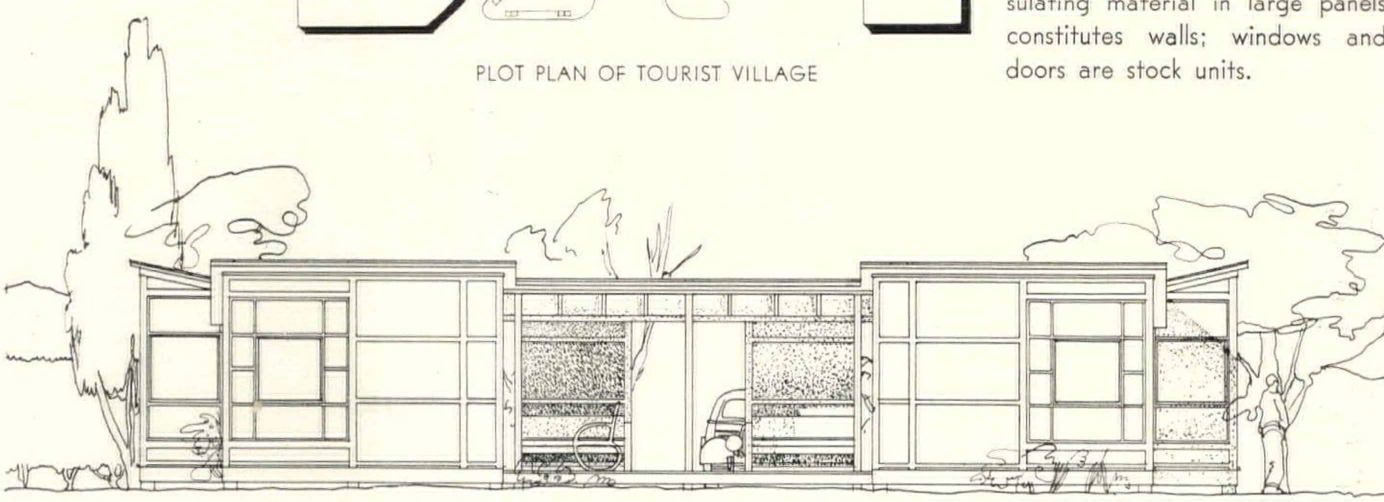
TOURIST VILLAGE

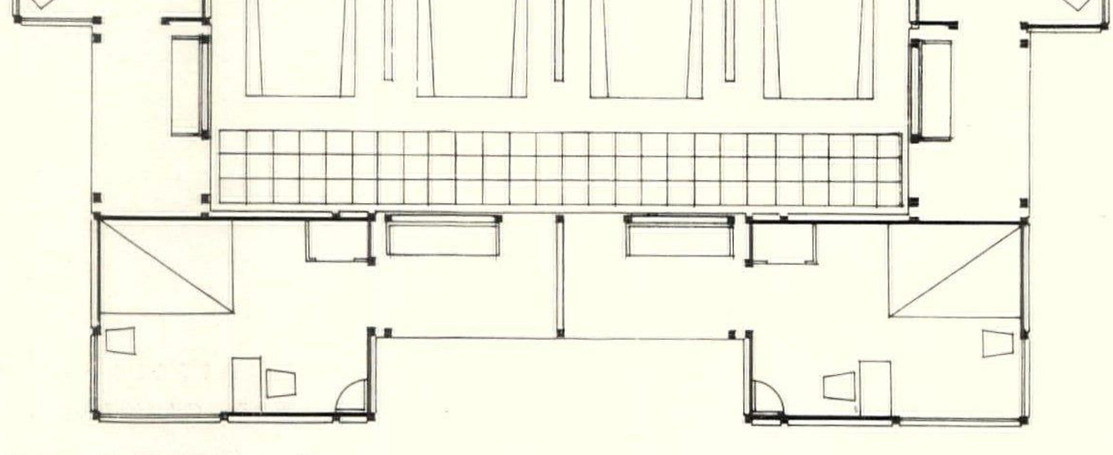


PLOT PLAN OF TOURIST VILLAGE

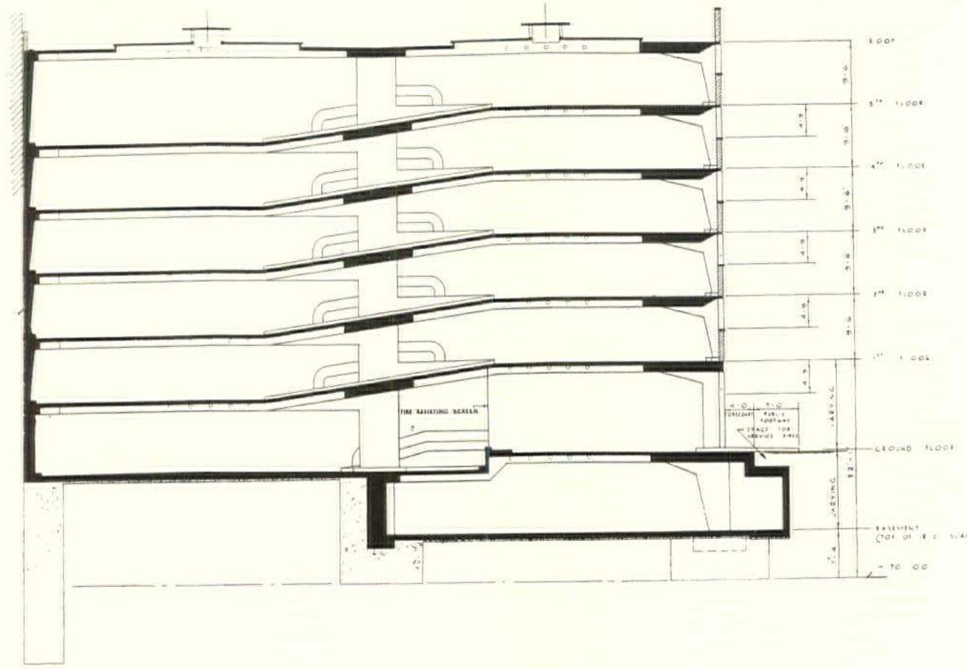
The cabins are designed to be operated in connection with a restaurant, gas station, garage and small store, all located along the highway.

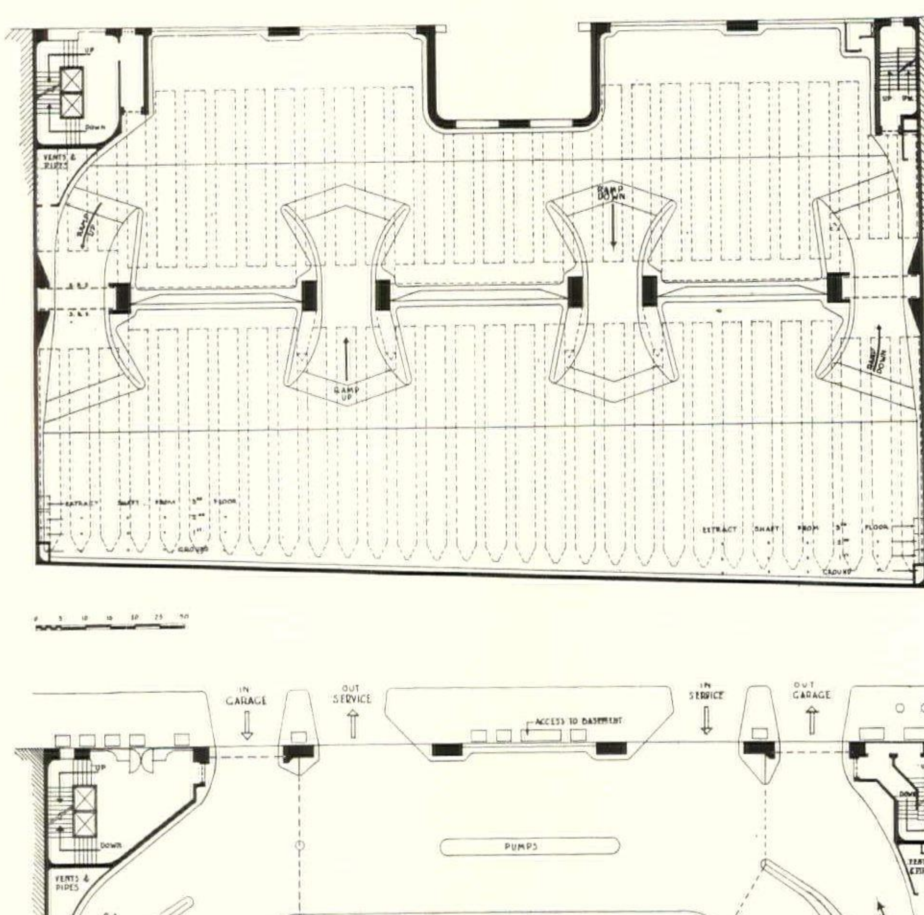
Grouping gives each cabin privacy and outlook conducive to stops of more than one night. Some cabins have additional space and cooking facilities for longer stays. Construction is wood frame, shop-cut and bolted in place; insulating material in large panels constitutes walls; windows and doors are stock units.

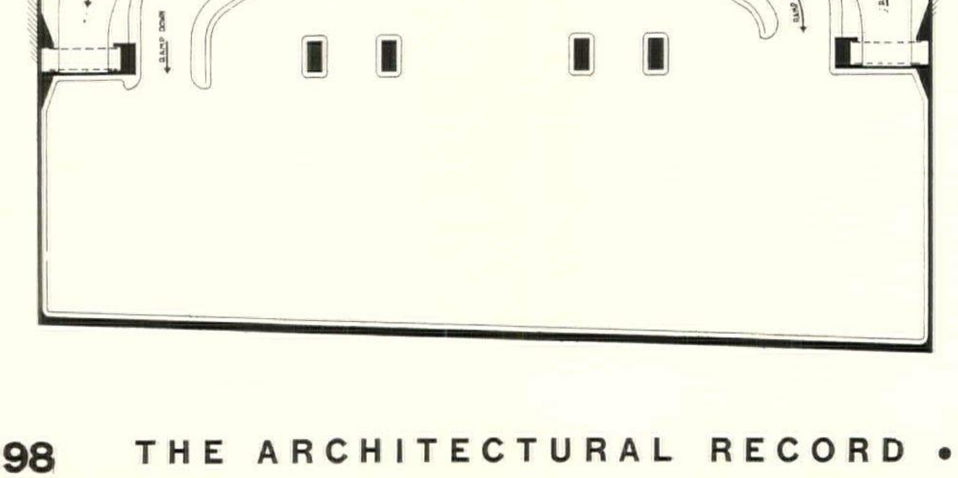




DESIGNED BY EARL G. VON STORCH

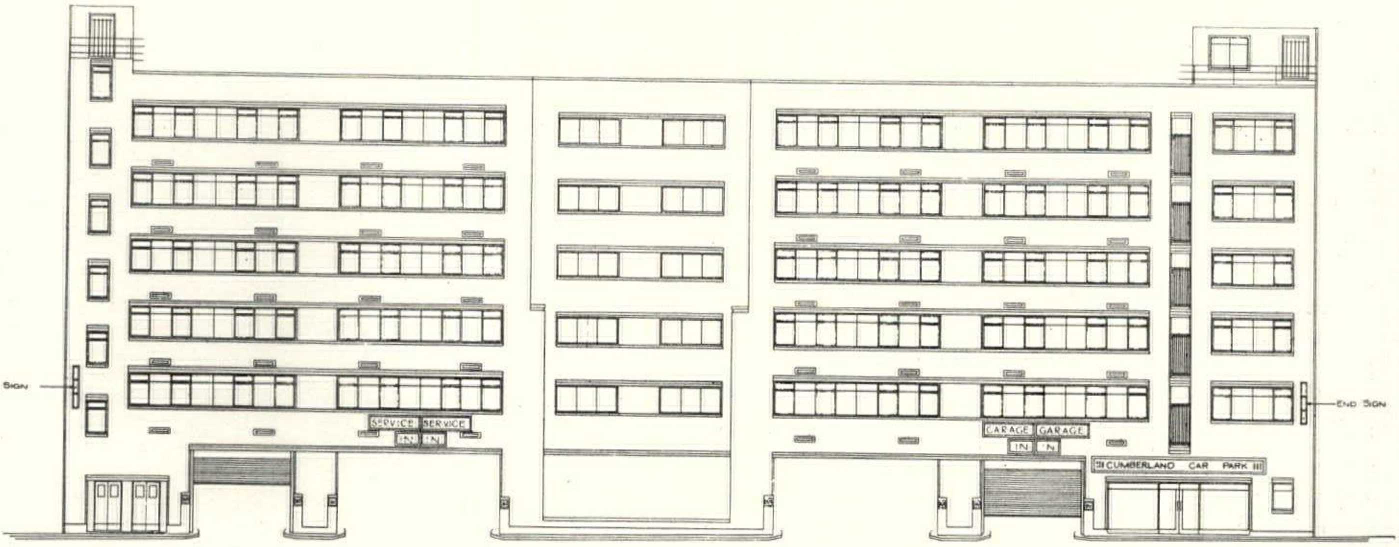






CUMBERLAND GARAGE AND CAR PARK, LONDON

SIR OWEN WILLIAMS DESIGNER AND ENGINEER



CUMBERLAND GARAGE AND CAR PARK IN LONDON

PLANNING PRINCIPLE

The general tendency in all traffic schemes is to regulate everything as much as possible in the clockwise direction—from left to right. In the Cumberland Garage both of the ramps and the parking accommodation have been designed and built on the anti-clockwise principle. Before plans were put on paper, experiments were conducted to ascertain whether the average driver turned more easily to the left than to the right. Contrary to all accepted ideas, these tests proved that the average driver can take left-hand turns more comfortably, more easily and with better judgment, than in the reverse direction.

FIVE PARKING FLOORS

There are five parking floors, each divided into two half floors, while the ground floor is devoted to repairing, "servicing," and beautifying the cars. The lower ground floor houses dressing rooms and bathrooms for the car owner, man or woman; the lounge; chauffeurs' rest rooms and changing rooms; a staff mess room and a luggage depository.

ONE-WAY TRAFFIC

The parking floors are reached by a ramp running spirally up one side of the building, and passing through every parking floor. This ramp is used for entrance only, and it is built on such a gentle incline that it is possible to walk up it from bottom to top without exertion. In practice, the ramp will not be used for walking, as there are self-operated passenger lifts and a staircase on either side of the building. An exactly similar ramp at the other end of the building is used solely by outgoing cars.

INVISIBLE RAY CONTROL

The ramp has sufficient headroom to allow any car to pass with ease, but in case a car piled to an excessive height with luggage should try to run up, an "invisible ray" system has been installed. Any car beyond the height limit will break the ray, whereupon two red discs will be lighted, the word "STOP" will shine out and a gong will ring violently.

COLOR IDENTIFICATION

The walls of the ramps are painted primrose yellow and orange, while all traffic notices are in orange and black. The ceilings and upper parts of the walls are painted white, to give maximum reflected light. Each floor has its ceiling striped with a distinctive color, and the car owner is given a ticket to correspond. This method of identification is superior to numbers, because color can be seen at a glance. The tickets are in three parts, one of which is given to the owner, another retained by the attendant, while the third is attached by a rubber band to the front or rear lamp (according to the parking position of the car). (The ticket will not be carelessly stuck under the windscreen wiper, a process which does not assist the working of this instrument.)

PARKING ARRANGEMENTS

When a car enters the garage, an attendant directs the driver to the least occupied floor. The attendant at the entrance always knows the state of each parking floor, as constant inter-communication is maintained by a special telephone system. The driver proceeds up the ramp to his parking floor, where he is met by a floor attendant. Each half floor has its own attendants, so there is no delay. The parking has been designed with every possible consideration, so that drivers have neither to wait, nor have the slightest difficulty in getting in or out, at a minute's notice.

PARKING METHOD
Cars are parked in slight echelon, a method of placing which gives greater ease of exit and cuts down maneuvering to the minimum. In sections of the floors, cars are nosed into position (the more natural procedure), in preference to backing. When the owner wishes to take his car out, he has only to back it away from the wall, drive straight into the path, which is always kept free and clear of cars, and down the exit ramp. No car will be "blocked in" by other cars.

PASSENGER-OPERATED LIFTS
When the car is parked, automatic lifts, operated by the passenger, take him swiftly down to the ground floor. If the gates of the lifts are carelessly left open, this is shown on an indicator in the reception office by a lighted signal corresponding with the color of the floor concerned. If the gates are not closed within a reasonable time, instructions to close them are signaled by means of a staff signal system.

DEPARTURE PROCEDURE
When the driver returns for his car, he takes his ticket to the office on the ground floor, where he pays his bill. His receipt is given to the attendant on the parking floor. Then, with the minimum of maneuvering, he drives his own car down the exit ramp. When he reaches the ground floor, he can either go straight into the street, or, if he needs oil or petrol, he can, without going into the roadway, drive into the filling station and get whatever he needs.

HEATING SYSTEM
During the winter the parking floors are kept at a "healthy" temperature for cars by the latest air-heating system. Electric fans are placed behind steam radiators and blow warm air throughout the building. This system not only maintains a pleasant temperature, but insures a continuous changing of air.

AIR SUPPLY
On each half floor are placed a water supply for filling radiators and a compressed air supply (operating at 150 pounds per square inch) for inflating tires. There are also power plugs, giving electric current, should any small electrical job be immediately required. These services, however, will generally be performed in the ground floor car clinic, where all repairs are done.

LIGHTING
A switchboard controlling the lighting of the garage is placed by the attendant's desk on each half floor. This switchboard contains indicators which record the amount of lighting shown on each floor as well as on the ramps. Each indicator is tinted to correspond with the distinctive color of the floor it represents. Should any driver wish to take out his car in the middle of the night, the attendant can, without leaving his post, light the way for a journey from any floor to the street.

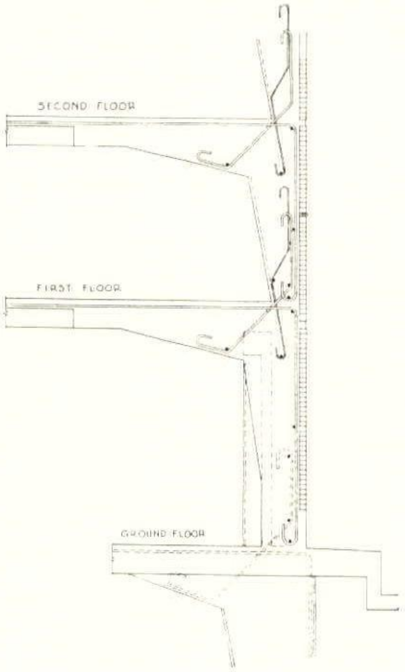
WELL-PLACED SWITCHES
No electric light switches are placed on the walls. Instead, they are fixed to the ceiling, while lights are placed about 7 feet from the wall. In this way, their illumination is directed on to the cars and not wasted on the walls. Similarly lighting and power plugs are also placed sufficiently high to avoid being hidden by the cars.

CLEANING
Each floor is cleaned by a high-powered vacuum cleaner. Portable containers are provided on each floor, containing sawdust or sand, to enable oil droppings to be immediately cleaned up.

GROUND FLOOR
On the ground floor there are accommodated the petrol filling station, control office, and in the rear section of the ground floor at a slightly lower level—car washing and repair shops.

BASEMENT
In the basement are retiring rooms, changing rooms, and bathrooms, for the use of car owners after depositing their cars. There are also, in addition to staff mess rooms, chauffeurs' retiring rooms, changing rooms, and rest rooms. For the public there is provided a luggage depository.

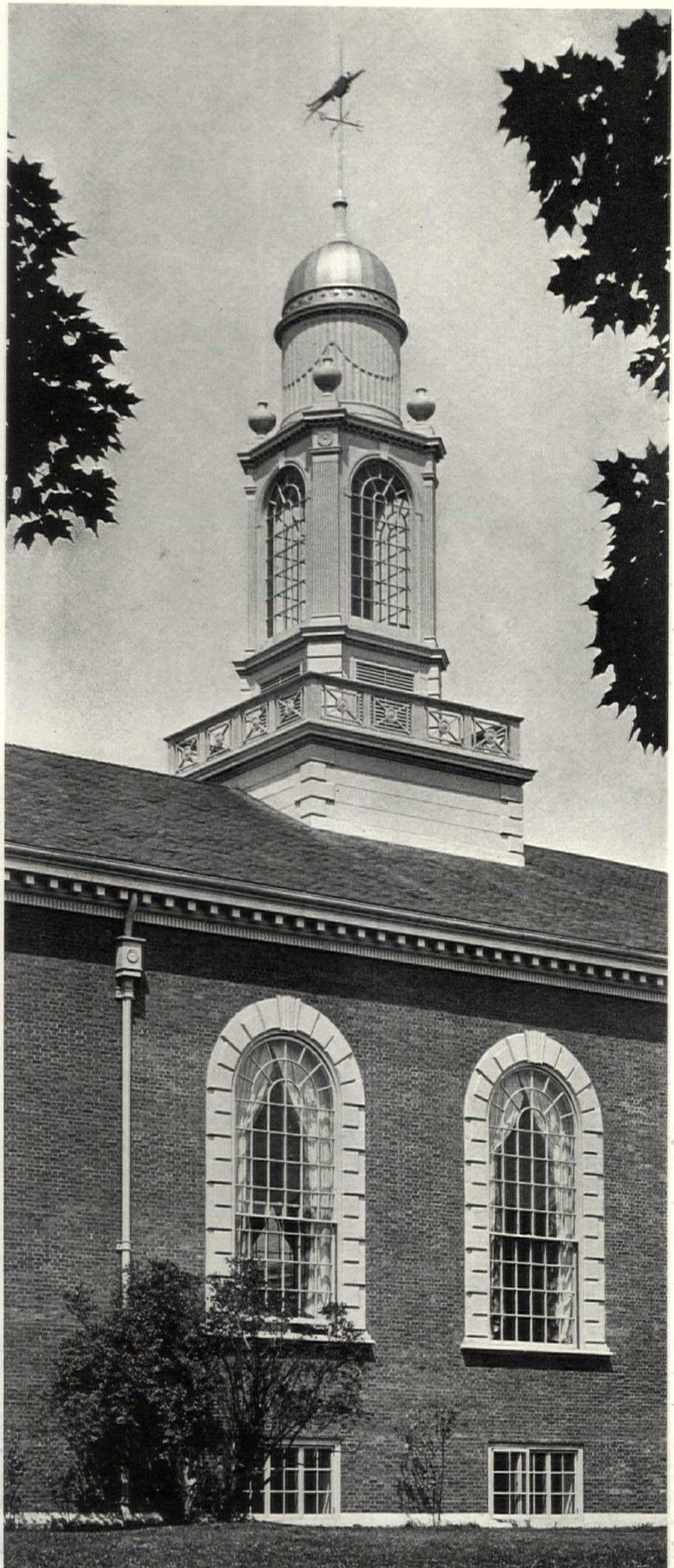
CONSTRUCTION
In the construction of a building of this type internal columns are obviously undesirable. The spans of the floors are therefore the full width of the roadways or "landings," approximately 55 feet. The headroom from floor to ceiling is 8 feet. The floors are constructed entirely in reinforced concrete, the quantities being 20,000 tons of concrete and 1,000 tons of reinforcing steel rods.



CONSTRUCTION DETAIL

CUMBERLAND GARAGE AND CAR PARK, LONDON

SIR OWEN WILLIAMS
DESIGNER AND ENGINEER



TOWN HALL

BRYAN MEMORIAL TOWN HALL AT WASHINGTON, CONNECTICUT

CAMERON CLARK, ARCHITECT

A sum of $200,000 was bequeathed by a former resident, Gregory Bryan, for a Memorial Building to be erected by a Board of Trustees: the character and use was to be decided by them after a careful survey of the town's activities.

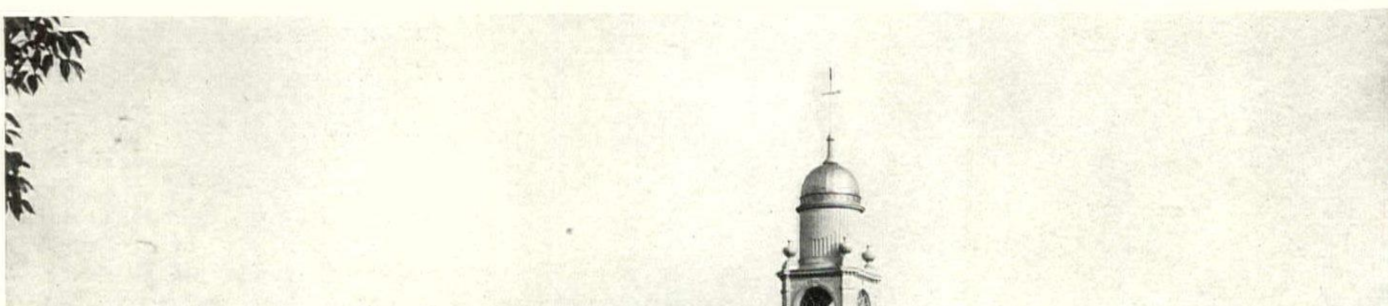
The building comprises: (1) Hall—capacity 500—usable for all types of meetings and entertainment, including dances. Requirements included a spacious stage with scene loft, switchboard, dressing room, movie screen, projection room at rear, acoustical plaster ceiling panels for sound pictures. Movable seats are stored under stage. Projection booth and spot-light space are concealed by sliding decorative sash above cornice line. Dressing room is easily accessible in basement.

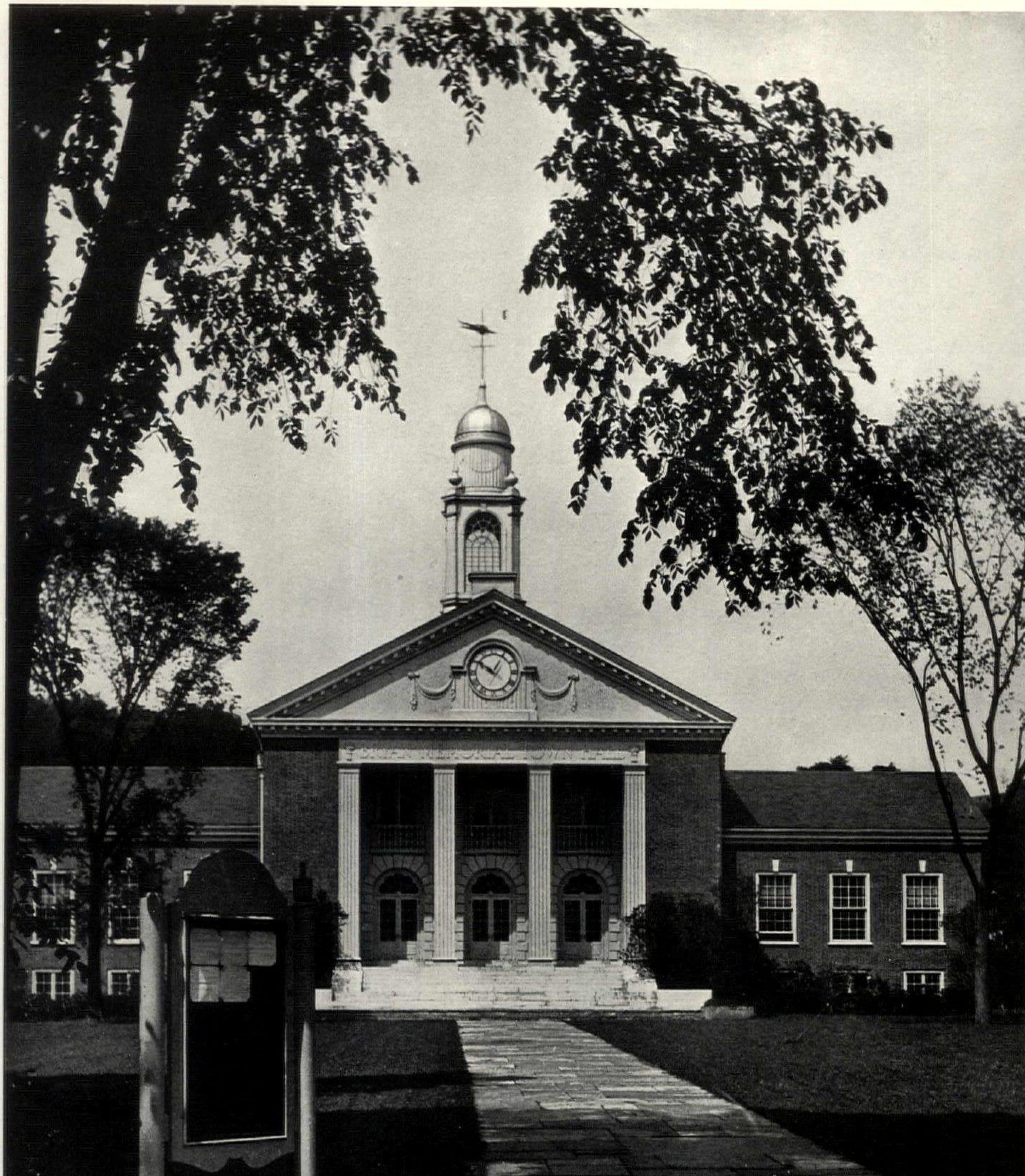
(2) Offices—on first floor: Selectmen, Probate Judge, Town Clerk, with conference room, separate vaults for each office and reading room. In basement: small court room, police room with cell, visiting nurses' room, Boy Scout and Girl Scout rooms.

(3) Social Room. Large basement room with 2 bowling alleys, 2 billiard tables and space for card games.

ENTRANCE TO COURT, JAIL, AMUSEMENT ROOMS

STATE ENTRANCE AND EXIT FROM HALL

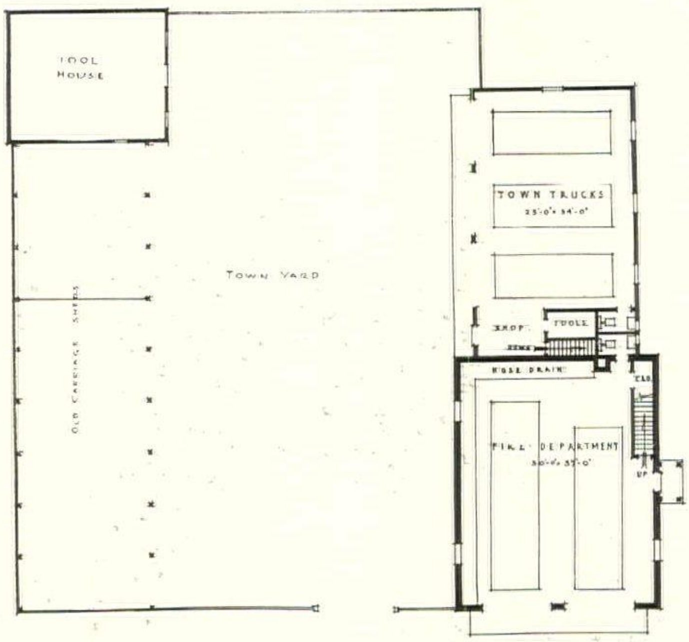




A TOWN HALL

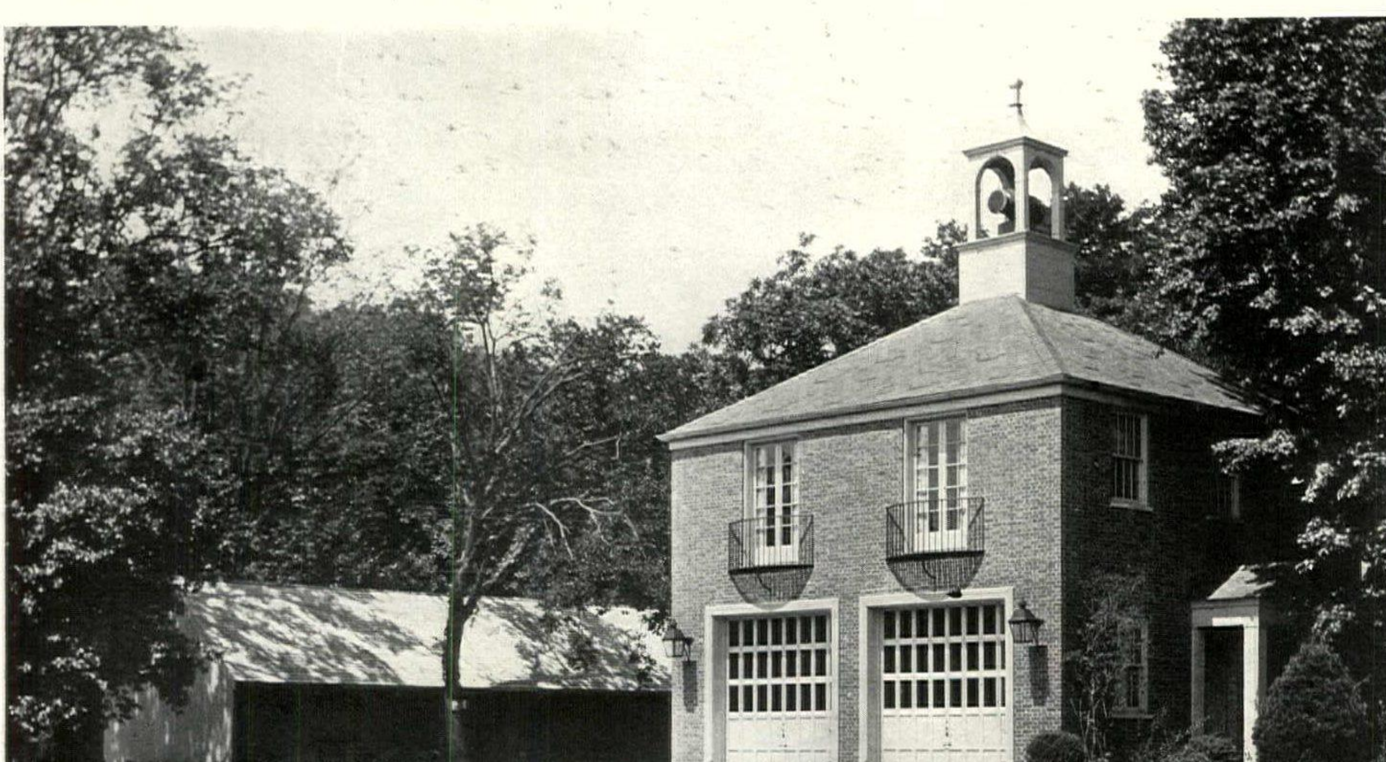
BRYAN MEMORIAL TOWN HALL
AT WASHINGTON, CONNECTICUT
CAMERON CLARK, ARCHITECT

FIRE STATION

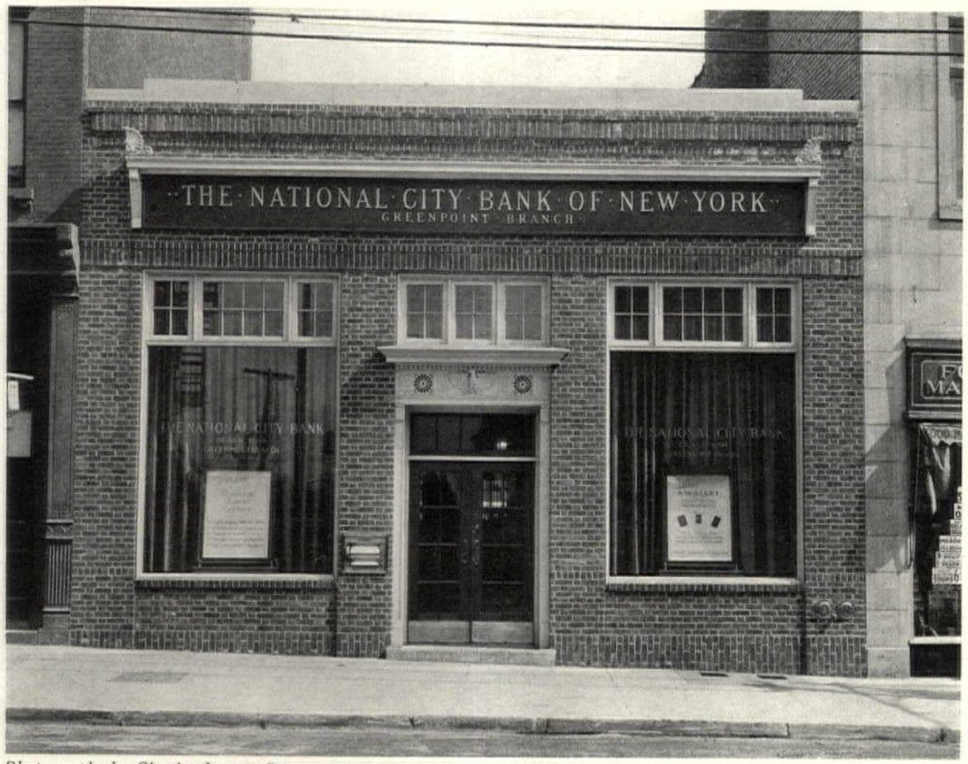


FIRE STATION AND TOWN GARAGE
CAMERON CLARK, ARCHITECT

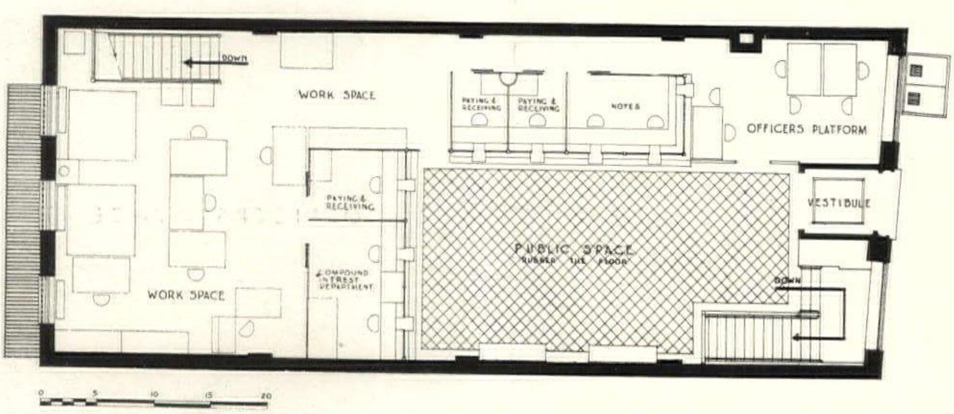
ADJACENT TO BRYAN MEMORIAL HALL AT WASHINGTON, CONNECTICUT



BRANCH BANK

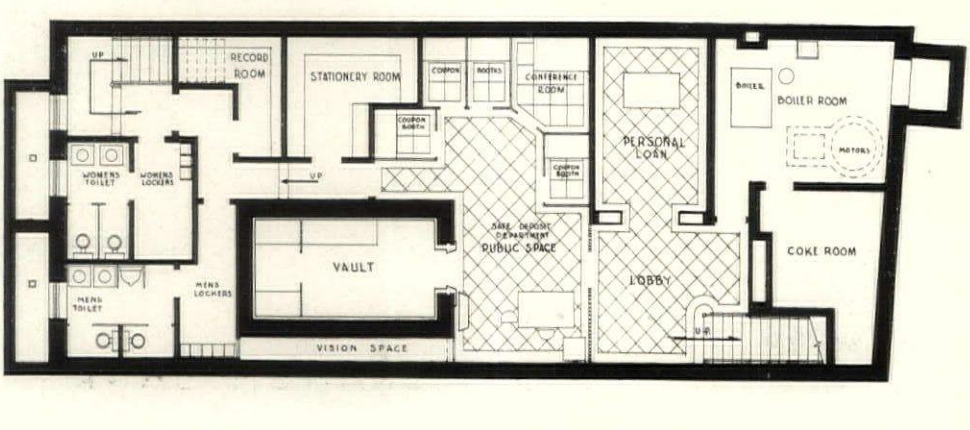


Photographs by Charles Latere Co.



GROUND FLOOR PLAN

BASEMENT PLAN



GREENPOINT BRANCH
NATIONAL CITY BANK
OF NEW YORK

AARON G. ALEXANDER
ARCHITECT

GREENPOINT BRANCH
NATIONAL CITY BANK
OF NEW YORK

AARON G. ALEXANDER
ARCHITECT

BANKING SPACE

OFFICERS' SPACE

Photographs by Charles Latere Co.

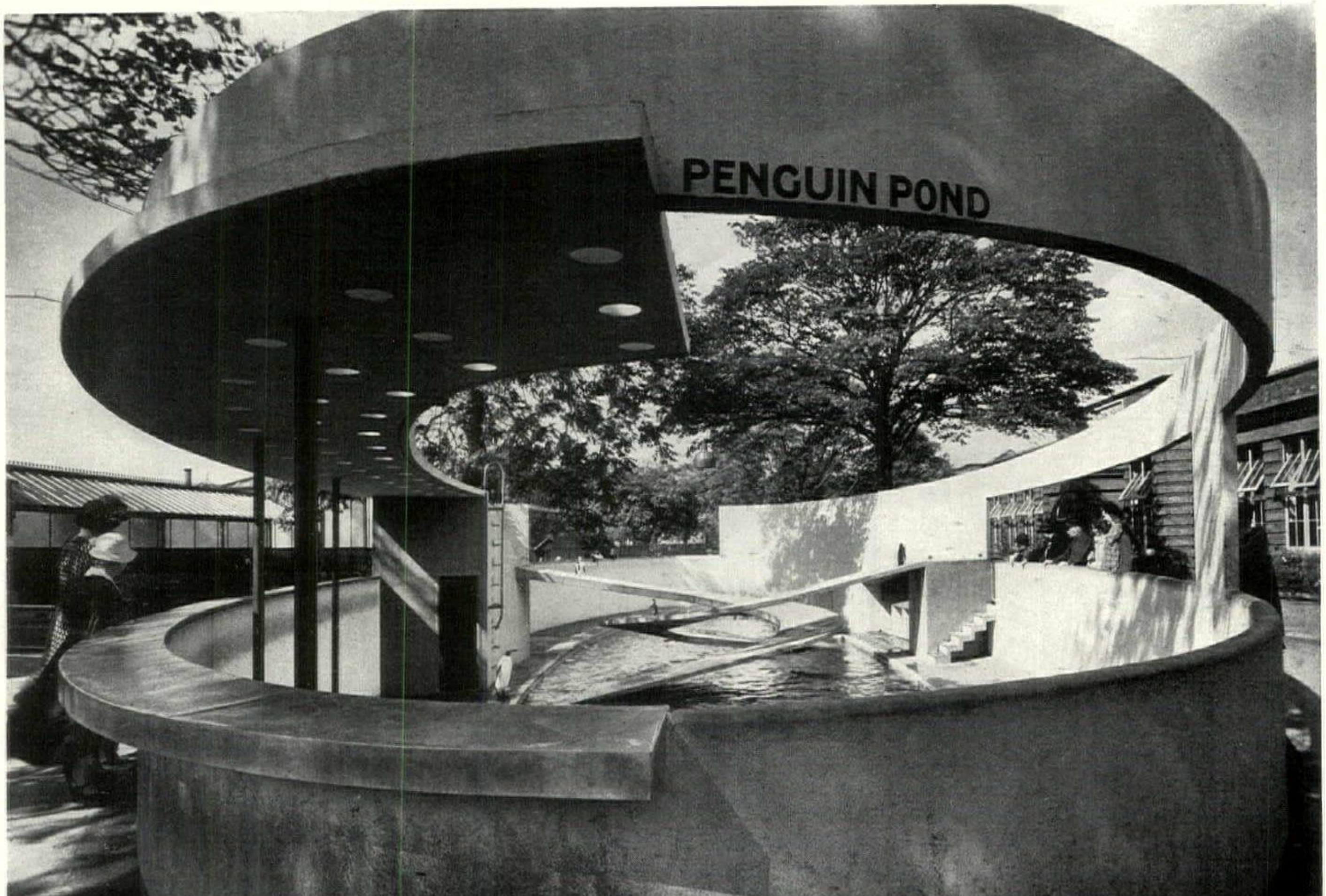
BRANCH BANK

PENGUIN POND

PENGUIN POOL IN REGENT'S PARK, LONDON
LUBETKIN, DRAKE AND TECTON, ARCHITECTS

The pool was designed as a setting for the dramatic qualities of the penguin. The two cantilevered ramps spiral around each other and provide a stage up which the penguin can waddle. Reached by a flight of steps from the top of the left-hand ramp is a glass-fronted diving tank at the eye level of spectators, and in this the penguins can display their great agility under water. A variety of surfaces is provided, ranging from plastic rubber on the flat paths to slate on the steps, and the concrete ramps are kept wetted by a revolving fountain. The bottom of the pool is painted bright blue.

Photograph by F. S. Lincoln


PENGUIN POND

Photographs by F. S. Lincoln

PENGUIN POND

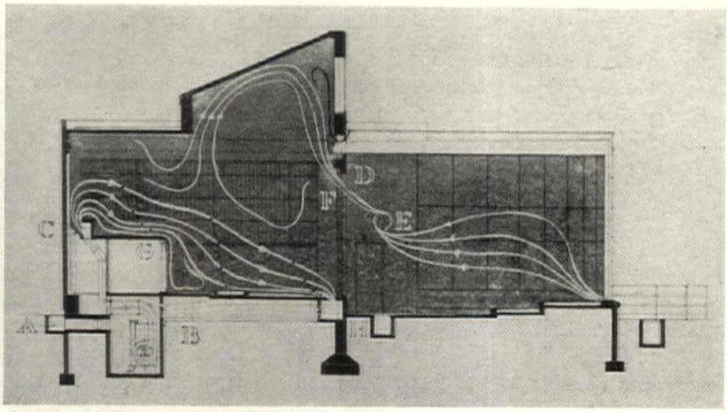
ZOOLOGICAL GARDENS, REGENT'S PARK, LONDON
LUBETKIN, DRAKE AND TECTON, ARCHITECTS

Photograph by F. S. Lincoln

PENGUIN POND

ZOOLOGICAL GARDENS, REGENT'S PARK, LONDON
LUBETKIN, DRAKE AND TECTON, ARCHITECTS

GORILLA HOUSE

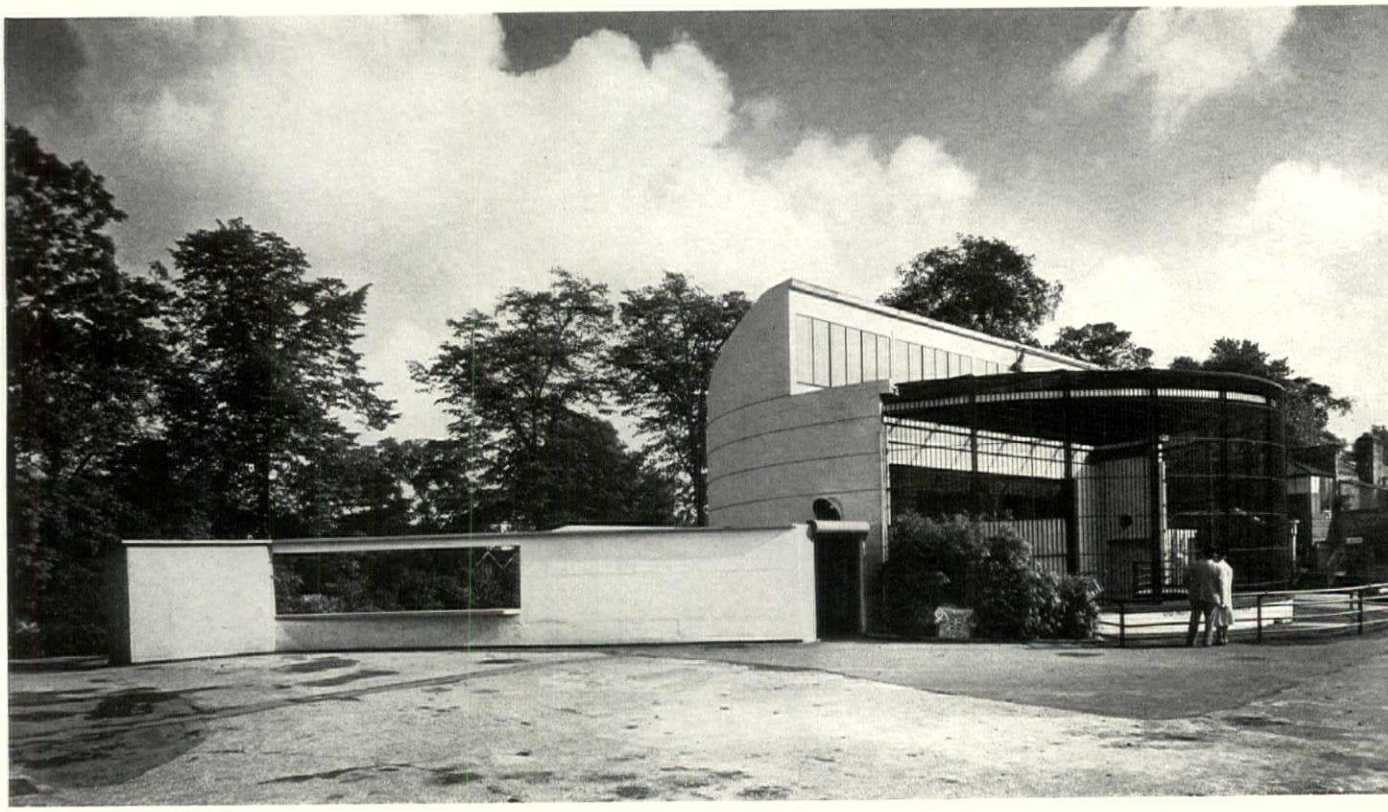


Courtesy of Architectural Review

The architectural problem consisted of accommodating the gorillas in such a way that in summer they should be in the open air while in winter they should be protected from the weather. The circular plan made possible a semi-circular revolving structure which is operated acording to climatic conditions. (The accompanying diagram shows the method of ventilation.) Since the gorillas are liable to human diseases they are therefore protected in winter by glass screens between themselves and their public. These screens can also be slid away into the wings when the summer cage is open; in the open air the infecting public must stand 8 feet away from the cage, outside the low railings, as shown in the illustration below.

GORILLA HOUSE IN LONDON ZOOLOGICAL GARDENS—TECTON, ARCHITECTS

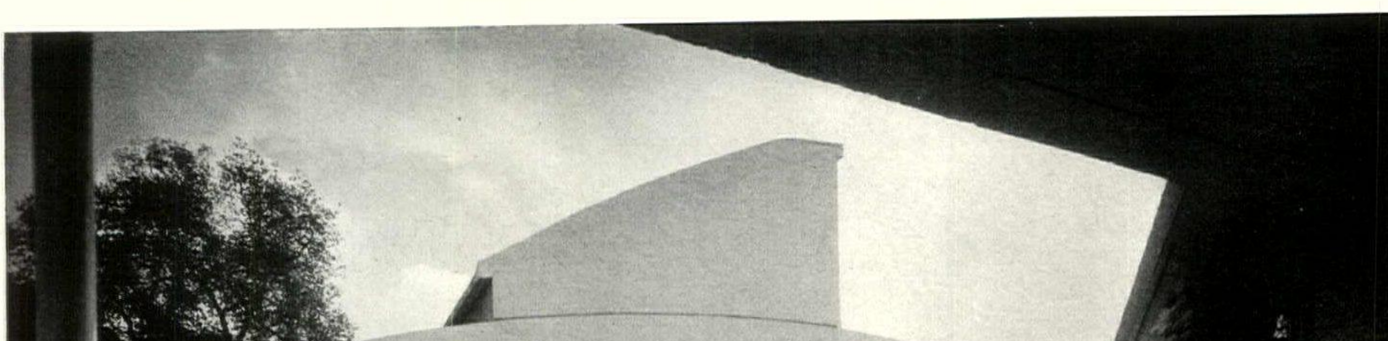
Photographs by F. S. Lincoln



GORILLA HOUSE

LONDON ZOOLOGICAL PARK
TECTON, ARCHITECTS

The construction is reinforced concrete, and the semi-circular wall 4 inches thick. Internally the house is finished by a $2\frac{1}{2}$-inch layer of cell concrete (made of fine sand, cement, and a frothy liquid which forms closed bubbles in the concrete, making it light and porous), plaster and paint.



Photographs by F. S. Lincoln

REMODELED RESTAURANT

Photograph by F. M. Demarest

SCHWARTZ'S RESTAURANT
NEW YORK CITY

CHARLES SHILOWITZ
ARCHITECT

The exterior is finished in Alabama Cream Madra marble, with steel sash and bronze frames and trim. The flower boxes are also bronze.

Photographs by F. M. Demarest

A REMODELED RESTAURANT

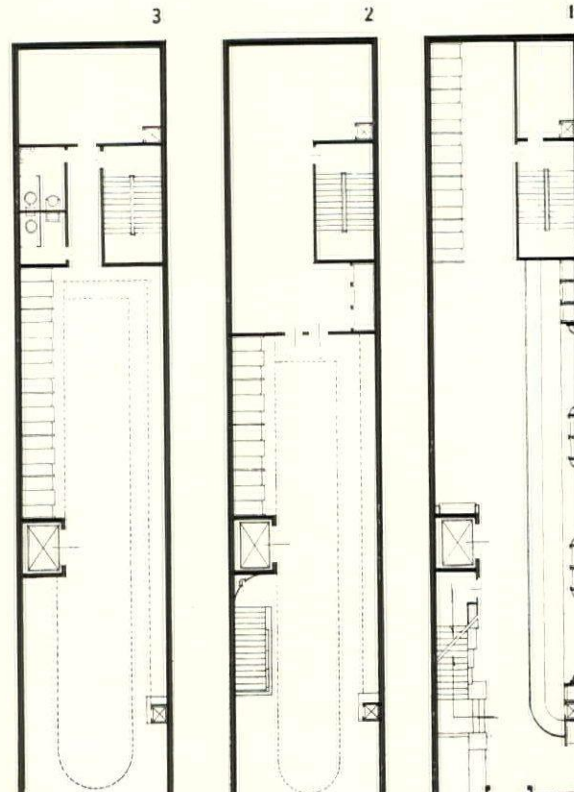
SCHWARTZ'S RESTAURANT, NEW YORK
CHARLES SHILOWITZ, ARCHITECT

In this building the basement is used for cold storage, dishwashing, locker rooms, and general utility; the first floor for bar and dining room; the second floor for men's dining room and kitchen; the third floor for women's dining room; the fourth floor for a banquet room; and the fifth floor for office, storage, and bake shop . . . The bar (shown on opposite page) has rosewood walls and American walnut panels with bronze strips at joints; the ceiling is sponged plaster . . . The second-floor dining room (illustrated above) has a dropped ceiling for lighting effects, walnut booths with blue upholstery, blue Linotile floors; the room is air conditioned.

Photograph by F. M. Demarest

SCHWARTZ'S RESTAURANT, NEW YORK
CHARLES SHILOWITZ, ARCHITECT

3 2 1



The third floor dining room has sponged plaster ceiling. The walls are finished in buff cloth with over-all pattern.

A REMODELED RESTAURANT

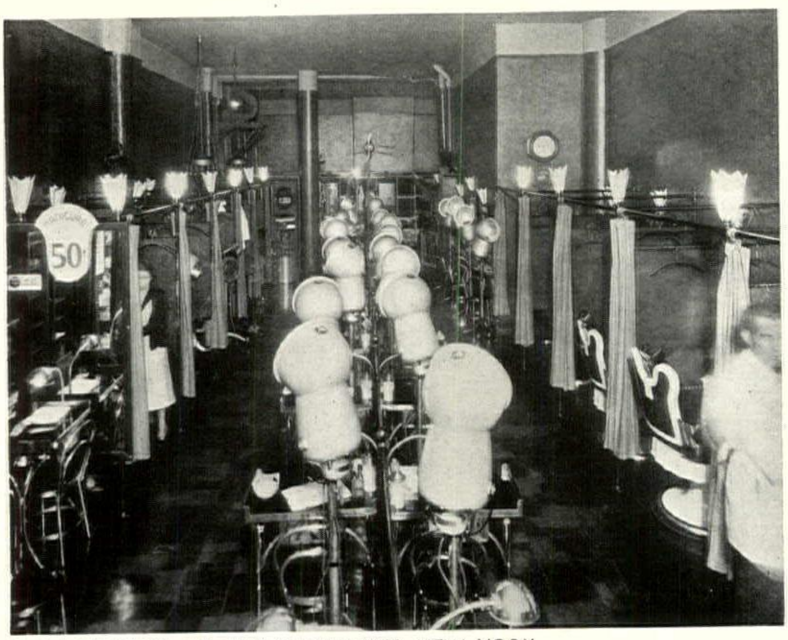
REMODELED BEAUTY SALON

Photographs by Palmer Shannon

LANTIERI BEAUTY SALON
NEW YORK CITY

VAHAN HAGOPIAN
ARCHITECT

The Lantieri Beauty Salon is one of the largest in New York and individually owned. The owner has introduced a logical division of the work into its different phases, creating departments specializing in various operations. There are departments for demonstration, hair cutting, hair-dressing, hair-dying, permanent waving, facial, reducing and body massaging. In addition there is a chiropodist and an electrolysis department.



OLD LOCATION AT 2147 BROADWAY, NEW YORK

All equipment shown in photograph of old location has been reused without transformation. A comparison of the new installation with the old location will serve to identify the furniture and yet show how different it looks in the new setting. Note the clock at the upper right hand corner of interior "before" illustration on this page, and compare it with the one appearing in the new store (page 120). In both, the mechanism is identical and of a standard make and inexpensive. For the new clock a wooden box was designed to house the mechanism, and a large dial in a sheet of enameled iron with counterbalanced aluminum hands was supplied by the metal man and set in place by the electrician.

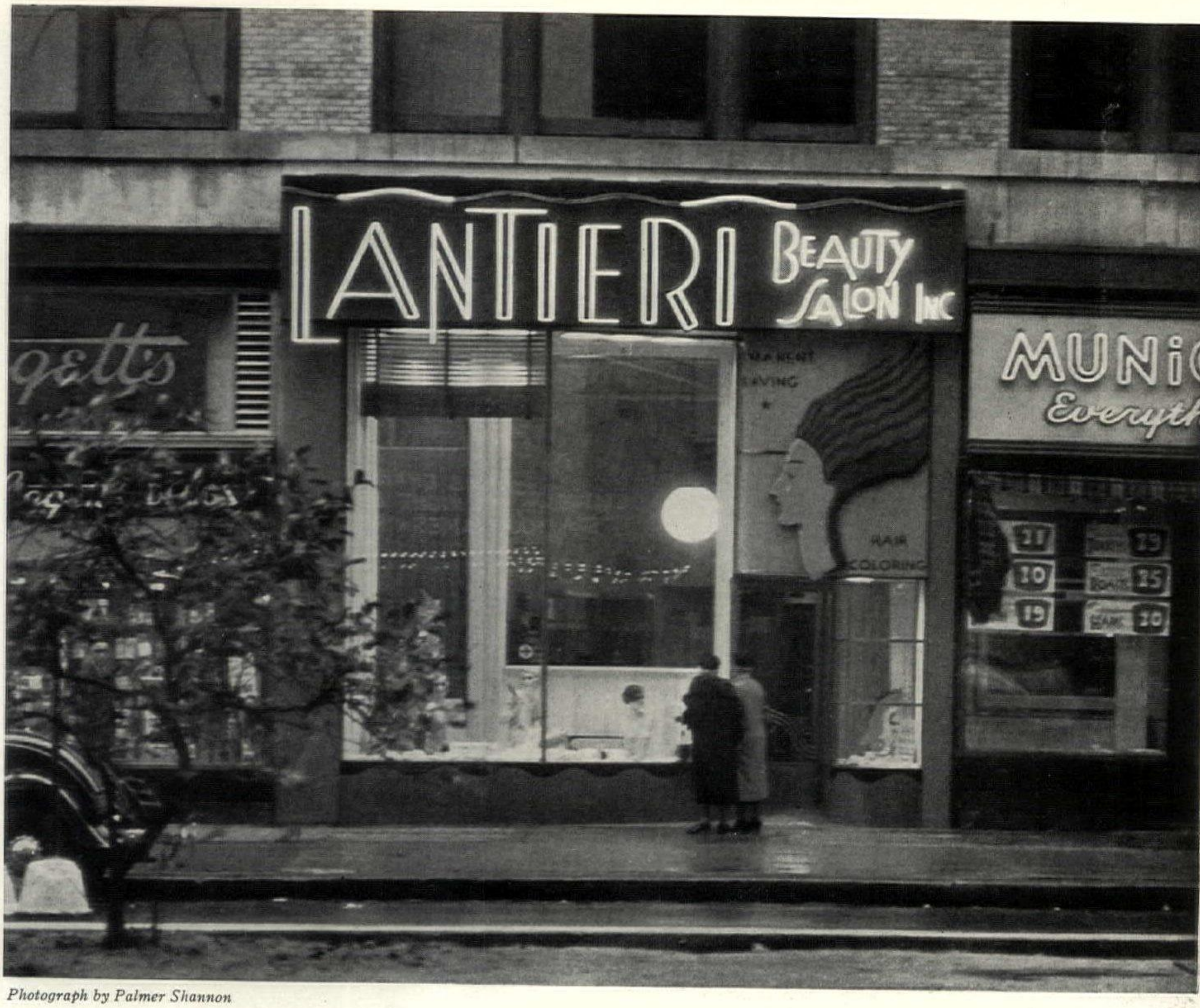
The reception space furniture and a few new barber chairs were purchased. The numerous hair-drying machines shown in the old views have been either stored away for emergency use or built into the facial rooms in the basement of the new location.

There are five Hoffmann hair-drying units, each with a capacity of eight hair-drying hoods. These take the place of the old cumbersome individual hair-drying machines resting on the floor (mentioned above), and tend to simplify the appearance of the premises. While the hair is drying the customer sits at one of the forty tables where she may have her manicure. This leaves the booth free for another customer.

To counteract the heat given out by these hair-drying units, and to condition the air in the summer and winter, a twenty-ton ice capacity plant has been installed.

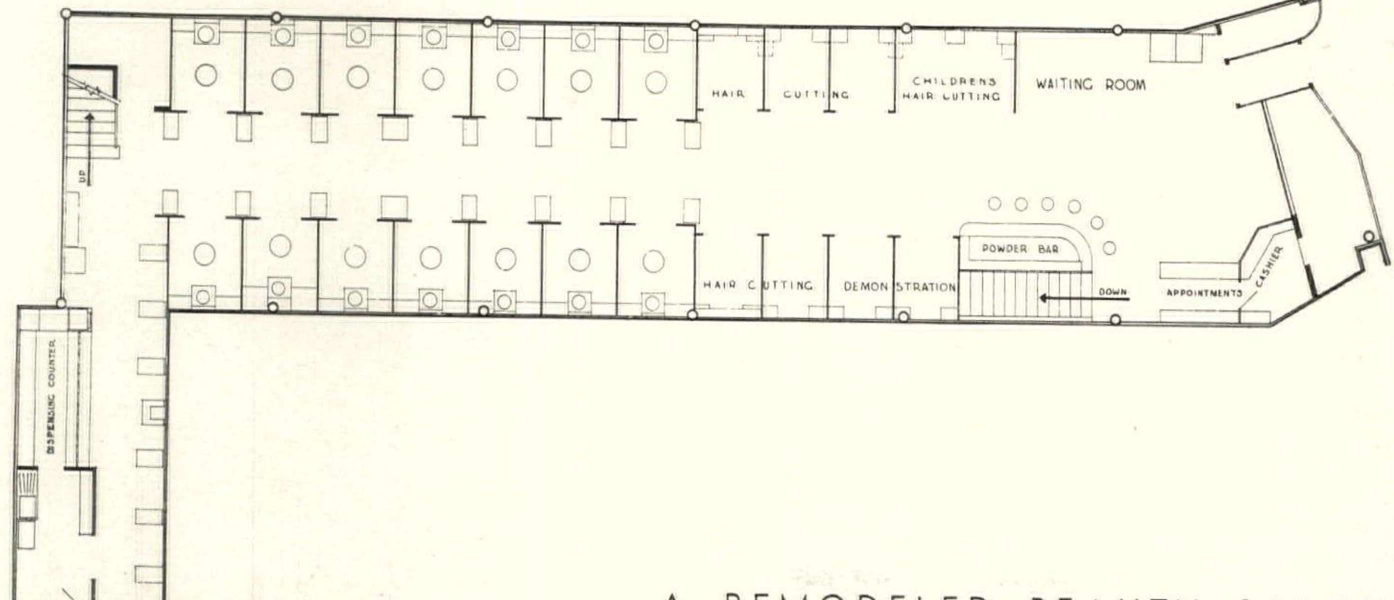
NEW LOCATION LEASED AT 2123 BROADWAY

TEMPORARY FRONT DURING CONSTRUCTION

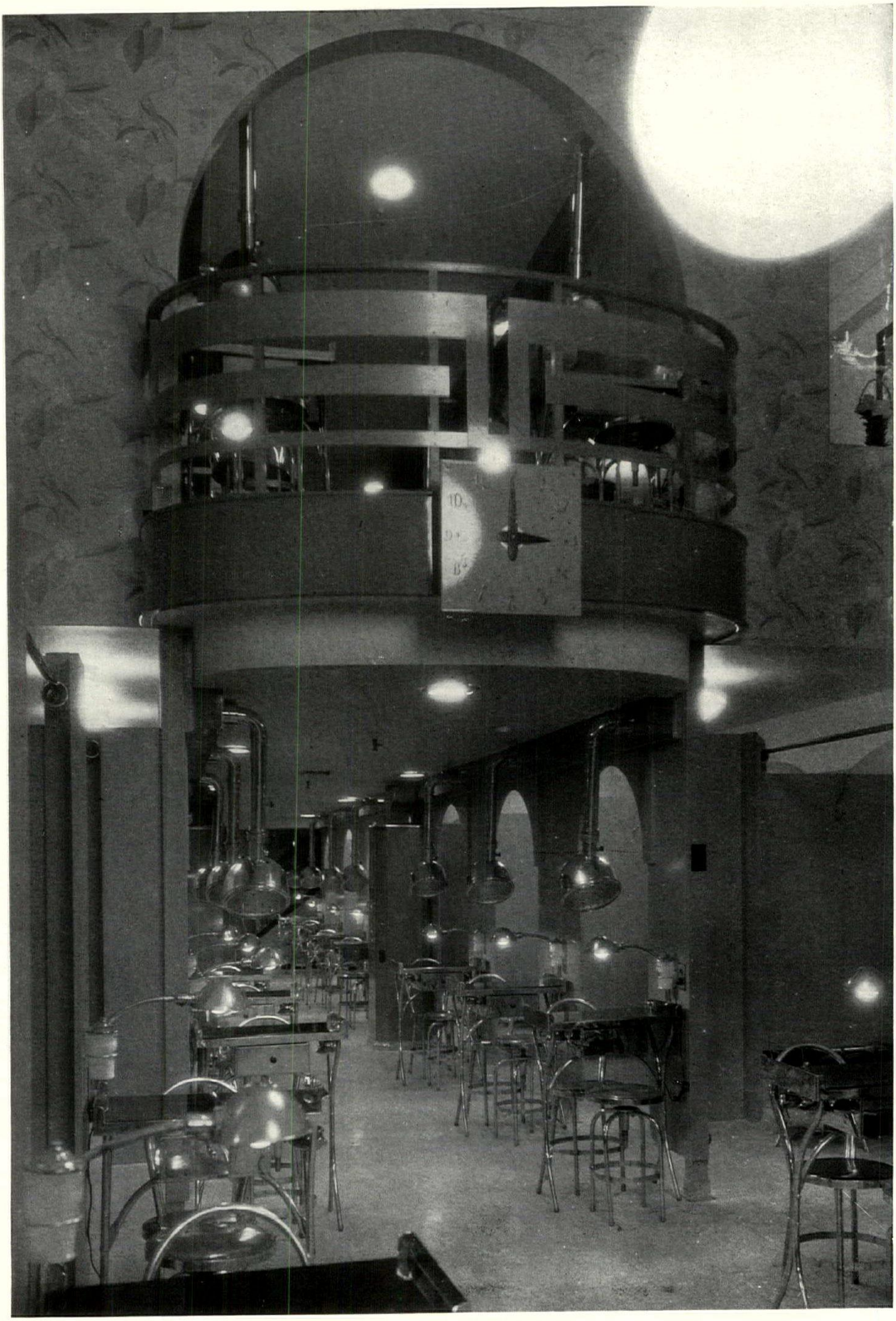


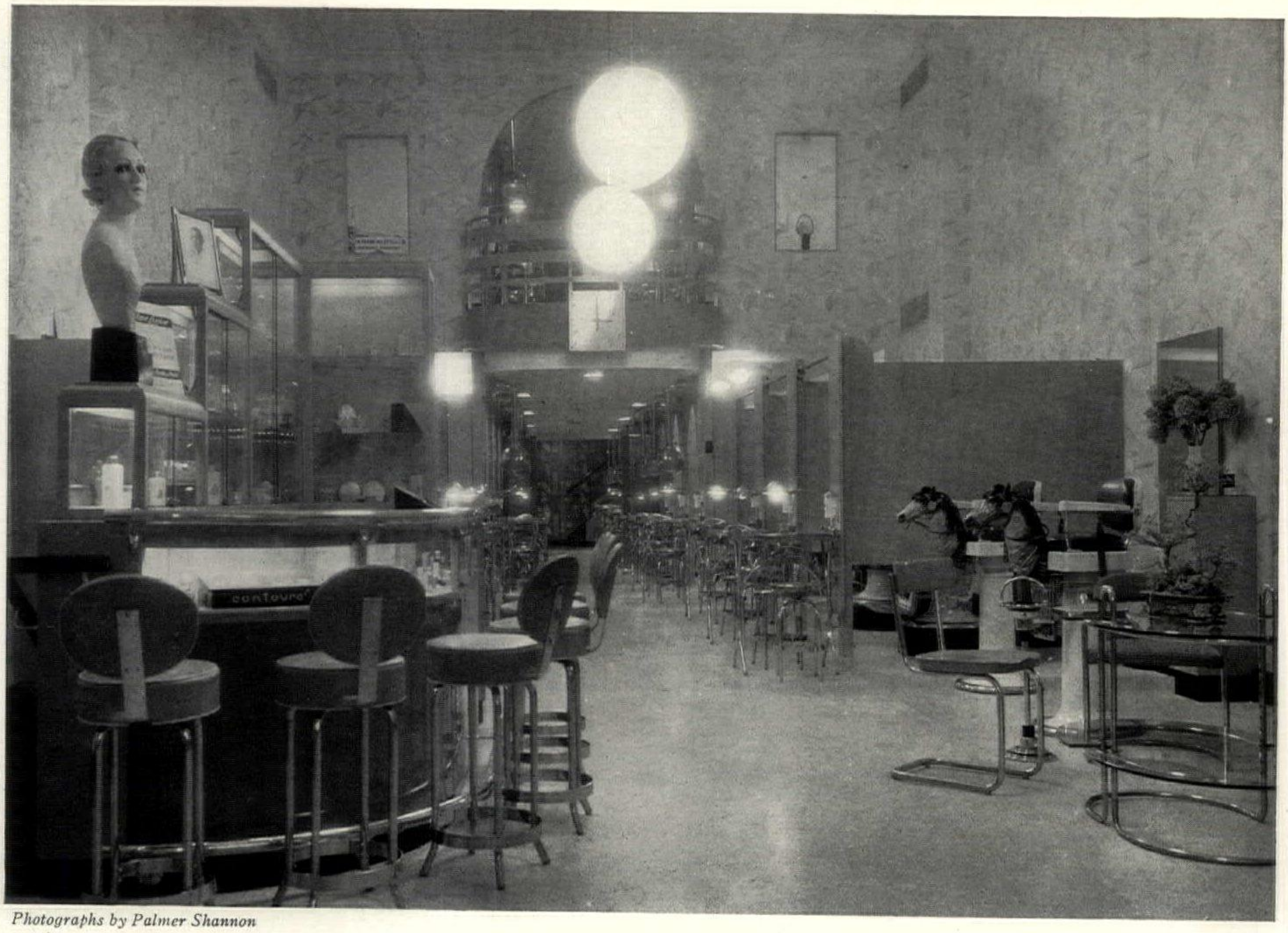
Photograph by Palmer Shannon

LANTIERI BEAUTY SALON, NEW YORK CITY—VAHAN HAGOPIAN, ARCHITECT



A REMODELED BEAUTY SALON

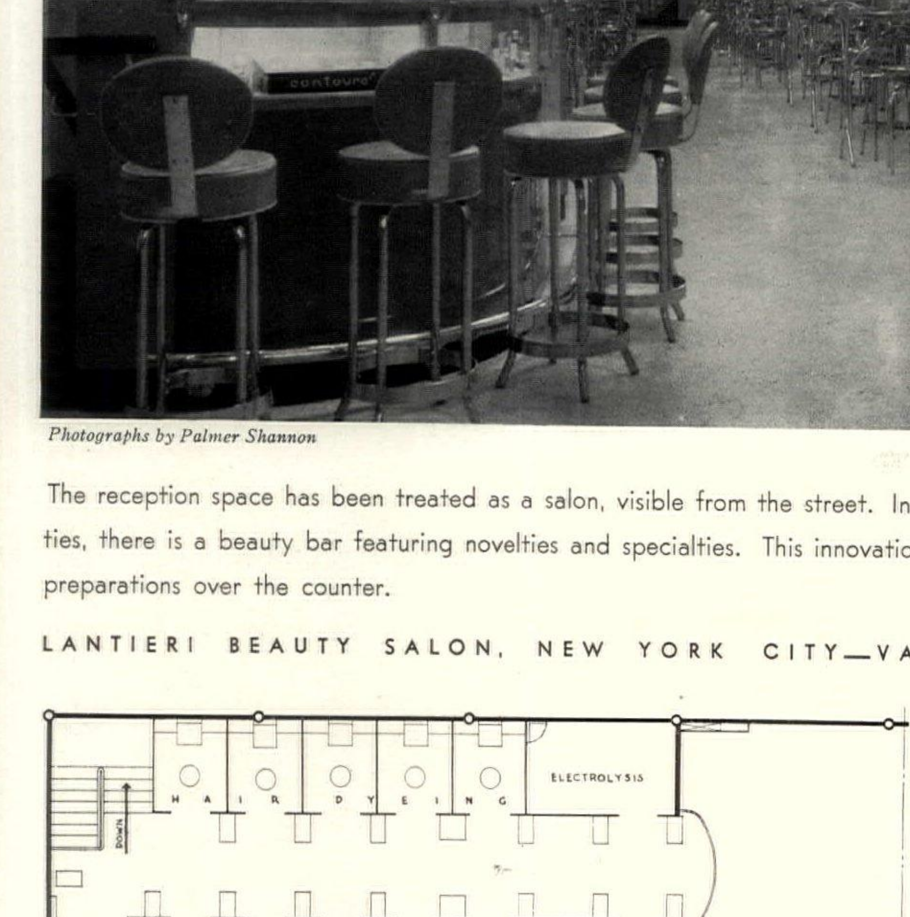




Photographs by Palmer Shannon

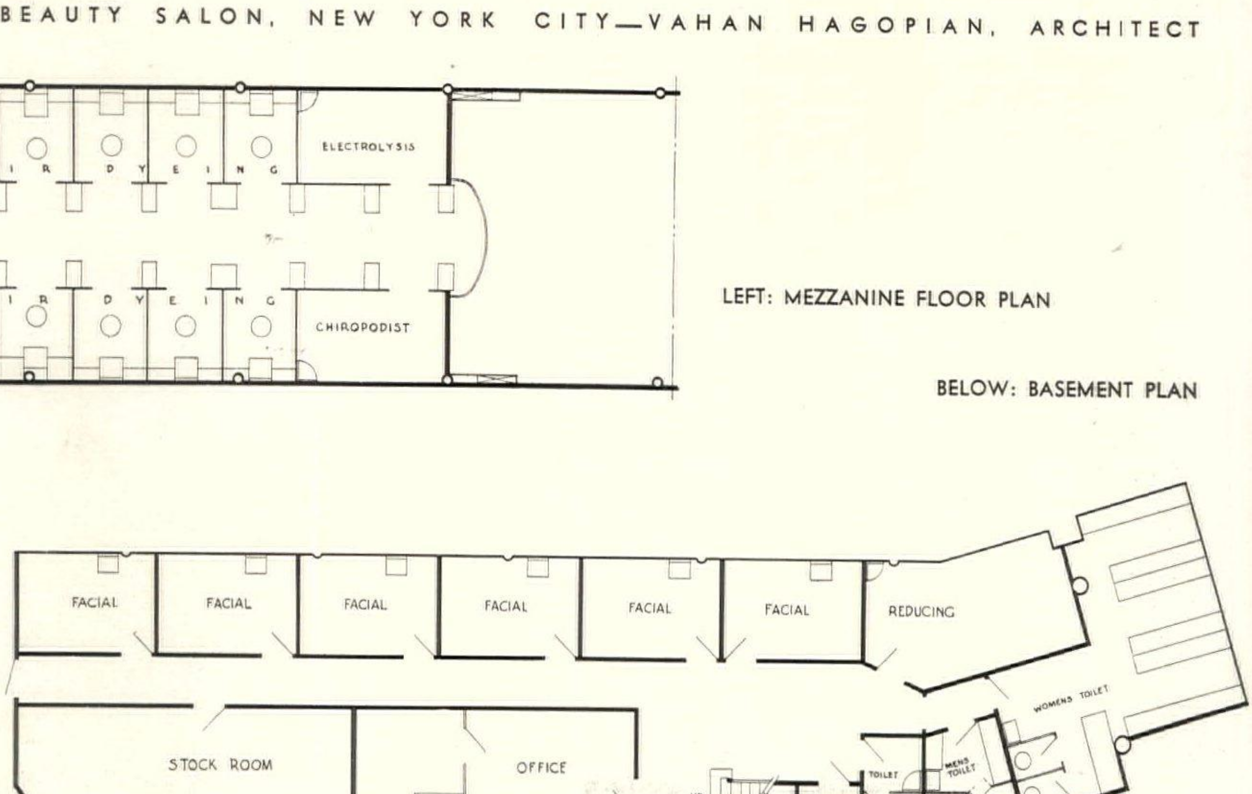
The reception space has been treated as a salon, visible from the street. In it, in addition to regular waiting room facilities, there is a beauty bar featuring novelties and specialties. This innovation eliminates the old method of selling beauty preparations over the counter.

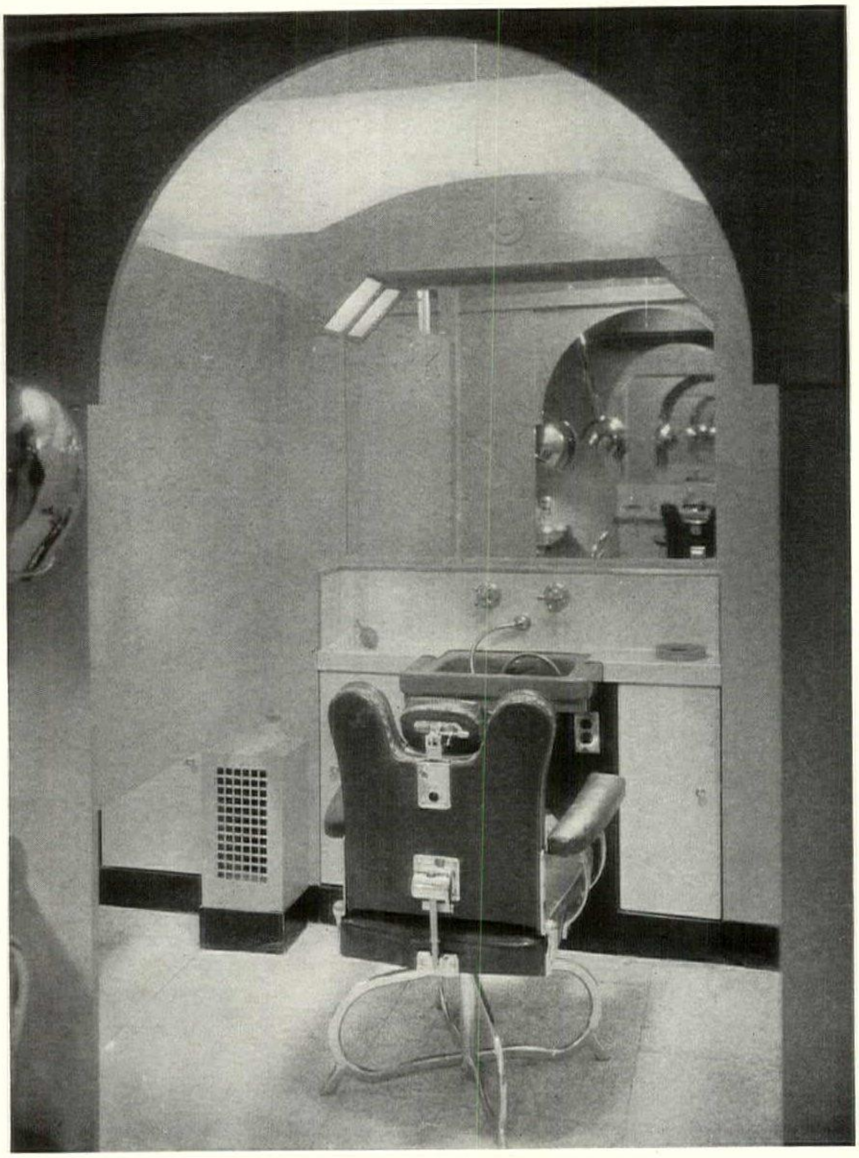
LANTIERI BEAUTY SALON, NEW YORK CITY—VAHAN HAGOPIAN, ARCHITECT



LEFT: MEZZANINE FLOOR PLAN

BELOW: BASEMENT PLAN





INDIVIDUAL TREATMENT BOOTH

A REMODELED BEAUTY SALON

CHILDREN'S DEPARTMENT

Photographs by Palmer Shannon

LANTIERI BEAUTY SALON, NEW YORK CITY
VAHAN HAGOPIAN, ARCHITECT

REMODELED THEATER

Photographs by S. A. Crimella

BEFORE MODERNIZATION

THEATER OLIMPIA IN MILAN
EUGENIO FALUDI, ARCHITECT

AFTER MODERNIZATION

A REMODELED THEATER

THEATER OLIMPIA IN MILAN
EUGENIO FALUDA, ARCHITECT

Entrance hall: Black and yellow marble floor. Traventine wainscot, and nutwood booth.

Bar on floor below: Red and yellow marble floor, black marble and ivory stucco walls.

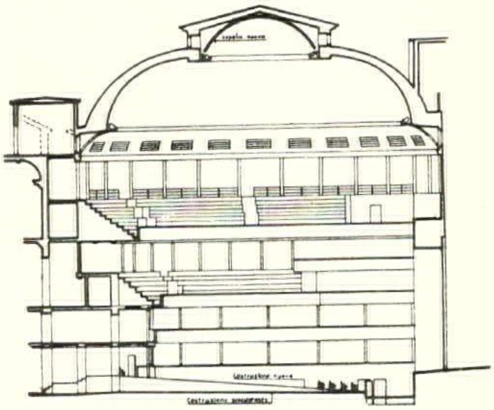
Photographs by S. A. Crimella

REMODELED THEATER

THEATER LIRICO, MILAN, ITALY
EUGENIO FALUDI, ARCHITECT

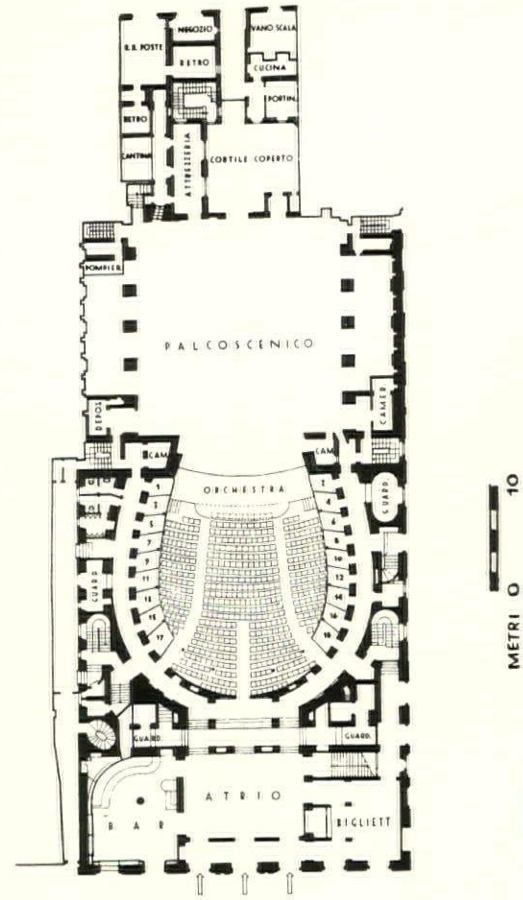
ENTRANCE HALL

Photograph by J. A. Crimella

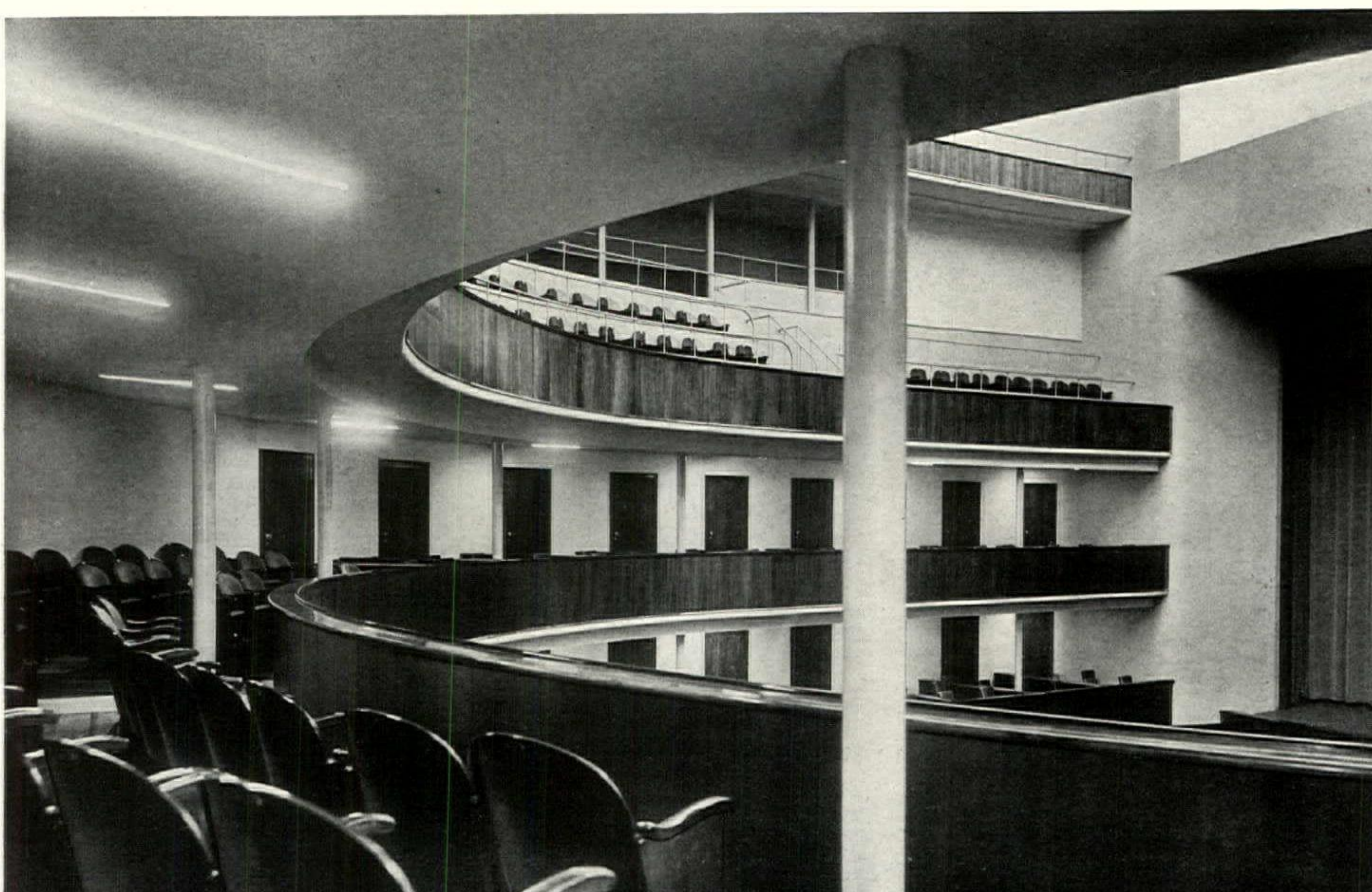


THEATER LIRICO
IN MILAN, ITALY

EUGENIO FALUDI, ARCHITECT

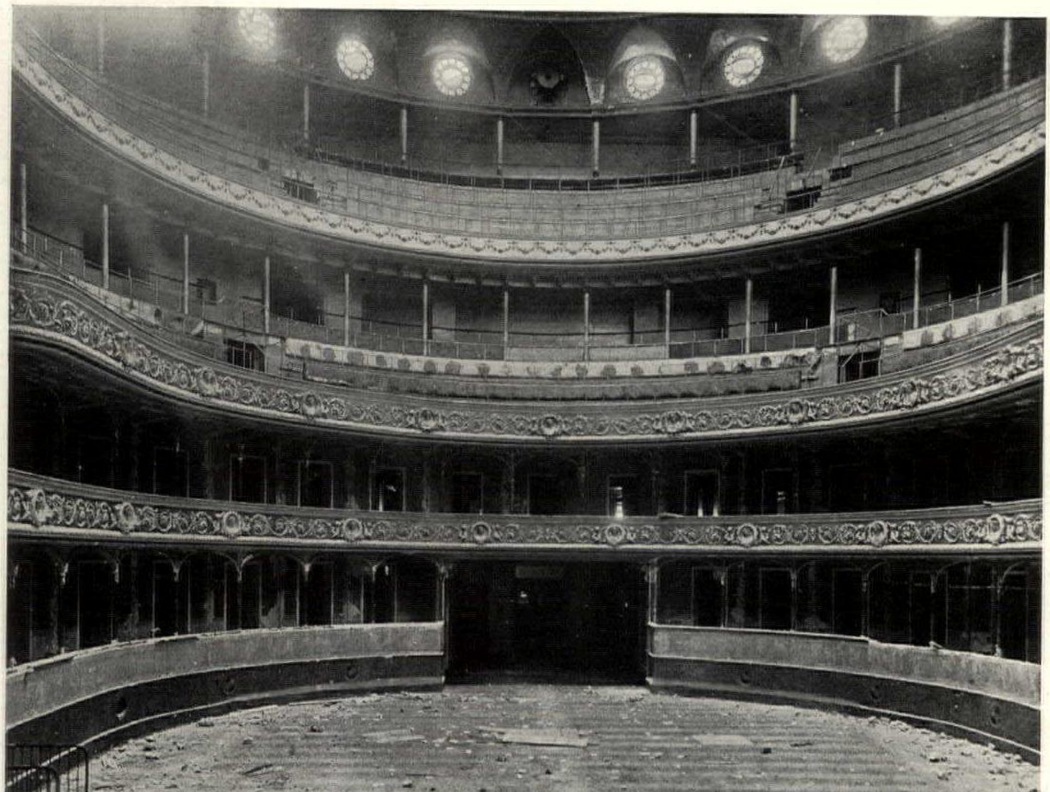


A REMODELED THEATER



THEATER AFTER MODERNIZATION: CUPOLA INDIRECTLY LIGHTED

INTERIOR OF THEATER BEFORE MODERNIZATION



Photograph by J. A. Crimella

A REMODELED THEATER

THEATER LIRICO IN MILAN, ITALY
BAR BY EUGENIO FALUDI, ARCHITECT

THE NEW ARCHITECTURE IN AMERICA

OBSERVATIONS OF AN ENGLISH VISITOR

BY JOHN GLOAG

The excavating archaeologist of 3,000 years hence who works first on the buried ruins of New York and then on Washington will conclude that those cities were erected by totally different races, whereas they are the architectural results of totally different moods indulged by one indisputably great race. The eighteenth century patron of architecture was educated in classic architecture; the twentieth century patron of architecture in America is educated in commercial advertising. The audacious beauty of New York has grown out of the spirit of salesmanship that pervades the city; and the architect has been called in to amplify the theme song of commerce, which is: "Tell the World!"

With this sort of patronage there has clearly been a readiness to experiment, which has sometimes been deflected by an appetite for mere novelty; and when the experimental mood is in abeyance what may be called the "topical" building appears. The Woolworth building was topical in its day; so was the Chrysler building; but time may demonstrate that Al Smith's handiwork, the Empire State Building, has authentic individuality, and it may retain its freshness and vigor after styles in trimmings (from which the Woolworth building suffers) and in ornamental lids (which is the complaint of the Chrysler building) are outmoded.

The visitor to New York finds her such a lovely and stimulating lady, that he never suspects, unless he meets a young, modern-minded American architect, that New York is overdressed, and that he has been captivated by the brisk and bewitching way she wears her foreign clothes. Then he learns that he has been admiring a city of old-fashioned buildings, hung with unnecessary masonry, with all the real creative work lavished upon their skeletons, and the use of new external materials that could make them real twentieth century buildings deliberately restricted by regulations, by traditional prejudices, and (it is even hinted) by vested interests.

But if New York is a city of "old-fashioned buildings," what about Washington? In that city it has yet to be discovered that gargantuan classic architecture is not the true architecture of the twentieth century. Washington is growing into the most expensive capital city in the world. Huge sums are being spent upon the erection of new government offices. Old nineteenth century buildings, still in excellent condition, are being demolished to make room for new masses of shining white stone. All the millions of dollars that are being poured out to wash up these sparkling islands of masonry are keeping the building industry busy and must be making enormous and continuous claims upon building material. The state is spending money, and it will have something to show for it, but it will be the wrong thing architecturally. Columns, columns, everywhere, and not a new thought peeping out anywhere.

But they have such sweeping courage in Washington that it is not only conceivable but extremely likely that in fifty year's time they will be pulling down that dazzling corinthian temple of white marble, the New Supreme Court, and erecting in its place a composition of steel and glass, while the young architects of that future time will glower and mutter: "That dead functionalist stuff—when *will* the old men learn!"

Meanwhile millions are being spent and a colossal opportunity is being missed, and all America appears to be taken in by it. Public men consider it a great gesture of modernization. Only the young architects, and only some of them, are aware of the tragic mistake that is being made with such hymns and shouting. To see Washington from the Arlington Cemetery is to see a white Graeco-Roman city; but, like men and women on the cinema screen, it is larger than life size. It is a monument; a consistent expression of America in a mood of national dignity; unparalleled in architectural history except by the Acropolis at Athens and the Forum at Rome. It performs no service to the architectural genius of its own century; its example may be directly harmful to the life and growth of the modern movement in America; and there it differs from Athens and from Rome, for those cities expressed with the finest and most enduring materials available, the national genius of their architects. To anybody who lives and works in England, blind love of tradition is a familiar obstacle in the way of good design; and to such a person the discovery that America cannot live architecturally in her own age is faintly shocking. Modern architecture, which is of the same stuff as the machine age that America has been largely instrumental in developing, is still unrecognized in the one country on earth that might have raised it from its experimental stage and made a fine, glowing and glorious thing of it.

Although public buildings and commercial buildings may provide no opportunity in the present state of patronage for creating twentieth century architecture, the problem of housing may receive some attention from industry, and thereby release design from its classic limitations. The prefabricated house may alter, in due time, existing ideas about architectural forms. One learns that architects have been called in by some manufacturers of prefabricated houses; and from the young men one learns that industry has generally consulted what these irreverent youths describe as "the tail-coat school," and that, as a result of this, one firm had produced metal houses painted to look like wood.

"Prefabricated houses will be well-designed if they do their job with the greatest efficiency," said one young architect to the writer. The faith of functionalism seems to blaze brightly in every mind under thirty. The young men are intolerant of the old school, "the tail-coat school," but they are constructive; they have experimental, adventurous minds, and they do not seem to recognize the limitations that would be constantly intruding upon and curbing the adventurousness of many of their English contemporaries. They are prepared to get outside their profession; to claim the right of accepting more spacious responsibilities; and to break up the aesthetic tradition that hampers the architect in every contact he makes with the tough realities of commerce and industry. In an ardent discussion about this, somebody said: "The architect must get the engineer and the real estate man together. Without the architect those two can destroy society: with the architect they can remodel it without any politician knowing that anything's happened."

Here is the technical application of the "Open Conspiracy" that H. G. Wells has been advocating for years. A practical assumption of social and economic responsibilities by capable technicians, while the politicians and the statesmen and the professional great men send battalions of words to fight for their own pet creeds or cronies, and to obscure every problem in the dust of conflict for some political faith. And who are better qualified to remodel society than architects—the only men in the social structure who have been trained to think logically and to plan? The young generation knows what it wants. It has identified the major obstacles, and is hammering away at a program for getting around them. And it has the courage to advocate the abandonment of professionalism that is based upon social charm and aesthetics, and to replace it with professionalism based upon business knowledge and competent salesmanship. No school ever taught those things to young architects—the depression has provided that part of their education.

"Architecturally we're much further ahead as a result of the depression," said one young architect. He was earnest, enthusiastic and humble about his work. He explained that this period of inactivity had enabled architects to look around and solve all sorts of small house problems—things they had never bothered about before. With the result that in the working parts of a house, in kitchens and bathrooms alone, they found that half the time they thought they were being functional they were just being fashionable, in a very superficial "streamlined" way. They had not only been able to do research in such matters; they had been able to specialize.

If men like these were consulted about the mass production of prefabricated houses, the citizens of the United States would, in a generation, have homes that were the envy of the world. At Chicago, during the last few days of the World's Fair, the writer had the good fortune to be conducted round the exhibition by an architect, and observed many experiments in housing, most of them marred by that funk of logical consequences which distorts or mutilates so much work in this country of experiments; a fact that is always slightly bewildering to an English mind attuned to the belief that in America new ideas have a better chance of life than anywhere else. There were prefabricated houses in metal; needlessly expensive, because they were not compactly planned, and their producers were apparently suffering from the trouble that retarded the early development of the automobile industry, when manufacturers insisted that the motor car was a rich man's toy and always would be. It is doubtful whether the makers of prefabricated houses are consciously saying that; but they are not attempting to solve the problem of cheap housing yet, if the exhibits at the Fair were a representative sample of their endeavors. Maybe they are awaiting the advent of a Henry Ford. The greatness of America lies in the certainty that a Henry Ford of housing will arrive.

It was explained that the prefabricated housing firms were breaking the idea gently to the American public. "Canned housing" had to be put over by making it look like something familiar to begin with. The architect who said that added: "If anybody gets a good idea here, they've got to get it under cover quick or they get shot up as revolutionaries." When the writer registered incredulity he enlarged on the subject. "We go to schools over here," he said, "and they teach us methods of construction, and they give us facts, and show us what has been done—but we're all afraid of doing something creative. Schools exist here to show people what will be accepted by other people. We don't create."

But at this point the visitor had to protest that ideas were bursting out all over the place. Admittedly, after the stimulation of New York and the urbanities of Washington, Chicago was a bit of an anti-climax; but there, in the World's Fair, which was probably the proudest muddle the world has ever seen, there was something alive, and, like all things full of life, full of mistakes, but promising one day to create a technique of handling materials and processes that may give a grandeur to Western civilization that will surpass every glory achieved in its Mediterranean cradle. Meanwhile design is everywhere degraded or hampered by the convention that new things should never be frank about their newness. And plan in its great social sense seems to be as little understood in America as in England. Flying from Washington to Chicago, across Western Virginia to Charleston, and then crossing and recrossing the Ohio to Cincinnati, and on via Indianapolis to the murky lakeside city, you see a lot of America in plan, and you observe that English sins of omission and imitation are also American sins. But with more space to play with in America, muddles are not quite so squalid as English muddles; small towns are not cramped; they are casual, but spacious.

But the modern architects are impatient. The World's Fair was described by one of them as "A Century of Safety First put over as Progress." And the dismal imitations of Gothic, Byzantine, Italian and Spanish Renaissance façades draped over the fronts of the towers of Chicago illustrate that patronage had determined that no acknowledgment should be made to the machine age that produced the metallurgical knowledge and the elevators that made those towers possible. An architect who designs in an "architectural style" is only the decorator. The real American architect of the last generation, with a few exceptions of whom Frank Lloyd Wright is indisputably the greatest, was the structural engineer. The new architecture which American engineers created got into the wrong costume; but the new generation of architects certainly has the will to abandon disguise and to create in partnership with engineering and with industry.

TECHNICAL NEWS AND RESEARCH

MEASUREMENT OF CONDITIONED AIR

By J. C. HARDIGG, Consulting Engineer

Standardization of methods in measuring and determining needs in air conditioning, as well as correct tabulation of operating data with a check on efficiency of performance, has been made possible by the new psychrograph recently made public at a meeting of the American Society of Mechanical Engineers.

In figuring any particular air conditioning installation, there is apt to be as many different answers as there are companies in the market, because each company has its own, and different, method of determining the work that must be done. All this confusion can now be eliminated by determining beforehand just what work is to be done, thereby putting all manufacturers on the same basis.

ATMOSPHERIC REQUIREMENTS

We condition air in order to maintain indoors a comfortable and healthful atmosphere. To do this we either heat or cool the air, either humidify or dehumidify it, keep it fresh, filter and circulate it. The first step is to determine the temperature and relative humidity at which the atmosphere will be kept. This temperature will vary from 70° F. in winter to from 10° to 15° F. cooler than the outside air in summer. The humidity will vary from 40 to 60 per cent in summer to, perhaps, something less in winter. A high humidity in winter frosts the window glass and for this reason humidity is reduced to a point where frosting does not occur. If it is desirable in any particular instance to maintain the same humidity both winter and summer, there are now on the market doublepane window sash which eliminate frosting. Having decided upon the indoor temperature and humidity, the amount of heating and cooling necessary is determined by the United States Weather Bureau's records for a particular vicinity for the past several years.

When the outside air is cooler and drier than the temperature and humidity to be maintained, inside heat and moisture must be added. When the outside temperature and humidity are greater, heat must be taken away in order both to cool and to take out the excessive moisture. There are only two ways by which to remove moisture from air: either chemically or by reducing the temperature of the air to a point where the moisture forms water and drops out of the air. This second method is used invariably because it is the cheaper.

The Weather Bureau records show the maximum and minimum temperatures of the outside air which have been experienced for many years. From these records we can determine the greatest amount of heating and cooling that we may reasonably expect and demand in order to maintain the conditions desired inside the home or office building.

An important part of the problem is the amount of fresh or outside air that it will be necessary to take into the system each minute. After much experimentation this amount has been found to vary from 10 cubic feet per minute for each person in a room to 30 cubic feet or more. It is readily seen that if the space under consideration is a living room where persons are reading or talking but not smoking, the amount of fresh air required will be much less than in a room of similar size where two or three tables of bridge players are smoking. Again, if the bridge players are in the room just for an evening's amusement, the air will be fresh and clear of smoke by the next morning under normal operation of the air conditioning system; if, however, the players are in a club where play goes on all day and far into the night, the amount of fresh air to be taken into the room normally must be materially increased.

Ventilation, or the amount of outside air that is supplied to the rooms of public places, is regulated by law in most communities. But the designers of air conditioned rooms must make sure that the amount supplied is sufficient to supply the needs of occupants even in small offices and residences. It is easy to imagine the accumulation of odors in a small office during dictation periods alone, if the employer is smoking a heavy cigar or a series of cigarettes and the stenographer has more than the usual trace of perfume. Only proper ventilation will take care of this situation.

In arranging for the proper supply of air to a room, the equally important point of removing an equal quantity must be given full consideration. In other words, if we connect an air duct to a hermetically sealed room, we shall be unable to push air into the room. Yet, if we supply an outlet duct as well, we can push into the room just as much air as is carried away by the outlet.

Another important point is the amount of moisture normally given off in the room to be air conditioned. The moisture given off by the human body must always be calculated, as well as the moisture given off by hot foods as they are brought into a restaurant from the kitchen, and the moisture in a small tearoom from innumerable pots and cups of hot beverage. With the publication of the psychrograph it is now possible to plot the individual needs of a room or building as easily as to plan a trip by train, boat or airplane.

Noise abatement is another necessary part of air conditioning. Equipment, whether a unit for one room or a system for conditioning a large building, should be noiseless in operation. In addition to this, it is possible to absorb or eliminate street noises which would come through the equipment or through an open window. A further step is to deaden the sound of voices or the hum of mechanical adjuncts by absorbing these noises in walls and ceilings by special lining material. The limit to the "silence" of an air conditioned room is the noise-tightness of windows and doors, and the amount of noise the walls and ceilings will absorb.

To visualize the work to be done by a properly operating air conditioning system or unit, we must again consider the hermetically sealed room at the conditions required. In winter heat will pass through the walls to the outside and chill the room; in summer heat will flow from the outside into the room and warm it too much. To maintain a uniform temperature in the room during winter, a part of the air is drawn out each minute and replaced with air warmer than the temperature to be maintained in the room, so that when it is mixed with the rest of the air the proper temperature is maintained. In a large number of installations this heat is added by blowing the air over the customary steam heated radiators in each room. In summer the air withdrawn is pulled down to the cooling equipment where its temperature is reduced the necessary amount before being returned to the room. Windows let heat through much faster than the walls, which necessitates supplying more heat in winter and more cooling in summer. After the heat leakage—loss in winter and gain in summer—of the building has been found, there must be determined the amount of heat given off inside the room or building by persons, electric light, food, and so on. The sum of these is the amount of heat that must be removed in summer cooling. The total amount of cooling is found by adding to this sum the amount of cooling necessary for the air of ventilation.

The amount of heat contained in either a pound or cubic foot of air depends both upon its temperature (dry bulb) and the amount of moisture it contains, i. e., its relative humidity. Of two samples of air at the same temperature but having different humidities, the sample with higher humidity will contain the more heat.

The relative humidity or the amount of moisture in the air of a room is determined by the dry bulb and wet bulb temperatures of the air. The dry bulb temperature is taken with the ordinary mercury thermometer. The wet bulb temperature is taken with a similar thermometer which has a wet wicking around its bulb at the bottom. Knowing these two temperatures, by referring to the ordinary psychrometric chart we can read directly the relative humidity, the grains of moisture per pound of dry air, its dew point or the temperature at which fog will start to form, and the number of cubic feet per pound of dry air, with the vapor contained in the pound of air, and the total heat per pound of dry air.

The amount of moisture present in the air to be conditioned plays an important part in determining the capacity of the equipment to be installed. Humidity variations from day to day change the demand made upon the equipment, in addition to the temperature changes. When heat is either taken away or added to a quantity of air, part of the heat changes the temperature of the air itself and the other part of the heat is absorbed in the moisture of the air.

Air at 100° F. and 65 per cent relative humidity contains 64 grains of moisture to the pound more than does air at 90° F. and 60 per cent relative humidity. The amount of heat required to evaporate this amount of water, but without raising the temperature of air, will raise one pound of dry air about 35° F.

"Sensible heat" is the heat we have all our lives seen recorded on the ordinary outdoor or indoor thermometer. "Latent heat" is the additional heat needed to evaporate the moisture that is contained in the air, and this we are learning to read on the wet bulb thermometer. "Total heat" is the sum of these two and is what we must calculate in planning to condition air.

THE NEW PSYCHROGRAPH

These variables: the persons in a room and the bodily heat they give off, the addition of hot foods and beverages, the steaming towels for barbershop facial packs, the electric driers of beauty parlors, and so on have been so many and so different that until the publication of the psychrograph, each separate room or condition had to be computed laboriously and minutely. At the end of all the figuring appeared differences of opinion owing to various methods of computing individual needs.

With the new psychrograph guesswork is eliminated, and even the layman may see and read the methods by which his own air conditioning needs are decided. To the reputable manufacturer of air conditioning equipment is given the same working basis as to all his competitors, thereby eliminating injurious price cutting which means sacrifice of efficiency to consummate a sale. With widespread use of the psychrograph nobody will be in the dark, either as to his own building's needs, the fulfillment of those needs by manufacturer or designer, or to the operation of his equipment after it is installed.

The psychrograph is the contribution of A. M. Norris (Chatard and Norris) of Baltimore. It is a chart so constructed that, given the exact conditions of a room or a building, even a layman can draw the connecting lines which will almost magically calculate for him the requirements and present before his eyes the things he must demand of all manufacturers. It is perhaps the greatest forward step in the whole field of air conditioning, because it enables for the first time the architect, engineer, manufacturer, owner and operator to speak together in common, understandable terms.

WESTINGHOUSE PSYCHROGRAPH

Based on original chart by A. M. Norris

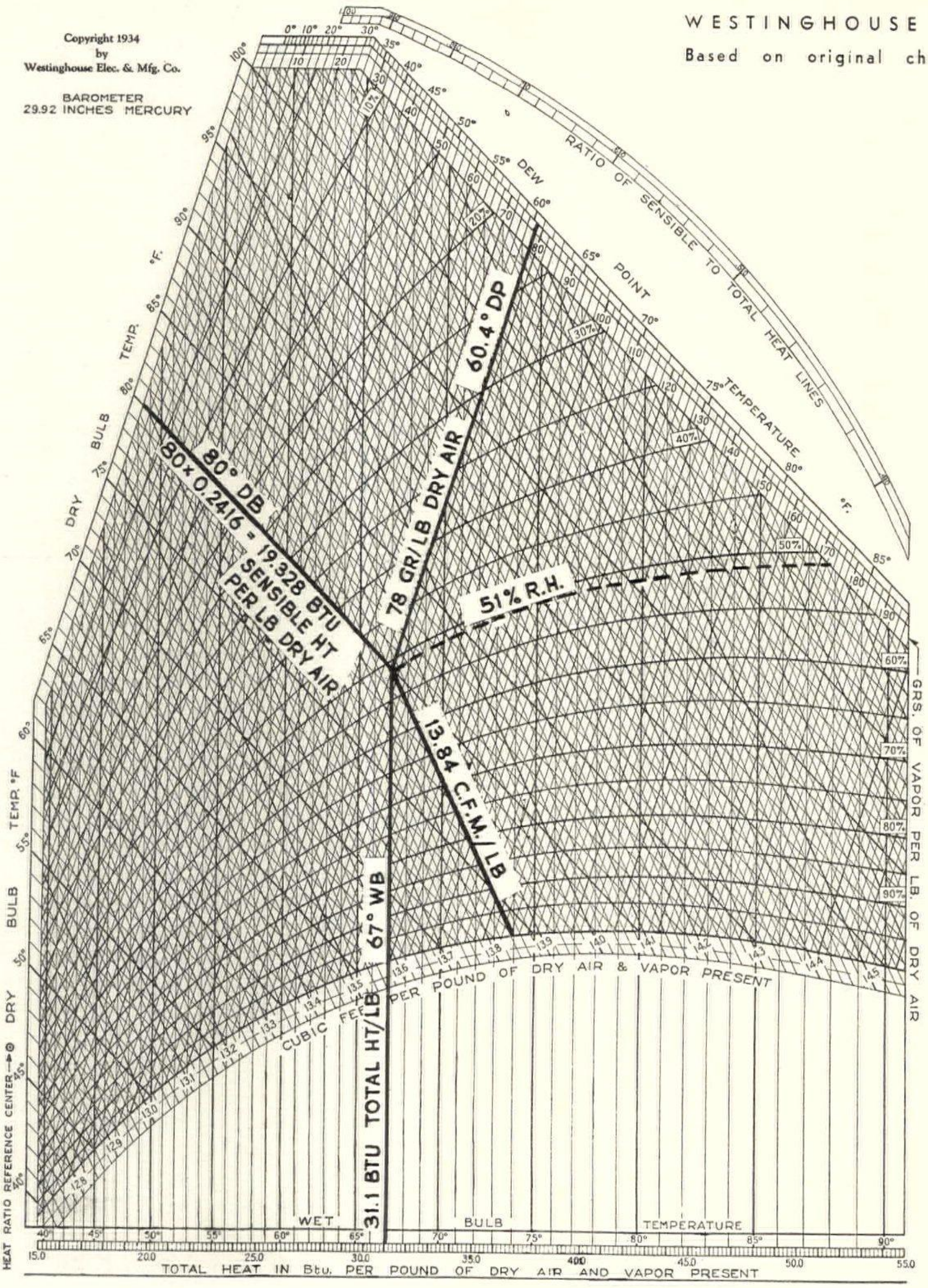


FIGURE I

THE PSYCHROGRAPH: ITS MEANING TO THE ENGINEER

By A. M. NORRIS, Chatard and Norris, Baltimore

The use of the psychrograph as an ordinary psychrometric chart is illustrated by Fig. 1 on which a single point has been taken.

FIGURE 1

At the single point taken, reference to Fig. 1 will show: dry bulb temperature 80°; wet bulb 67°; relative humidity 51 per cent; dew point 60.4°; grains of vapor per pound of dry air 78; cubic feet per pound of dry air plus vapor present 13.84; B.t.u. sensible heat 19.33; B.t.u. total heat 31.10.

It will readily be seen that if any two of the above characteristics are known, the lines representing them may be drawn and intersections of these lines will fix all other characteristics for the sample.

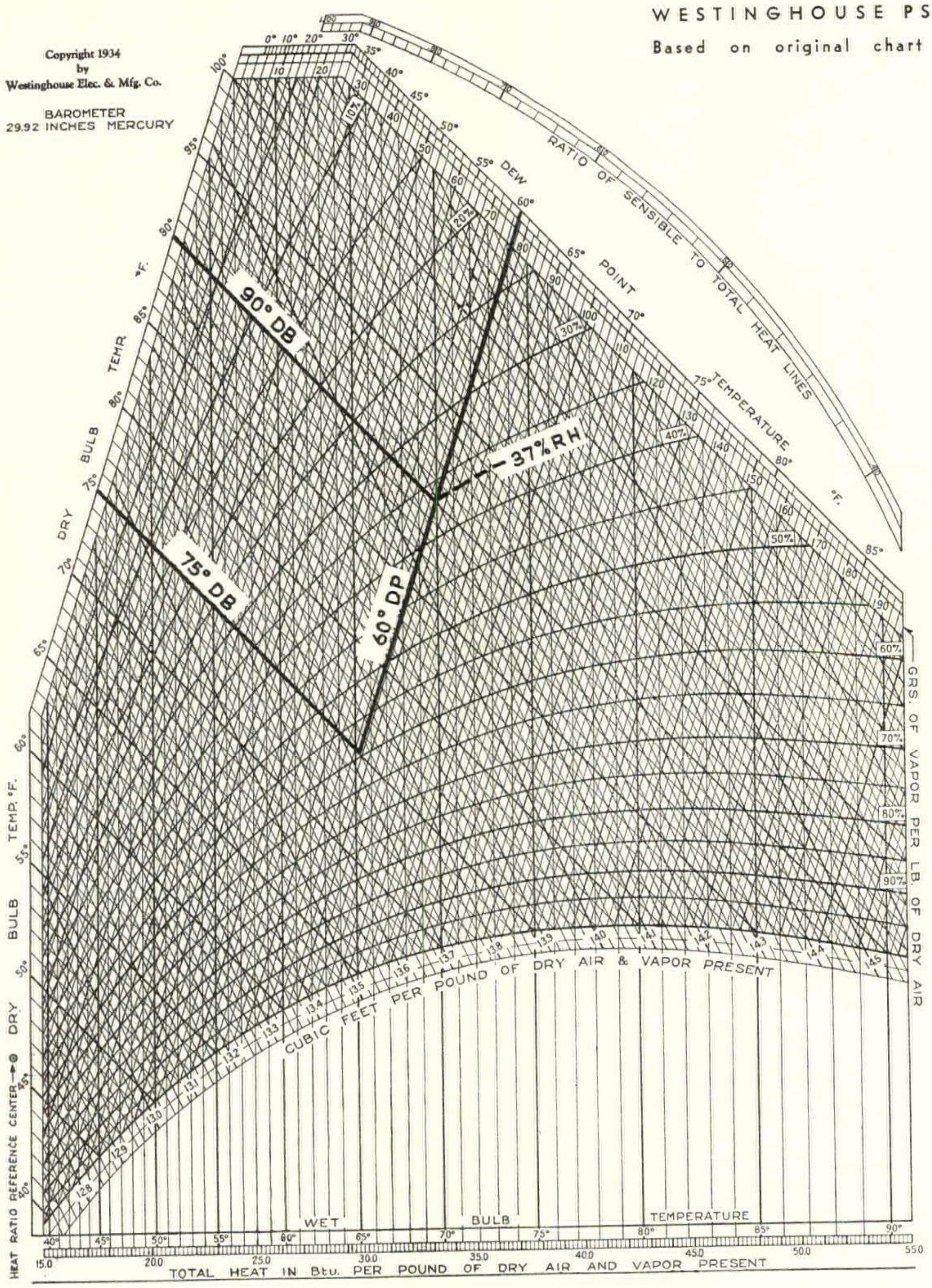


FIGURE 2

FIGURE 2

Given: Dew-point temperature 60° and dry bulb 75°.
Find: The relative humidity, should the dry bulb be increased to 90° with no moisture added (dew point remaining constant).

Locate the point of intersection of the slant line representing 60° dew point and the slant line representing 75° dry bulb temperature. At this point move obliquely upward and to the right along the 60° dew-point line to the intersection of the 90° dry bulb line. At this point relative humidity is read as about 37%. Incidentally, the wet bulb temperature has increased from about 65° to approximately 70°.

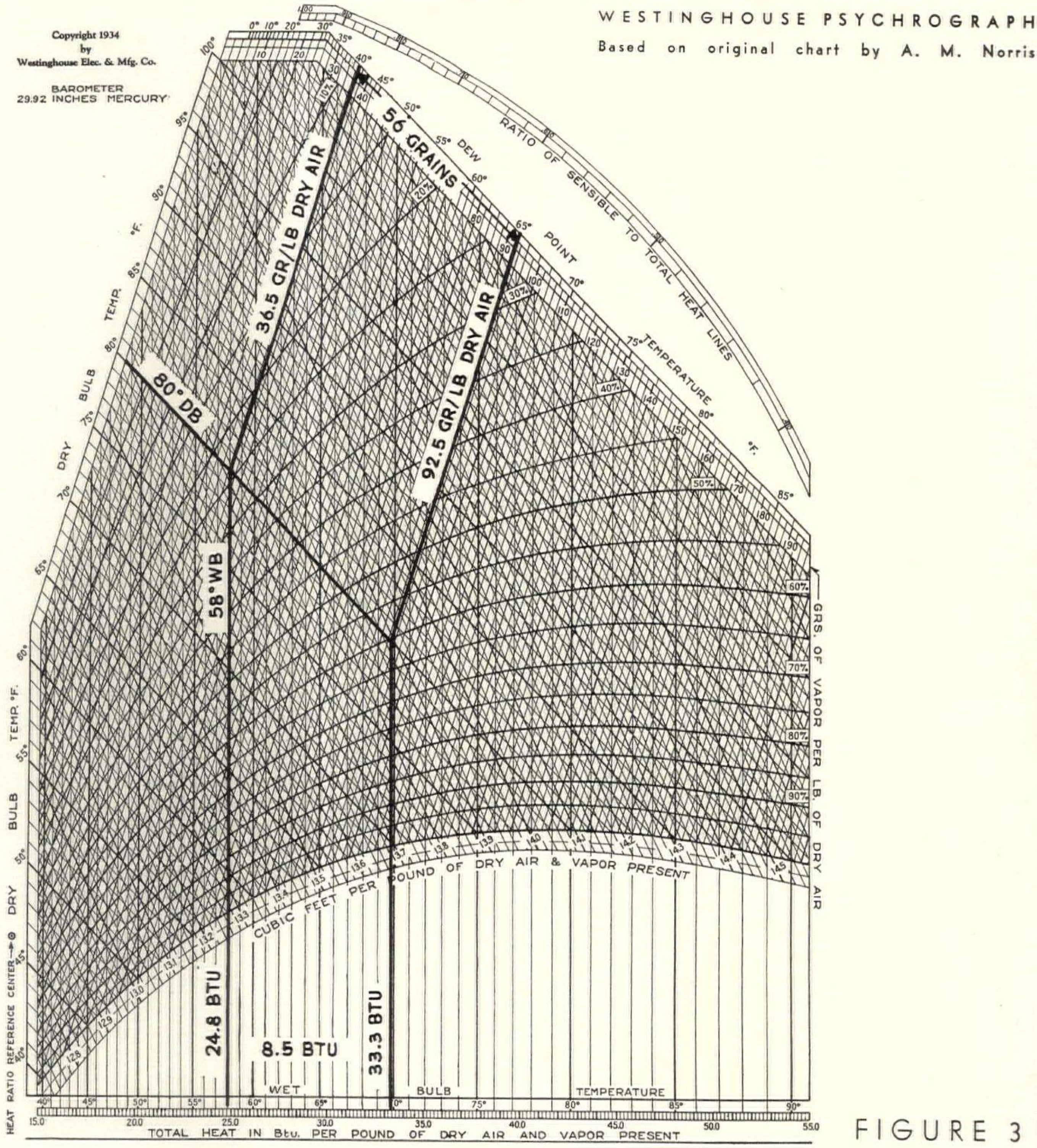


FIGURE 3

FIGURE 3

Given: Air at 80° dry bulb temperature and 58° wet bulb temperature.

Find: The increase in total heat when 56 grains of moisture per pound of air are added and the dry bulb temperature remains at 80°.

Locate the point of intersection of the slant line representing the 80° dry bulb temperature and the vertical line representing the 58° wet bulb temperature. From this point project upward and to the right where 36.5 grains per pound is read (total heat may be read as 24.8 B.t.u. per pound directly from the wet bulb temperature).

If 56 grains per pound is added, the mixture will contain $36.5 + 56 = 92.5$ grains per pound. Locate this quantity on the right-hand scale and then project downward to the left to the intersection with 80° dry bulb temperature line. From this intersection project vertically downward where total heat for the new conditions is read as 33.3 B.t.u. per pound. Thus, with the dry bulb remaining constant, the total heat increased from 24.8 to 33.3 per pound, or 8.5 B.t.u., with an increase in moisture content of 56 grains per pound.

WESTINGHOUSE PSYCHROGRAPH

Based on original chart by A. M. Norris

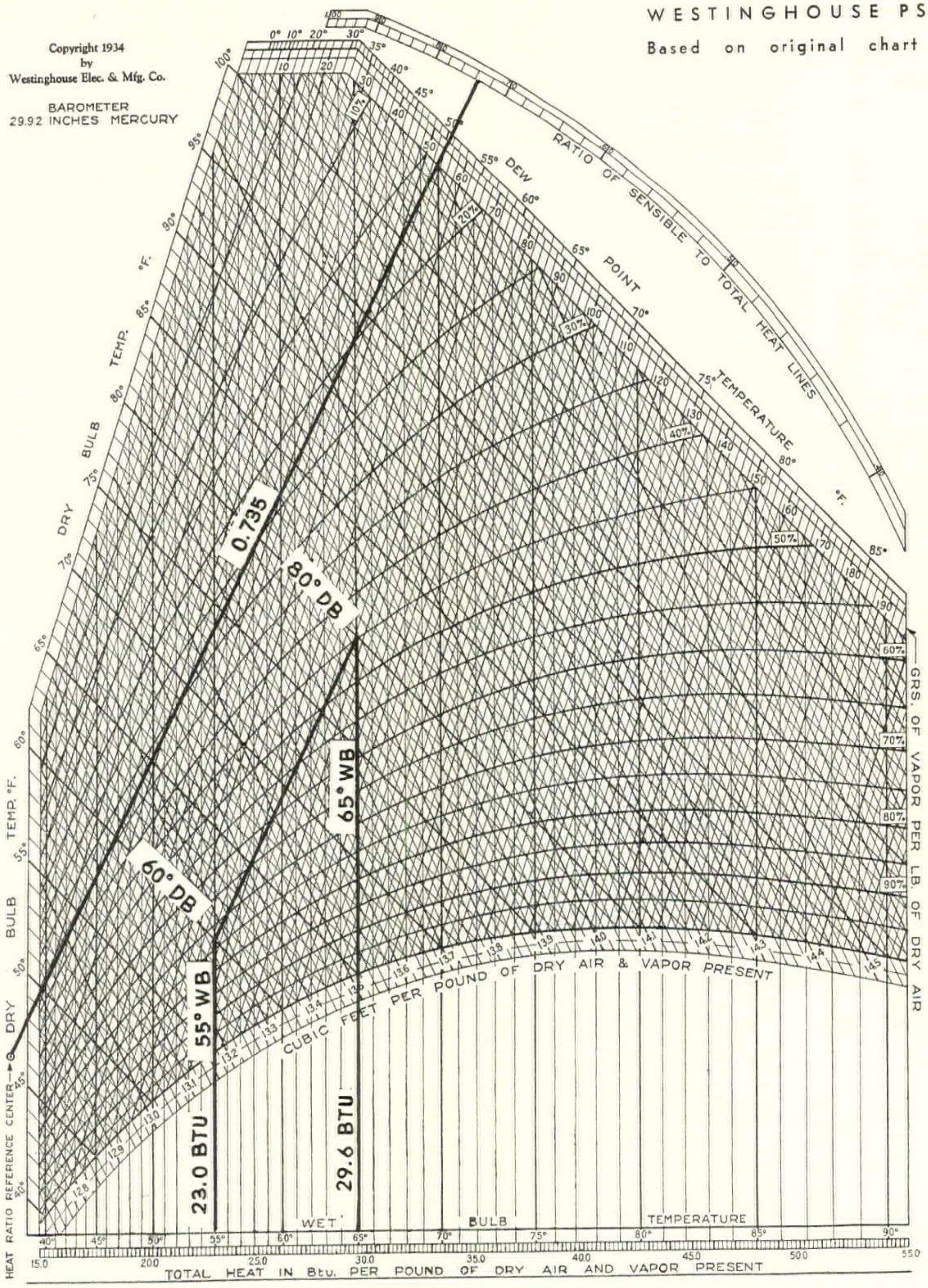


FIGURE 4

FIGURE 4

Given: Air cooled from 80° dry bulb temperature and 65° wet bulb temperature (about 45% relative humidity) to 60° dry bulb temperature and 55° wet bulb (72.5% relative humidity).

Find: Latent heat and sensible heat extracted in cooling.

This example illustrates a graphical solution that cannot be made directly on any other psychrometric chart. Locate the two points representing the conditions of the air at the two sets of dry bulb and wet bulb temperatures. Project vertically downward and read the total heat for the two points as 29.6 and 23.0 B.t.u. per pound of air. Connect the two points by a straight line. Draw a parallel line through the heat ratio reference center to the curved scale marked "Ratio Of Sensible To Total Heat Line," and read the ratio as .735. The total heat extracted is 29.6 minus 23.0 equals 6.6 which, multiplied by .735 equals 4.85 B.t.u. per pound of sensible heat and 6.6 minus 4.85 equals 1.75 B.t.u. per pound of latent heat.

The sensible heat value may be checked by multiplying the dry bulb temperature difference by the heat required to raise the temperature of 1 lb. of air 1° which is .2416. This calculation gives 20 × .2416 equals 4.83 B.t.u. per pound of sensible heat and checks the figure from the chart very closely.

WESTINGHOUSE PSYCHROGRAPH

Based on original chart by A. M. Norris

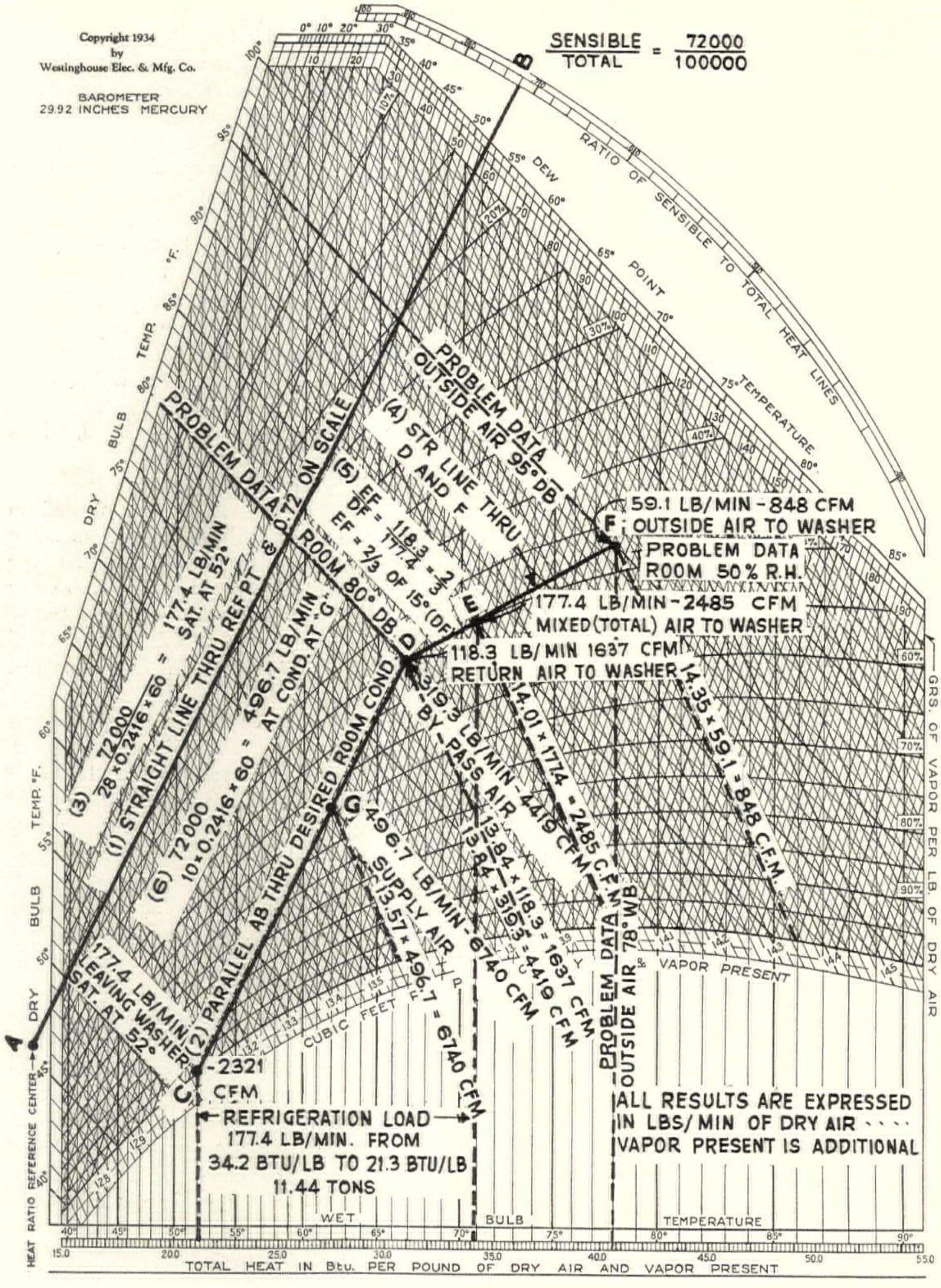


FIGURE 5

FIGURE 5

This figure illustrates a graphic solution of an air conditioning problem in which it has been assumed that a by-pass system, using a washer, will be installed.

The outside air is assumed at 95° dry bulb and 78° wet bulb, and an allowance of 848 CFM or 59.1 lb. per minute of outside air for ventilation purposes has been assumed. The desired room condition is 80° dry bulb and 50% relative humidity. It is also assumed that a heat estimate has been made and it has been found that the heat load, exclusive of the ventilation air which passes first through the washer, but inclusive of any infiltration, is 72,000 B.t.u. per hour of sensible heat and 100,000 B.t.u. per hour of the total heat.

The heat estimate must be broken down as outlined above, because we are interested in the quantity of sensible and total heat which is liberated in the conditioned space, which must be disposed of, or carried out, by the conditioned air supply, which supply must be raised from its condition at the outlets to the desired room condition by picking up this heat.

The surplus heat above delivery condition in the air for ventilation, which passes first through the washer, is removed in the washer, and thereafter this air becomes simply a vehicle for the removal of room heat along with the reconditioned recirculated air. It is also assumed that the desired difference between room temperature and supply air temperature is 10°.

The problem is solved as follows:

Find point B on the scale of the "Ratio of Sensible to Total Heat Lines." In this case the ratio is 0.72. Through the 0.72 point and the heat ratio reference center A draw a straight line AB. Find the desired room condition at D, representing 80° dry bulb and 50% relative humidity. Through point D draw a straight line CD, parallel to AB and intersecting the saturation curve. In accordance with Theorem No. 1*, this line CD will be the locus of all possible delivery airs which will give the desired room condition since the delivery air must pick up heat in the ratio $\frac{\text{sensible}}{\text{total}} = 0.72$ to finally reach this desired room condition, and therefore the point G at 70° dry bulb will be the desired quality of the delivery air. This delivery air may be obtained by mixing room air at condition D and saturated air at condition C in the proper proportion, which will be 10 parts of saturated air at condition C to 18 parts of room air at condition D, since the heat lost by the air at condition D equals 10 degrees drop times quantity of air at condition D in pounds of dry air per unit of time, multiplied by the specific heat of a pound of dry air, and this in turn will equal the heat gained by the air at condition C which equals 18 degrees rise times quantity of air at condition C in pounds of dry air per unit of time, multiplied by the specific heat in a pound of dry air. Eliminating common factors and transposing, we may write:

Quantity of air at condition C is to the quantity of air at condition D as 10 is to 18 or as DG is to CG.

Since the refrigeration is all applied to the saturated air, which must have capacity to absorb and remove 72,000 B.t.u. per hour of sensible heat, this value divided by the temperature rise of 28° of the saturated air to 80°, by the specific heat in a pound of air (0.2416) and by 60 minutes will give 177.4 lb. per minute of air saturated at 52° required.

It is also possible to figure the delivery air at 70° in the same manner by dividing 72,000 B.t.u. per hour by 10° temperature difference by specific heat of a pound of air (0.2416) and by 60 minutes to obtain 496.7 lb. of delivery air per minute. 496.7 less 177.4 will equal 319.3 lb. per minute of room air through the by-pass to give the mixture; and the ratio of $\frac{177.4}{319.3} = \frac{10}{18}$.

By Theorem 2* the condition of the air to the washer may be obtained by drawing a straight line through the point D, representing the room condition, and point F representing the outside air condition of 95° dry bulb and 78° wet bulb. Under the terms of the problem there must be 59.1 lbs. per minute of outside air, and the air through the washer is 177.4 lb. as stated above. 177.4 lb. less 59.1 lb. will leave 118.3 lb. of return or room air which must mix with the outside air to pass through the washer. Since the temperature difference between D and F is 15° and the ratio of outside air to return air is $\frac{59.1}{118.3} = \frac{1}{2}$, EF must be twice the distance DE, and the point E falls on the 85° dry bulb line. This is another way of stating the relationship from that given on the graphic solution diagram, but it will be clear that DF $\times$ 118.3 must equal EF $\times$ 177.3 or $\frac{EF}{DF} = \frac{118.3}{177.4} = 2/3$, which is to say, EF equals 2/3 of 15° or 10°.

All of the above results have been expressed in pounds per minute of dry air, the vapor present being additional. Reference to the diagram will indicate the method of converting all of these quantities into cubic feet per minute. For instance, at the point F, a pound of dry air plus the vapor present will occupy 14.35 cubic feet and 14.35 $\times$ 59.1 lb. equals 848 cubic feet per minute.

In the same manner, the cubic feet per pound for point E was determined to be 14.01; for point D, 13.84; for point G, 13.57, and for point C, 13.08.

It will be seen that the mixtures check out on the cubic feet per minute basis as 848 cubic feet per minute of outside air mixed with 1,637 cubic feet per minute of room or return air will total 2,485 cubic feet per minute of air to the washer and 4,419 cubic feet per minute of room air mixed with 2,321 cubic feet per minute of washer air will result in a mixture of 6,740 cubic feet of delivery air.

The refrigeration required may be figured by projecting point E, which represents the air to the washer, to the B.t.u. scale at the bottom of the chart, and obtaining 34.2 B.t.u. per pound; also project point C, which is the saturated air, to the B.t.u. scale, and read 21.3 B.t.u. per pound, which is to say that each pound will have 12.9 B.t.u. removed from it in passing through washer. Since 177.4 pounds per minute of air at condition C passes through the washer and, from each pound, we remove 12.9 B.t.u., the total refrigerating load will be 11.44 tons.

It is, of course, obvious that this problem has been worked out in far greater detail than is usually required. This is done to illustrate the complete information which can be obtained through a graphic solution.

**Theorem No. 1*: A line drawn parallel to any given heat ratio line, through any given point on the chart, will be the locus of all changes of psychrometric condition in the air represented by the given point, when heat is added to, or deducted from, this air in the given ratio of sensible heat to total heat. From this it follows that,

Theorem No. 2: When two samples of air are mixed, the locus of all possible psychrometric conditions for mixtures in varying proportions must be the straight line joining the two points which represent the psychrometric qualities of the two samples, since one sample must lose heat and the other gain heat in identical quantity and ratio of sensible and total; and the two points and the point representing the mixture will all lie on the same heat ratio line parallel.

An exception to this rule occurs when the straight line joining the two points crosses and recrosses the saturation curve. In this case the locus of possible mixtures may follow the saturation curve instead of crossing it and the quality of mixture will be somewhat uncertain, if less than saturated, as a portion of the vapor present may condense out of the mixture and fail to reevaporate.

Both theorems are true because of the system used in constructing the psychrograph, which is in fact built up on coordinate paper with inclined axes, the coordinates being equal divisions of sensible heat in one direction and equal divisions of total heat in the other. This will result in a heat ratio plotting as a straight line.

The original paper, of which this article is an abridgement, contains the proof of these theorems, and will be published in full in the proceedings of the A. S. M. E.

THE

ARCHITECTURAL RECORD

HOUSING AS A NEW INFLUENCE IN ARCHITECTURE

The conviction is general among architects that when recovery sets in the conditions of practice will differ materially from those which existed during the post-war activity. It is now evident that one of the changed conditions has to do with the types of residence common in suburbs and small cities. It is for the benefit of these types that capital is being made available. The new capital—for whatever purpose borrowed, refinancing or new construction, by a municipality, a limited dividend corporation, an operative builder or an individual home owner—will be secured by the same kind of mortgage. This mortgage will be taken by thrift institutions which in the interest of their depositors will be obliged to have it insured by the Federal Mutual Mortgage Insurance Corporation.

The standards of eligibility for insurance set up by the Corporation cover every major factor which, according to experience, bears on stability of real estate values, from the community plan with its physical, social and economic features, including opportunities for employment, to site coverage, design, plan and construction. The standards are in advance of common practice, calculated to abolish traditional abuses and, by eliminating waste, to promote economy of cost.

Having the force and character of legislation, the standards describe results rather than means. For example, they demand sound construction but do not say how sound construction is to be achieved. For practical application they require interpretation and illustration.

The most authentic commentary on those of the standards that affect the practice of architecture is the work done by the Housing Division of the Public Works Administration. Not only does this work comply with mortgage insurance requirements but it suggests that admirably designed, planned and constructed fireproof houses can be privately built for income groups heretofore neglected by operative builders.

A publication of exceptional value to architects is in preparation by the Housing Division. Through the courtesy of Col. Horatio B. Hackett, Director of the Federal Emergency Housing Administration of Public Works, this magazine is privileged to publish a selection of the plans and the substance of the text. A good part of The Record for the current month is therefore given to the forthcoming publication, to be entitled "Sample Plans." The issue as a whole is devoted to a representative showing of houses in the category for which the benefits of the reorganized mortgage market are intended.

HOW THE PWA HOUSING DIVISION FUNCTIONS

By Colonel HORATIO B. HACKETT, Director, Housing Division, Public Works Administration

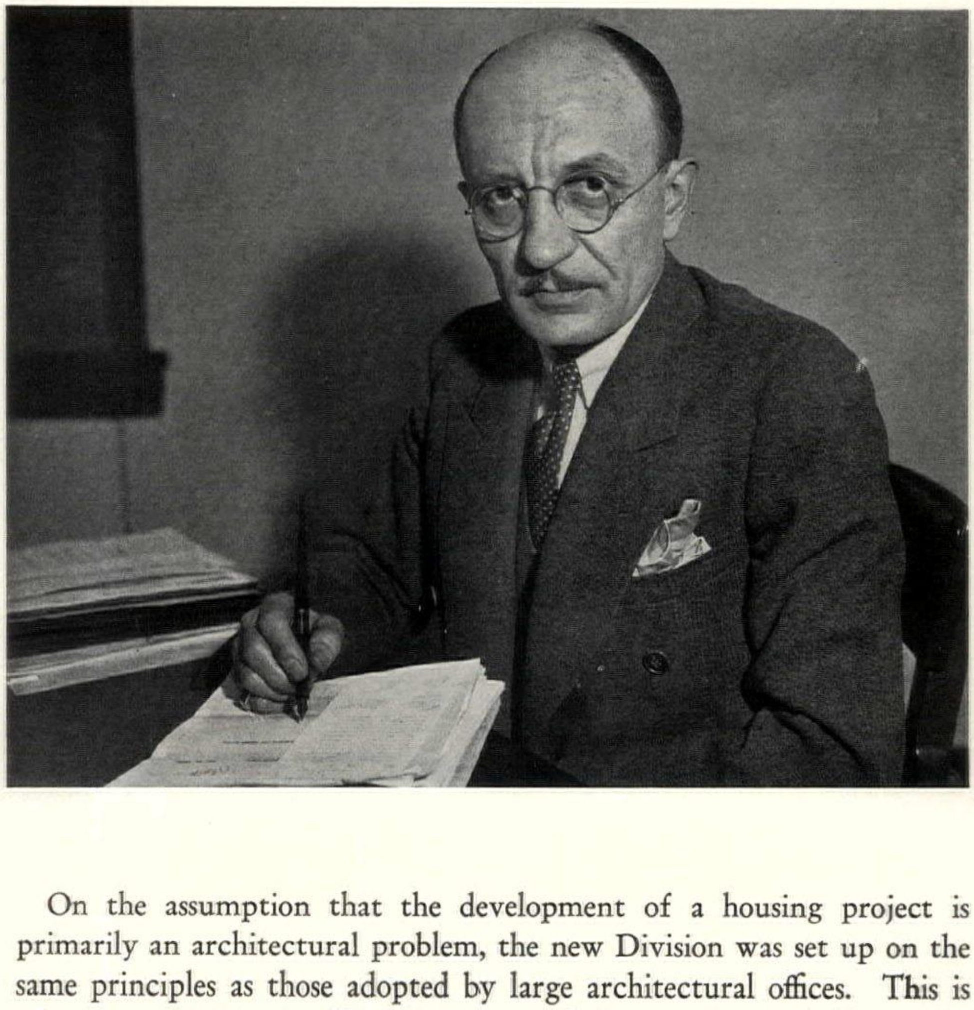
In several cities slums have been torn down through the Public Works Administration's program. In many more plans are being formulated for new housing to replace long dilapidated areas. Contracts are being let for construction of housing projects. Limited dividend corporation developments, made possible by the Housing Division, are receiving tenants. The entire nation has become "slum conscious" and the rehabilitation or removal of slums has become miraculously probable. Stimulated by the opportunities afforded by the PWA's Housing Division, cities are sizing up their housing conditions and turning to the Federal Government for aid.

When originally established the Housing Division was responsible for directing a slum-clearance and low-rent housing program through aid and supervision of limited dividend corporations. The restrictions of this plan were soon apparent. To accomplish extensive work in clearing blighted or slum areas, it was evident that a direct Federal program was required. This meant that the Division would have to be organized to aid and guide cities in assembling pertinent facts concerning their housing needs. A staff of highly qualified architects and engineers would be required to analyze and evaluate proposed construction plans and site developments. It would be necessary to have one branch to assemble land, another to direct construction and a group to care for management. Briefly, the merely supervisory functions of the organization had to be revamped to assume executive responsibilities.

As the Housing Division abandoned the limited dividend set-up and turned to direct Federal initiation, development, and construction of projects, it realized that almost nowhere in the country was there an adequate background of statistical, sociological and technical knowledge to make it possible for architects to plan projects intelligently. Not only were data unavailable in most cities but the authorities did not even know what data were essential. This statement is intended to reflect discredit on no one. That state of affairs was inevitable in a country where, until two years ago, ninety-nine out of a hundred persons had never heard the phrase "low-cost housing."

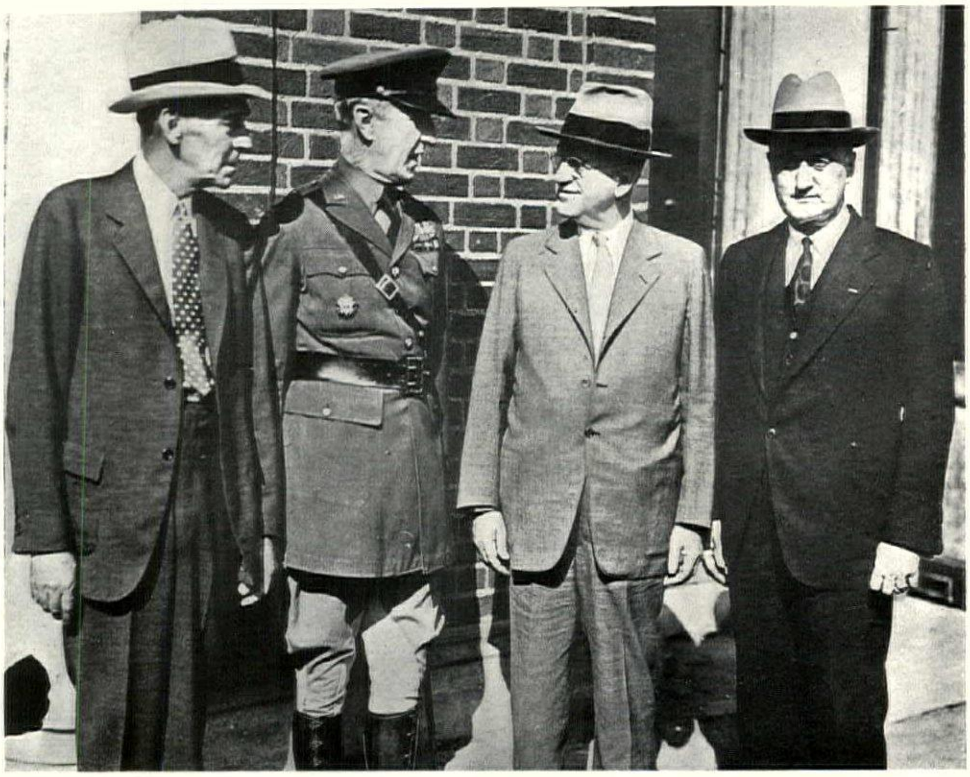
In the reorganization of the Housing Division to handle the Federal program, it was essential that projects be handled expeditiously. We were driving for well conceived projects, but also for speed in production. We wanted to get the program moving and to put men to work.

HORATIO B. HACKETT
Director, Housing Division



A. R. CLAS
Assistant Director

On the assumption that the development of a housing project is primarily an architectural problem, the new Division was set up on the same principles as those adopted by large architectural offices. This is of course a highly simplified statement of the case, but it holds true in general terms. We envisioned an organization to accept applications for



Just before the first Federal project in the Housing Division's program was inaugurated officially. Photo taken at Atlanta, Ga., at ceremonies marking demolition of slum area to be replaced by the Techwood and University projects. Left to right: D. A. Calhoun, local Supervisory Project Manager; Major General George Van Horn Moseley; Secretary of the Interior Ickes, and Col. Horatio B. Hackett, Director of the PWA Housing Division.

projects and to develop them logically with a minimum of time by passage from one branch to another according to the type of work involved.

Thus it was that a Branch of Initiation and Recommendation was set up to handle the first steps in a project. When a city submits an application for a Federal slum-clearance and low-rent housing project to the Division, it is referred to this Branch. The personnel of this group, chiefly architects, checks data submitted, visits the applicant cities, aids with compiling the social and economic factors necessary in analyzing a project, and shapes it up roughly as to size, type and cost.

It sometimes happens that cities in preparing applications for PWA housing undertake searching analysis of their housing situations. When detailed analysis of existing and needed housing is made by applicants, the work of the Initiation and Recommendation Branch is correspondingly lightened. Otherwise the Branch aids in having such investigation completed.

With the necessary data assembled, sites studied and the most promising areas selected, the Branch makes a report on what it considers the most feasible project to meet local conditions. An operating set-up is included. This report is submitted to the Public Works Administrator for approval.

The next step is assembling the land. Following approval of the recommendations the Branch of Land Acquisition swings into action. In the process of acquiring the desired site, this Branch lets local contracts for appraisals, and secures title searches, surveys and options on property parcels involved.

Purchase of the land is supervised and controlled by a representative of the Division, who proceeds to the city where the project is to be erected and handles all matters in connection with the land assembly. Our experience has been that land accumulation, even with the aid of Federal condemnation, requires from four months in smaller cities to seven

Photo shows Secretary Ickes, and the Hon. Ellen Wilkinson, former Labor Member of Parliament and former parliamentary private secretary to the department in charge of English housing, examining a model of a low-cost housing project on exhibit at the National Housing Conference in Washington.

Wide World Photos

months in the larger centers. Condemnation proceedings are usually friendly. The policy of acquiring land through eminent domain is followed only in exceptional cases, principally to terminate any attempted speculation.

As soon as the optioning process indicates that land can be purchased at an appropriate figure, a contract is made with private architects chosen from the city involved. This contract provides for the preparation of a set of plans and specifications, and does not include supervision. While the Division keeps control of this work, free rein is given to architects in the preparation of their plans and specifications.

At this phase the Branch of Plans and Specifications plays its main role. Representatives from this unit, trained in the work of site planning and unit layout, costs, landscaping and design, are sent from Washington to the various cities in which plans are being prepared for the purpose of checking the work as it progresses so that satisfactory drawings may be presented in the shortest possible time.

Architectural contracts are made with a group of architects rather than with an individual so that the work can be distributed as much as possible. Architects are usually selected directly by the Housing Division from its complete and carefully compiled records of qualification. Drawings are made following notification of selection. The fee for architectural service is in accordance with a definite schedule and varies from six per cent on construction amounting to $100,000 to two per cent on $10,000,000. The fee is based on an expected repetition of units, with no unusual ground conditions.

After transfer of land title to the Federal Government, the Branch of Construction contracts for demolition of existing buildings. When project plans are signed and the area razed, this Branch has charge of awarding a general construction contract and supervising its execution. All contracts are subject to PWA regulations.

The Management Branch begins its most active work simultaneously with plans for demolition. Field employees of this Branch supervise the relocation of tenants and participate in surveys affecting tenancy for the new housing. The management of these projects will entail more than mere responsibility of building management. For this reason the job categories of this Branch provide for persons trained in accounting, operating, renting, general supervision, recreation and education.

In addition to the five major branches mentioned, there is an Administrative Branch which carries out the administrative functions of the housing organization.

There is also the Legal Branch which works closely with the Land Acquisition Branch in matters of title search, condemnation and other steps of land accumulation, and cooperates with all branches on contractual relationships. During recent months the Legal Branch has been particularly active in responding to requests from state and municipal governments for assistance in drafting housing legislation. Along this line a model housing act has been drafted by the legal staff.

PREPARATION OF SAMPLE PLANS

As a means of expediting its work, the Housing Division established architectural guides or "sample" plans which are discussed in the following pages of this issue of The Architectural Record.

The plans do not seek to impose standardization. Rather they incorporate many principles which we feel should govern construction of low-rent housing, and they greatly facilitate laying out a project. They represent almost every conceivable situation confronting architectural consideration, and are submitted to architects as suggestions, with the invitation to adapt the fundamental principles to their particular local problem.

The sample plans employ T, ribbon, cross, gallery and other types of layout. Each unit contains a specified arrangement of apartments, with a room layout incorporating standard minimum dimensions.

It is a simple matter to prepare small pine blocks on a 32nd-inch scale, representing each building unit. By placing these on a 32nd-inch scale drawing of the site, we are able quickly, in the same manner as a child plays with blocks, to arrive at desirable arrangement of buildings. With this method it is possible to devise a satisfactory site layout in a few hours and at the same time eliminate expense in drawing plans.

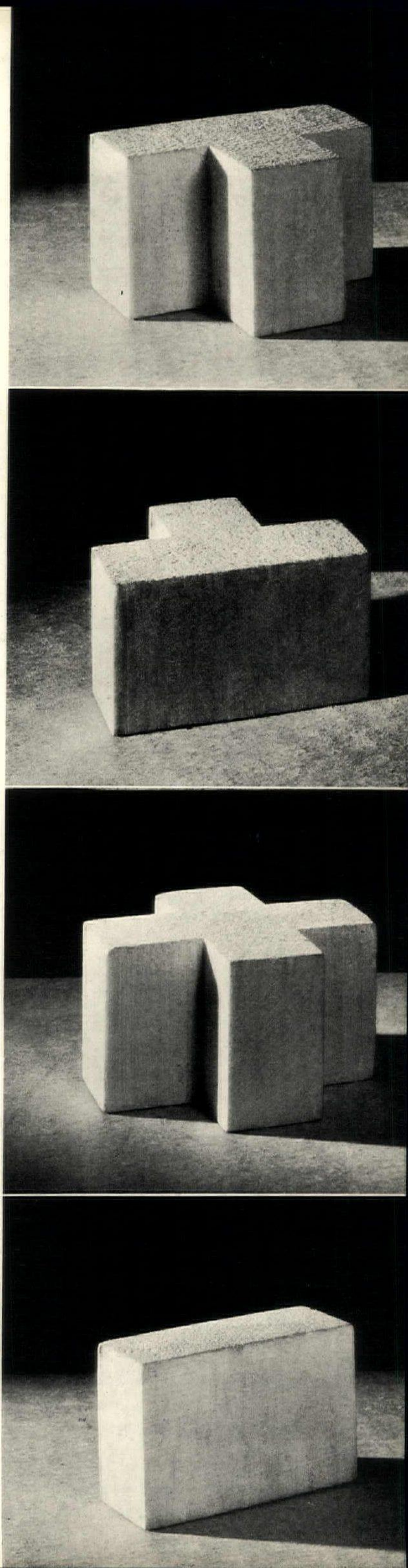
With this equipment an architect, or his group, can come to Washington and in a few days lay out a site or plot plan that will meet with the approval of the Housing Division, and save many days of useless drawing.

Study of the plans reproduced in this issue will illustrate the principles I am discussing. It is not necessary for the local architect to spend months in research before submitting his preliminary plans. With the means at hand to solve his layout problem and with a guide to the treatment of the living units, he should be able to develop his plans promptly without the excessive cost of preliminary work.

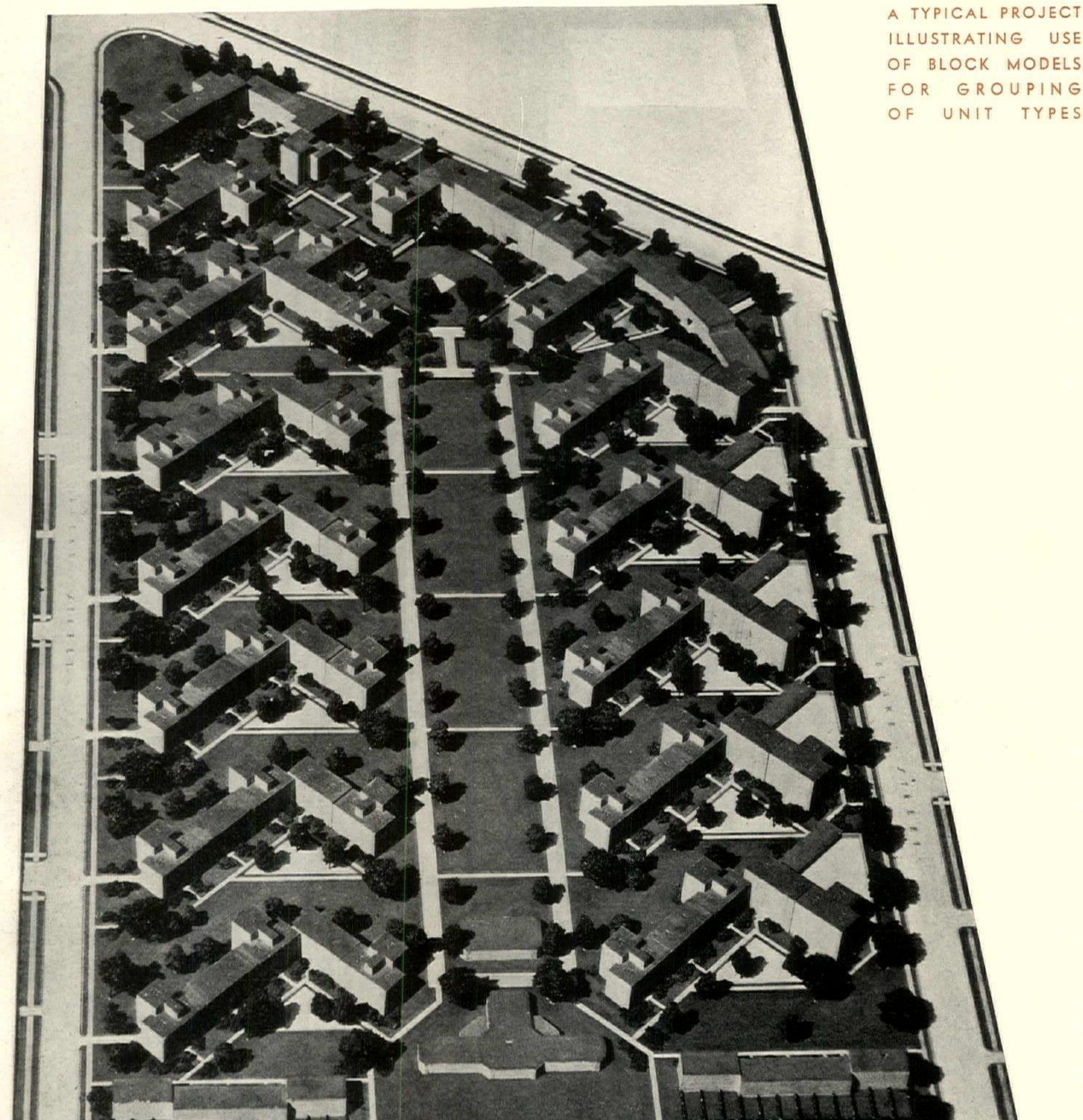
Should these sample plans open new avenues of approach in the minds of architects, and if they will aid them in formulating their own ideas, I feel that the time involved in their preparation has been well spent.

SAMPLE PLANS

PREPARED BY HOUSING DIVISION PUBLIC WORKS ADMINISTRATION FOR LOW-RENT HOUSING PROJECTS



A TYPICAL PROJECT ILLUSTRATING USE OF BLOCK MODELS FOR GROUPING OF UNIT TYPES



Photograph by PWA Housing Division

UNIT TYPES OF PLANS FOR LOW-RENT HOUSING PROJECTS

Small wood blocks, dimensioned to scale, are suggested by the Housing Division for use in arranging and massing the unit types of plans presented in the following pages. The general group layout will vary with local problems since the relationship of the assembled units is as much a study of particular community needs as of site conditions. For this reason all plans are presented impartially by the Housing Division, and the final choice is left to the architect and others familiar with specific local requirements. The computations and constructive suggestions given with each plan are intended to show comparative features and to assist the architect in making his selections.

In many projects it may be found advisable to combine the various types in order both to increase the rentability and to add to the architectural composition of the plot plan. Additional facilities, such as community buildings, stores and garages, must necessarily be designed separately by the architect to suit the special needs of the group.

It should be noted that the minimum desirable sizes shown in the sample plans might be increased efficiently and would thereby add to the rentability. These plans, in practically every case, were developed to cover minimum requirements only. It should also be observed that no plans can possibly be decreased without seriously affecting rentability.

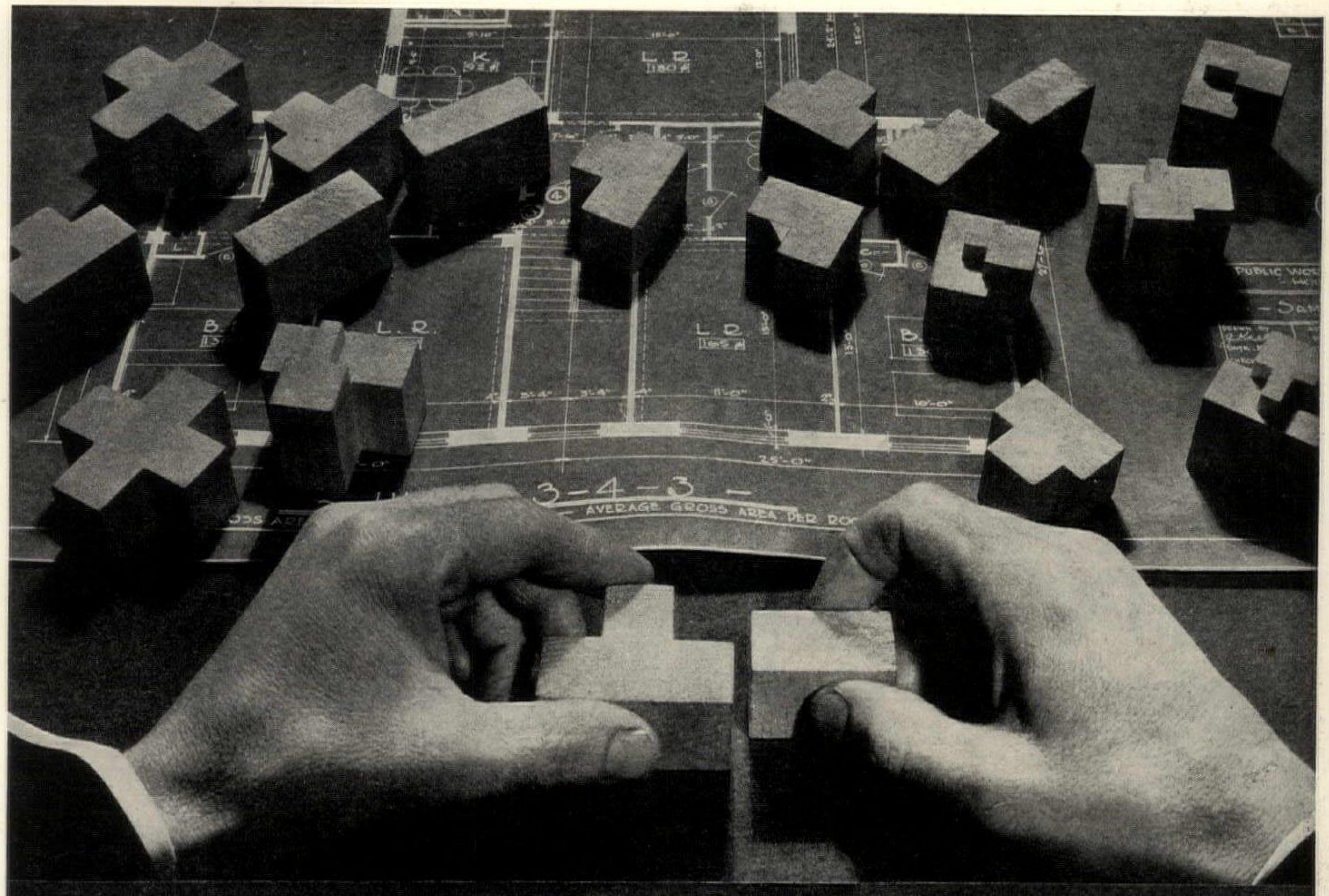
(1) APARTMENT HOUSE TYPE:
Architectural variations — T-plans, ribbon plans, cross plans, balcony plans, gallery plans.
Construction variations—Center column plans, off-center plans.

(2) FLAT HOUSE PLAN TYPE:
Ribbon plans, balcony plans.

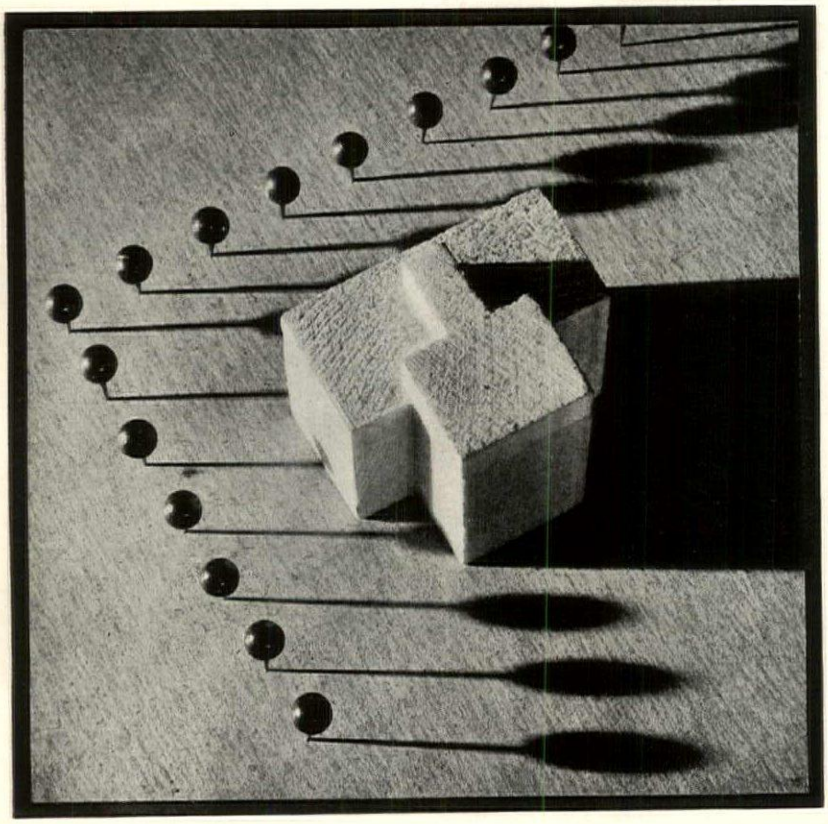
(3) ROW HOUSE PLAN TYPE:
Ribbon plans, balcony plans.

(4) GALLERY PLAN TYPE.

(5) COMBINATION FLAT AND ROW HOUSE TYPE:
Three-story building combining (2) and (3).

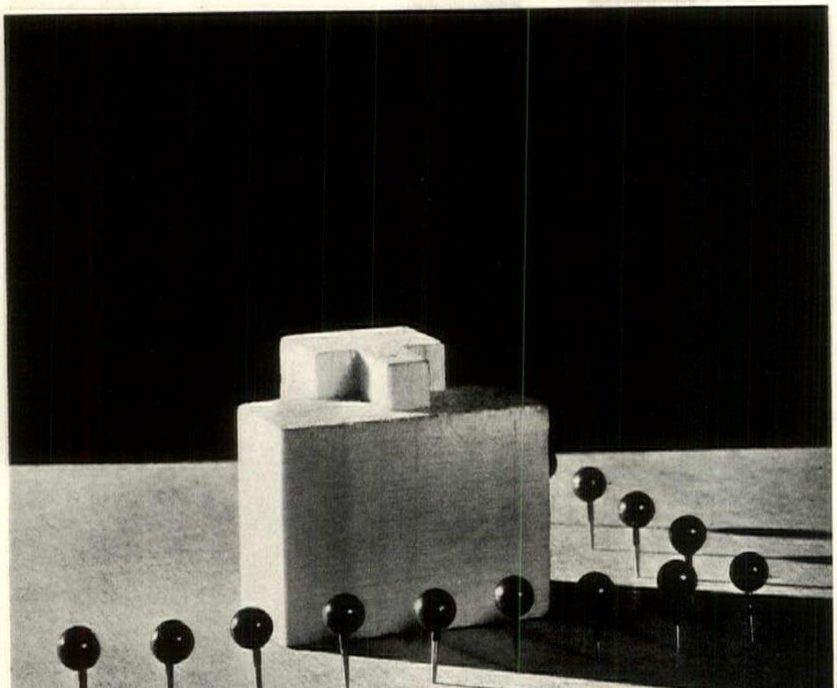


Photograph by F. S. Lincoln



T-PLANS

Contrary to the general belief that this type of plan should be used only where a break occurs in a series of straight ribbon plans, it has been found that the T-plan is most adaptable for ribbon use. In apartment house design the T-plan not only reduces stair and incinerator costs but it also lowers the amount of exterior wall perimeter expressed in terms of lineal feet per room. Some critics may say that the deep stairwell characteristic of the T-plan is waste space; to offset this argument, careful checking will indicate that the actual depth of the stairhall is hardly any greater than is found ordinarily.



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ON-CENTER COLUMN VS. OFF-CENTER COLUMN: The placing of the line of columns between the two exterior walls has long been a subject of argument among architects. There are advantageous factors as well as disadvantages attached to each arrangement, and for that reason only types are presented. Actual examples have proven no appreciable difference exists in construction cost between the two methods, although the greater plan possibilities of the off-center column plans should be noted.

CHIEF CHARACTERISTICS OF UNIT PLANS:

Incinerator for each unit.

Juxtaposition of kitchen and bath in each suite.

Bathrooms uniformly of standardized dimensions.

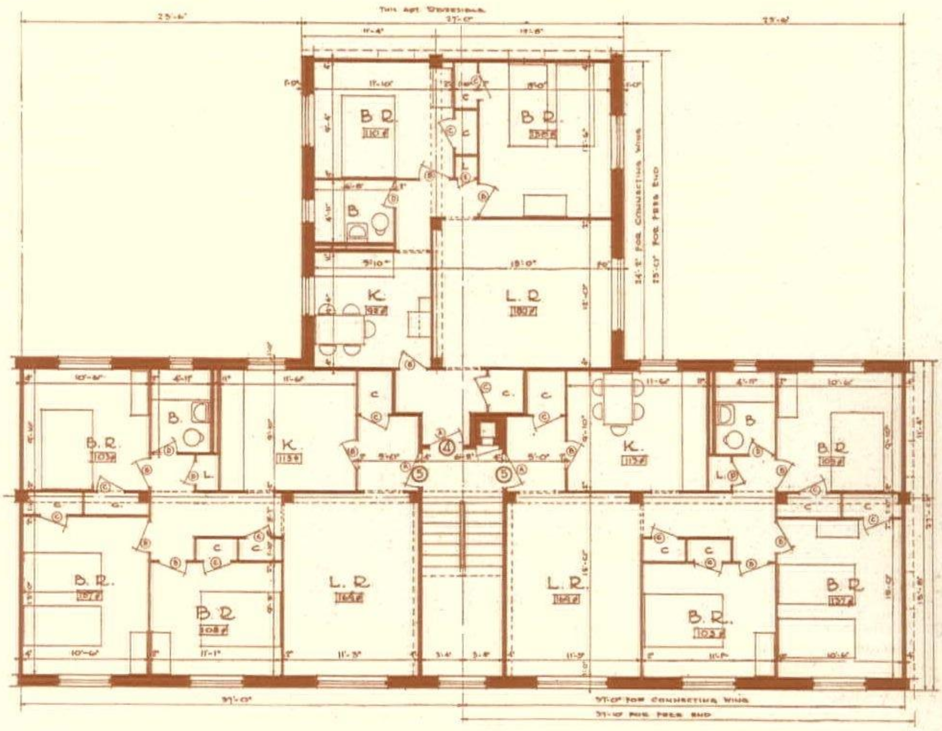
Kitchens designed for dining space.

Living rooms designed for possible use as bedrooms.

Minimum space in hallways.

Passage from any room to front door without disturbing privacy of other rooms.

Standardized span of 27'-0" from outside wall to outside wall.

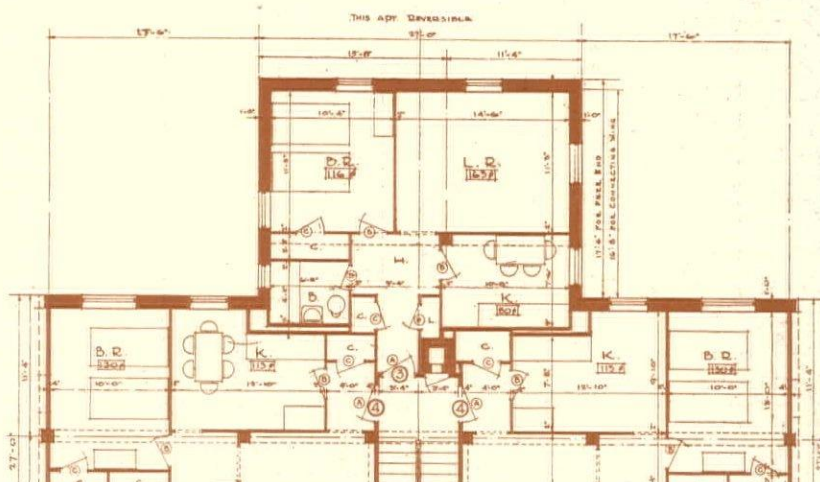


UNIT 5-4-5

TOTAL GROSS AREA PER UNIT: 2650 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 189 SQUARE FEET

OFF-CENTER COLUMNS



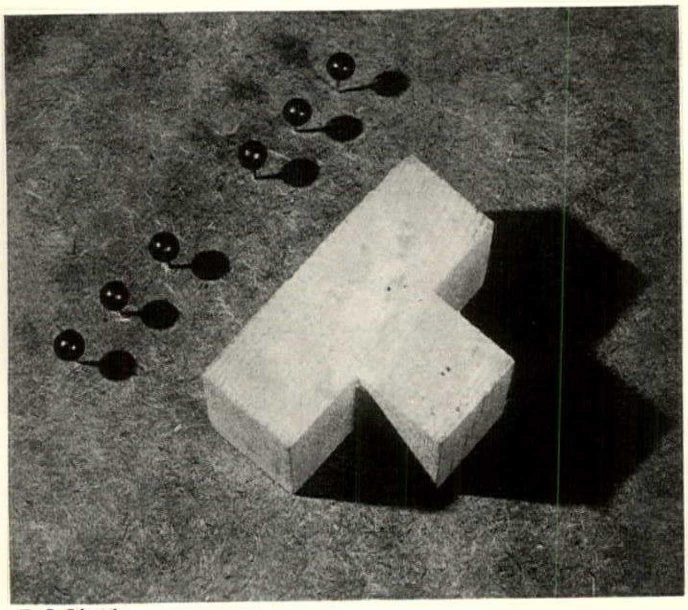
UNIT 4-3-4

TOTAL GROSS AREA PER UNIT: 2146 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 195 SQUARE FEET

OFF-CENTER COLUMNS

T-PLANS CONTINUED



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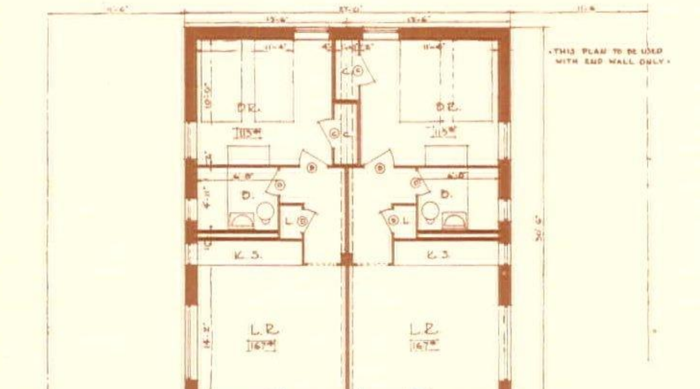
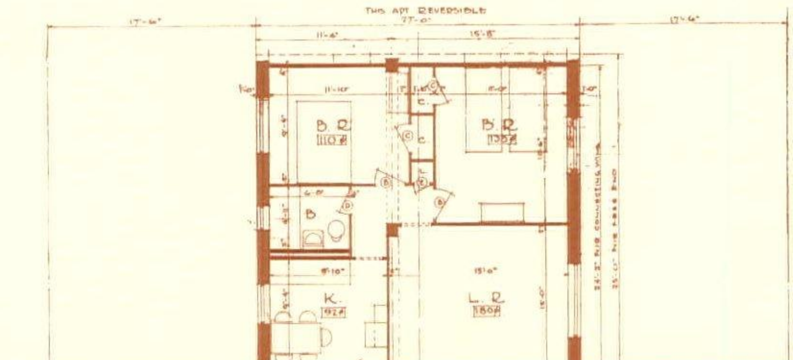
ALL PLANS WITH COLUMNS OFF-CENTER



UNIT 3-2s-2s-3

TOTAL GROSS AREA PER UNIT: 2174 SQUARE FEET

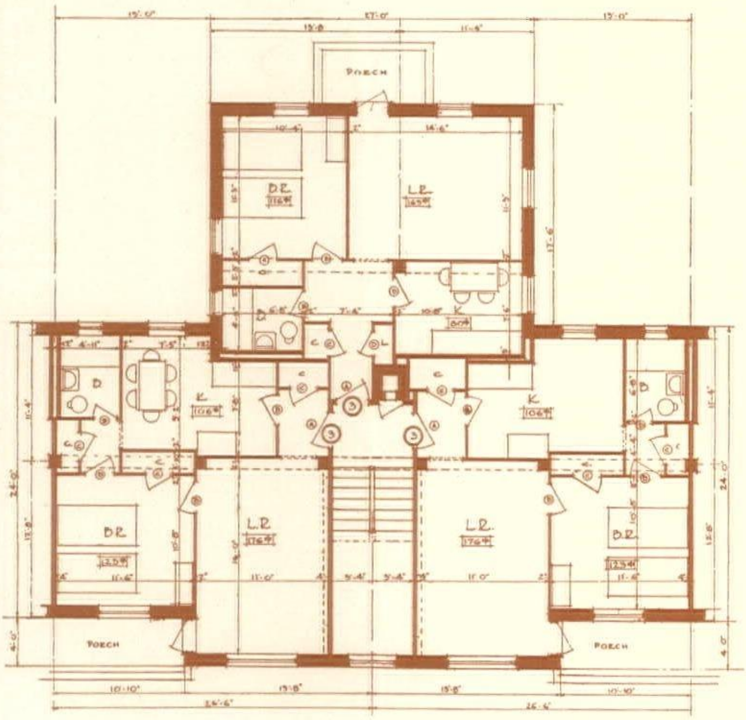
AVERAGE GROSS AREA PER ROOM: 217 SQUARE FEET



UNIT 4-4-4

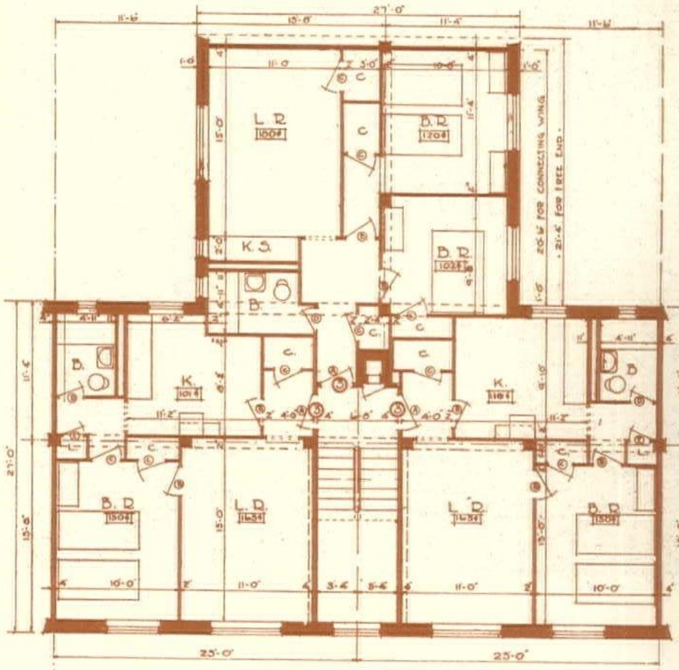
TOTAL GROSS AREA PER UNIT: 2327 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 194 SQUARE FEET



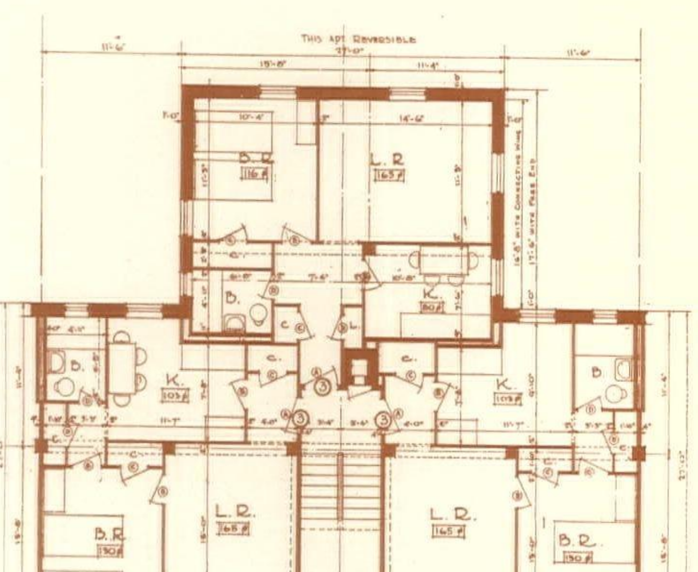
UNIT 3-3-3 (BALCONY)

TOTAL GROSS AREA PER UNIT: 1797 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 200 SQUARE FEET
(PORCHES NOT INCLUDED)



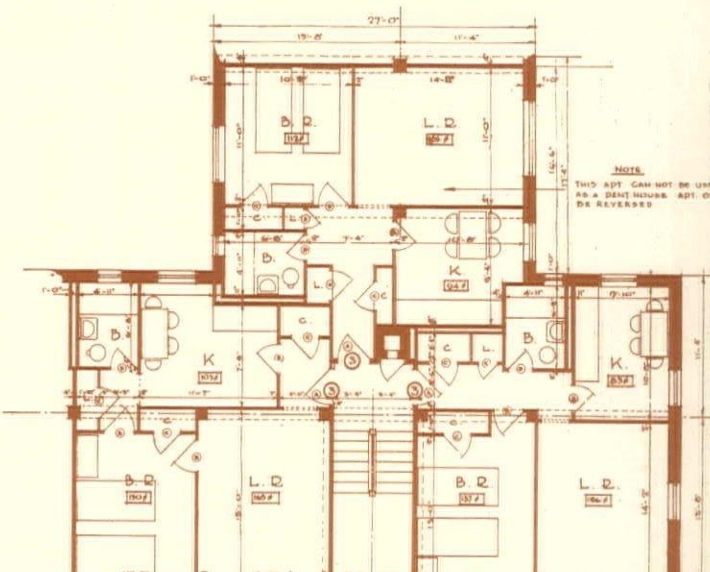
UNIT 3-3s-3

TOTAL GROSS AREA PER UNIT: 1904 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 211 SQUARE FEET



UNIT 3-3-3

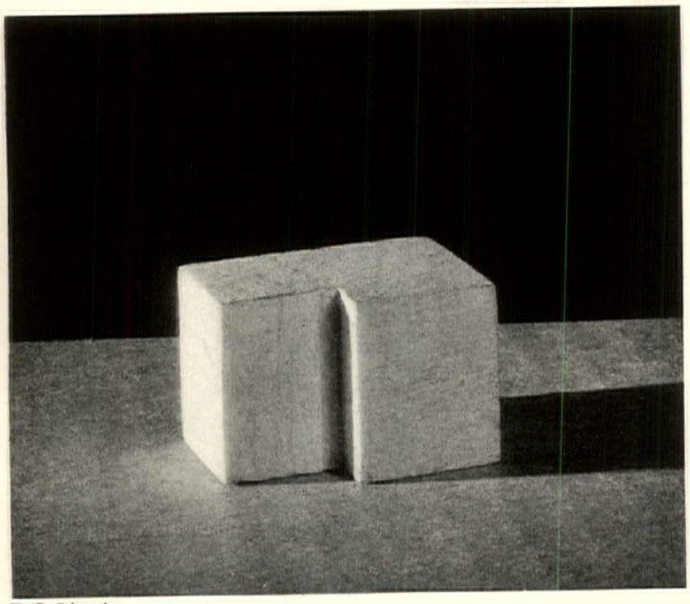
TOTAL GROSS AREA PER UNIT: 1822 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 202 SQUARE FEET



UNIT 3-3-3-"A"

TOTAL GROSS AREA PER UNIT: 1818 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 202 SQUARE FEET

L-PLANS



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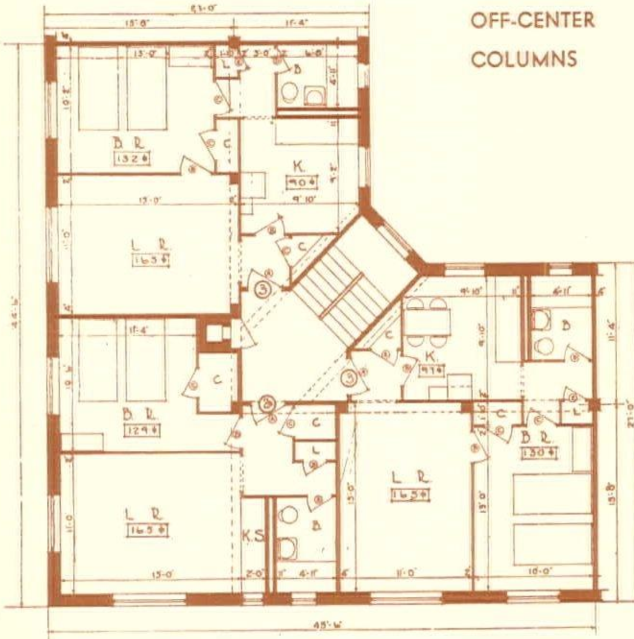
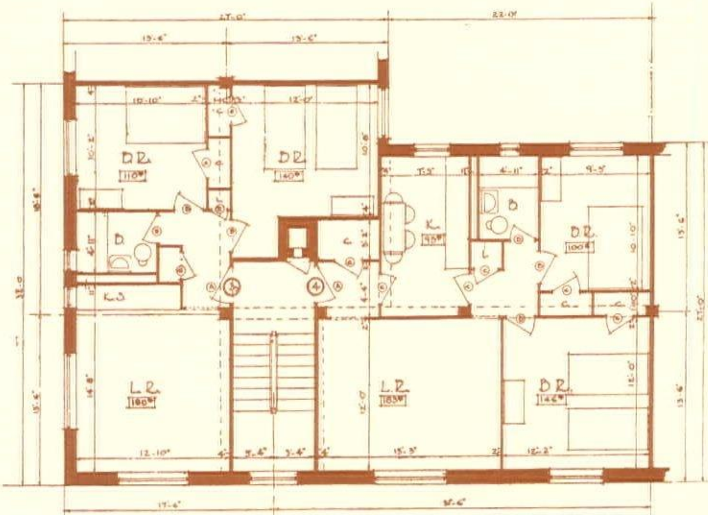


OFF-CENTER COLUMNS

CORNER UNIT 3-2s-3

TOTAL GROSS AREA PER UNIT: 1711 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 214 SQUARE FEET

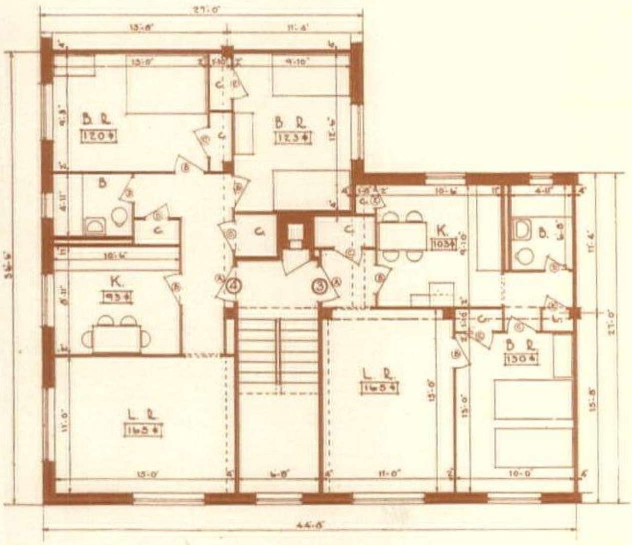


CENTER COLUMNS

CORNER UNIT 3s-4

TOTAL GROSS AREA PER UNIT: 1458 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 208 SQUARE FEET

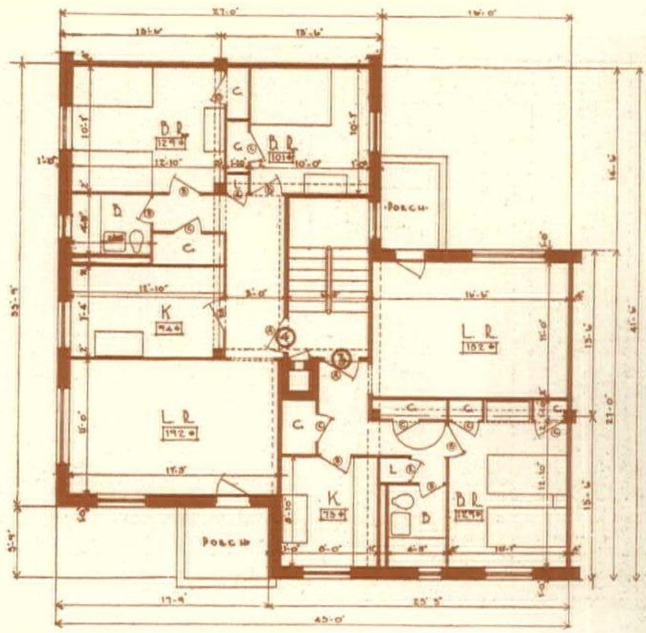


CORNER UNIT 3-4

TOTAL GROSS AREA PER UNIT: 1462 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 208 SQUARE FEET

OFF-CENTER COLUMNS

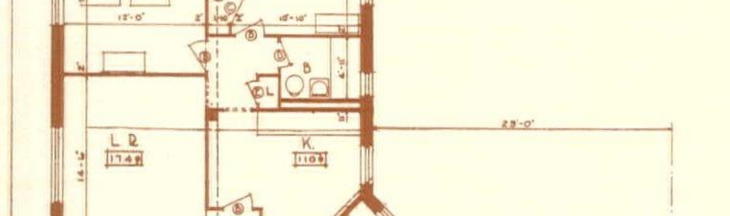


CORNER UNIT 3-4

TOTAL GROSS AREA PER UNIT: 1440 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 205 SQUARE FEET

CENTER COLUMNS



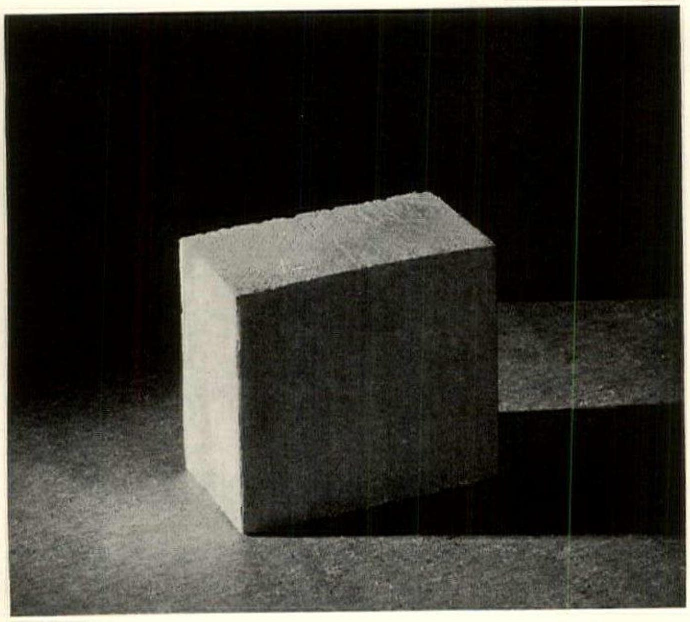
CENTER COLUMNS

CORNER UNIT 4-2s-4

TOTAL GROSS AREA PER UNIT: 2114 SQUARE FEET

AVERAGE GROSS AREA PER ROOM: 212 SQUARE FEET

RIBBON PLANS



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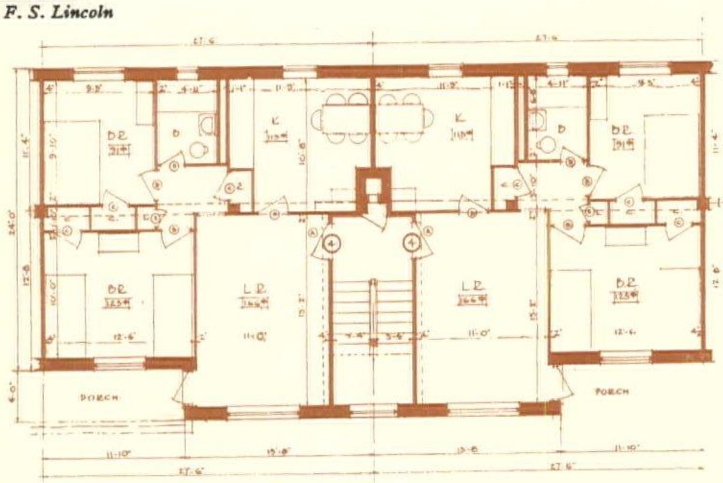
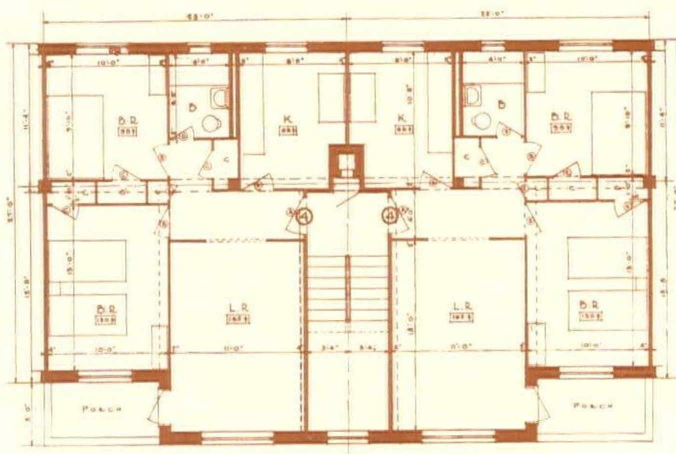


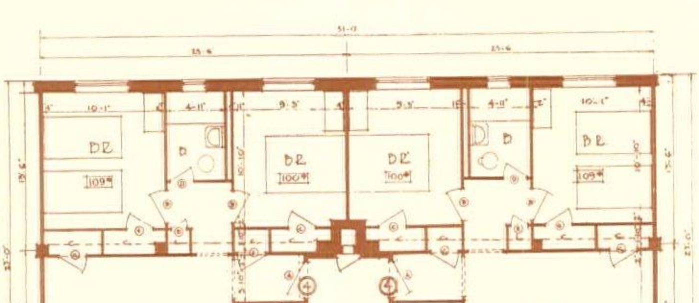
UNIT 4-4 (BALCONY)

TOTAL GROSS AREA PER UNIT: 1445 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 181 SQUARE FEET
PORCHES NOT INCLUDED—OFF-CENTER COLUMNS



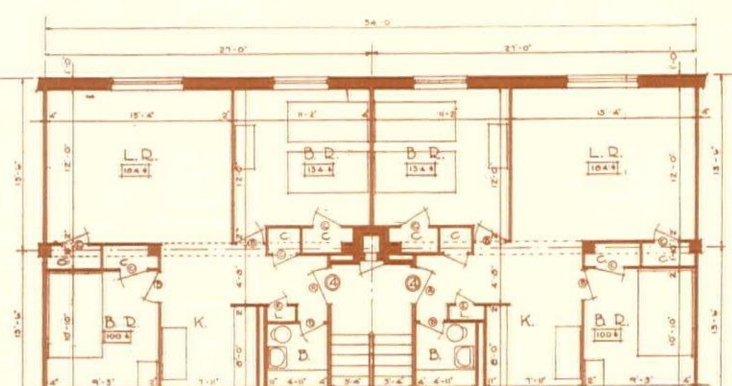
UNIT 4-4 (BALCONY)

TOTAL GROSS AREA PER UNIT: 1506 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 188 SQUARE FEET
PORCHES NOT INCLUDED—OFF-CENTER COLUMNS



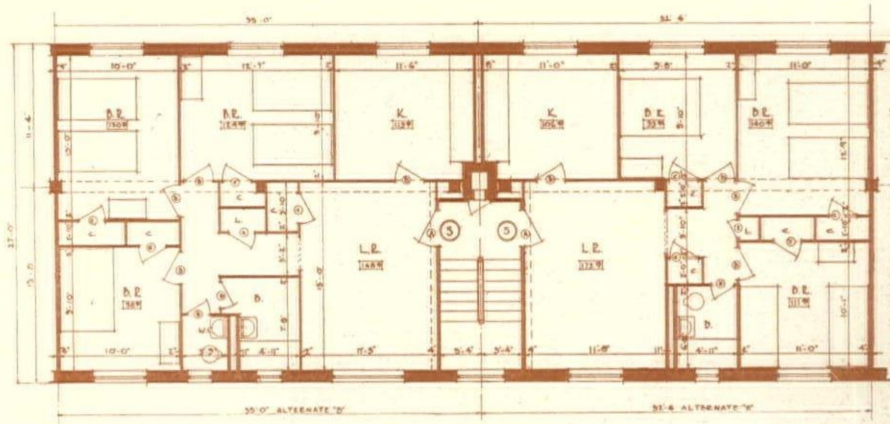
UNIT 3s-3s (BALCONY)

TOTAL GROSS AREA PER UNIT: 1425 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 237 SQUARE FEET
PORCHES NOT INCLUDED—CENTER COLUMNS



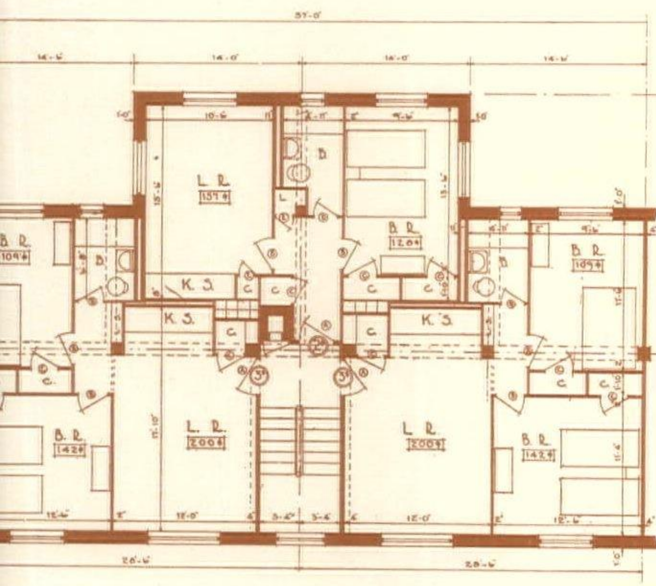
UNIT 4-4 (BALCONY)

TOTAL GROSS AREA PER UNIT: 1568 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 196 SQUARE FEET
PORCHES NOT INCLUDED—CENTER COLUMNS



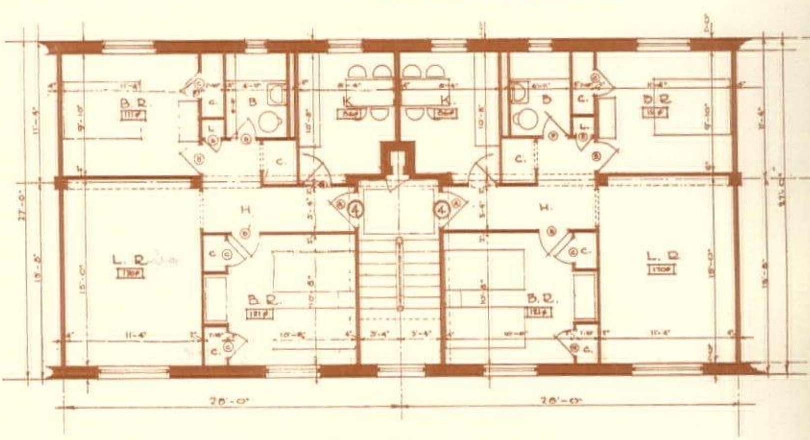
UNIT 5-5

TOTAL GROSS AREA PER UNIT:
945 SQUARE FEET (35'0" UNIT)
878 SQUARE FEET (32'6" UNIT)
AVERAGE GROSS AREA PER ROOM:
189 SQUARE FEET (35'0" UNIT)
175 SQUARE FEET (32'6" UNIT)
OFF-CENTER COLUMNS



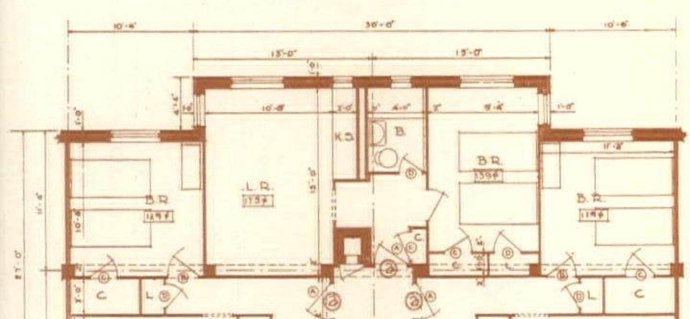
UNIT 3s-2s-3s

TOTAL GROSS AREA PER UNIT: 1781 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 223 SQUARE FEET
OFF-CENTER COLUMNS



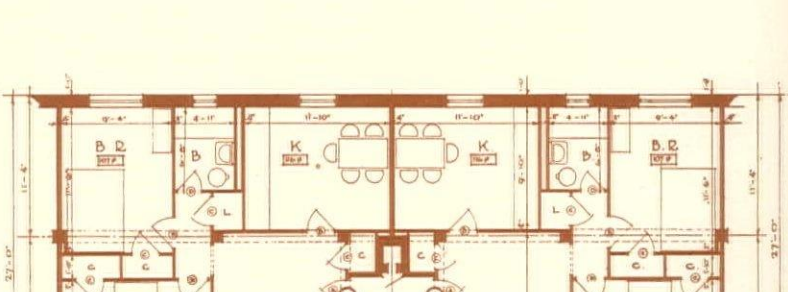
UNIT 4-4-"C"

TOTAL GROSS AREA PER UNIT: 1512 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 189 SQUARE FEET
OFF-CENTER COLUMNS



UNIT 2s-2s-2s

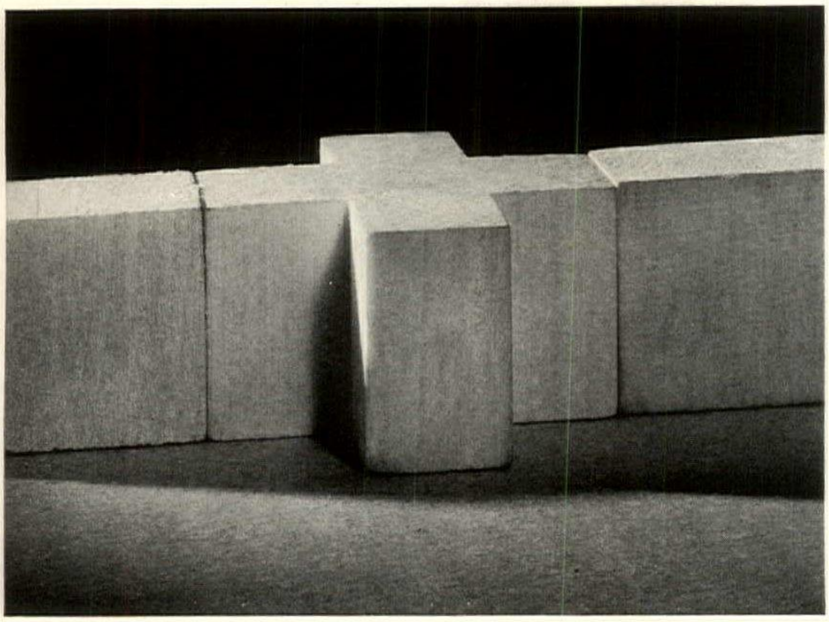
TOTAL GROSS AREA PER UNIT: 1507 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 251 SQUARE FEET
OFF-CENTER COLUMNS



UNIT 4-4-"B"

TOTAL GROSS AREA PER UNIT: 1494 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 187 SQUARE FEET
OFF-CENTER COLUMNS

CROSS PLANS



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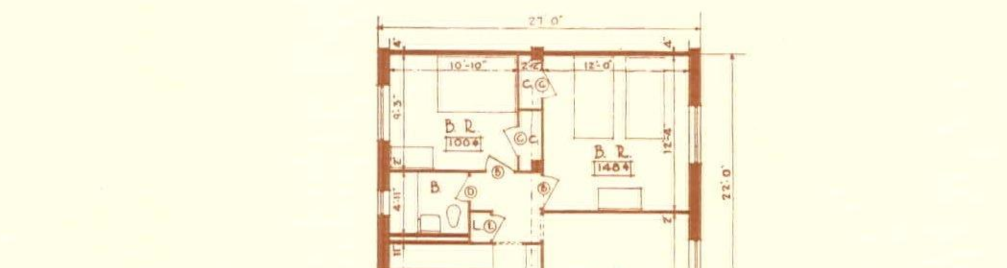
UNIT 4-4-4-4

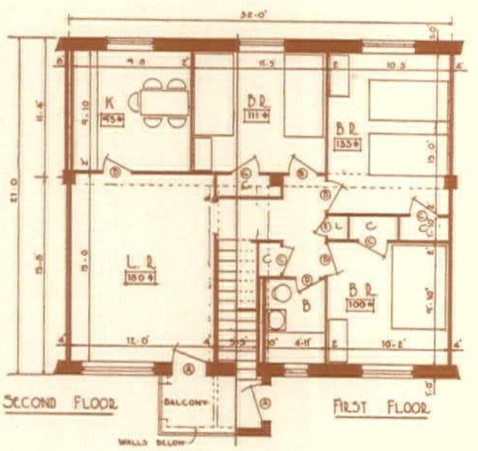


CENTER COLUMNS

TOTAL GROSS AREA PER UNIT: 3267 SQUARE FEET

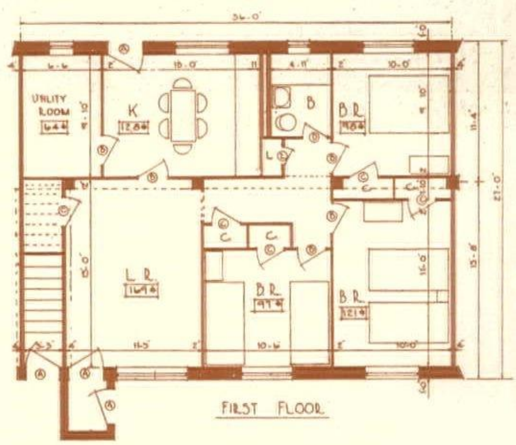
AVERAGE GROSS AREA PER ROOM: 204 SQUARE FEET

TWO-STORY FLATS



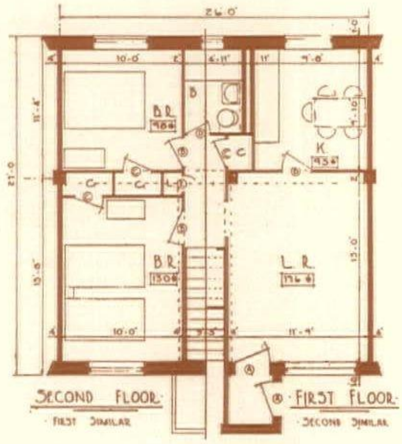
FIVE-ROOM FLAT

TOTAL GROSS AREA PER UNIT: 886 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 177 SQUARE FEET



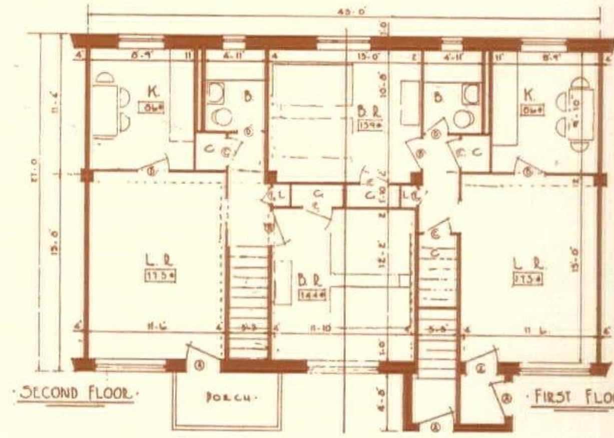
FIVE-ROOM FLAT WITH UTILITY ROOM

TOTAL GROSS AREA PER UNIT: 996 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 199 SQUARE FEET



FOUR-ROOM FLAT

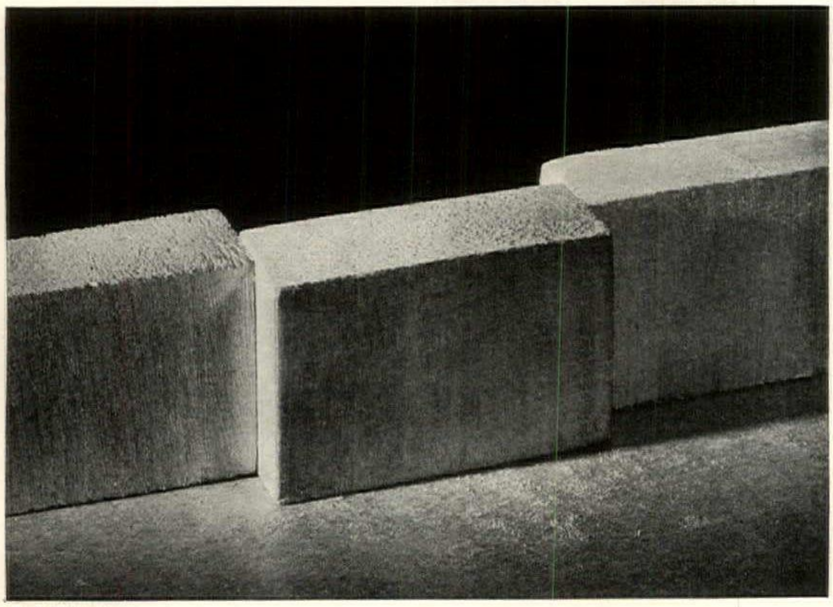
TOTAL GROSS AREA PER UNIT: 729 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 182 SQUARE FEET



INTERLOCKING THREE-ROOM FLATS

TOTAL GROSS AREA PER UNIT: 1188 SQUARE FEET
AVERAGE GROSS AREA PER ROOM: 198 SQUARE FEET

ROW HOUSES



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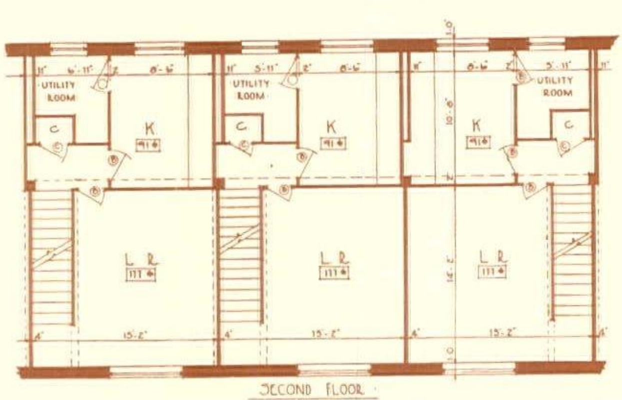
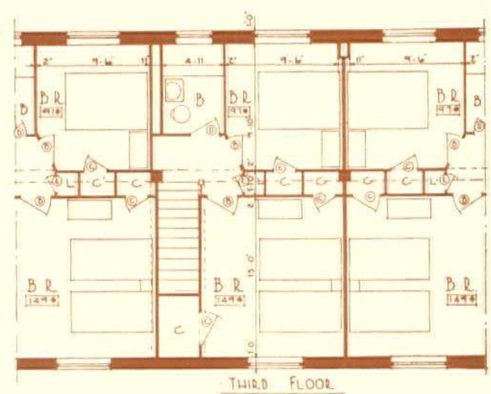
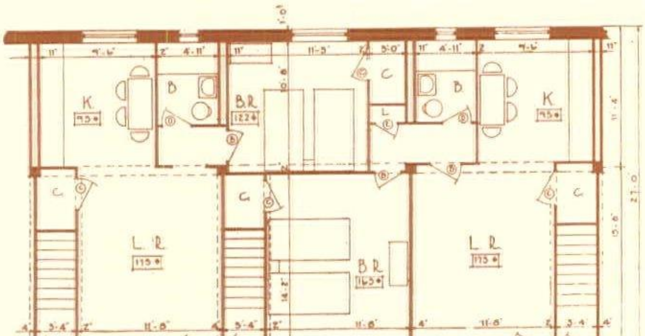


SECOND FLOOR



THIRD FLOOR

3- AND 4-ROOM HOUSES IN THREE STORIES



FIRST FLOOR

TOTAL GROSS AREA (3 FLOORS)
PER UNIT: 3767 SQUARE FEET

AVERAGE GROSS AREA
PER ROOM: 209 SQUARE FEET

(INTERLOCKING 3-ROOM HOUSES
CAN BE USED ON FIRST FLOOR)

CHARACTERISTICS OF EACH TYPE

(1) **Apartment house type:** Sometimes referred to as the multi-story dwelling. Usually three and four stories in height depending on local conditions. Preferable on expensive land because of room density per acre. Desirable where tenants seek complete services and communal provisions. Individual garden space lacking. Preferred by many tenants because responsibility ceases at door of apartment. Possible savings in construction costs because of repetition of units. More desirable for small units than for larger ones. Lack of soundproofing.

(2) **Flat house plan type:** Usually two stories in height. Sometimes very efficient on matters of maintenance. Construction cost comparable to apartment house type. Desirable in communities where tenants enjoy some garden and lawn facilities.

(3) **Row house plan type:** Desirable where tenants seek gardening and lawn facilities; the more private yard, the less cost for general landscape upkeep. Most privacy. Most expensive kind of housing, figured in terms of original construction cost per room, but lowest in maintenance costs. Either one or two stories in height. Basement a serious problem to be considered carefully. This type of building most fitting on relatively inexpensive land. Low density in rooms per acre. Privacy of sleeping quarters on the second floor an advantage.

(4) **Gallery plan type:** Sometimes affected by local building code regulations. Generally used as a special feature in connection with a developed plot plan. Considered characteristic of warm climate. Living and bedrooms on opposite sides of gallery.

(5) **Combination flat and row house type:** Usually three stories in height with flat on first floor and row house on upper two floors. For use in communities where a certain amount of privacy is demanded by tenants. Most efficient unit for maintenance costs. Desirable where land costs are fairly inexpensive. High density per acre.

4-ROOM ROW HOUSE

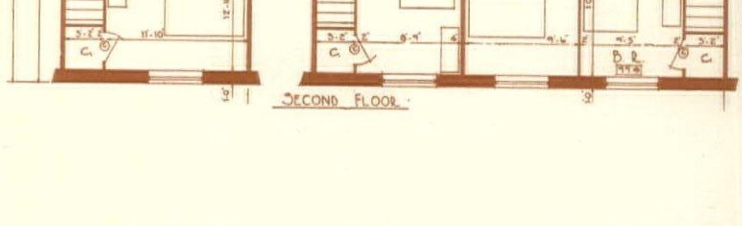
TOTAL GROSS AREA
PER UNIT: 837 SQUARE FEET

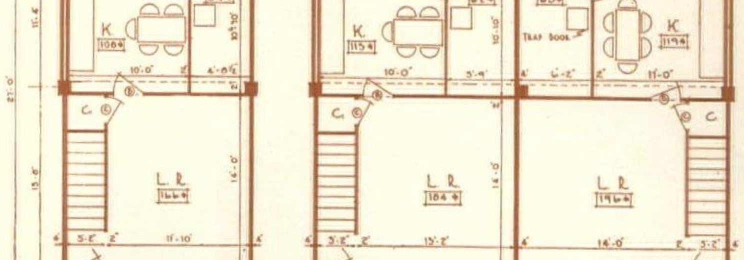
AVERAGE GROSS AREA
PER ROOM: 209 SQUARE FEET

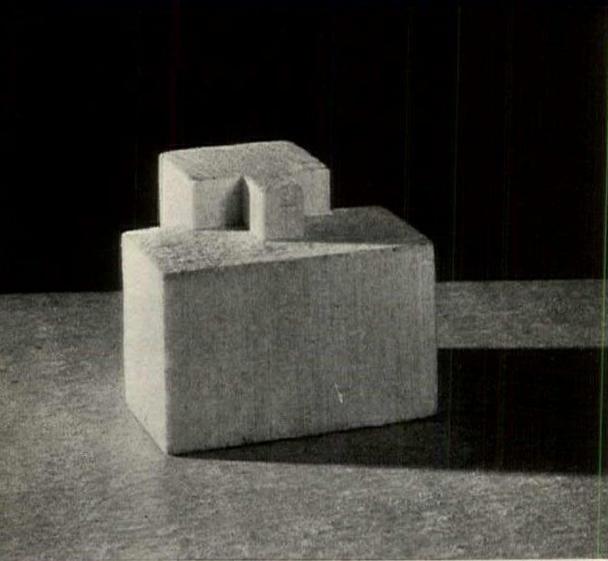
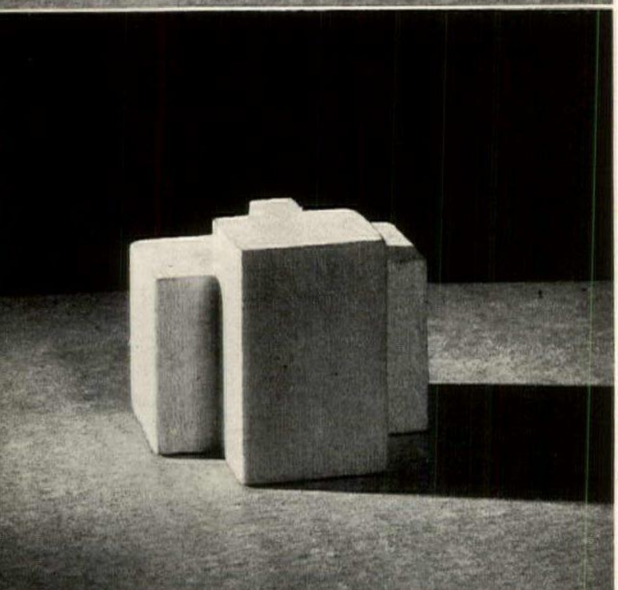
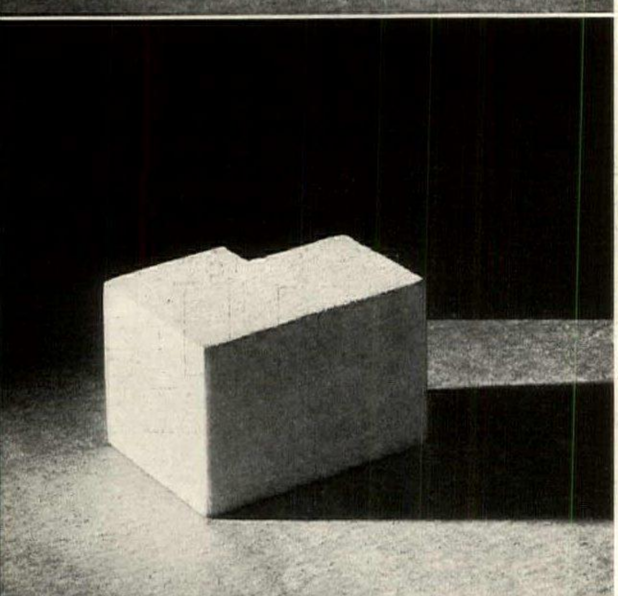
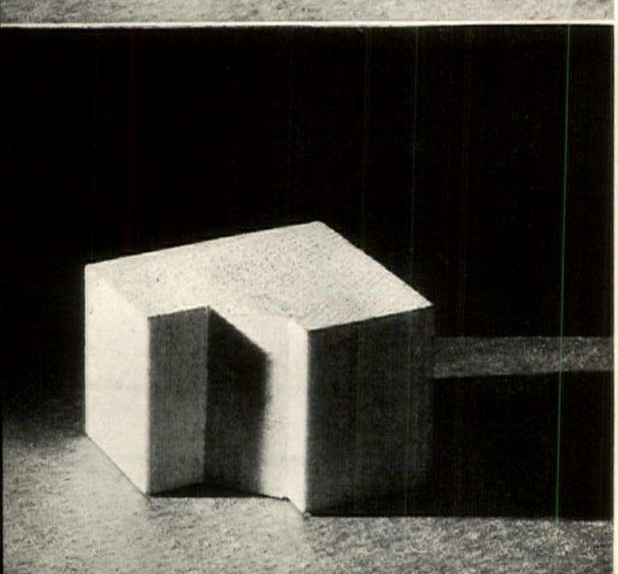
4-5-ROOM ROW HOUSE

TOTAL GROSS AREA
PER UNIT: 1890 SQUARE FEET

AVERAGE GROSS AREA
PER ROOM: 210 SQUARE FEET





APARTMENT HOUSE PLANNING REQUIREMENTS

INCLUDING BASIC DIMENSIONS

The accompanying check list of requirements for apartment house planning was prepared in answer to a demand for a listing of the essentials of plan arrangement and equipment. It is intended as a supplement to the studies undertaken by the Housing Division of the Public Works Administration.

Low-cost housing, if attained under normal conditions of professional practice, demands economy. Lowering the cost of housing need not be attained by the substitution of cheapness but by consideration of approved planning and construction methods that eliminate waste, reduce the necessity for repair to a minimum, and with recognition of efficiency, convenience and pleasantness.

NEIGHBORHOOD LOCATION

EASY ACCESS TO SCHOOLS, CHURCHES, SHOPPING CENTERS AND TO PLACES OF ENTERTAINMENT.

REASONABLE DISTANCE FROM PLACE OF EMPLOYMENT.

TRANSPORT FACILITIES TO PLACE OF EMPLOYMENT.

NEIGHBORHOOD STORES IN CLOSE PROXIMITY AND IN A ZONED LOCALITY.

For each one thousand people there is needed about 300 feet of business frontage. This includes central shopping district and neighborhood store area.

APARTMENT OR HOUSE LOCATION PRIMARILY RESIDENTIAL, PROTECTED BY ZONING REGULATION.

It has been found generally necessary that zoning regulations be supplemented by deed restrictions. Deed restrictions should be carefully drawn and should apply to every lot, whether sold or unsold. (See Zoning Regulations, U. S. Department of Commerce.)

RESIDENTIAL LOTS SHOULD BE NOT LESS THAN 85 FEET IN DEPTH.
ADJACENT PLAYGROUNDS FOR CHILDREN AND ADULTS. PARK WITHIN 5 MINUTE WALK.

TO SECURE MAXIMUM EFFICIENCY, NEIGHBORHOOD UNITS SHOULD NOT EXCEED 160 ACRES IN AREA NOR BE MUCH LESS THAN 100 ACRES.

PREFERRED STREETS RUN NORTHEAST BY SOUTHWEST AND SOUTHEAST BY NORTHWEST TO ATTAIN UTMOST ADVANTAGE OF SUNSHINE AND NO ROOMS OF DUE NORTH EXPOSURE.

ROOF TERRACE REACHED BY SUN'S RAYS BUT PROTECTED FROM COLD WINDS.

To encourage children, elderly people and the sick to get out-of-doors on sunny days in winter.

STREET TREES, GRASS STRIPS AND PARKS WITHIN THE HOUSING GROUP.

GROUNDS LANDSCAPED.

LOCATION ON MINOR SIDE STREET.

NO HOUSING SHOULD BE UNDULY NEAR RAILROAD TRACKS, AVIATION FIELDS, PUBLIC GARAGES, MARSHES OR NOXIOUS INDUSTRIES.

ELEMENTARY SCHOOLS WITHIN A RADIUS OF NOT MORE THAN 1/4 MILE.

STEEP SLOPES SHOULD BE AVOIDED AS ADDING UNDULY TO THE COST OF BUILDING AND DEVELOPMENT.

EXAMINE SUBSOIL TO DISCOVER EFFECT ON DRAINAGE, LIABILITY TO DAMPNESS OF FOUNDATIONS.

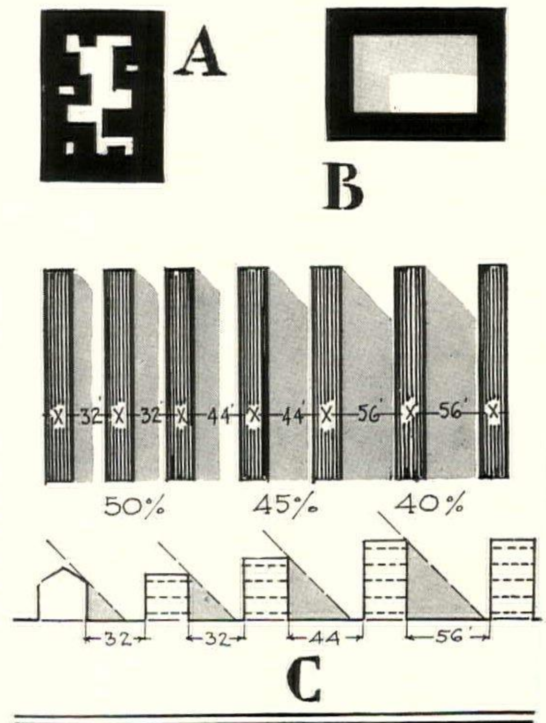
EXPOSURE TO PREVAILING WINDS OF SUMMER AND WINTER, CONSIDERED AS AFFECTING CLIMATIC AMENITIES.

Formerly the ground area not occupied by buildings (usually kept down to the minimum permitted by local building codes) consisted of backyards and courts; this, of course, meant that the buildings themselves used about eighty per cent of the land. In current project plans approximately 25 per cent of the land is built on. The other 75 per cent is used for lawns, gardens, play spaces and the like. Landscaping, therefore, is now an integral part of the entire scheme and must be studied with the same care given to the layout of the buildings.

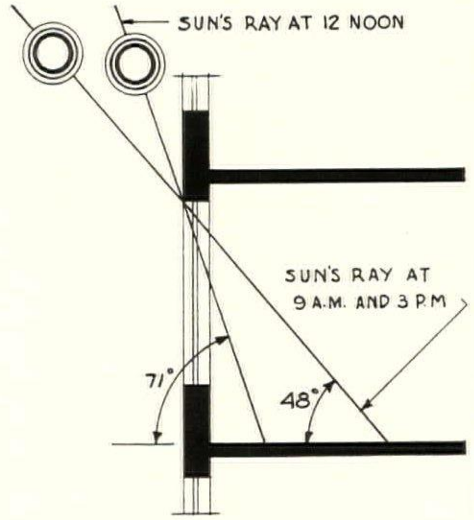
"There is a definite tendency to make individual blocks longer than formerly. Blocks up to 1,000 feet or more in length are now not uncommon. Pedestrian crossings are sometimes provided in the middle of long blocks on the principle that it is not inconvenient to drive all the way around, but that it may be a serious inconvenience to walk, particularly for school children."*

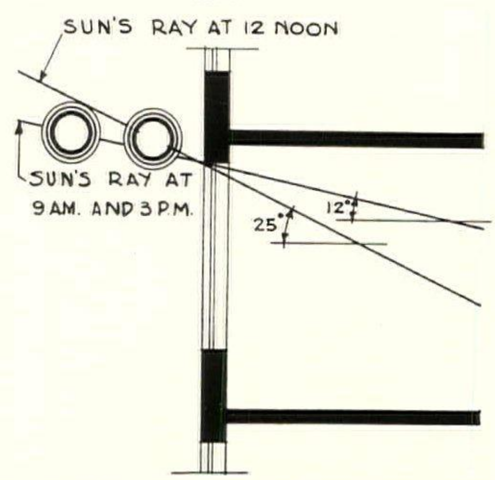
SAFETY OF CHILDREN INSURED BY THE STREET PLAN THAT MAKES IT UNNECESSARY FOR A CHILD TO CROSS A STREET AT GRADE IN ORDER TO GET TO SCHOOL OR PLAYGROUND.

* Planning for Residential Districts. The President's Conference on Home Building and Home Ownership. p. 55.



(A, B AND C) COMPARISON OF OLD AND NEW METHODS OF BLOCK DIVISION. (C) RELATIVE COVERAGES AND SUNLIGHT EXPOSURE FOR TWO-, THREE- AND FOUR-STORY DWELLINGS. SPACING IS INDICATED FOR DWELLINGS FACING SOUTH IN ORDER TO PROVIDE FULL SUNLIGHT AT 45 DEGREES. H. WRIGHT.





COMPARISON OF SUNLIGHT ENTERING A ROOM AT SUMMER AND WINTER SOLSTICE, DUE SOUTH EXPOSURE.

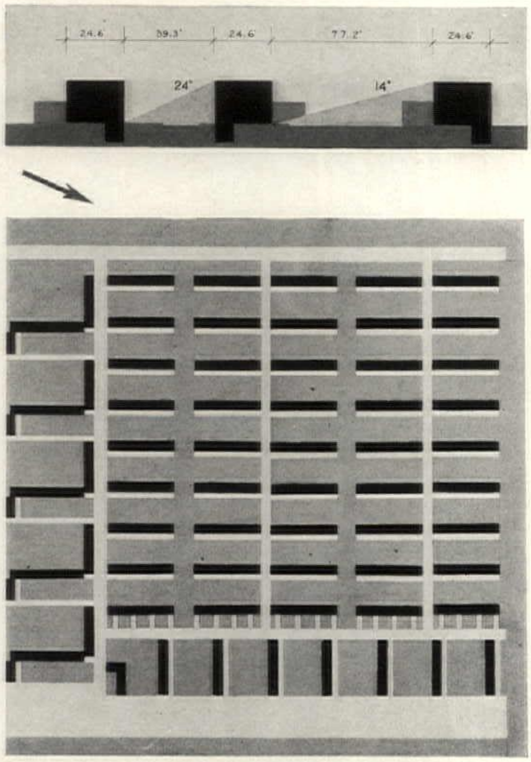
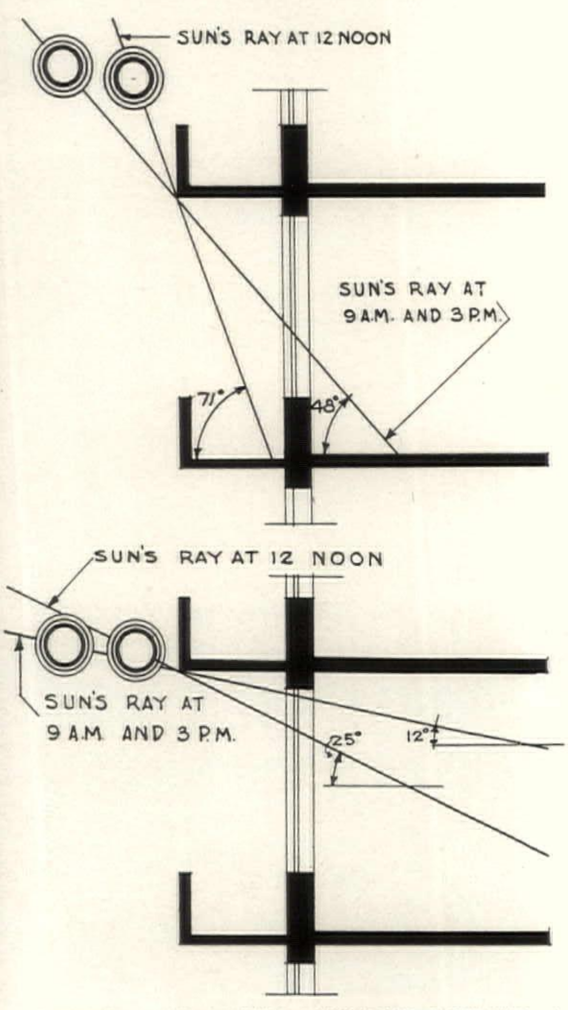


DIAGRAM OF HOUSING OF MINIMUM AND MAXIMUM DESIRED SPACING. ORIENTATION PERMITS FULLEST EXPOSURE TO EAST, SOUTH AND WEST. FOOTPATHS PARALLEL BUILDINGS. THERE IS NO MAIN TRAFFIC CROSSING THE HOUSING AREA.



SUMMER AND WINTER SUNLIGHT ENTERING A ROOM WITH PROJECTING BALCONY.

NEIGHBORHOOD LOCATION (CONTINUED)

THERE SHOULD BE NO THROUGH TRAFFIC CROSSING THE APARTMENT DEVELOPMENT.

The occupants will vary considerably with the location of a project, and therefore successful operation will necessarily be the result of careful study of factors which govern the mode of living expected by prospective tenants.

ORIENTATION

THE FACING OF ROOMS FOR LIVING AND SLEEPING SHOULD BE SUCH AS TO SECURE A MAXIMUM OF SUNLIGHT AND SUNSHINE IN ALL ROOMS.

This is attained by the design of plot plan or layout of property—that houses will have most desirable orientation.

"No room should have solely a north exposure unless its window area is increased by at least 50 per cent over the normal amount."*[1]

Authorities recommend that row houses extend northeast by southwest and southeast by northwest so as to obviate rooms of due north exposure.

THERE SHOULD BE AT LEAST ONE WINDOW IN EACH ROOM.

Preferably two or more opening directly on an open space. "The total window area should be at least fifteen square feet with window heads as near ceiling as possible." *[1]

"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 the 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." *[3]

Where sun is to south or west in warm climate it is desirable to use awnings, easily raised or lowered and readily removed at close of season.

NORTH ROOMS SHOULD HAVE ADDITIONAL WINDOWS TO EITHER EAST OR WEST. THE NORTH ROOMS SHOULD THEREFORE BE CORNER ROOMS.

THE NATURAL CONSTRUCTION AND SIMPLICITY IN ARCHITECTURE ARE PREFERRED TO ORNAMENTATION.

COLOR, SKILLFULLY DETERMINED, IS A MOST DESIRABLE ASSET IN ATTAINING GOOD APPEARANCE. THIS COLOR MAY BE NATURAL AND APPLIED.

FOR BEDROOMS, PROVIDE ADEQUATE WALL SPACE FOR BED LOCATION, PREFERABLY TWIN BEDS, AND WITH POSSIBILITIES FOR CROSS-VENTILATION.

ROOMS OF AMPLE SIZE TO ACCOMMODATE PLACING OF FURNITURE FOR MOST CONVENIENT USE AND WITH AMPLE WALKING, SITTING AND WORKING AREA.

BUILDING DESIGN *[2]

"The degree to which design of housing should be influenced by the present living habits of the proposed tenants is a very debatable question. Experienced social workers have come to the conclusion that it is not practical to formulate housing plans by asking the prospective tenants what they want. The families usually do not know what they want or their demands are so varied and out of reason that they form no sane basis for design. The most that can be done is to study:

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*[1] Housing Objectives and Programs. The President's Conference on Home Building and Home Ownership. p. 155.

*[2] Outline of Survey and Planning Procedure for Low-Cost Housing. National Association of Housing Officials, Chicago. p. 9.

*[3] The Home and The Child. The Century Company, New York.

BUILDING DESIGN (CONTINUED)

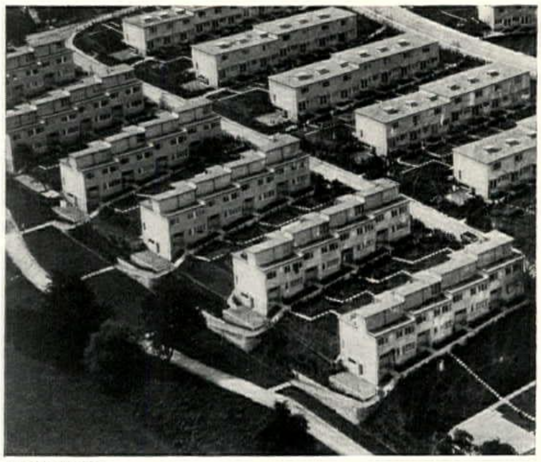
"DISTRIBUTION OF FAMILY SIZE.

Studies serve as a means of determining the number of dwelling units of various sizes to be provided.

"DESIGN BASED ON STUDIES OF EFFICIENT HOME ECONOMICS.

This will entail an examination of recommendations of qualified bodies regarding minimum efficient room sizes and domestic equipment.

"The experience and opinions of social welfare workers who have intimate contact with the low wage-earning class and whose conception of minimum decent housing is based upon practical experience will be a valuable check on over-ambitious architects or others." *1



Mittelholzer

LOW-COST HOUSING ON IRREGULAR SITE. BLOCKS ARE FROM NORTHEAST TO SOUTHWEST SO AS TO ATTAIN UTMOST IN SUNLIGHT EXPOSURE.

TYPICAL DEFECTS OF EXTERIOR DESIGN:

Absence of relation between exterior treatment and interior plan requirements.

Decorative details unrelated to structural frame.

Faked roofs and gables with no relation to the actual roof.

Chimneys applied as decoration without fireplaces and fireplaces without chimneys.

Mixture of stone and brick for antique decorative effect.

Highly decorative false fronts to street and with a more commendable restraint in treatment of ends and rear.

Discordant mixture of a large variety of materials on face of building.

Over-emphasis of picturesque quality.

False windows.

The emphasis on scenic qualities is a passing fad that will detract from the permanent value of the property.*2

BUILDING SHOULD BE DESIGNED AND LOCATED SO AS TO MAKE POSSIBLE MAXIMUM SUNNING AND NATURAL LIGHTING IN ALL ROOMS.

THERE SHOULD BE DIRECT SUNSHINE AT SOME TIME OF DAY IN EACH ROOM THROUGHOUT THE YEAR. NO ROOM SHOULD HAVE ONLY A NORTH EXPOSURE.*1

COVERED PORCHES SHOULD NOT BE PLACED OR PROJECT SO AS TO GREATLY REDUCE NATURAL LIGHTING OF A ROOM.

INTERIORS

ROOM ARRANGEMENT SHOULD BE SUCH AS TO ALLOW FOR EASE AND COMFORT OF LIVING, CARE OF HOUSEHOLD WORK, CARE OF CHILDREN, ENTERTAINING.

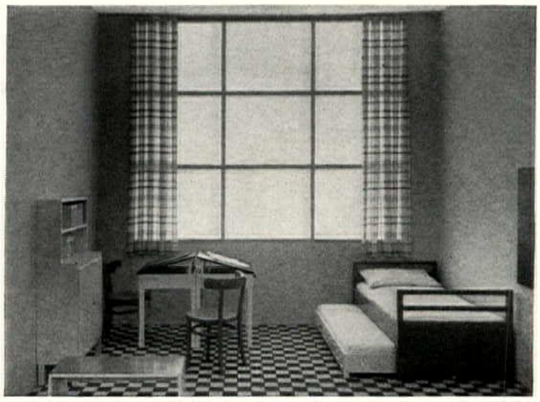
Waste motion and labor can be reduced by conforming to experience-principles in planning.

THERE SHOULD BE READY ACCESS FROM ROOM TO ROOM BUT EACH ROOM SHOULD HAVE POSSIBILITY FOR UNDISTURBED USE WHEN DESIRED.

ACCESS TO BATHROOM IS PREFERABLY FROM HALLWAY.

ALL ROOMS SHOULD HAVE ADEQUATE NATURAL VENTILATION AND CROSS-VENTILATION.

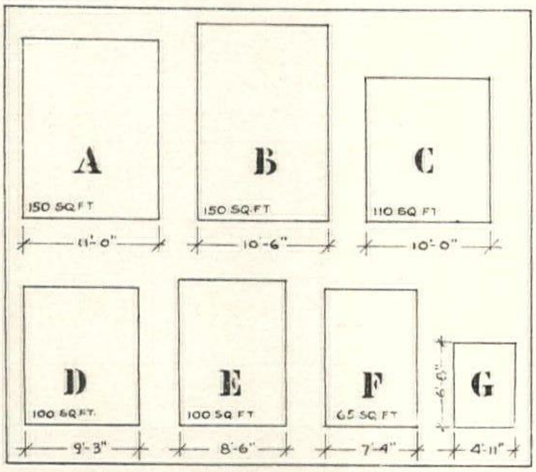
Secured by windows on opposite or adjoining sides or by doors that permit through ventilation.



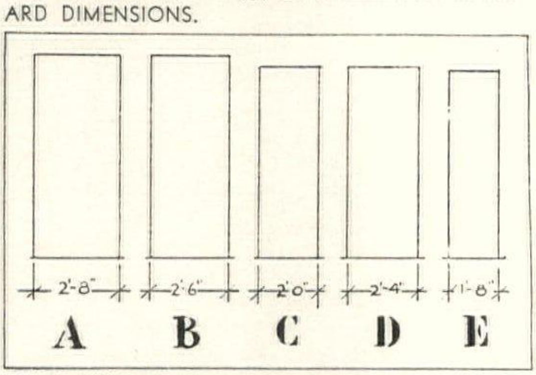
ROOM FURNISHED TO MEET SPECIAL REQUIREMENTS OF CHILD.

*1 The Home and The Child. The Century Company, New York. p. 17.

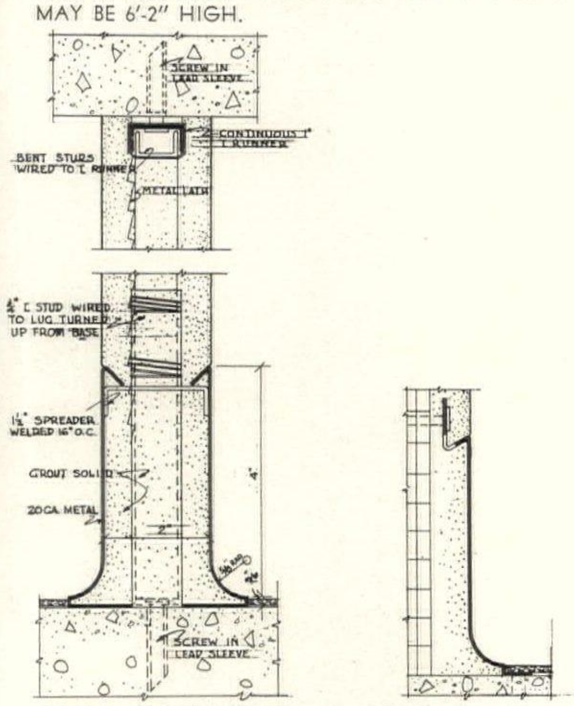
*2 House Design, Construction and Equipment. The President's Conference on Home Building and Home Ownership, Washington, D. C. p. 7.



ROOM SHAPES AND MINIMUM SIZES. THESE MINIMUM WORKABLE AREAS CANNOT BE REDUCED WITHOUT AFFECTING RENTABILITY AND CONVENIENT USE. THEY GENERALLY SHOULD BE INCREASED. (a) APARTMENT LIVING ROOM, (b) HOUSE LIVING ROOM, (c) MAIN BEDROOM, (d) SECOND BEDROOM, (e) HOUSE SECOND BEDROOM, (f) KITCHEN, (g) BATHROOM OF STANDARD DIMENSIONS.



DOOR WIDTHS RECOMMENDED BY PWA (HOUSING DIVISION). (a) ENTRANCE, (b) BEDROOM, (c) BATHROOM, (d) CLOSET, (e) LINEN CLOSET. DOOR HEIGHTS, 6'-4", 6'-6", 6'8"; CLOSET DOORS MAY BE 6'-2" HIGH.



PROFILE OF WALL BASE—20-GAUGE STEEL, FOR 2" SOLID PARTITIONS AND ALL WALLS. TECHWOOD HOUSING PROJECT, ATLANTA, GEORGIA.

INTERIORS (CONTINUED)

THE SUBDIVISION OF APARTMENTS AND HOUSES SHOULD PERMIT FLEXIBILITY OF ARRANGEMENT.

Making possible alteration or extension to meet increased or changed family needs. Use should be made of wall sections that permit re-use in the new location.

1. MINIMUM ROOM SIZES (Recommended by PWA, Housing Division):

	Minimum Dimension	Minimum Area Square Feet
Apartment living room	11'0"	150
House living room	10'6"	150
Main bedroom	10'0"	110
Second bedroom	9'3"	100
Kitchen	7'4"	65
House second bedroom	8'6"	100
Bathroom—standard dimensions	4'11" x 6'8"	

2. RECOMMENDED DOOR SIZES:

	Minimum Width	Desirable Width
Entrance door	2'8"	2'10"
Bedroom door	2'6"	2'6"
Bathroom door	2'0"	2'4"
Closet door	2'4"	2'4"
Linen closet door	1'8"	2'0"

Note: All doors 2'6" or more in width should be 1¾" thick.

TEMPERATURE AND HUMIDITY

RECOMMENDED ROOM TEMPERATURES AND HUMIDITY.

"1. **Temperature**—The temperature in rooms during periods of occupancy should register preferably from 60 to 70 degrees Fahrenheit at all times, except when the outside temperature exceeds 60 degrees Fahrenheit. This does not apply to rooms used for special purposes such as industrial places where high or low temperatures are essential and unavoidable.

"2. **Humidity**—The relative humidity in occupied rooms should not exceed 70 per cent, except when the outside-bulb temperature exceeds 59 degrees. In no case, however, should the wet-bulb temperature exceed 78 degrees." *

FLOORS

FLOORS SHOULD BE FIRM, COMFORTABLE TO WALK AND STAND ON AND EASILY KEPT CLEAN.

COLOR OF FLOORS SHOULD HARMONIZE WITH COLOR SCHEME OF ROOM.

If of wood, floorboards should be kiln dried hardwood.

BATHROOM FLOORS

(1) preferably tile; (2) may be continuous linoleum, rubber or cork in plain color; (3) cement finish over concrete for lowest cost, with dampproofing and cement hardener.

KITCHEN FLOORS OF LINOLEUM WITHOUT PATTERN.

LINOLEUM SHOULD BE LAID OVER A LAYER OF FELT.

CONSTRUCT WALLS AND FLOORS AS NEARLY INTEGRAL AS POSSIBLE.

FOUNDATIONS AND CELLAR FLOORS (WHERE THEY OCCUR) SHALL BE DAMPPROOF, SOUND AND DURABLE.

INSULATE BUILDING AGAINST DAMPNESS, HEAT, COLD AND SOUND.

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* Fresh Air and Ventilation. By C.-E. A. Winslow. E. P. Dutton & Company, New York.

CELLARLESS APARTMENTS

GAINS FROM OMISSION OF CELLAR:

Lower construction cost, reduced fire hazard, improved dwelling sanitation.

LOSS:

Storage space, laundry facilities must be provided at ground level; heating space in utility room at first floor level.

A report of the National Board of Fire Underwriters, released in 1926, showed that 70 per cent of all dwelling fires started in cellars.

Some cities require cellar excavation. Pittsburgh, Pennsylvania, does not require cellar, neither do building codes of New York City, Chicago and other large American cities.

Building Code Committee, U. S. Department of the Interior, For Minimum Building Requirements For Dwellings, does not require cellars if the space below the first floor joists is protected.

KITCHEN

"The kitchen—the domestic workshop—will be so designed as to make possible the preparation and serving of food, with its ancillary labors, with the least possible waste of time and effort, and with a minimum of fatigue." *1

"Equipment required in every kitchen: a stove, sink with water supply, work tables or work surfaces at satisfactory heights, refrigerator, adequate space for articles to be stored, 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

(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, 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.*2

INSTALL SINK WITH DRAIN BOARD TO THE LEFT AND A FLAT SURFACE OR DRAIN BOARD AT RIGHT, BOTH AT HEIGHT OF TOP EDGE OF SINK.

THE DRAIN BOARD SHOULD BE AT LEAST 32 INCHES LONG AND THE STACKING SURFACE AT LEAST 36 INCHES.

THERE SHOULD BE AN OPEN SPACE UNDER THE SINK.

Some space above the sink should be available for narrow shelves for storage of cleaning materials.

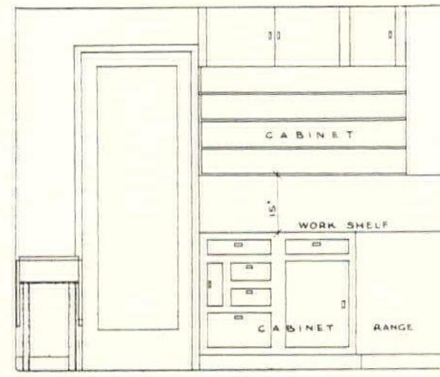
THE SINK SHOULD BE WELL LIGHTED.

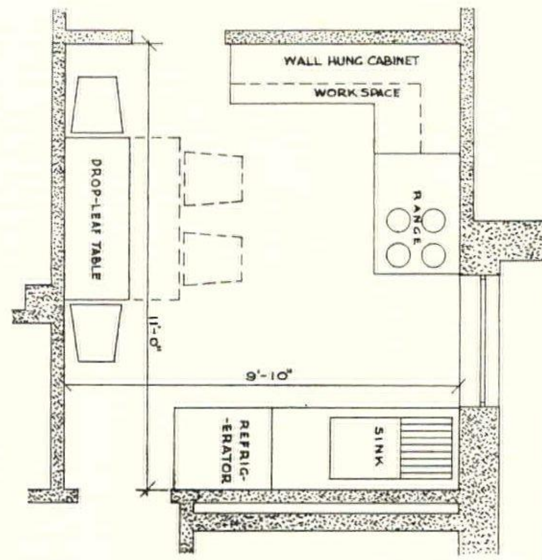
With a window preferably in the wall at right angles, so placed as to throw light on the sink. If on the same wall as the sink, it should be placed directly over the sink but with protection from glare.

ARTIFICIAL ILLUMINATION SHOULD BE SO PLACED, AND OF SUFFICIENT HEIGHT, TO GIVE GOOD LIGHT ON THE WORK AT THE SINK WITHOUT THROWING A SHADOW.

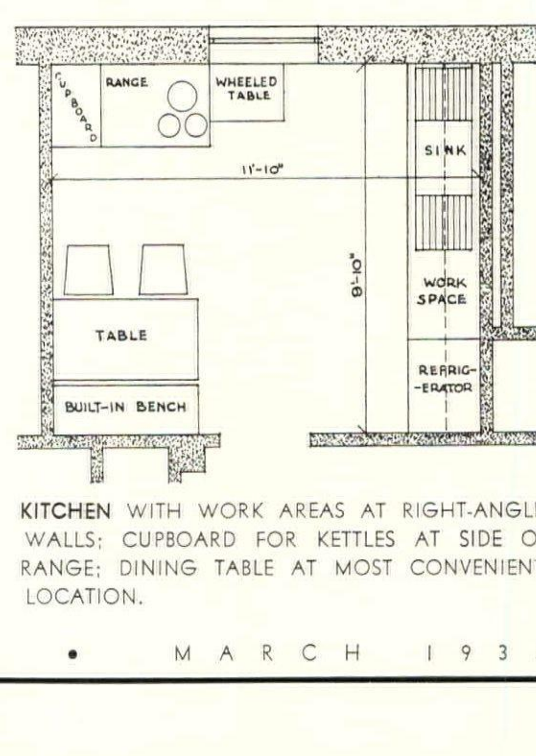
*1 Housing Objectives and Programs. The President's Conference on Home Building and Home Ownership. p. 156.

*2 Planning the Kitchen. By Dr. Louise Stanley, Chief, Bureau of Home Economics, U. S. Department of Agriculture, Washington, D. C.

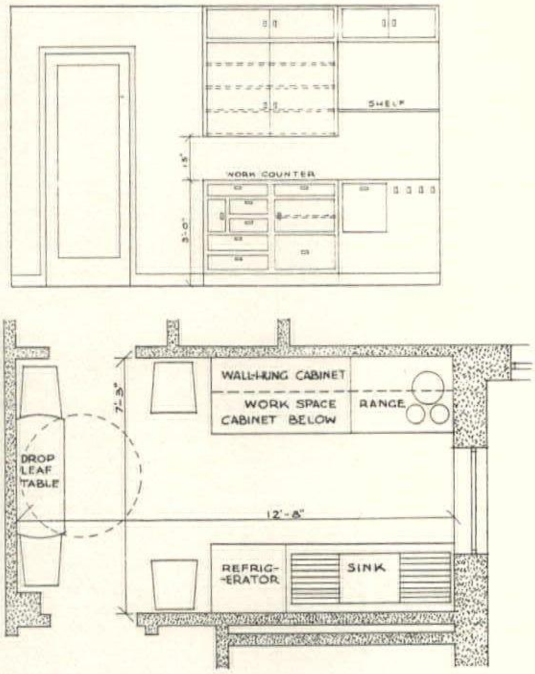




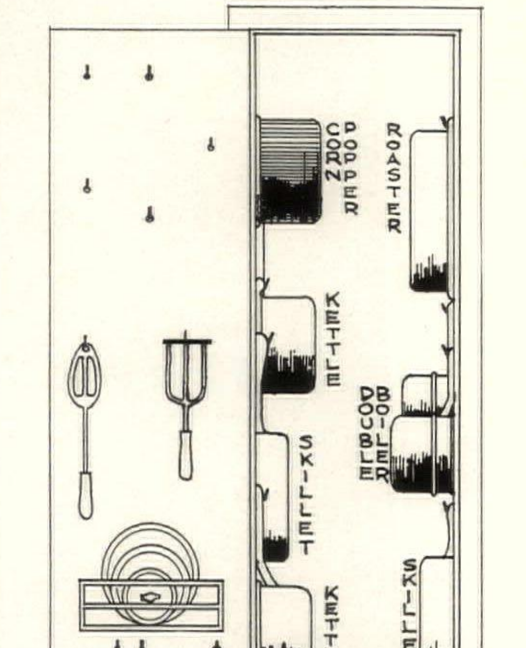
KITCHEN ARRANGEMENTS SHOWN ON THIS PAGE WERE PREPARED UNDER THE DIRECTION OF DR. LOUISE STANLEY, DIRECTOR OF HOME ECONOMICS FOR U. S. DEPARTMENT OF AGRICULTURE. THE PLANS WERE SELECTED FROM HOUSING DIVISION PWA "SAMPLE PLANS." THE KITCHEN, IN ALL CASES, ADJOINS BATHROOM TO REDUCE COST OF PLUMBING INSTALLATION. THERE IS A DINING TABLE IN ALL KITCHENS. PLANNING OF EQUIPMENT CONFORMS TO NORMAL METHODS FOR FOOD PREPARATION.



KITCHEN WITH WORK AREAS AT RIGHT-ANGLE WALLS; CUPBOARD FOR KETTLES AT SIDE OF RANGE; DINING TABLE AT MOST CONVENIENT LOCATION.



KITCHEN OF SMALL SIZE; RANGE ON OPPOSITE WALL FROM SINK; LIGHT ON SINK FROM LEFT. WORK SPACE INDEPENDENT OF PASSAGE BETWEEN DOORS.



CLOSET FOR KETTLES AND COOKING UTENSILS. APPROVED LOCATION AT SIDE OF RANGE. HOOKS AND RACK ON DOOR.

KITCHEN (CONTINUED)

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 EASY REACH OF THE COOKING SURFACE.

THE WORK TABLE FOR MIXING, CAKE MAKING AND THE LIKE SHOULD BE OF SUFFICIENT HEIGHT TO PERMIT WORK WHILE SITTING, AND SHOULD HAVE KNEE SPACE BELOW.

Staple articles 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.

Since the wall space is needed for placing equipment, **the rectangular kitchen makes possible a more satisfactory arrangement than a square one.**

A kitchen should be at least $6\frac{1}{2}$ feet wide, otherwise only one side wall can be used for efficient placing of equipment.

The architect can contribute much to efficiency of the kitchen by specifying convenient heights for working surfaces and by planning storage spaces so as to minimize stooping and stretching.

SINK AND WORK SURFACES FOR STANDING SHOULD BE FROM 34 TO 36 INCHES.

KITCHEN WINDOWS LOCATED SO AS TO OVERLOOK CHILDREN'S PLAYGROUND.

GROUP KITCHEN EQUIPMENT ACCORDING TO THE PURPOSES IT IS TO SERVE:

Elements arranged along the walls to furnish a nearly continuous working surface.

HEIGHT OF WORKING SURFACE ADJUSTED TO INDIVIDUAL WORKERS.

WORK AREAS NOT SEPARATED BY DOORS.

STOVE BETWEEN SINK AND WORK TABLE UNITS.

REFRIGERATOR CLOSE TO WORK TABLE AND SERVING AREA.

SINK AND SERVING UNITS COMBINED SO THAT THE SERVING COUNTER MAY ALSO BE A DRAIN BOARD.

SINK AND SERVING UNIT ADJACENT TO DINING AREA OF KITCHEN.

PROVISION FOR A STOOL TO BE USED AT SINK.

HOOD OVER STOVE WITH VENT TO CARRY OFF FUMES AND HEAT.

VENTILATING FAN IS DESIRABLE FOR WARM CLIMATES AND WHERE THERE IS NO CROSS-VENTILATION.

Location near ceiling on opposite wall from window.

BATHROOM

PROVIDE SHALLOW CABINET RECESSED IN WALL.

Mirror may be on door but this is not preferred; overhead illumination; shelves in this cabinet should be removable and adjustable as to distance apart; shelf for drinking glasses.

BATHROOM MIRROR IS MOST CONVENIENT IF PLACED DIRECTLY ON THE WALL, RATHER THAN ON THE DOOR OF A CABINET.

SHALLOW DRAWER FOR TUBES OF DENTAL PASTE, OINTMENT AND SMALL FLAT ARTICLES.

RACK ON WALL OR IN VENTILATED WALL CABINET FOR TOOTHBRUSHES.

RODS FASTENED TO WALL FOR TOWELS, WASHCLOTHS, ETC.

SPACE IS DESIRABLE FOR WHEELED TABLE FOR CARE OF INFANT; SHELF BENEATH FOR TRAYS AND BASKETS.

MINIMUM BATHROOM WINDOW, 1'-8" BY 3'-0".

BATHROOM (CONTINUED)

SEPARATE AND SAFE SPACE FOR PRESCRIPTION MEDICINES AND POISONOUS SUBSTANCES; NOT WITH TOILET SUPPLIES.

TOILET CABINET IS MORE CONVENIENT AT ONE SIDE OF THE LAVATORY, RATHER THAN DIRECTLY ABOVE IT.

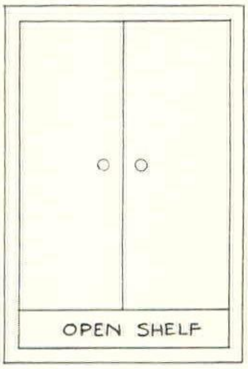
It is desirable to have some storage space for towels and washcloths to supplement general supply in linen closet.

SPACE FOR HAMPER TO STORE SOILED TOWELS, LINEN, ETC.

BATHROOMS AND TOILETS SHOULD HAVE OUTSIDE WINDOWS.

PLUMBING FIXTURES TO BE SANITARY, EASILY FLUSHED, PROPERLY VENTED TO ROOF.

PIPES TO BE NON-CORROSIVE; WITH TRAPS, ACCESSIBLE.



TOILET CABINET. PREFERABLE LOCATION AT SIDE OF LAVATORY; FIXED MIRROR OVER WASH BASIN; THIS CABINET SHOULD HAVE ADJUSTABLE SHELVES; SHELF BELOW FOR DRINKING GLASSES.

CLOSETS *

A SEPARATE CLOSET FOR EACH PERSON IS DESIRABLE.

ATTACH FULL-LENGTH MIRROR TO BEDROOM WALL IN PREFERENCE TO DOOR.

The full-length mirror should be at least 14" wide.

SLIDING TRAYS PREFERRED FOR STORING FOLDED GARMENTS.

PROVIDE CLOSET IN LIVING ROOM FOR STORAGE OF FOLDING BED WHEN LIVING ROOM IS USED AS AUXILIARY BEDROOM.

A CLOSET OPENING FROM A LIVING ROOM SHOULD BE OF SUCH DIMENSIONS THAT IT CAN BE USED FOR SEVERAL PURPOSES, SUCH AS STORING A BED, SEWING EQUIPMENT, CHILD'S PLAYTHINGS, GAME BOARDS, SMALL MUSICAL INSTRUMENTS; ALSO BED CLOTHING AND GARMENTS.

PASSAGE TO BATHROOM OR ENTRY DOOR SHOULD NOT BE THROUGH LIVING ROOM WHEN INTENDED FOR REGULAR USE AS BEDROOM.

STORAGE AREA ALLOWED FOR THE BED IS 2 FEET IN DEPTH, AND 5 FEET IN WIDTH.

PROVIDE CLOSET FOR BED CLOTHES AND LINEN.

Depth of 18 to 24 inches accommodates articles commonly stored in bedding closets, including sheets and spreads as folded after ironing. If bed coverings and pillows are stored elsewhere, the closet may be only 14 inches in depth. A desirable length is 36 inches. This accommodates most blankets folded once. The distances between shelves or trays that are 15 to 18 inches wide are 10 inches. If shelves are 24 inches wide, they should be at least 12 inches apart. A sorting shelf may be from 30 to 40 inches from the floor.

LOCATE CLOSETS TO SERVE NEEDS MOST CONVENIENTLY.
Closet for outdoor wraps near entrance door and reached without passing through rooms.

PROVIDE SEPARATE CLOSET FOR CHILDREN'S WRAPS, EQUIPPED WITH LOW HOOKS, RODS AND LOW SHELVES.

Height: 3'-2" to 4'-6".

CLOTHES CLOSETS SHOULD BE EQUIPPED WITH RODS AND A SHELF FOR HATS.

Closet should be of depth to take easily clothes hangers with clothes on them.

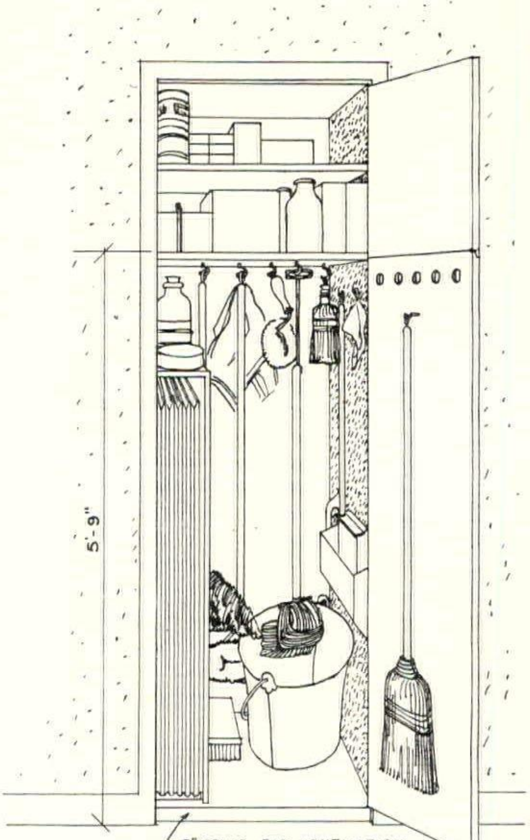
CLEANING CLOSET AT ENTRY TO KITCHEN OR IN KITCHEN NEAR ENTRANCE DOOR.

LINEN CLOSETS LOCATED IN HALLWAY NEAR TO BATHROOM.

Subdivided for convenient use; sorting shelf.

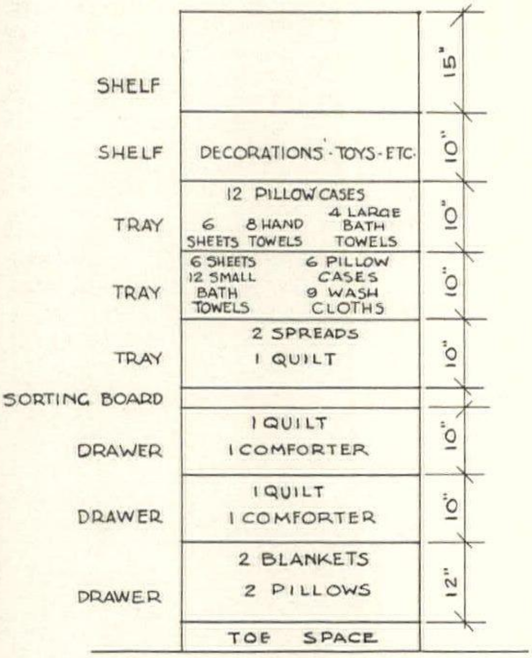
ALL CLOSETS SHOULD HAVE DOORS, PREFERABLY THE WIDTH OF CLOSET SPACE.

There should be knobs on inside as well as outside so that closet doors can be opened by children from inside.

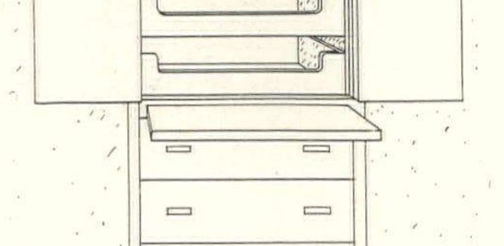


CLEANING CLOSET (SIZE, 14" x 27" OR 17" x 25"). DIMENSIONS AND ARRANGEMENT BASED ON EQUIPMENT AND SUPPLIES FOUND IN REPRESENTATIVE HOME OR APARTMENT. 5 HOOKS FOR LONG ARTICLES; 4 HOOKS FOR SHORT ARTICLES. UPPER SHELF 9" DEEP; LOWER SHELF 14" DEEP. DESIGNED BY MAUD M. WILSON, HOME ECONOMIST.

* Information on closet planning compiled from "Closets and Other Storage Arrangements for the Farm Home" by Maud Wilson, U. S. Department of Agriculture.



LINEN CLOSET ARRANGEMENT WITH CAPACITY, DIMENSIONS AND METHOD OF STORING. DESIGNED BY MAUD M. WILSON, HOME ECONOMIST, FOR BUREAU OF HOME ECONOMICS, U. S. DEPARTMENT OF AGRICULTURE.



CLOSET FOR BEDDING AND LINEN—FOR STORAGE OF BED LINEN, BED COVERS, AND TOWELS. NOTE SORTING BOARD AT TABLE HEIGHT.

CLOSETS (CONTINUED)

ARRANGE CLOSETS TO ACCOMMODATE PERSONS OF VARYING HEIGHTS.

Two or more doors for a wide or high closet are more convenient than one door.

VENTILATE CLOSET BY OPENING IN DOOR EXCEPT FOR CEDAR-LINED CLOSET.

It is, of course, desirable to have a window in closet.

PROVIDE ACCOMMODATION FOR FOLDING BEDS.

AUTOMATIC ELECTRIC LIGHT FOR LARGE CLOSETS.

MINIMUM INSIDE DEPTH OF CLOSET, 24".

MINIMUM WIDTH OF OPENING OF CLOSET, 24".

MINIMUM FREE SPACE IN CLOSET OF WALK-IN TYPE, 24" x 24".

The dimensions that follow will aid the draftsman in arranging closets for convenience:

Minimum distance from center of hanger rod to wall:

For adult use	12 inches
For children, 6 to 12 years of age	10 inches
For children, 3 to 5 years of age	8 inches

Distance between floor and top of rod (assuming use of hanger which places top of garment 4 inches from top of rod):

Garments for adults, general use	63 inches
Short coats, skirts	45 "
Evening gowns	72 "
Garments stored in moth bags	72 "
Garments of children, 6 to 12 years of age	45 "
Garments of children, 3 to 5 years of age	30 "

BEDROOM CLOSET, HOOK TO HOOK, 7".

PLAY COATS, SMALL CHILDREN, 9".

HOOKS SHOULD NOT BE PLACED WITHIN 5 INCHES OF THE EDGE OF A DOOR.

HOOKS FOR USE OF SMALL CHILDREN SHOULD NOT BE ABOVE EYE-LEVEL.

The average adult requires bedroom closet accommodation for 12 garments hung on hangers. Accommodation would therefore require 36 inches of rod hanger space and 10 garment hooks; space for 6 pairs of shoes and hat shelf 36" long.

CLEANING CLOSET

PROVIDE CLEANING CLOSET IN KITCHEN OR VESTIBULE.

Dimensions and arrangement of cleaning closet are based on equipment and supplies found in the representative home or apartment. Portable ironing board and table leaves may or may not be included here, depending on whether or not space is found elsewhere. The following over-all dimensions would be considered in providing space for cleaning items:

Vacuum cleaner, 49" high, 16" wide, 14" deep, hose 9' long; step ladder, 49" high, 20" wide, 6" deep; ironing board, 62" high, 16" wide, 4" deep; pail, 13" diameter (over handles), 10½" high; table leaves, 13" wide, 54" high; dust mop, 61" long; mop end, 9" wide; wet mop, 57" long; mop end, 7" wide; wall brush, 60" long, 10" wide, 3" deep; dustpan, 34" long, 13½" wide, 3" deep; broom, 54" long, 14" wide, 2" thick; carpet sweeper, 54" long (box, 14" x 10" x 5"); waxer, head, 9" x 5" x 3".

Lower part of closet should be fitted with hooks for equipment that will hang, while the upper is equipped with shelves. If shelving is extended to ceiling, then provide separate doors for upper and lower sections. Upper shelves should be narrower than lowest one.

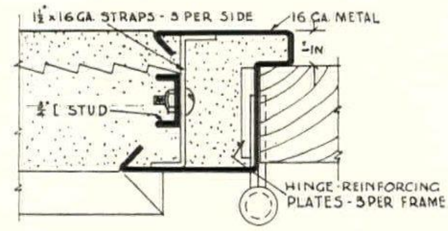
CONSTRUCTION

HOUSES SHOULD BE RESISTIVE TO FIRE.

Public hallways and stair halls should be inclosed and separated from the rest of the floor space by fire-resistant inclosures, also floor surfaces and trim of approved incombustible material. The stairs and stair landings to be of incombustible material.

"Public hall inclosures and walls separating different tenants shall be built not less than 4 inches thick, of solid or hollow brick, building tile, concrete or gypsum blocks, or not less than 3 inches thick of reinforced concrete or solid metal lath or cement plaster; or such other incombustible materials and thickness as shall meet requirements of the partition fire test." *

DIRECT ACCESS TO EXTERIOR DOOR.



SOLID 2" PLASTER PARTITIONS. ¾" CHANNELS SET 16" O. C. INTO CHANNELS AT FLOOR AND CEILING. DOOR FRAME OF 16-GAUGE STEEL. TECHWOOD HOUSING PROJECT AT ATLANTA, GEORGIA.

STAIRWAY

STAIRWAY HANDRAILS AT WALL AS WELL AS STAIR RAILING.

PROVIDE LOW HANDRAILING FOR CHILDREN 24" ABOVE STAIR NOSING.

INSIDE PLAYSPACE FOR CHILDREN.

COOL CLOSETS FOR STORING CANNED FRUITS AND VEGETABLES.

"ALL STAIRS SHALL HAVE TREADS AND RISERS OF UNIFORM WIDTH AND HEIGHT throughout each flight; the rise shall be not more than 7¾ inches and the tread, exclusive of the nosing, not less than 9½ inches.

"STAIRWAYS USED AS REQUIRED MEANS OF EXIT SHALL BE AT LEAST 44 INCHES WIDE between face of wall and an open balustrade. Stair halls with double flight and landing should total 7'-4" width within walls. Handrails attached to walls must not project more than 3½"." *

NO ARRANGEMENT OF TREADS KNOWN AS WINDERS SHALL BE PERMITTED.

STAIRWAYS ADEQUATELY LIGHTED.

EVERY INCLOSED STAIRWAY SHALL BE PROVIDED WITH ADEQUATE SYSTEM OF LIGHTING, arranged to insure reliable operation when through accident or other cause the regular lighting is extinguished.

EXIT DOORWAYS HAVE A CLEAR WIDTH OF AT LEAST 40 INCHES.

CEILING HEIGHTS SHOULD BE NOT LESS THAN 8'-6" HIGH FROM FINISHED FLOOR TO FINISHED CEILING.

WINDOW TYPES recommended permit full area opening or at both top and bottom.

Possibilities for safely washing outside of glass area from room interior.
Provision for screening without interfering with window operation.
Provision for shades and curtains.

LANDSCAPING

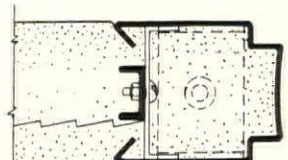
TREES, SHRUBS AND VINES, LOCATED AND SUPERVISED IN PLANTING AND CARE BY REPUTABLE LANDSCAPE ARCHITECT.

TREES AND SHRUBS SHOULD BE PLACED SO AS TO PROVIDE SHADE BUT NOT TO SHADOW WINDOWS.

ATTRACTIVE SCREENS PROVIDED BY HEDGES AND VINE-COVERED LATTICE.

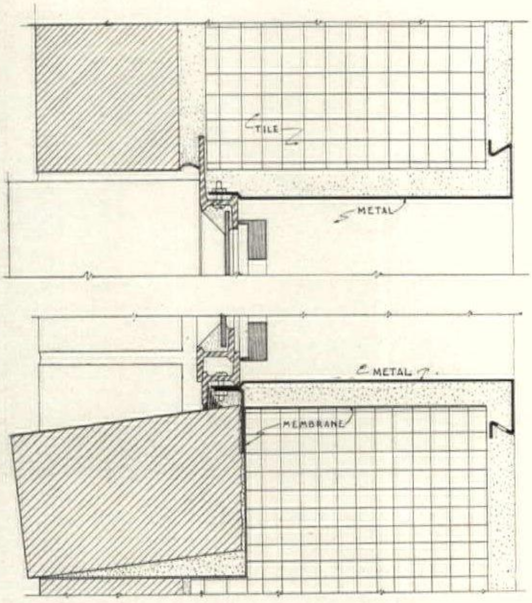
SCREEN GARAGES AND LAUNDRY YARDS.

The apartment house suggests community play areas and lawns whereas the row house or flat is generally treated with individual gardens. A considerable difference in initial cost and upkeep will result through such selection of living unit and should be looked upon as one of the deciding factors. From the social side it may be seen that a community atmosphere is created wherein the park space and playgrounds for children are brought within easy reach and made most accessible to every one. Proper site planning should take care of the correct layout of through streets and secondary streets so as to guard against traffic mishaps, vehicular noises and odors.

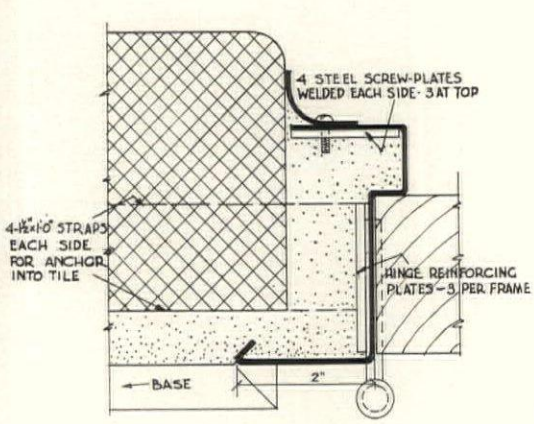


DOOR TRIM FOR DOUBLE-SWINGING DOOR IN 2" SOLID PARTITIONS.

* The National Board of Fire Underwriters' Handbook. p. 137.
* The National Board of Fire Underwriters' Handbook.



SECTION OF TYPICAL WINDOWS, TECHWOOD FEDERAL HOUSING PROJECT, ATLANTA, GEORGIA. NOTE STAMPED STEEL WINDOW TRIM, FREE FROM PROJECTIONS.



DOOR TRIM SET IN GLAZED TILE PARTITION WALLS FOR HALLWAYS. TECHWOOD FEDERAL HOUSING PROJECT, ATLANTA, GEORGIA.

GARAGES

CONVENIENTLY LOCATED GARAGE ACCOMMODATION, INCLUDING ACCESS FROM STREET.

FIREPROOF CONSTRUCTION PREFERRED.

FIREPROOF WALLS TO SEPARATE COMPARTMENTS.

LOCATION INDEPENDENT OF APARTMENT.

DAYLIGHT AND ELECTRIC ILLUMINATION AT FRONT END OF CAR.

PROVISION FOR WATER.

STORAGE SHELF.

FLOOR OF CONCRETE DRAINED TO ENTRANCE.

PROVISION FOR HEATING IN COLD LOCATION.

LAUNDRY

For low-cost housing it is supposed that, generally, the kitchen will be converted to laundry use. This presupposes the installation of a combination sink and laundry tray. There should be ample drying space for each apartment.

The separate laundry, where provided, should be airy, dry and well lighted. It should be comfortable, convenient and equipped with laundry trays, wringer rack, laundry stove (desirable), access to drying space, outlets for washing machine and iron.

NOISE AND ITS PREVENTION *[a]

"Acoustic defects in modern residential buildings are largely due to lack of solidity." The more homogeneous the materials, the more easily is sound transmitted, hence a steel frame structure with brick filling, etc., and having means of resisting vibration at the bearing of girders, is a desirable construction.

Sound insulating door panel. A sound insulating door comprises outer panels of wood and inner layers of sound absorbent materials such as felt, asbestos or spun glass wool.

Sound absorptive quilt; unit panels for kitchen ceiling; rigid insulation; separation of walls.

CONTROL OF VERMIN (Cockroaches, Bedbugs, Ants)

REDUCE WOODWORK TO MINIMUM.

Cement or steel baseboards in preference to wood; door frames of metal; pipes preferably carried clear of walls with openings where they pass through carefully caulked to prevent access.

OMIT PICTURE MOLDS.

Hot water piping should be located as near as possible to bathrooms, installed so as to prevent harboring of vermin; floors and ceiling should have smooth cement, washable surfaces; linoleum floors laid directly on concrete; avoid tongue and grooved boarding and loose textured insulation board. Old buildings can be fumigated with hydrocyanic acid gas.*[b]

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*[a] Building Science Abstracts. H. Bagand.
*[b] Building Science Abstracts. H. Bagand.

SPACE REQUIREMENTS FOR CHILDREN'S PLAYGROUND*

DEFINITION: "An outdoor area which provides play opportunities for children, primarily betwen the ages of five and fifteen."

PROVIDE SAND BOXES AND BUILDING BLOCK PLATFORMS.
(9′ x 12′) within view of apartment windows.

PLAYGROUND SITUATED WITHIN EASY WALKING DISTANCE OF APARTMENT OR HOUSING DEVELOPMENT.

"An area of three and one-half, preferably four, acres, is needed in every neighborhood where the present or estimated future child population equals approximately six hundred children. If they are to have an opportunity to play baseball, five acres should be provided."

Two and one-half acres may be considered as satisfactory for the needs of 300 children.

EQUIPMENT AND SPACE REQUIREMENTS FOR PLAYGROUNDS:

FACILITY AND AREA

APPARATUS	Sq. Ft. Required	Child Capacity
Climbing tree	100	6
Slide	450	6
Horizontal bars (3)	500	12
Parazontal bars	600	12
Horizontal ladders (2)	750	16
Traveling rings (stationary)	625	6
Giant stride	1,225	6
Small junglegym	180	10
Low slide	170	6
Low swings (4)	600	4
High swings (6)	1,500	6
Balance beam	100	4
See-saws (3-4)	400	8
Junglegym (medium)	500	20
Total	7,700	122

MISCELLANEOUS EQUIPMENT AND GAME SPACES	Sq. Ft. Required	Child Capacity
Open space for pre-school children	1,200	25
Open space for games of children 6-10	10,000	80
Wading pool	3,000	40
Handcraft and quiet game area	1,600	30
Outdoor theater	2,000	30
Building block platform	400	20
Sand boxes (2)	600	30
Shelter house	2,500	30
Total	21,300	285

SPECIAL AREAS FOR GAMES AND SPORTS	Sq. Ft. Required	Child Capacity
Soccer Field	36,000	22
Playground baseball (2)	38,125	40
Volley ball court	2,800	20
Basketball court	3,750	16
Jumping pits	1,200	12
Paddle tennis courts (2)	3,600	8
Handball courts (2)	2,100	8
Tether tennis courts (2)	800	4
Horseshoe courts (2)	1,200	8
Tennis courts (2)	13,200	8
Straightaway track	7,200	10
Total	109,975	156
Landscaping	6,000	
Additional space for paths, circulation, etc.	7,000	
Grand Total	151,975 (3.49 acres)	563

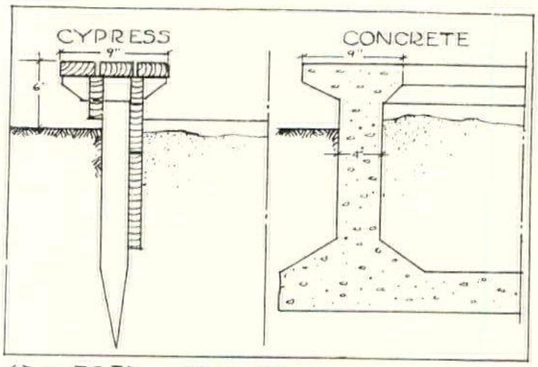
* Based on report of George D. Butler of the National Recreation Association.

Galloway

CHILDREN'S PLAYGROUNDS FOR APARTMENT PROJECTS. PROVIDE 25 SQUARE FEET FOR EACH CHILD BETWEEN 5 AND 15 YEARS. IN GENERAL, PROVIDE ONE ACRE OF RECREATION AREA PER 300-500 PERSONS.

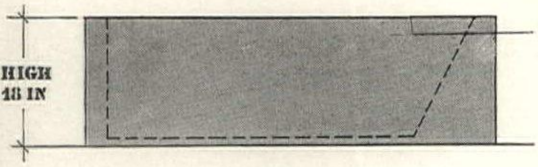
Galloway

PLAYGROUNDS PLACED IN A SETTING OF TREES AND SHRUBBERY TO CONSERVE THE NEIGHBORHOOD VALUES.

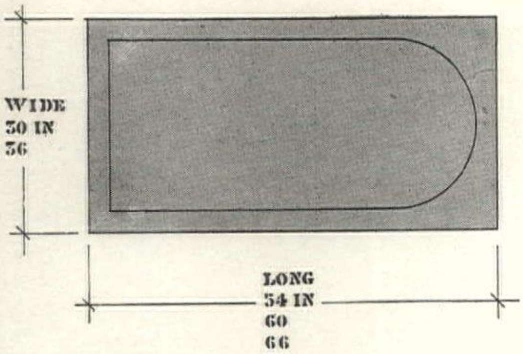


SAND BOX

CONSTRUCTION OF SAND BOXES WITH WOOD OR CONCRETE. PROVIDE DRAINAGE FOR TANK TYPE. SAND BOX SIZE, RECOMMENDED BY NATIONAL RECREATION ASSOCIATION, IS 9 FEET BY 12 FEET. BENCHES SHOULD BE PROVIDED NEAR SAND BOXES. WOOD BENCHES AND SAND BOX SURROUNDS SHOULD BE FREE FROM SPLINTERS, AND PAINTED.



ELEVATIONS



PLANS

BASIC DIMENSIONS

WINDOWS (Double-hung, Wood)

Standard size: width, 1'-4" to 3'-0" every 2" interval. Height, 3'-0", 3'-6", 4'-0", 4'-6", 5'-2".

DOORS

Door sizes for houses recommended by the Housing Division of PWA are: Entrance door, 2'-8" minimum, 2'-10" desirable width; Bedroom door, 2'-6"; Bathroom door, 2'-0", 2'-4" desirable width; Closet door, 2'-4" width; Linen closet door, 1'-8"—2'-0"; all doors 2'-6" or more in width should be 1¾" thick; door heights to be 6'-2"—6'-8".

ROOMS

Minimum sizes recommended by PWA (Housing Division):
Apartment living room, 11'-0" x 14'-0".
House living room, 10'-6" x 15'-0".
Main bedroom, 10'-0" x 11'-0".
Second bedroom, 9'-3" x 11'-0".
Kitchen, 7'-4" x 9'-6".
Bathroom (standard), 4'-11" x 6'-8".
These sizes determined as smallest workable sizes for rooms of low cost. Where building costs permit, the dimensions listed should be increased.

PLUMBING FIXTURES

Kitchen sink (without drain board), 21" to 24" by 22" to 30" long. Height of rim, 32" to 36" above floor.

Kitchen sink (with single drain board), 21" to 24" by 41" to 52" long. Height of rim, 32" to 36" above floor.

Bathtub, 30" to 36" by 54" to 72" long, 18" high. Finish tile or plaster surface will reduce bathroom width by one inch.

Lavatory (wall type), 18" to 30" by 15" to 24" wide. Height of rim, 31" above floor surface.

Lavatory (freestanding, 2" off wall), 24" to 36" by 20" to 24" wide. Height of rim, 31" above floor.

Toilet, width over-all, 22" to 24". Projection from wall, 24" to 30".

Shower cabinet, 32" x 32" to 42" x 42", 72" to 78" high.

Laundry tray (single), 20" to 26" by 22" to 30" long. Height of rim, 31" to 36" above floor.

Laundry trays (double), 22" to 27" by 40" to 50" long. Height of rim, 31" to 36" above floor.

KITCHEN EQUIPMENT

Range (oven above), 21" to 27" by 21" to 30" long, 34" to 38" high.

Range (oven at side), 23" to 27" by 40" to 48" long, 40" to 54" height over-all.

Refrigerator, 18" to 27" by 24" to 32" long, 48" to 60" high.

FURNITURE

Table, 34" to 40" wide, 4'-0" long for 4 to 6 persons, 6' long for 6 to 8 persons, 29" high.

Dining table, 3'-0" diameter will accommodate 4 persons; 4'-0" diameter, 6 persons; 28" to 29" high.

Chairs, 17" deep by 16" wide. Height, 32" to 42" over-all. Seat, 18" above floor.

Easy chair, 30" by 30". Height, 32"-36". Seat height, 16"-18".

Davenport, length, 6' to 7'; depth, 30" to 36"; height over-all, 30".

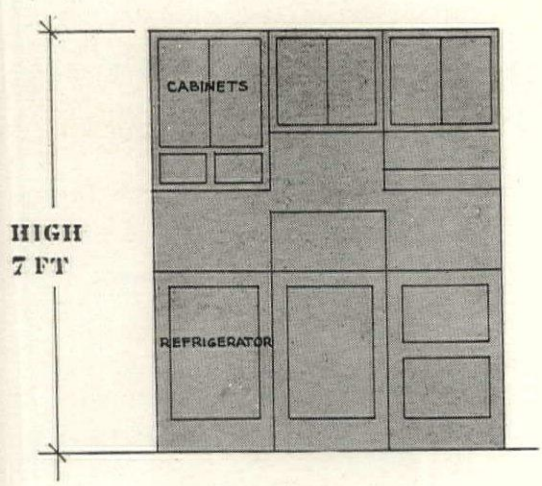
Upright piano, 4'-10" to 5'-4½" long, 2'-0" to 2'-2" wide.

Grand piano, 4'-10" to 5'-0" wide, 5'-10" to 7'-3" long; height, 3'-4".

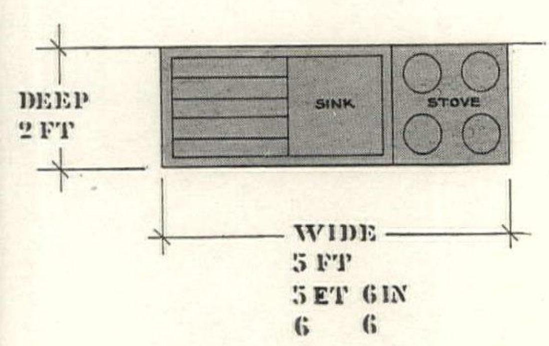
Baby grand, 4'-7" to 4'-10" wide, 4'-11" to 5'-8" long; height, 3'-3" or 3'-2".

Single bed, 3'-0" to 3'-3" wide, 6' to 6'-6" long.

Double bed, 4'-0" to 4'-6" wide, 6'-0" to 6'-6" long.



ELEVATION



PLAN

STANDARDS FOR LOW-RENT HOUSING

PLANNING REQUIREMENTS SET UP BY PWA HOUSING DIVISION

Extensive research into the field of low-rent housing has brought to light certain definite conclusions regarding basic principles to be followed in the successful development of housing projects of this type. For the past eighteen months the Housing Division of the Public Works Administration has been compiling data as well as creating and developing new basic ideas on this subject.

Within a surprisingly short time low-rent housing has become a reality and, in the absence of organized data, the Government has found it necessary to provide information. The Housing Division has had access to the records of all projects both here and abroad, and while the material assembled at this time represents only a starting point, it is felt that through the use of it the architects and others interested will have definite suggestions with which to approach the problem.

In view of the rapid strides being made, all plans and accompanying data are to be considered only as transitional. Standardization is not implied. It is dangerous to attempt to determine plan solutions in low-rent housing, for what may now appear to be satisfactory may soon be proved unwise. The present solutions of housing problems must be looked upon as progressive steps in our education in this field.

FACTORS THAT INFLUENCE DESIGN

There are many factors, such as climate, location, and economic, social and political conditions, that may affect the ultimate solution of a housing project, but there are certain features, on the other hand, that will remain constant. First, and most important of these, is the housing unit, which is the largest single grouping of rooms that may be dealt with.

HOUSING UNITS

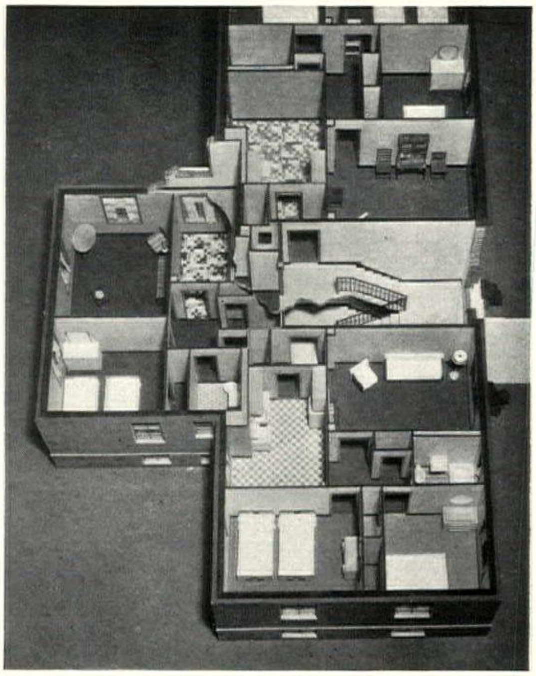
A housing unit may be defined as being a compact and efficient room group served by one stair and consisting of as many rooms or dwelling units as may be intelligently worked around this stair. The unit plan is generally one floor in height but may be repeated one above the other, as in the case of the apartment house. Row houses and flats are treated similarly in that unit plans form the basic element of design.

It has been found that the unit plan is a specific problem whereas the site plan, heights of buildings, and the proper selection of dwelling units, all require detailed study to satisfy the individual demands required by varying local conditions. The effort of the Housing Division has been to find the best available unit plan solutions in each group, leaving the final choice to the architect and others familiar with specific local problems.

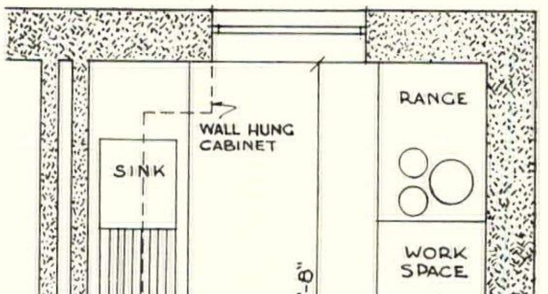
To make a housing project successful, the dwelling units must be tenanted by those who are not only attracted by the original appeal but who find them so livable that they continue to be happy as occupants. This not only makes "satisfied customers" but reduces the tenant turnover to a necessary minimum. At the same time every known rule of basic economy must be exercised.

With this in mind a schedule of architectural standards was adopted by the Housing Division embodying the following features applicable to low-rent housing:

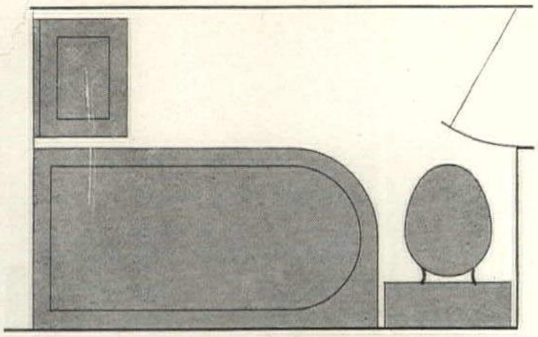
1. KITCHEN DATA:
   - (a) Cross currents of air desirable although not readily had.
   - (b) Advisable to install ready-made cabinets.
   - (c) Study arrangement to avoid lost motion, unnecessary stretching or stooping, and allow for easy opening and tight closing of doors, windows, and drawers.
   - (d) Preferable to have kitchen located near entrance.
   - (e) Locate good artificial lighting so as to reach all corners at night.
   - (f) Eating in kitchen must be considered and space allowed for this in planning.



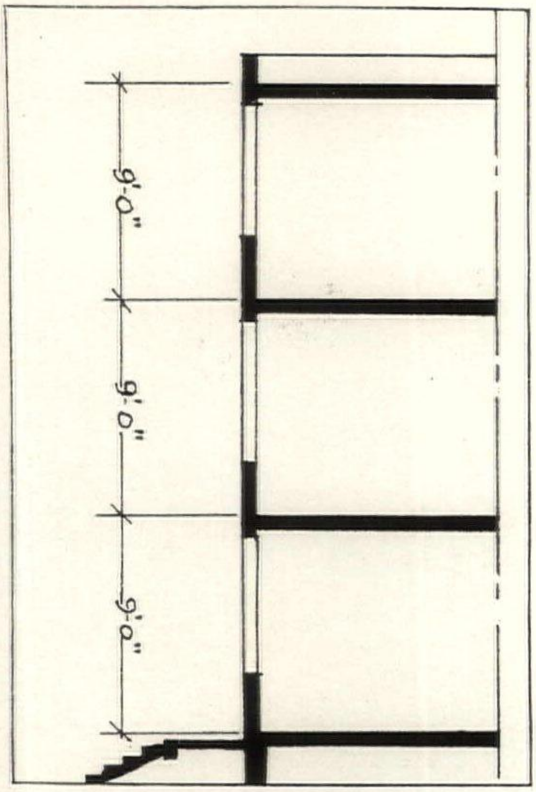
ONE OF THE TESTS APPLIED BY THE FEDERAL HOUSING DIVISION TO ITS ARCHITECTURAL PLANS FOR A PROJECT. THIS MODEL WAS BUILT TO ONE-HALF INCH SCALE FOLLOWING THE UNIT PLANS DISCUSSED IN THIS ISSUE OF THE ARCHITECTURAL RECORD.



TYPICAL KITCHEN FROM PWA (HOUSING DIVISION) "SAMPLE PLANS." THERE IS DESIRABLE CROSS CIRCULATION OF AIR; DINING TABLE, WITH DROP LEAF AT WINDOW.



BATHROOM OF NARROW ARRANGEMENT WITH ACCESS FROM HALL; 31½ SQUARE FEET. BATHROOM SIZE 4'-11" x 6'-8" (33.2 SQUARE FEET) SUITED TO "SAMPLE PLANS" ILLUSTRATED IN THIS ISSUE.



NINE FEET FLOOR TO FLOOR STORY HEIGHT RECOMMENDED, EXCEPT AS REQUIRED OTHERWISE BY LOCAL ORDINANCE. BASEMENTS—EIGHT FEET FROM FLOOR TO CEILING.

2. **BATHROOM DATA:**
   (a) Layout to be standardized throughout project.
   (b) Preferable to locate bathrooms adjoining kitchen so as to use one set of plumbing stacks.
   (c) Walls of hard white cement.
   (d) Floors and base of tile.
   (e) One medicine cabinet in each bathroom.

3. **PORCHES AND BALCONIES:**
   (a) Mainly a matter of study applied to the project locality.
   (b) Care should be exercised in the placing of porches so as not to reduce unduly the amount of natural lighting in rooms off porches.

4. **VESTIBULES:**
   (a) Desirable on ground floor leading into stair hall.
   (b) No announcer bells required except for apartments with separate entrance stairways.
   (c) Mail boxes to be installed in vestibules; architects should consult with Post Office Department for arrangement of mail boxes and secure official approval of the site plan for mail deliveries and house numbers.

5. **STAIRS AND STAIR HALLS:**
   (a) Walls of apartment houses to be built of hard, washable, glazed tile, except for special conditions.
   (b) Incinerators, rather than dumb-waiters, in all apartment house structures over two stories in height.
   (c) Steep stairs to be avoided.
   (d) Stair landings to be broad and triangular turns or winders to be avoided.
   (e) Handrails on both sides to be provided throughout.
   (f) All stairways to be adequately lighted.

6. **STORAGE SPACE:**
   (a) In apartment houses, storage space to be provided for each unit—one method of putting basements to good use.
   (b) In row houses and flats, storage space may be either in basement (group or individual) or in superstructure utility room.

7. **CLOSETS:**
   (a) Standard formula to determine number of closets: for each dwelling unit one coat closet (preferably in entry or vestibule), one linen closet, and at least one for each bedroom.
   (b) Minimum depth 1'10".
   (c) Use of doors on closets depends on individual project.
   (d) Closets to be kept away from exterior walls in all cases—this is done to conserve light area.
   (e) No cutting into rooms with closets.

8. **WINDOW AREA:**
   (a) At least one-tenth of floor area.
   (b) Minimum bathroom windows 1'8" x 3'0".
   (c) Windows to run up close to ceiling so that light penetrates deeply into rooms.

9. **STORY HEIGHTS:**
   (a) Except as required otherwise by local ordinances, story heights to be 9'0" from finished floor to finished floor.
   (b) No room to have less than 8'6" from finished floor to finished under side of ceiling slab, except basements which may be 8'0".

10. **MISCELLANEOUS:**
   (a) At least one chamber in each dwelling unit to be designed for twin beds.
   (b) Essential to eliminate whole beams in ceilings of all important rooms.
   (c) No compulsory passing through living rooms except in special cases.

ECONOMY IN PLAN LAYOUT

In addition to the above, due consideration should be given to the fact that an economy in plan layout must be accomplished without the loss of any desirable features, and at the same time allowing for a certain amount of flexibility. **After a minimum schedule of room sizes has been adopted, it will be found that in most cases the efficiency of a unit will be better satisfied through a proper sequence and arrangement of rooms rather than by simply increasing the room dimensions.** A well designed kitchen or bathroom with properly arranged fixtures and equipment is more useful than a larger room in which little or no thought has been given to room layout. As applied to living rooms and bedrooms, in addition to excess original construction cost, too much furniture would be needed by the tenant in projects where rooms are made excessively large.

Other factors, such as the proper use and layout of basement (if one is to be built), the most efficient type of construction to be used and many others are so much a local problem that they should be handled individually, and therefore no attempt has been made to adopt standards for them.

It should be noted that the minimum desirable sizes shown in the sample plans might be increased efficiently and would thereby add to the desirability of the plan from the renting standpoint, since, in practically every case, these plans were conceived to cover **minimum** requirements only. However, it should be observed that no plans can possibly be decreased without seriously affecting rentability. On the contrary, great improvements may be obtained by increasing either or both dimensions by one or two feet. This should result in fewer vacancies as the initial construction cost is but slightly increased, with a correspondingly small difference in maintenance costs existing between the minimum size plan and one that has been increased by about ten per cent.

Outstanding among the underlying principles which resulted in the code of minimum standards being adopted by the Housing Division and as outlined above, are the following:

Galloway

CHATHAM VILLAGE, PITTSBURGH, PA. INGHAM AND BOYD, ARCHITECTS; CLARENCE S. STEIN AND HENRY WRIGHT, CONSULTANTS.

MINIMUM ROOM SIZES:

It will be noted that a minimum dimension as well as a minimum area was standardized for different types of rooms. This was done in order to make every room livable and to avoid odd-shaped rooms. Each kind of room was studied for the amount of furniture as well as for the equipment that will go into it, and walking space around all of these was carefully considered. A radical point of departure to be observed is that all bedrooms were admittedly made wide enough for occupancy by two persons. Also note the standard dimensions adopted for bathrooms which, it has been found, comfortably (but not wastefully) allow sufficient space for all fixtures.

KITCHEN DATA:

Much study has been put into this particular matter as it is considered by many to be the focal point of all dwelling unit activities. Since the dining room was ruled out of use as far as Government housing is concerned, the kitchen must now provide space for eating purposes as well as for the usual cooking and storage duties. As will be noted from the items mentioned, the research expended in this part of the building structure is giving evidence of having the kitchen resolve itself into a work laboratory for the home.

CLOSETS:

These have been standardized both in number per dwelling unit and in size. It has been observed that only too often in the past, wherever a spare corner would be found, the architect would naturally turn it into a closet. Inversely, if no such places were found then the necessary closet space would be cut out of the room. These are all considered to be bad practices; therefore the standardization.

DWELLING UNITS:

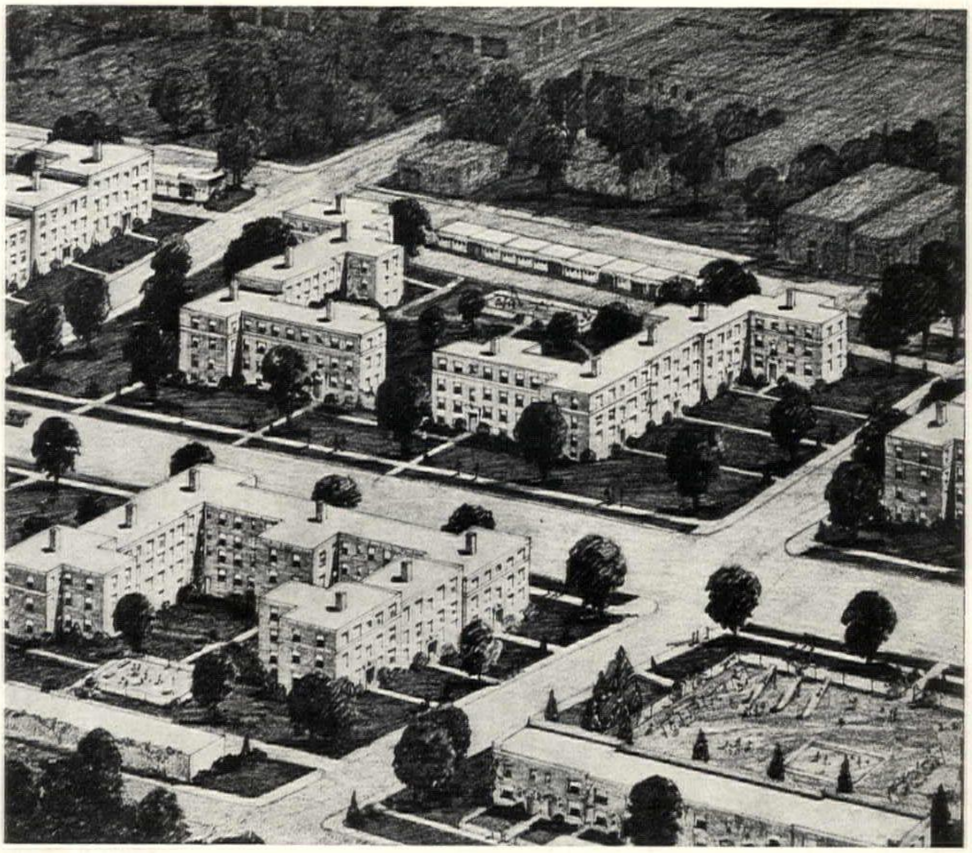
This term may be defined as any room, or group of rooms, designed as the living quarters of one family or household, and equipped with cooking and toilet facilities, and having an independent entrance to a public hall, or one directly to the outside; sometimes referred to as suite or apartment. The Housing Division is, at present, advocating three types of dwelling units, namely those in apartment houses, row houses, and flats. The underlying principles that help to determine the prevailing type for any one project, are, as described above, selected by the local architect as a result of local conditions. No one type may be said to be better than any other because each has its place. Apartments lean towards use on more expensive ground and in localities where occupants expect this kind of living along with complete services. Row houses are characteristic of sections in which tenants seek the individuality of private occupancy with garden space. Flat houses lend themselves more to less expensive land where the occupants do not demand the services expected of the apartment house type of resident· resultant savings are of course to be had.

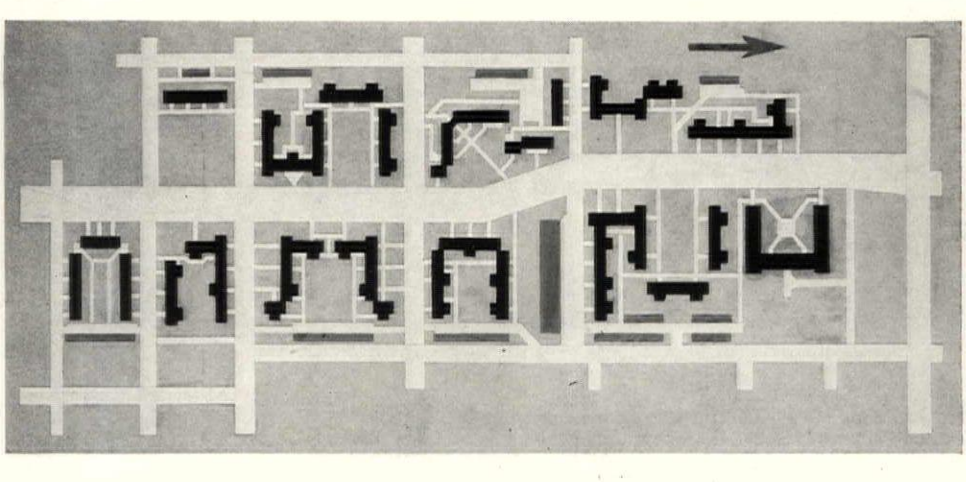
APARTMENT HOUSES WITH AMPLE SPACE FOR LANDSCAPE PLANTING.

STANDARDS FOR RESIDENTIAL CONSTRUCTION —CONTROL THROUGH MORTGAGE INSURANCE

This news digest covers developments connected with the Federal Government's long-term program for reviving and stabilizing residential construction—developments that have taken place since the National Housing Act was passed last June. The program aims to improve building standards for the common types of residence in which the bulk of the urban population is housed and to make mortgage money available on terms devised to eliminate the speculative waste heretofore customary in finance, real estate development and construction.

The news under review indicates that private residential construction will be ready to go ahead presently this year to the extent justified by supply and demand and raises the hope that architectural services will be more in request hereafter than they have been in an unregulated speculative real estate and building market. The digest is in three parts, the first dealing with Federal low-rent housing construction, the second with private residential construction, and the third with mortgage insurance standards.





TECHWOOD at Atlanta, Georgia —the first all-Federal project in the Public Works Administration's slum-clearance and low-rent housing program to reach the actual construction stage. This new housing consists of 3-story dormitory and 2- and 3-story apartments. It will provide 603 dwelling units and dormitory quarters for Georgia Institute of Technology. Allotment: $2,700,000. Land cost: 49 cents a square foot. Architects: Burge and Stevens.

Part 1: FEDERAL HOUSING CONSTRUCTION

PLAN REQUIREMENTS FOR LOW-RENT HOUSING

In preparation for the Government's enlarged program of low-rent housing construction, the Housing Division of the Public Works Administration has made a series of plan studies showing arrangement of rooms in an apartment and of apartments on a floor. The series occupies some forty 18 by 24-inch blueprint sheets. It is accompanied by a text of about 10,000 words, setting forth the requirements and recommendations accepted as governing factors in the plan studies. The Division takes the position that, as the Government money invested in housing projects will be amortized over a long period, the plans as well as other features must embody advanced practice in order to prevent early obsolescence.

The text and the plans, to be published under the title "Sample Plans," constitute a book of reference on a subject that is still new to most American architects—the planning of low-rent housing. The types of housing employed in Housing Division projects—apartment houses of three or four stories, flat houses of two stories and row houses of one or two stories—are in common use in suburbs and small cities. To promote the building of these types as well as free-standing dwellings is one of the principal objectives of the Home Loan Bank Act and the insurance title of the Housing Act. Those members of the Home Loan Bank system that operate under Federal charters are—and those operating under State charters expect shortly to be—permitted to offer 80 per cent building loans on houses for one to four families not exceeding with the land $20,000 in value, this high loan coverage being safely coupled with a low interest rate bacause the mortgages securing the loan are (1) amortized, (2) discountable and (3) eligible for insurance by the Federal Mutual Mortgage Insurance Corporation, which is authorized by law to determine standards of eligibility.

As insurable mortgages seem likely to play a leading rôle in the future construction of typical moderate-cost houses for one to four families, and as the Housing Division follows standards acceptable to the Mutual Mortgage Insurance Corporation, the architect in private practice will have reason to study the Housing Division requirements and recommendations.

CONSTRUCTION STANDARDS AND COST

The forthcoming publication "Sample Plans," being devoted to a particular subject, deals with related subjects only to the extent that they contribute assumptions necessary to the house plan. The principal assumption with respect to construction is that it must be "sound, lasting and economical." However, we have oral authority for the statement that the Housing Division projects contemplated in this plan study are to be of fireproof construction. The standards therefore may be summed up in the terms soundness, durability, economy and fireproofness.

In Techwood these qualities have been realized by the use of exterior walls of poured concrete or tile faced with brick, reinforced concrete floors, metal casement windows and metal trim, together with metal kitchen cabinets and shelving, incinerators, and other equipment normally associated with high-grade construction.

Economy being so important in low-rent housing, the following letter from Richard W. Onslow, Assistant to the Director of Press Relations, Federal Emergency Administration of Public Works is of interest:

"The average cost per cubic foot as estimated by the Division is running at the present time around 30c. To this must be added the cubic cost for mechanical equipment, which at the present time is running around 9c per cubic foot. This gives an average total cost of 39c for the buildings.

"These figures do not include landscaping nor land cost, but represent our estimates on the buildings themselves. These estimates cover the Techwood and University, Indianapolis, Cincinnati and Cleveland projects. They should not be construed as anything more than estimates.

"I might say, however, that the contract price for the Techwood project fell well within our estimates."

All projects mentioned are of fireproof construction.

LOW-RENT HOUSING DEFINED

The following definitions are taken from a copy of the manuscript for "Sample Plans":

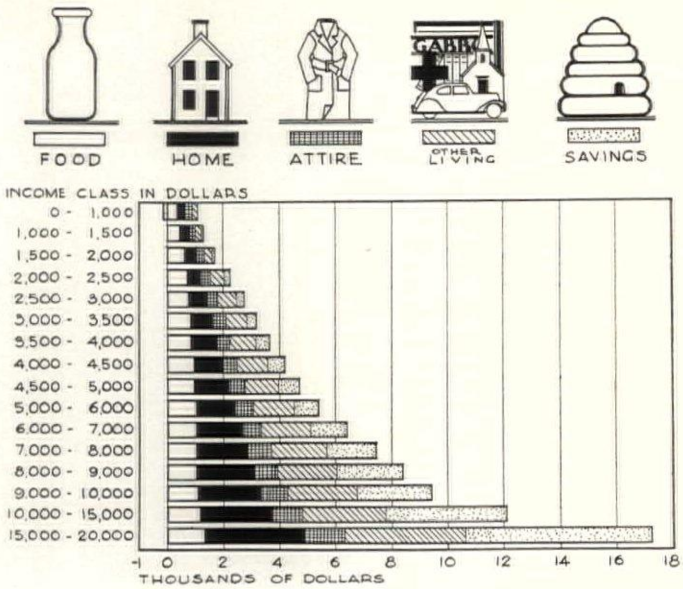
1. Low-rent housing provides shelter embodying modern standards of construction, light, ventilation, privacy and sanitation at rentals not to exceed one-fourth of the average family income for wage-earners in the lower brackets of the income group.

2. An alternative definition is that the maximum monthly room rental charged shall not be greater than the median monthly rental per dwelling unit now paid, divided by the number of persons in the median size family in that particular community.*

To apply these definitions to a given project involves a study of the community for which the project is intended. However, being both a standard of measure and a declaration of policy, they are sure to be used in connection with a variety of general studies; for example, estimating the amount of housing economically practicable at a given rent.

Information on such topics as tenure of home, value or monthly rental of nonfarm homes, size of family, families classified according to number of children under 10 years old, number of children under 21 years old, number of gainful workers, number of lodgers, age of head, employment status of home-maker, dwellings classified according to number of families accommodated, families having radio sets, and families classified by color and nativity of head is given for the United States, for each State, for counties, for the smaller cities and other urban places, and for wards or other subdivisions of the larger cities in Volume VI, entitled "Families," of the Fifteenth (1930) Census Reports on Population.

*For a discussion of this definition see, "A Method for Determining What Constitutes Low-Cost Housing," by Norbert Brown, REAL ESTATE RECORD AND BUILDERS' GUIDE, September 16, 1933, pp. 3-4.



ESTIMATED NUMBER OF FAMILIES BY INCOME CLASSES, 1929 (in thousands)

Income Class[a] (In dollars)	Families of Two or More Persons		
	Total	Non-Farm	Farm
Under 0[b]	120	50	70
0 to 500[b]	1,982	600	1,382
500 to 1,000	3,797	2,085	1,712
1,000 to 1,500	5,754	4,749	1,005
1,500 to 2,000	4,701	4,094	607
2,000 to 2,500	3,204	2,811	393
2,500 to 3,000	1,988	1,767	221
3,000 to 3,500	1,447	1,312	135
3,500 to 4,000	993	898	95
4,000 to 4,500	718	656	62
4,500 to 5,000	514	474	40
5,000 to 6,000	666	626	40
6,000 to 7,000	407	388	19
7,000 to 8,000	252	243	9
8,000 to 9,000	172	168	4
9,000 to 10,000	128	126	2
10,000 to 15,000	304	301	3
15,000 to 20,000	108	107	1
20,000 to 25,000	59	59	c
25,000 to 30,000	35	35	c
30,000 to 40,000	40	40	c
40,000 to 50,000	22	22	c
50,000 to 75,000	27	27	c
75,000 to 100,000	12	12	..
100,000 to 250,000	16	16	..
250,000 to 500,000	4	4	..
500,000 and over	4	4	..
All Classes	**27,474**	**21,674**	**5,800**

[a]Includes income from occupation, investments, and sale of property; also includes imputed income on owned homes, but does not include imputed income on durable consumption goods other than homes. The distribution above $15,000 is very rough.
[b]The estimates for this class are highly tentative.
[c]Less than 500 included in $15,000 to $20,000 class.

Until recently the most useful survey of information on family incomes and budgets was perhaps the one contained in the Publications of the President's Conference (1931) on Home Building and Home Ownership.

This survey is now superseded by the original research study "America's Capacity to Consume," by Maurice Leven, Harold G. Moulton and Clark Warburton (The Brookings Institution, Washington, D. C., 1934), a book of first-rate importance to housing students. The accompanying partial reproduction of a table on page *227* is printed with permission from the publishers.

RENTS IN A LOW-RENT PROJECT

Ground has been broken in Atlanta, Georgia, for the first all-Federal project in the Public Works Administration's slum-clearance and low-rent housing program to reach the actual construction stage. The project is the Techwood development, for which the land has been acquired at 49 cents a square foot, and a $2,108,337 contract awarded.

Federal projects to clear slums and provide modern housing for families in the lower income groups are progressing in some 30 cities. Title to sites in four cities has been vested in the United States, and additional sites are being acquired.

The Techwood development will be of modified Georgian design and of fireproof construction. It adjoins the campus of Georgia Institute of Technology and will provide, in addition to 603 family units in apartments and row houses, 159 dormitory rooms for the students of the Institute.

Twenty-three units make up the project; seven courts of row houses, thirteen three-story apartment buildings, the dormitory, a playground shelter, and an administration building with offices, stores, and equipment for a clinic. There will be 397 living units of three rooms, 128 of four, 53 of five, and 26 of six-rooms. For the use of tenants, the project includes 186 garages.

Thirteen blocks of substandard dwellings were cleared for the housing development. Only 20 per cent of the reclaimed area will be used for buildings; the remainder will be landscaped and devoted to park and recreational purposes.

The rent schedule has not yet been worked out. Nor has the Management Branch set any minimum and maximum family incomes as criteria for tenants. Preliminary official estimates indicate that rents may average $7.41 a room a month, a figure that may be changed, possibly downward, when the project is finished.

It does not seem unreasonable therefore to assume that the rents when finally established will run from $7.50 to $8 a room a month. A three-room apartment will on this assumption call for a yearly rent of $270 to $288 and a five-room apartment for $450 to $480. If the assumption turns out to be correct, these admirably planned, constructed and equipped low-rent houses are adapted to family incomes ranging from $1,080 to $1,920 a year.

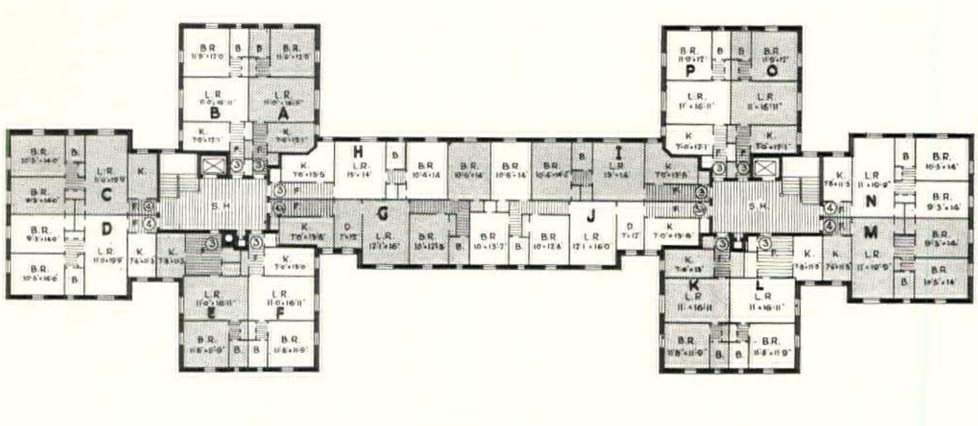
It is, of course, understood that 30 per cent of the expenditure for labor and materials is a subsidy, and that the rents are to liquidate the total cost of the project, after deducting the subsidy. The land was originally acquired by a limited dividend corporation, which transferred the title to the government.

McLaughlin Aerial Surveys

The Boulevard Gardens Housing Corporation, a limited dividend corporation formed under the New York State Housing Law, has secured a loan of $3,450,000 from the Federal Emergency Administration of Public Works, in Washington, to build ten 6-story apartment houses, providing housing for 960 families at an average rental of $11 a room. The interest rate of the loan is 4% and, by amortizing at the rate of 2.4% annually, the mortgage will be fully repaid in approximately 26 years. The project is not tax-exempt. Each unit will contain 332 rooms divided into 96 apartments. In each unit there are two 2-room apartments, sixty 3-room apartments, twenty-two 4-room apartments, six 4½-room apartments, and six 5½-room apartments, the half room in the latter sizes being a separate dining alcove. Two self-service elevators, incinerators, modern gas ranges, mechanical refrigeration and radio outlets will be standard equipment in each building.

BOULEVARD GARDENS, INC.
HOUSING DEVELOPMENT
AT WOODSIDE, NEW YORK

T. H. ENGELHARDT, ARCHITECT
ADOLPH M. DICK, CONSULTANT



Wood Aerial Surveys, Inc.

Allotment: $1,039,000. Estimated total cost: $1,153,607. To provide approximately 284 living units (1,085 rooms).

JUNIATA PARK (LIMITED DIVIDEND) HOUSING CORPORATION PROJECT IN PHILADELPHIA
W. POPE BARNEY, ARCHITECT . . . . . KASTNER AND AND STONOROV, ASSOCIATES

RECAPITULATION OF PWA HOUSING PROJECTS:

Eight Limited Dividend Projects	$ 12,669,600 - - -	3,452 Living Units
Thirty-two Approved Federal Projects....................	$115,778,000 - - -	24,500 Living Units (approx.)

In addition, fifteen Federal projects are ready for submission for approval, contingent upon availability of funds. These involve $41,295,000.

Total acreage to be acquired for thirty-two approved projects: approximately 719.5 acres. Average size of project site: 22.5 acres. Coverage: 25 - 30 per cent.

Part 2: PRIVATE RESIDENTIAL CONSTRUCTION

THE SECURITY OF DECENT HOMES

Among the measures that further this objective of the President are (1) the Federal Home Loan Bank System, (2) the Home Owners' Loan Corporation, (3) the Federal Mutual Mortgage Insurance Corporation, (4) the Housing Division, (5) insurance of modernization loans, to mention only those which bear directly on urban housing.

Bills before the Congress to reshape and strengthen the group of organizations already in existence will not be reviewed at this time. However, the provision in the banking bill which would permit member banks of the Federal Reserve System to lend more freely on real estate mortgages warrants special mention. The provision is explained by Marriner S. Eccles, governor of the Federal Reserve Board, in his statement on the bill as follows:

> "The changes proposed would authorize banks to use a larger proportion of their assets for mortgage loans than is permitted by existing law, to lend up to 75 per cent of the property value and for a term up to twenty years on properly amortized first mortgages, and to make such loans without regard to the local geographical limits to which the existing law confines them.
>
> "Member banks of the Federal Reserve System hold nearly $10,000,000,000 of time deposits that represent in large part the people's savings. These are long-time funds. Their use for long-time purposes is proper from every point of view."

The proposed changes are intended to clarify the amendment of the Federal Reserve Act contained in the National Housing Act of June 27, 1934, which permits member banks to lend in excess of 50 per cent of the value of the real estate and for a longer term than five years upon mortgages insured under the provisions of Title II of the National Housing Act. The implifications of this amendment are that member banks of the Federal Reserve System may lend up to 80 per cent on amortized mortgages for periods not to exceed 20 years, and some of the biggest banks of the country have applied to the Mutual Mortgage Insurance Corporation for approval as mortgagees. The banking bill before the Congress limits the coverage to 75 per cent, instead of 80 per cent, but otherwise explicitly enables the thrift departments of member banks to hold the same kind of amortized insured mortgage as that which members of the Home Loan Bank System may hold.

The time deposits of member banks of the Federal Reserve System contain only a part of the thrift accounts of the country. The larger part is held by institutions of the kind eligible for membership in the Home Loan Bank system—building and loan associations, mutual savings banks, life insurance companies and the like. Such institutions, with the exception of Federal savings and loan associations, operate under State charters and are subject to State laws which permit them to lend not more than 50 or 60 per cent of the value of the real estate.

These laws were enacted when short-term mortgages were common and it was customary for a thrift institution to hold a first mortgage while second and often third mortgages were taken by concerns financing sales by operative builders. That part of the mortgage business upon which activity in new construction depended—through building loans, junior mortgages, bond issues—was bankrupted by the depression. To replace it, so far as moderate-cost housing is concerned, the long-term amortized mortgage covering up to 80 per cent of real estate values has been standardized by the Home Loan Bank Act and related Federal legislation and is insured by the Federal Mutual Mortgage Insurance Corporation.

To enable State chartered thrift institutions to invest in mortgages insured by the Corporation authority has to be given by 46 State legislatures, two having already passed the required legislation. Four do not meet this year. The governors of thirty-eight of the remaining States had up to January 21 responded favorably to the suggestion from President Roosevelt that they recommend enabling legislation.

There cannot be much doubt but that by the time the Congress and the majority of the State legislatures now in session adjourn the one remaining major item in the Government's program for reorganizing the residential mortgage market will have been put into effect.

The former sources of building loan money are dried up. As there is no adequate volume of building loan money in sight except that which the legislative measures now under consideration promise to liberate, and as the security specified by those measures is the amortized insurable mortgage on houses for one to four families, it is safe to say that the bulk of private residential construction will hereafter be financed by means of this new form of lien.

This fact is of outstanding importance to the practice of architecture, because the regulations determining eligibility of mortgages for discount in the Home Loan Bank system and for insurance by the Federal Mutual Mortgage Insurance Corporation constitute in effect a Federal building code for the private as well as public construction of the types of home in which the great majority of the urban population is housed. The regulations are intended to carry out some of the implications contained in the phrase "security of decent homes." They promote stabilization of real estate values, encourage wholesome social and economic environments, and further sound planning and construction by setting up minimum requirements with regard to the community plan, the site plan, the house, the financial responsibility of the builder and so on, and the minimum requirements are enforced by prescribed means, including inspections and appraisals.

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It is the purpose of the following paragraphs to indicate the contents of the more important official releases in which these regulations may be found. The text of the releases is used freely without being set off by quotation marks.

Part 3: MORTGAGE INSURANCE STANDARDS

OPERATIVE (SPECULATIVE) BUILDING

Circular No. 4. Operative Builders. Information concerning insurance of mortgages on projects of operative builders under Title II of the National Housing Act (except operations under section 207). Federal Housing Administration, Washington, D. C., December 15, 1934.

Section 207 relates to mortgages on low-cost housing projects. When the National Housing Act was signed June 27, 1934, it was not clear how speculative building, which had for years produced the bulk of residential construction, would fare in the reorganized residential mortgage market. The answer depended upon the policy of the Mutual Mortgage Insurance Corporation—a policy which the Act authorized the Administrator to develop. Circular No. 4 sets forth the new status of the speculative or operative builder.

The Administration recognizes the operative builder as an important producer of residential mortgage security. Production of residential properties without proper relation to the economic need results in unsound and unstable property values, and is therefore not to be encouraged.

The Administration also recognizes the operative builder as an influential element in the creation of housing standards and conditions—both present and future. It is largely through the medium of his activities that desired improvement is transformed into reality. There exists, therefore, a natural union between the operative builder and the Administration in bringing about improvement in housing standards and conditions.

This circular is confined to the activities of the operative builder as a producer of one- to four-family dwellings. He is eligible to apply for the benefits of mutual mortgage insurance upon the same general basis as the individual home builder, and the factors which the Administration will consider in passing upon his application are in substance the same.

The number of insured mortgage loans which the operative builder may obtain is limited only by the conditions of demand and quality as may be determined by the Insuring Office. No mortgage, however, may (1) exceed $16,000 in principal amount, (2) exceed 80 per cent of the appraised value of the property, or (3) have a maturity to exceed 20 years.

Such mortgages may be placed upon (1) detached, (2) semi-detached or (3) row type one- to four-family dwellings subject to the following limitations:

1. Each dwelling must be located on a separate plot of land.

2. Each dwelling must be capable of being separately owned.

3. Each dwelling must be financed as a separate unit.

Although the Administration is not empowered to insure a mortgage until there is located upon the property which constitutes the security a one- to four-family dwelling, it is empowered to make commitments for the insuring of mortgages prior to the date of their execution and disbursement thereon.

Commitments of three types will be made upon the application of an approved mortgagee, for the insuring of a mortgage covering an operative builder's project:

1. Commitment will be made to an approved mortgagee where the operative builder has a definite buyer for the completed dwelling property. In such case the application for the insured mortgage loan shall be made by the buyer, as original mortgagor.

2. Commitment will be made to an approved mortgagee where the operative builder contemplates that an unknown buyer will be the original mortgagor. This commitment will be made subject to the subsequent submission and approval of a mortgagor's application for an insured mortgage loan.

3. Commitment will be made to an approved mortgagee where the operative builder is to be the original mortgagor, upon the Administration being satisfied as to the following:

(a) That he is able, with his own capital, to finance any portion of the cost of the project not financed through the medium of the mortgage loan.

(b) That he is able to carry the mortgage responsibility on a reasonable number of vacant or unsold projects.

(c) That the project is economically sound and conforms to all other applicable rules and regulations of the Administration.

In such cases, the application for the insured mortgage loan shall be made by the operative builder as original mortgagor.

ARCHITECTURAL STANDARDS FOR PRIVATE CONSTRUCTION

Circular No. 2. Property Standards. Requirements for mortgage insurance under Title II of the National Housing Act. Federal Housing Administration, Washington, D. C., November 27, 1934.

This circular is of special interest to architects. It begins with a statement of objectives. The Federal Housing Administration, as the custodian of funds accumulated from insurance premiums, must eliminate, so far as possible, the risks to which these funds may be subjected. The mortgage-insurance facilities of the Federal Housing Administration may be made available, therefore, only to those properties whose prospects of continued utility are sufficiently good to give assurance of their enduring as sound investments throughout the life of the mortgage.

In addition, the National Housing Act definitely places upon the Federal Housing Administration the obligation to encourage improvement in housing standards and conditions.

The Federal Housing Administration intends that mortgages insured under its program shall be upon dwellings which are substantial and durable in structure, convenient and efficient in arrangement, attractive in appearance, and appropriate in their neighborhood setting. It intends that these dwellings shall be placed only in neighborhoods which possess, in considerable degree, security from those disintegrating influences which are more certain to destroy property values than defects in the building themselves.

The same standards will be applied to existing buildings, both as to structure and neighborhood, as to new buildings. To insure the continued financing of substandard existing housing, or of housing in decadent or unprotected neighborhoods, would be to imperil a program dedicated to the development of better housing conditions and of sound housing finance.

This circular indicates the qualities in a residential property and its environment which will result in a favorable insurance rating of the mortgage covering it. It states also, in certain instances, minimum requirements, the absence of which in a given case will render a mortgage ineligible for insurance.

Among the topics treated are minimum neighborhood requirements, standards of land utilization, design, services and equipment, planning and accommodation, minimum construction standards.

SUBDIVISION STANDARDS

Circular No. 5. Subdivision Development. Standards for the insurance of mortgages on properties located in undeveloped subdivisions. Title II of the National Housing Act. Federal Housing Administration. Washington, D. C., January 10, 1935.

Subdividers have in the past done pretty much as they pleased. It has been common practice to sell lots in places where there was no need for them and where the streets, indicated by plowed furrows, bore no relationship to nearby highways or to more distant city streets. The Division of Town Planning of the Department of Public Welfare of Massachusetts, in its annual report for 1934, estimates that there are in the country probably enough laid-out but undeveloped lots to care for 100,000,000 people. The statement is made in support of needed State legislation and is followed by the argument: "These improperly located and badly planned subdivisions necessitate many miles of unnecessary streets and services. Our industries and businesses do not plan for the utmost inefficiency and expense, and it is time for our taxpayers' associations, made up mainly of industrial and business men, to support sound planning simply because of its reaction on local expenses."

This reference to local expenses by the Massachusetts report suggests that the following paragraph in Circular No. 5 of the Federal Housing Administration is in line with rising sentiment: "The real estate tax situation shall be such that there is not existing or anticipated a disproportionate burden of taxes upon residential properties; not to exceed 50 per cent of the residential lots shall have delinquencies of more than two years' standing against them on account of the nonpayment of real estate taxes . . . or of special assessments."

Among the subheads in the Circular are minimum physical and financial requirements, desirable standards, methods of overcoming defects in existing developments. Subdivisions must contain or be convenient to schools, markets, parks and playgrounds, places of employment, means of transportation and so on.

LOW-COST HOUSING PROJECTS

Circular No. 3. Low-Cost Housing. Insurance of mortgages on low-cost housing projects under Section 207, Title II, of the National Housing Act. Federal Housing Administration. Washington, D. C., November 27, 1934.

The National Housing Act provides for the insurance of mortgages upon two general classes of property:

(1) Properties occupied by one- to four-family dwellings.

(2) Properties comprised in low-cost housing projects occupied by a larger number of family units, either in one building or in a group of buildings.

The Federal Housing Administration may consider the insurance of a single mortgage upon a property comprising more than four family units only when the application satisfies the Administration as to conformity with the regulations herein set forth. All properties falling into this general class will be referred to as low-cost housing projects.

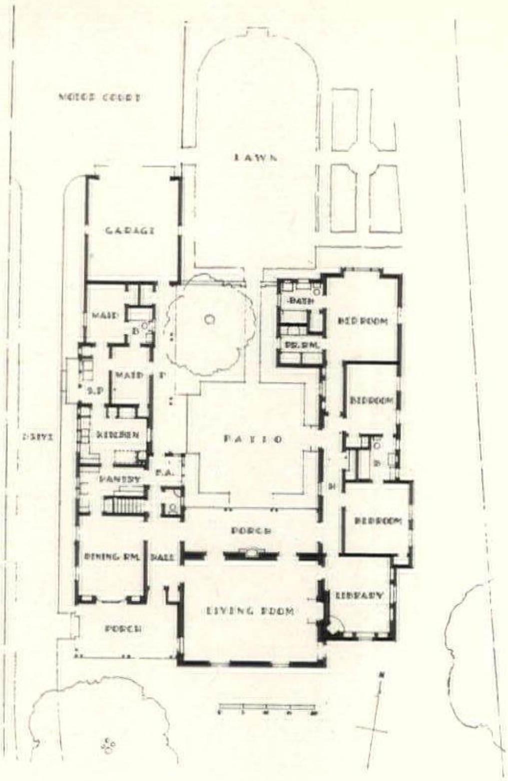
The following general classes of mortgage upon low-cost housing projects are eligible for insurance:

(1) Mortgages executed by any properly constituted Federal, State, municipal or other public authority, which is regulated or restricted by law as to rents, charges, capital structure, rate of return and methods of operation in a manner and to an extent satisfactory to the Administrator,

(2) Mortgages executed by any private limited dividend corporation, organized under a State housing law, which is regulated and restricted by such law as to rents, charges, capital structure, rate of return and methods of operation in a manner and to an extent satisfactory to the Administrator, and

(3) Mortgages executed by any private limited dividend corporation which, though not organized under a State housing law, is organized solely for the purpose of erecting, owning and operating such low-cost housing projects and is, by the terms of its certificate of incorporation, or by contract, regulated or restricted as to rents, charges, capital structure, rate of return and methods of operation in a manner and to an extent approved by the Administrator.

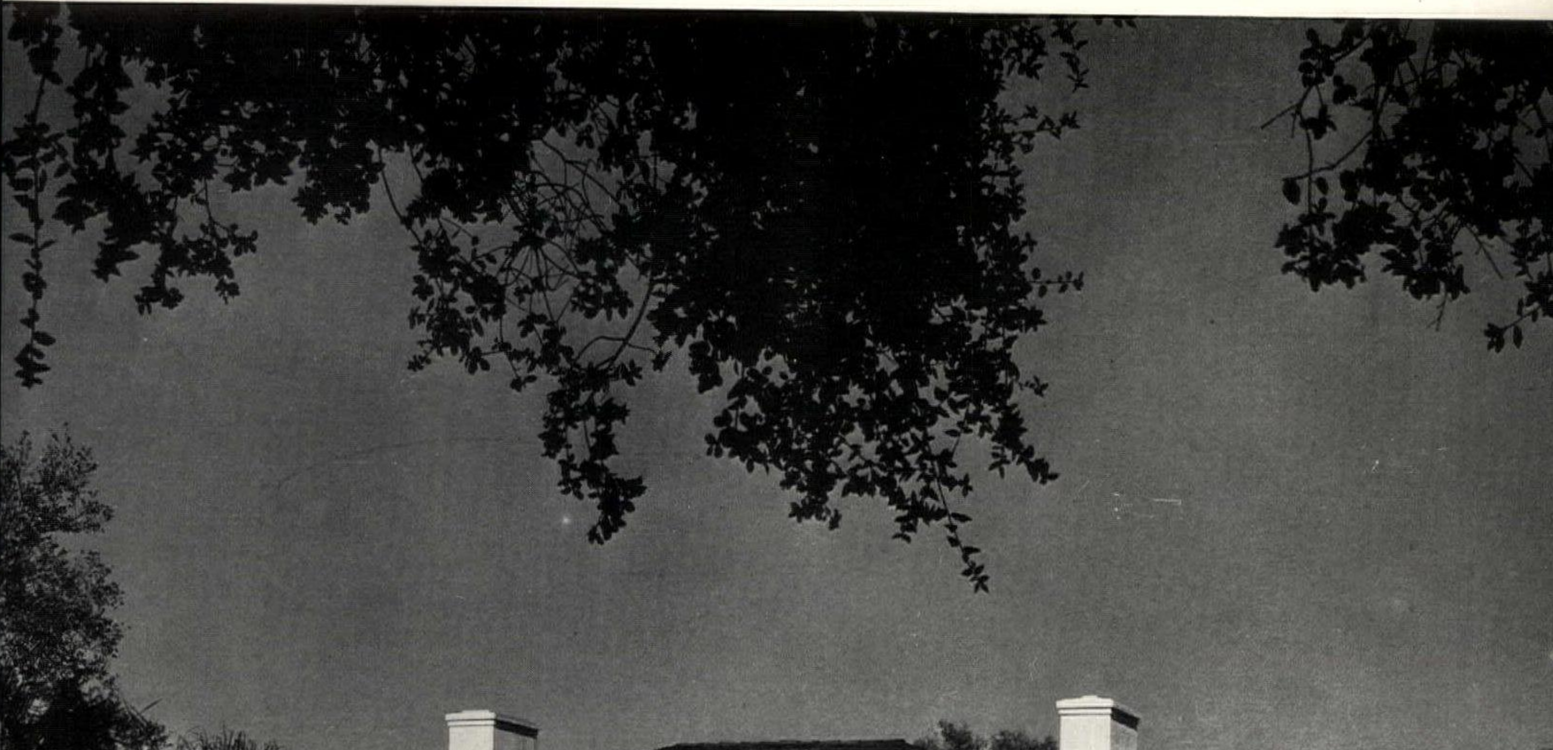
The topics covered include projects of public housing authorities, projects of private limited dividend corporations, submission of applications, maximum rentals, determination of insurability, economic and social considerations, legal considerations, physical structure, design and livability, value, cost and financial structure, management. The building plan criteria, while briefly stated in this circular, are developed in detail in the forthcoming publication "Sample Plans," of which the substance is reported in this issue of THE RECORD.



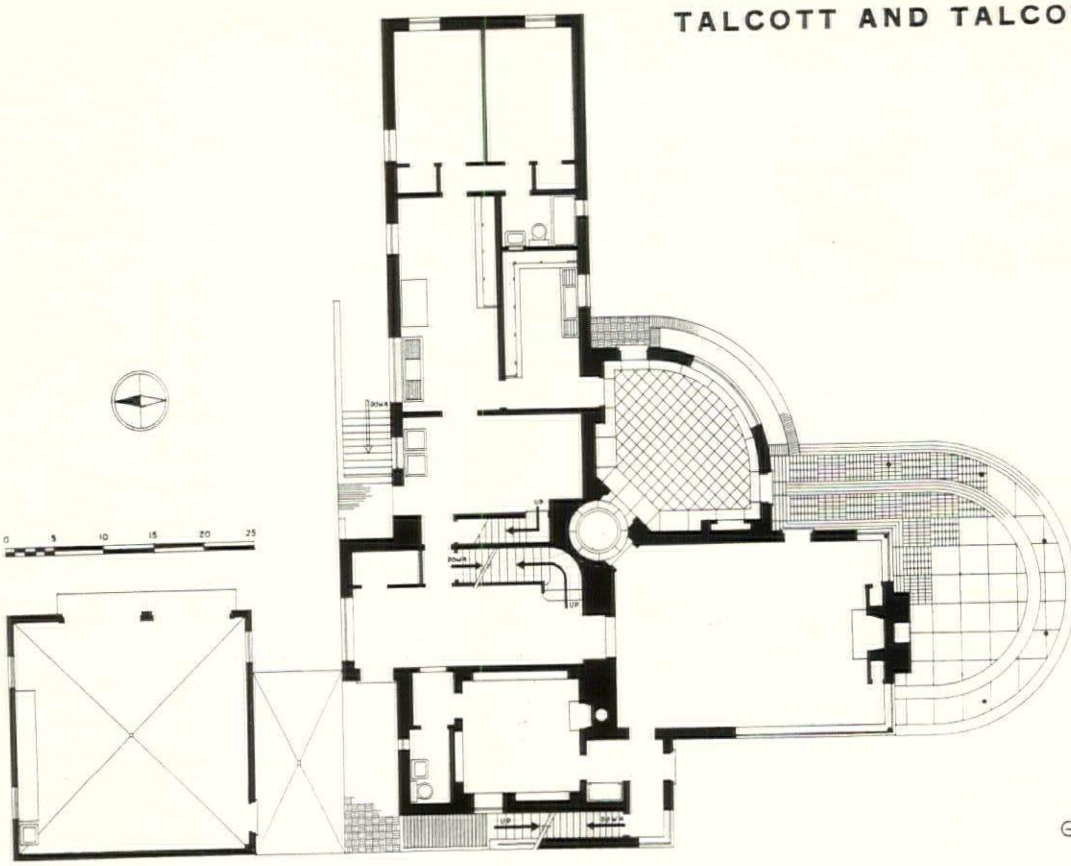
PORTFOLIO

OF SMALL HOUSES

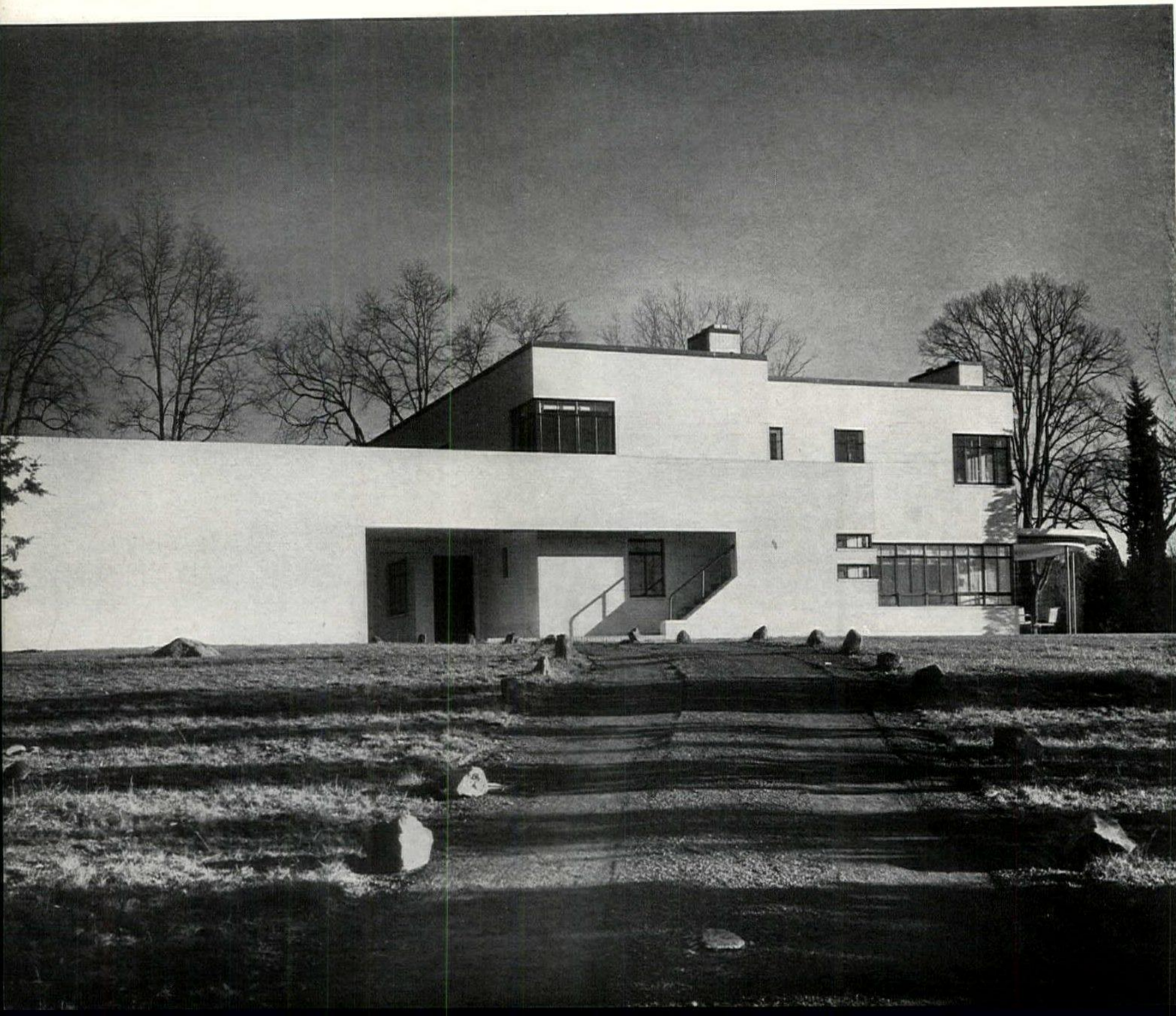
HOUSE OF H. S. PARSONS
SAN MARINO, CALIFORNIA
PALMER SABIN, ARCHITECT



Photograph by George D. Haight



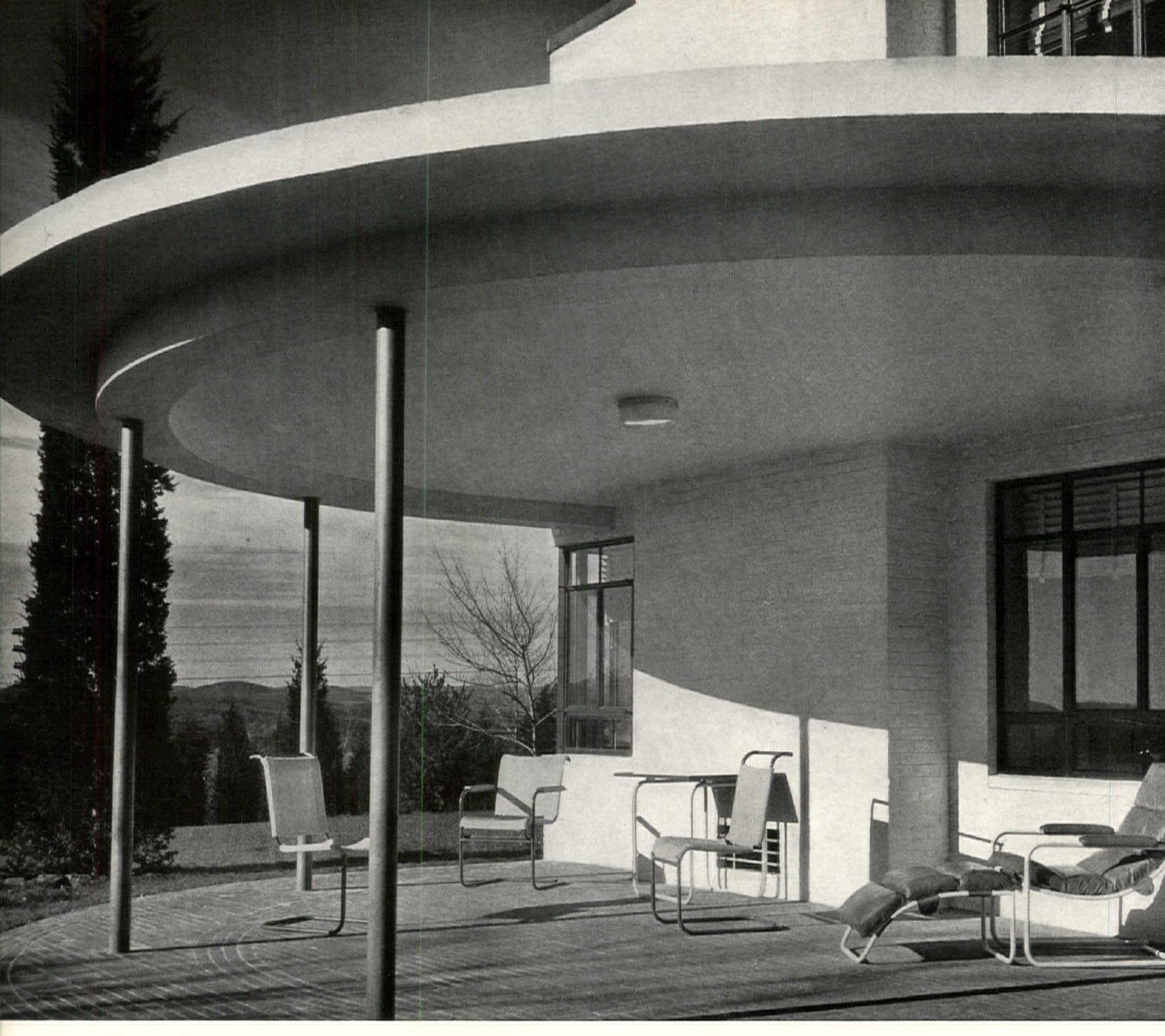
GROUND FLOOR PLAN



Photographs by Richard Garrison

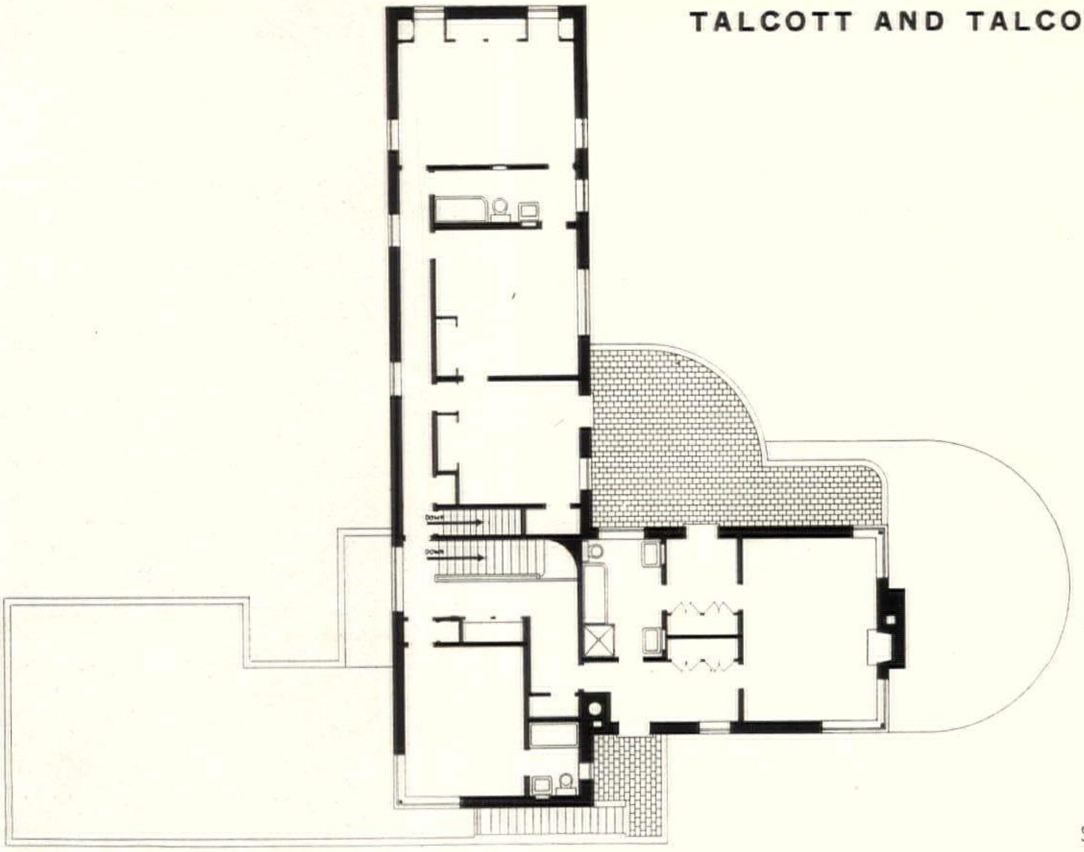
HOUSE OF OSTROM ENDERS . . . . AVON, CONNECTICUT

Among the planning requirements the following were most important: Children's rooms which could be cut off from the rest of the house, so that when the children grew up and left home, the parents would not have the feeling of living in a large house with many empty rooms. Outside stairway to give direct access to the owners' quarters and to permit them to return from hunting or riding without tracking through the main hall. Dining room adjacent to porch to allow outside dining in spring, summer, and fall. The house is painted white with red doors and black steel sash. Through the use of venetian blinds and shades of various colors in the different rooms, a colorful effect is obtained in the façades. The interiors are painted in plain flat colors.

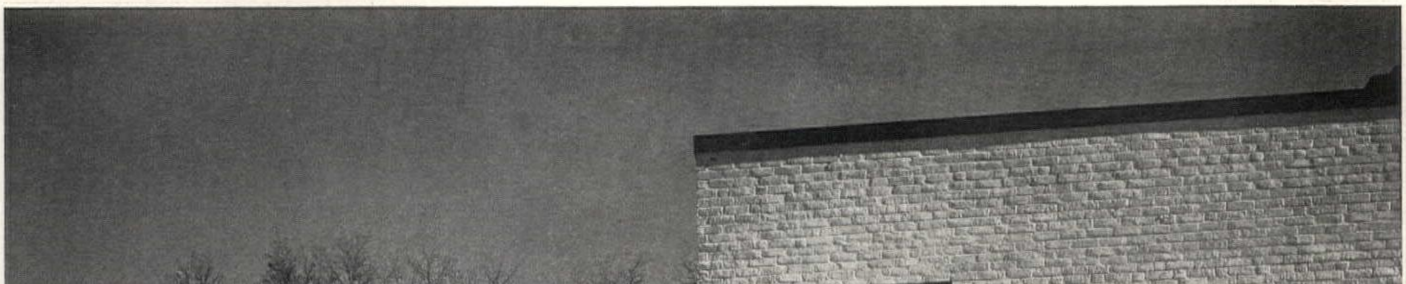


HOUSE OF OSTROM ENDERS . . . . AVON, CONNECTICUT

The house is built of 8" hollow tile bearing walls with a 4" brick veneer, furred and plastered on the inside. Floors and partitions are of wood. The main roof is Barrett specification on wood joists and is insulated with cork and rock wool; it is drained by interior leaders. The terraces over the dining room and at the head of the outside stairway are tiled. Windows are stock steel sash. The interiors are simple, with plain trim, flush doors, and plain plastered walls throughout, except in the library which is finished in brick. There is a white marble floor in the hall, a rubber tile floor in design in the dining room, and linoleum floors in the service quarters and baths; elsewhere, strip oak flooring. Recessed ceiling lighting fixtures throughout are used for general illumination.



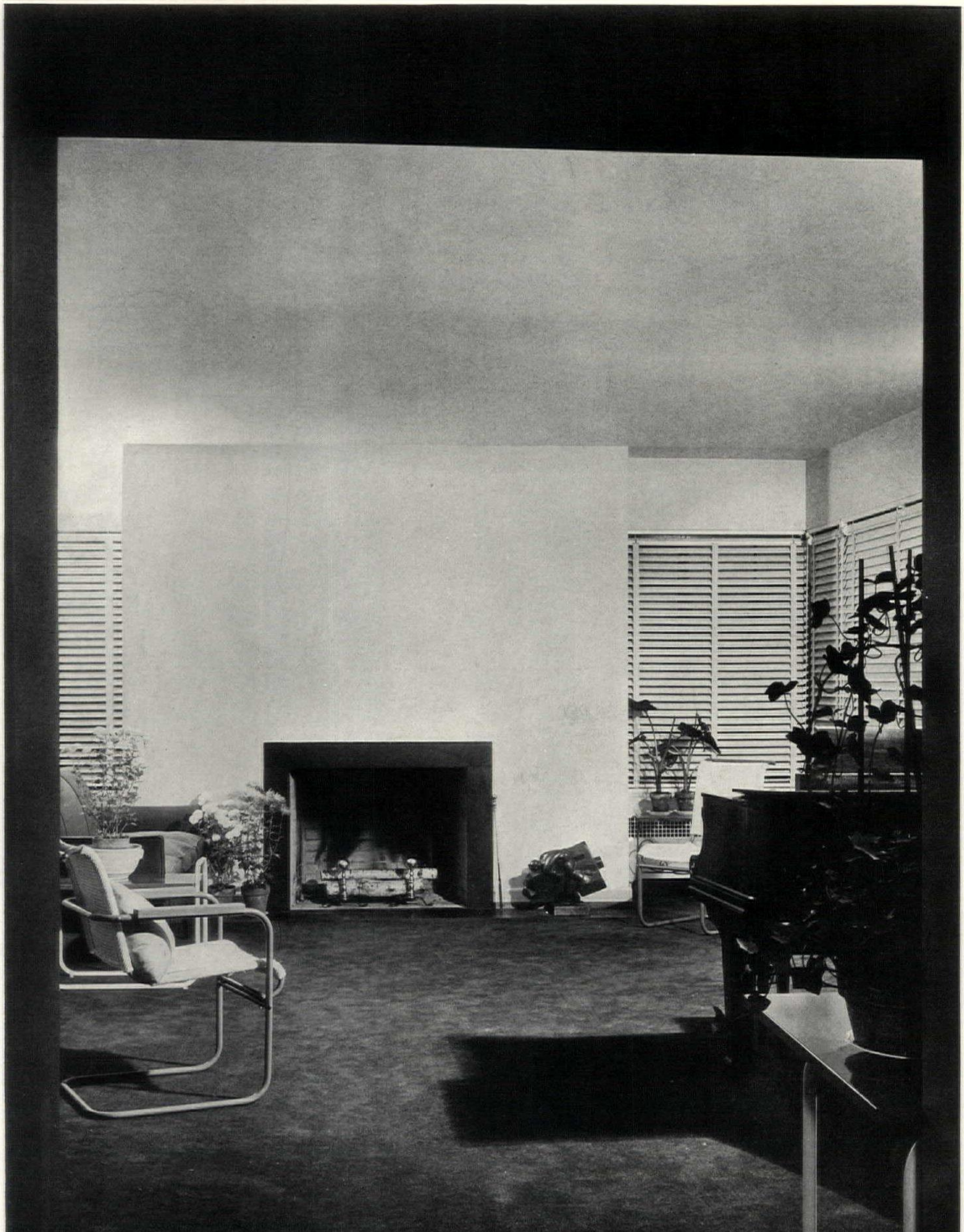
SECOND FLOOR PLAN



Photographs by Richard Garrison

Photographs by Richard Garrison

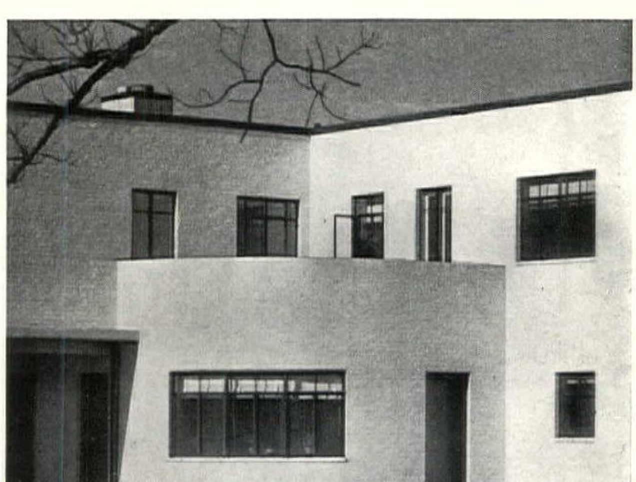
HOUSE OF OSTROM ENDERS, AVON, CONNECTICUT . . . . . LIBRARY

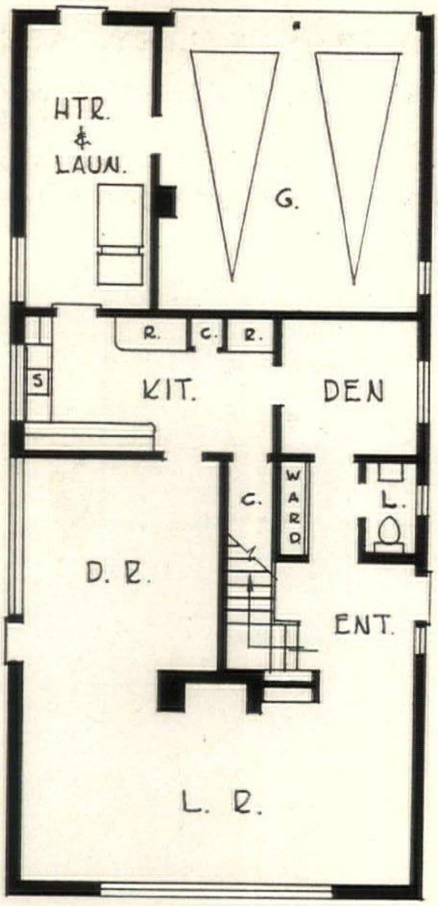


LIVING ROOM . . . . TALCOTT AND TALCOTT, ARCHITECTS

Photographs by Richard Garrison

HOUSE OF OSTROM ENDERS, AVON, CONN.—TALCOTT AND TALCOTT, ARCHITECTS





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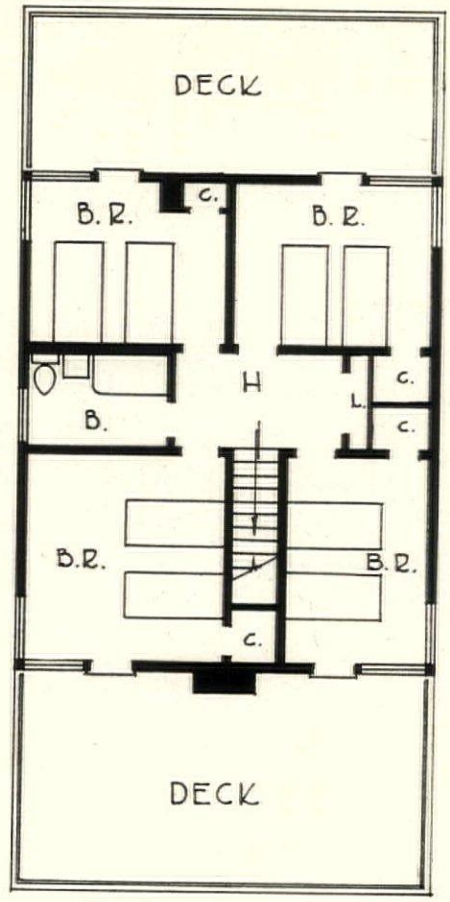


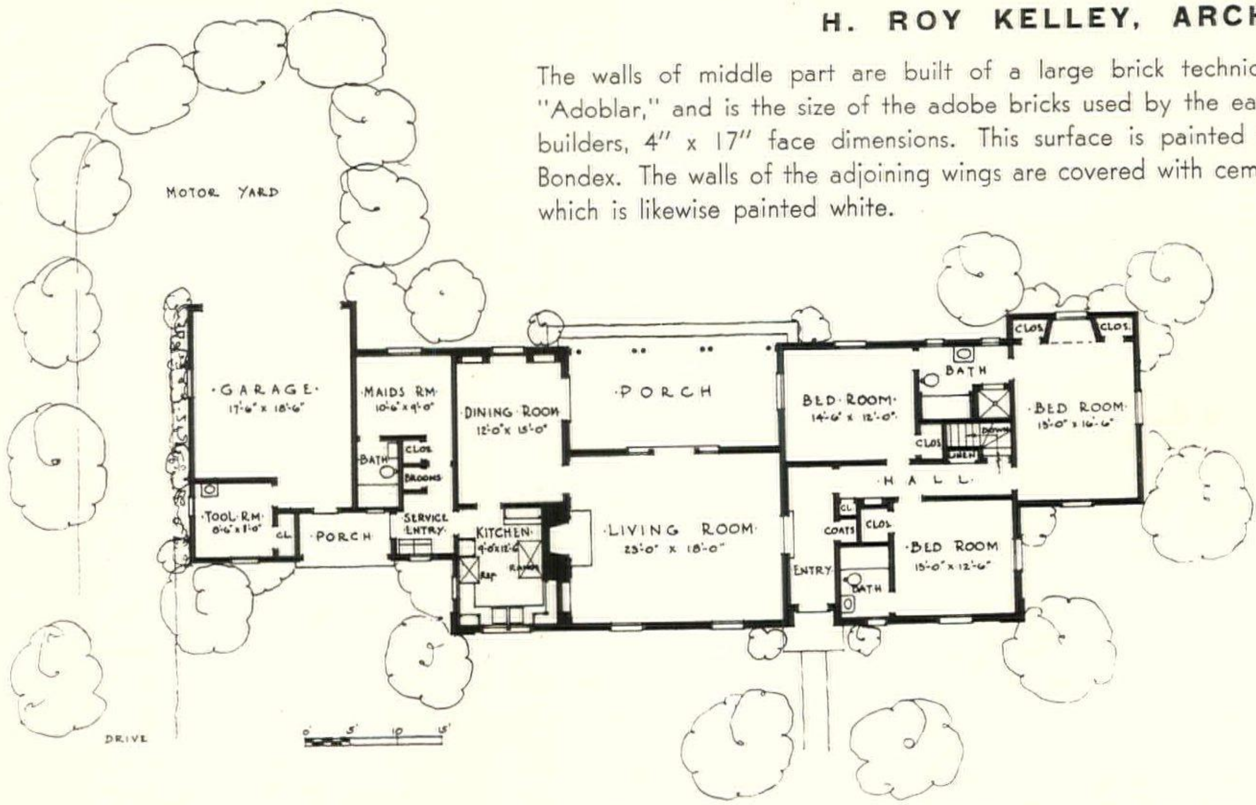
2

Standard materials used throughout. Total cost of house: $8,000.

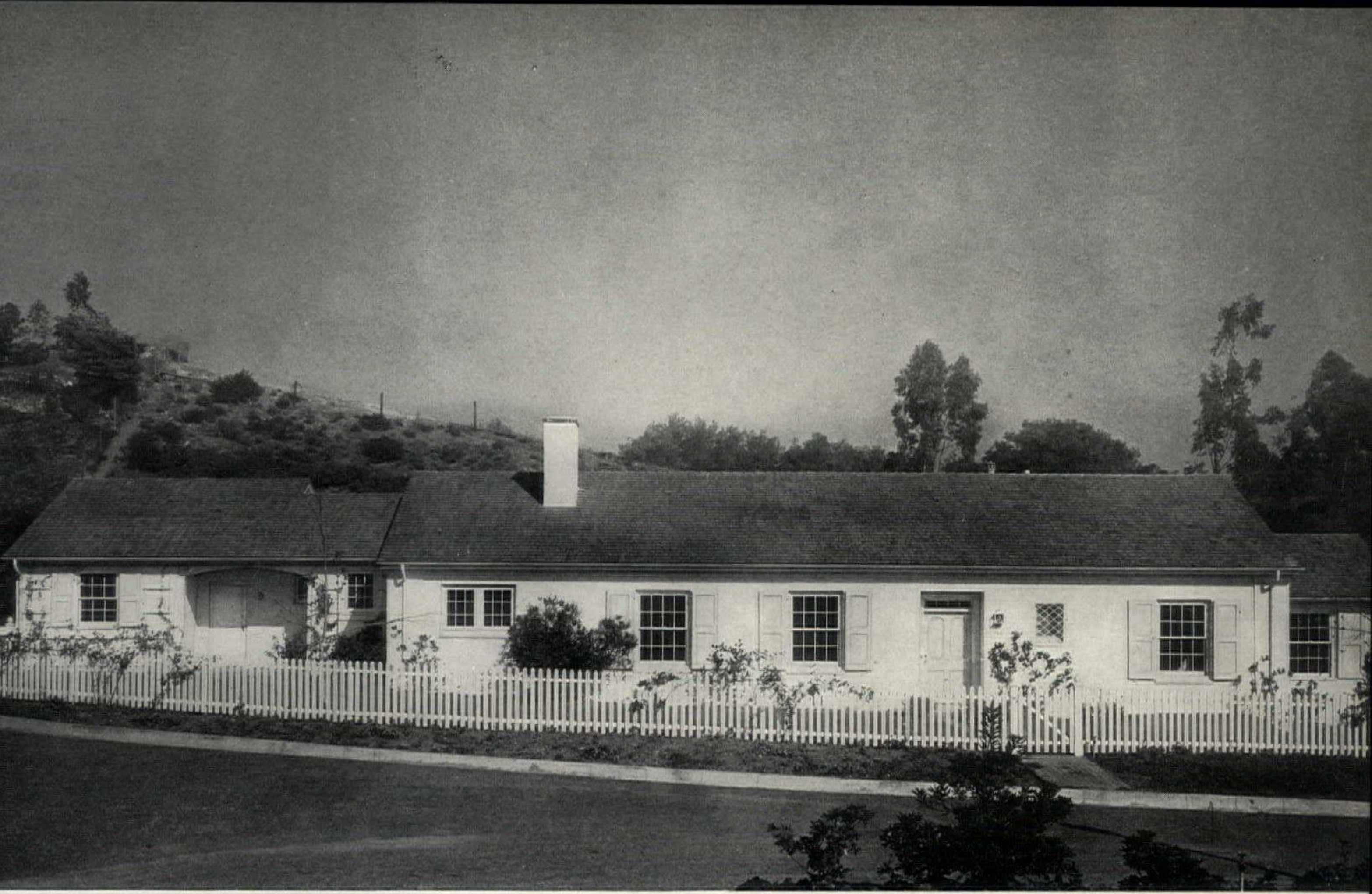
HOUSE AT KAUKAUNA, WISCONSIN — GEORGE FRED KECK, ARCHITECT

H. ROY KELLEY, ARCHITECT

The walls of middle part are built of a large brick technically called "Adoblar," and is the size of the adobe bricks used by the early Spanish builders, 4" x 17" face dimensions. This surface is painted with white Bondex. The walls of the adjoining wings are covered with cement plaster which is likewise painted white.



Photographs by George D. Haight

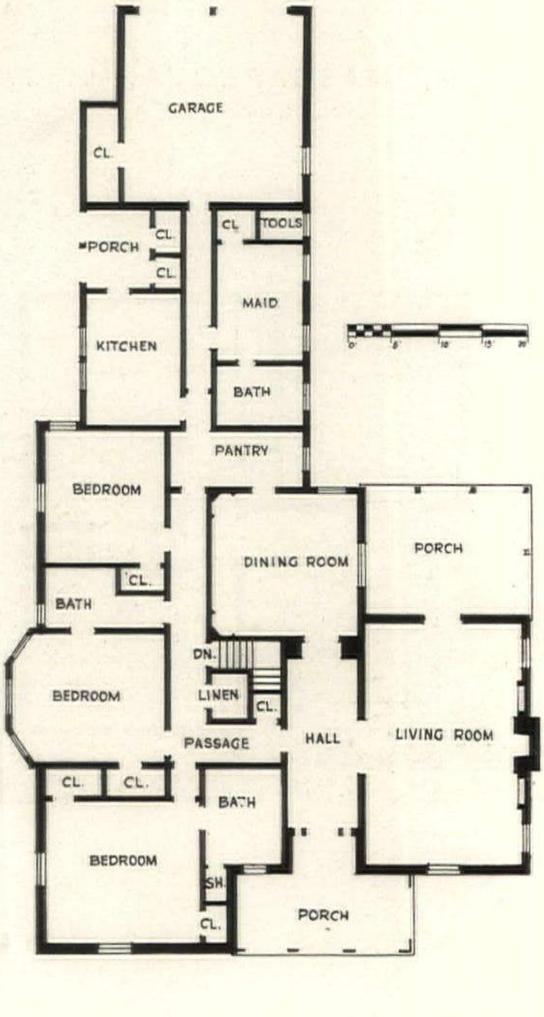


Exterior trim and windows are painted white. Entrance door and shutters are soft light yellow. The roof is shingled, soft brown in color. The steps, porch, floors ana walks are of red brick.

HOUSE OF MAJOR L. TOPLITT AT BRENTWOOD HIGHLANDS, CALIFORNIA

HOUSE OF MRS. J. G. OWSLEY AT SAN MARINO, CALIFORNIA

Photographs by George D. Haight



GARRETT VAN PELT, ARCHITECT

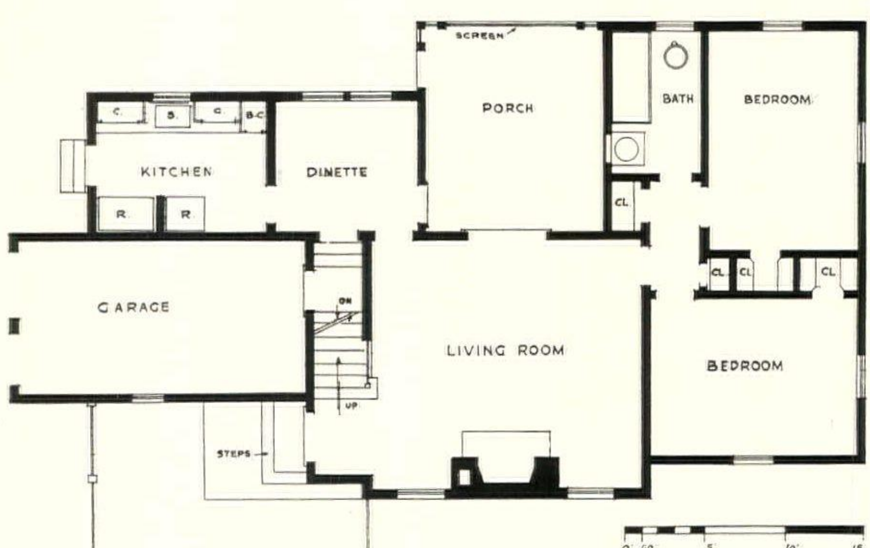
The exterior walls are constructed of brick, washed very pale ochre color with warm ochre trim and Naples yellow wainscot under the porch. The ornamental cast iron of porch is painted ivory. The shingle roof is of natural aging. The living room is designed in Georgian and is featured by a high ceiling and knotty pine paneling. The dining room looks into a formal garden in the rear of the house.

Photographs by Gustav Anderson

"THE ARLINGTON" — HOUSE AT HARBOUR GREEN, MASSAPEQUA, L. I.

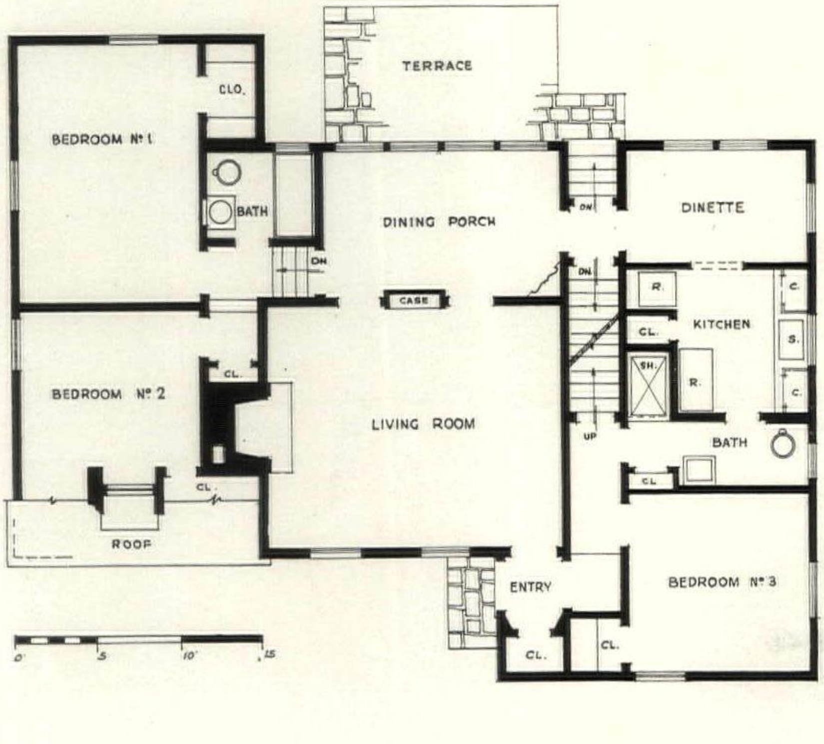
RANDOLPH EVANS, ARCHITECT

This house was built for sale by the Harmon National Real Estate Corporation as one of nearly a hundred neighboring houses which have been erected in the past few years. This house is one of the most recent. It is heated with a coal-burning boiler and a straight steam heating system. The floors throughout are oak except in the bath and kitchen which are finished with tile and linoleum. Walls are covered with period wall papers over three coats of plaster on spruce lath and the trim is pine. The second floor provides space for two future bedrooms and bath. The plumbing for the second bath is roughed in, and fixtures and finish may be provided by the owner at any time.

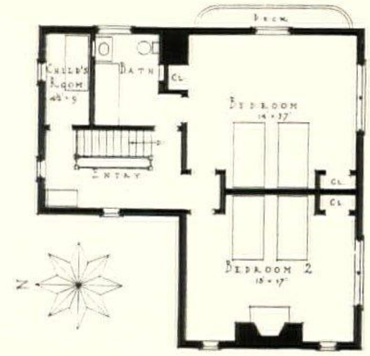


HOUSE OF DR. I. H. TULKIN AT ORCHARD HILL, NEW YORK

RANDOLPH EVANS, ARCHITECT



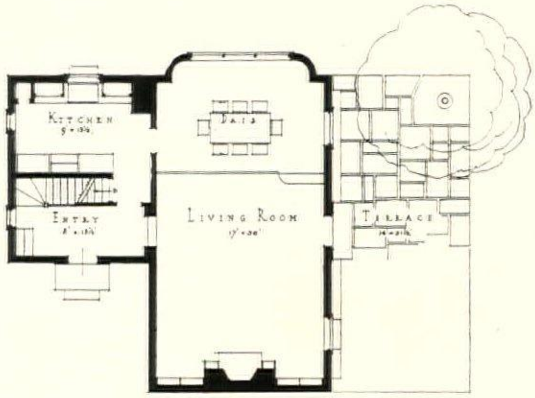
The house overlooks the White Plains valley and was designed so as to make the most of the natural slope and of distant views. The two-car garage is under the lowest corner of the house and connects to the basement through a fireproof door. The basement was finished with whitewash; dark red paint was used on the floor. At the top of the stair from the basement is a small vestibule that opens on the terrace and provides a service entry. Terrace, porch and dining room were planned so as to secure the distant views. The house is decorated with Colonial wall papers.



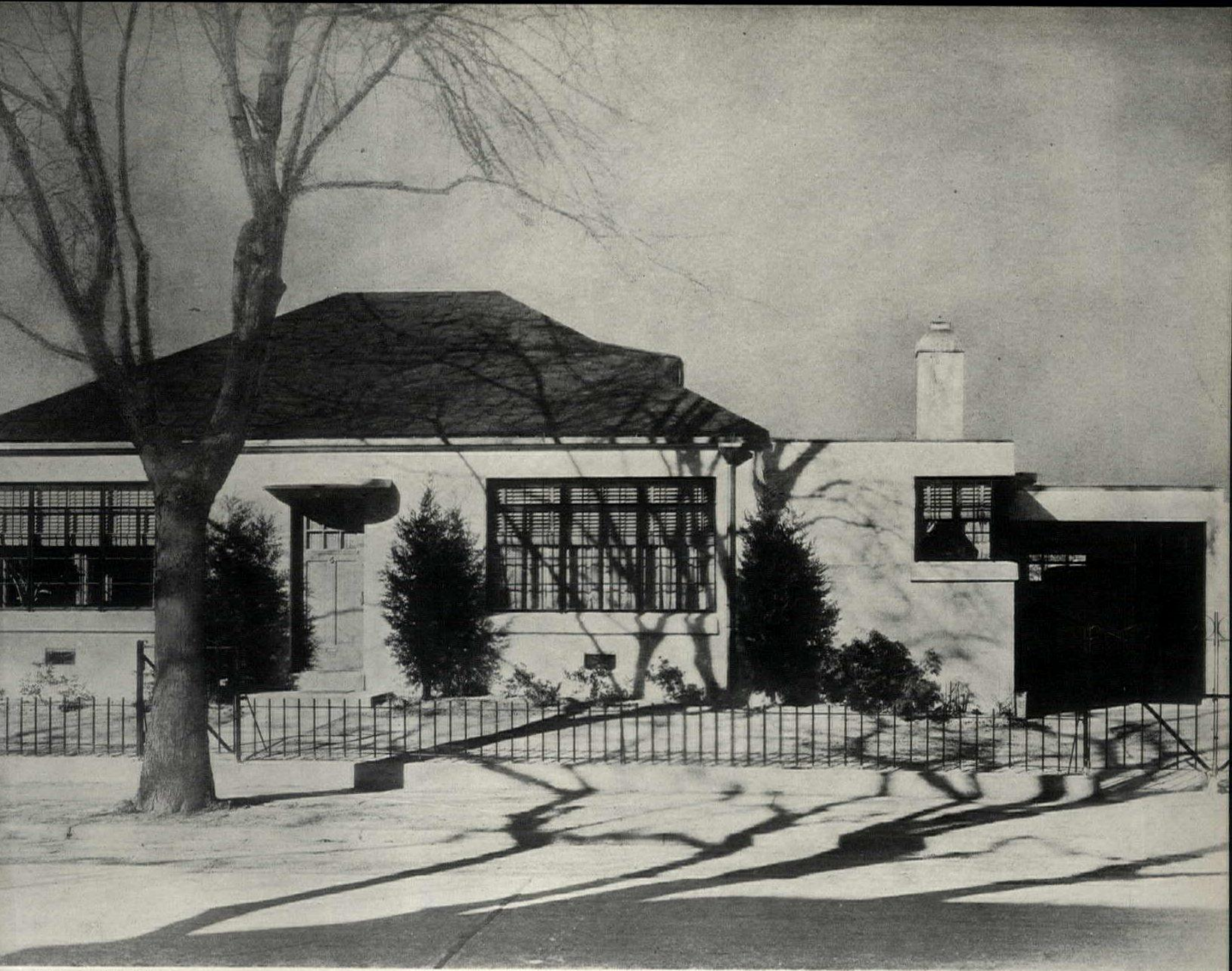
WEEK-END HOUSE AT CANTON, MASSACHUSETTS

GORDON ALLEN, ARCHITECT

J. HAMPDEN ROBB, ASSOCIATE



This house is of wood frame construction. The outside stucco is a peach color. The roof is black slate and the chimneys are brick painted to match the slate. The gutters and conductors are leaded copper. The terrace has bluestone flagging, and in one corner has been planted a crab-tree in the hole of an old well-stone from New Hampshire. All windows are steel casements. The living room has a black Zenitherm floor and a black cast stone mantel. The house is constructed at a cost of $11,600, or 50c a cubic foot.

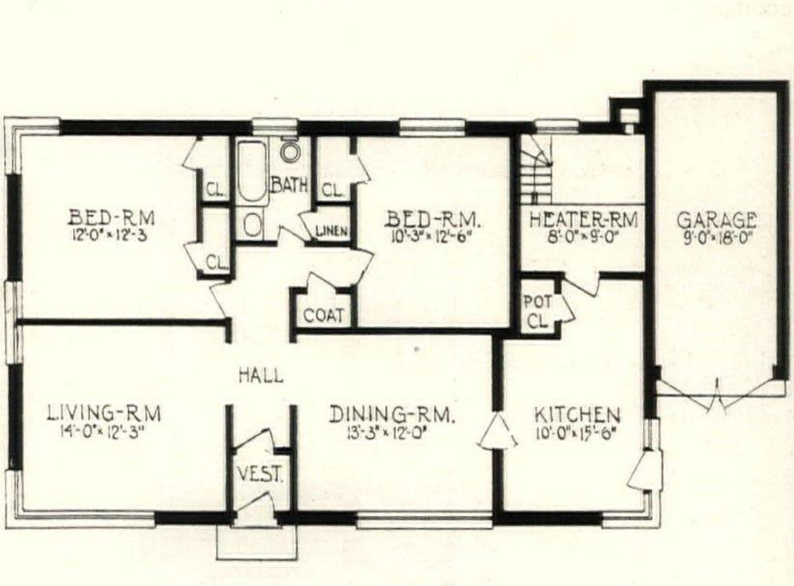


Photograph by Hickman Studio

HOUSE OF CHARLES G. G. SCHMIDT AT LYNBROOK, LONG ISLAND

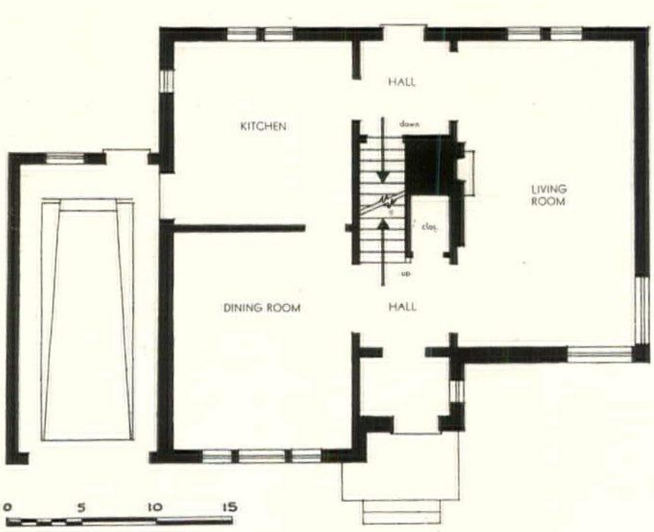
C. F. ROSBORG, ARCHITECT

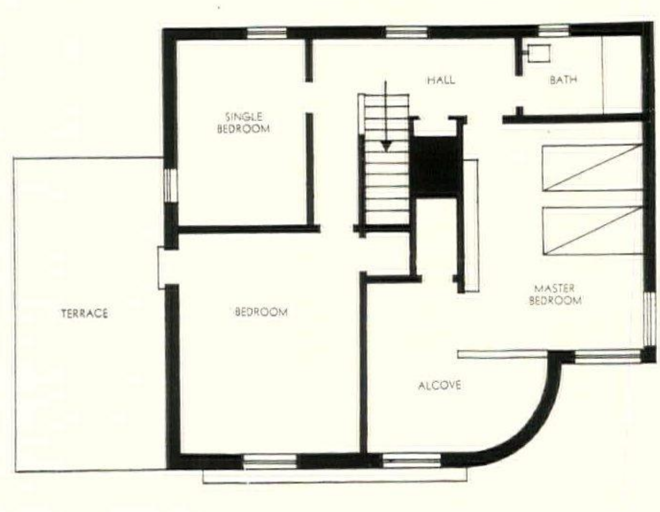
This house was designed and built to meet a budget of $5,000. The cost includes finished hardware, electric work, lighting fixtures, complete plumbing, and a one-pipe steam heating system with oil burner. The exterior walls are constructed of cinder concrete blocks: a one-inch air space separates the eight-inch exterior construction from a light wall of cinder units on the inside, thus providing insulation. Interior partitions are also cinder concrete blocks, 4" thick and finished with paint applied directly on the masonry. The reinforced concrete floor is raised above ground level to provide circulation of air underneath.



HOUSE OF LONGUEUIL, QUEBEC, CANADA—ARMOND BOURBEAU, ENGINEER

This house is constructed of 8-inch concrete blocks finished in stucco and plaster. The floors are $2\frac{1}{2}$-inch concrete slabs on specially treated wood joists. The main partitions are 6-inch concrete blocks finished in plaster. The cost, including air conditioning equipment, but exclusive of land and furniture: 30c a cubic foot.





Photographs by Rice Studio Limited

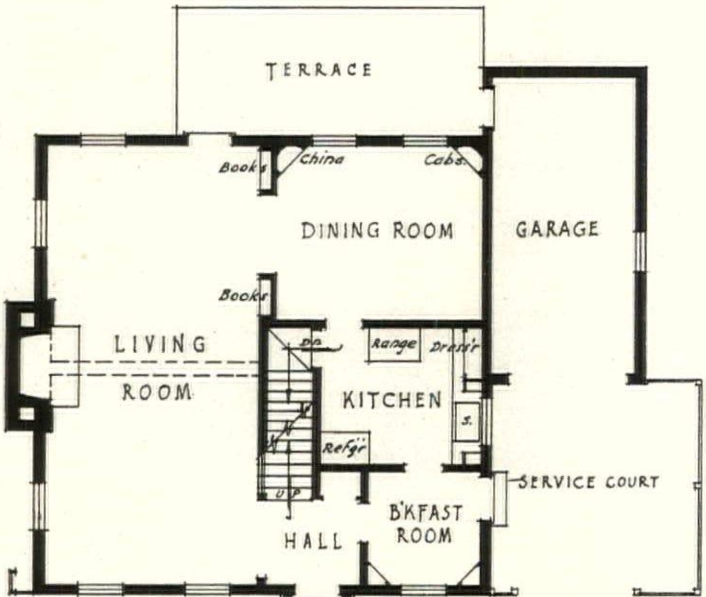
HOUSE OF LONGUEUIL, QUEBEC, CANADA—ARMOND BOURBEAU, ENGINEER

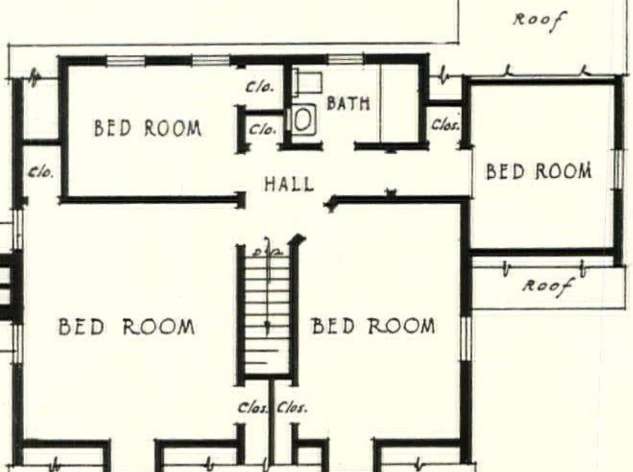
HOUSE OF
GRANVILLE H. STEARNS

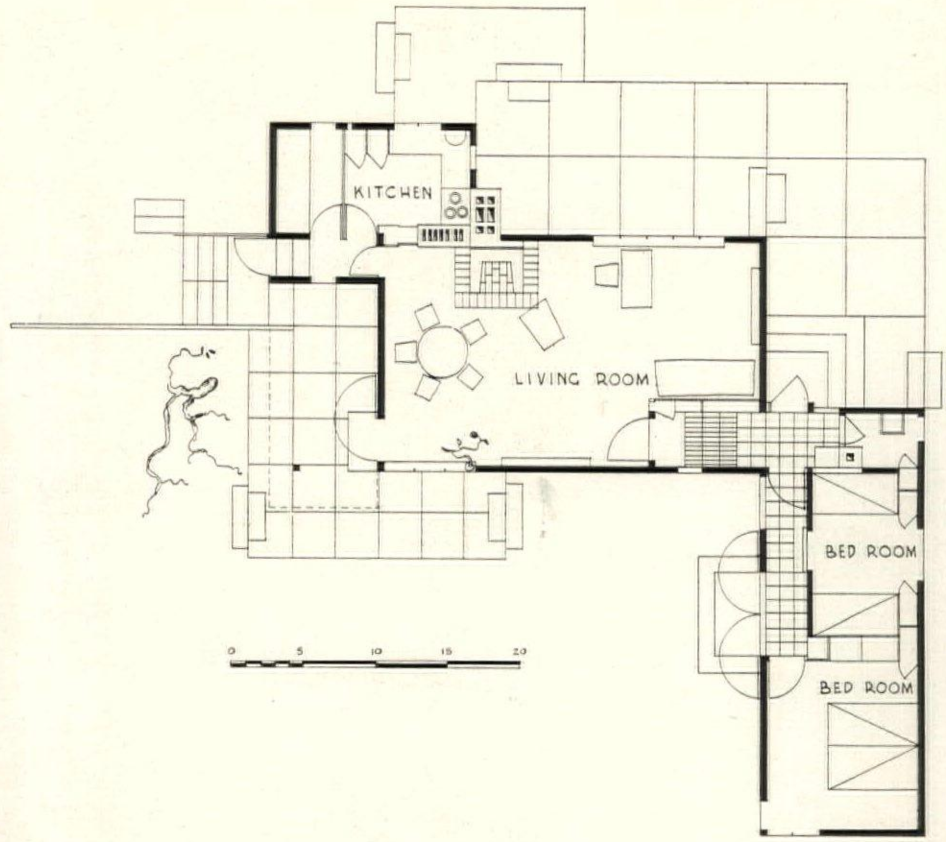
ROCKVILLE CENTRE
LONG ISLAND

MAXMILLIAN R. JOHNKE
ARCHITECT


Photograph by Murray M. Peters



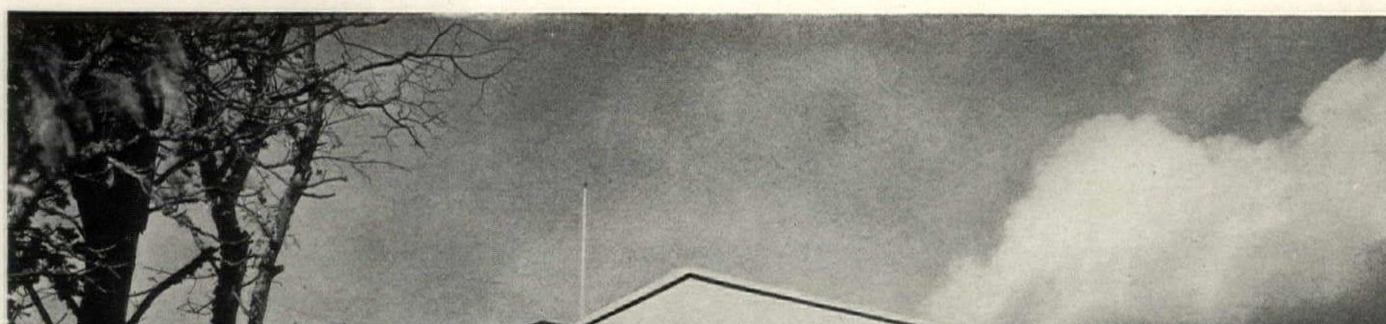




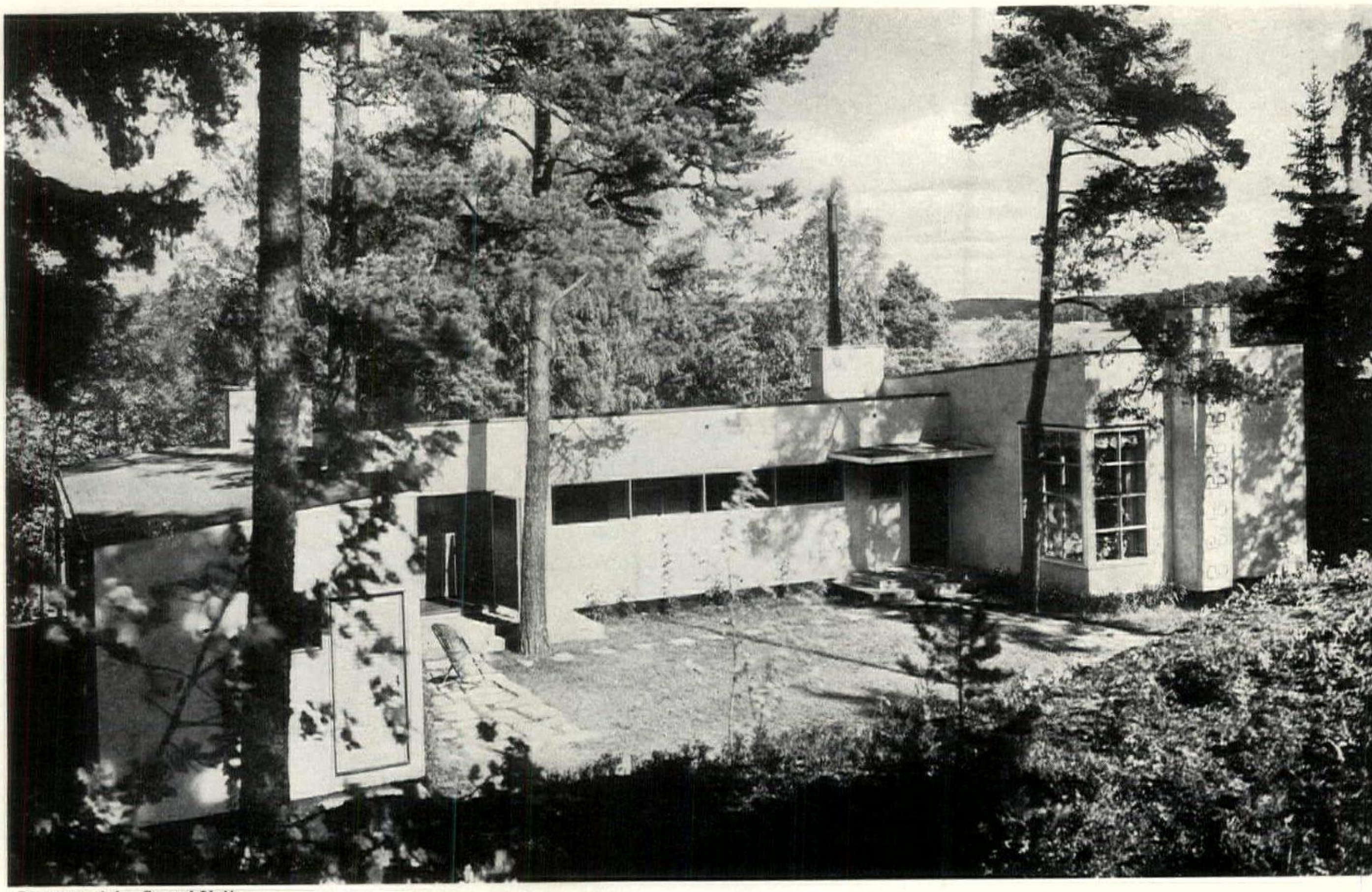
WEEK-END HOUSE
OF DR. E. M. EKMAN

HIRVENSALO
IN FINLAND

ERIK BRYGGMANN
ARCHITECT

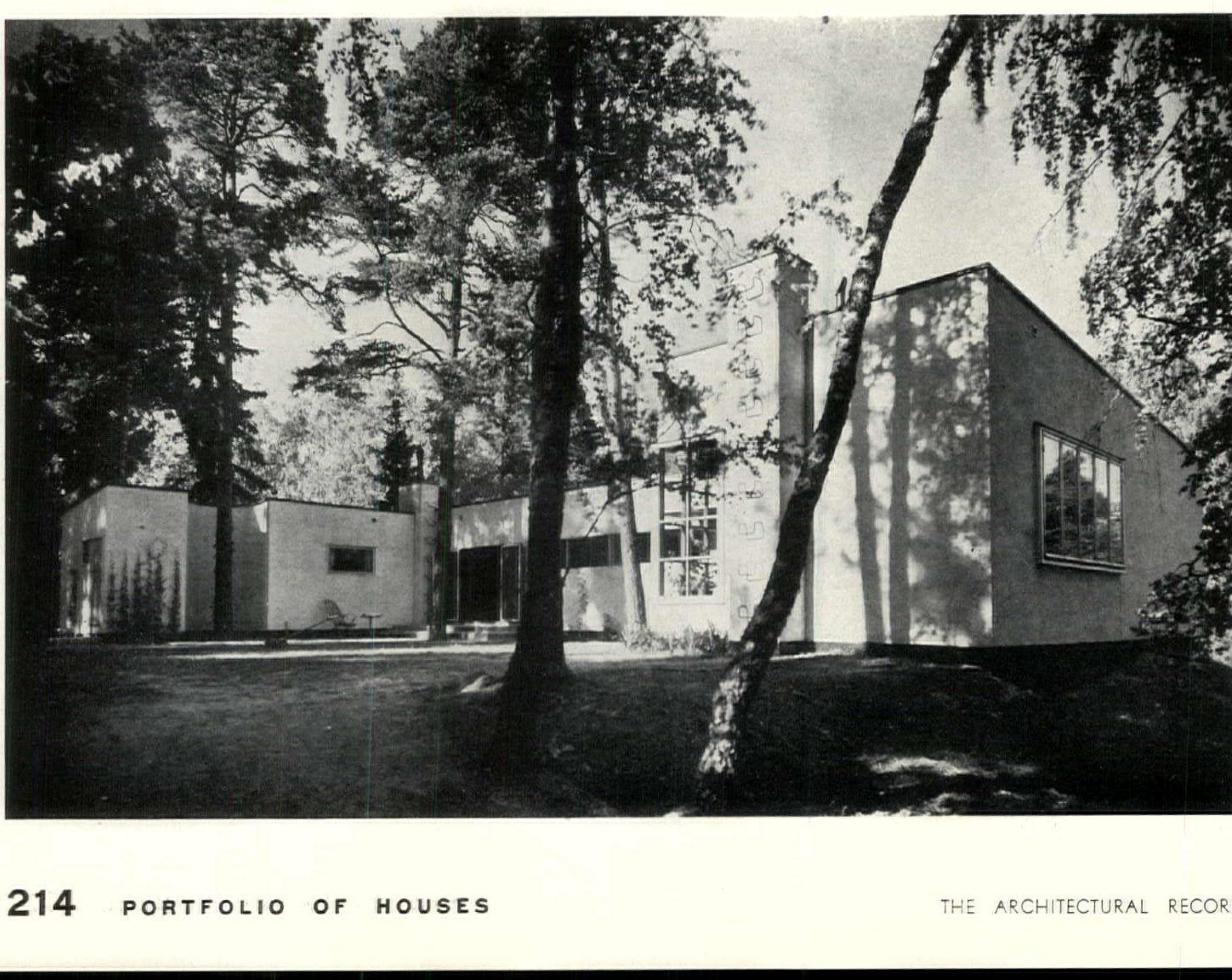


Photograph by Gustaf Velin



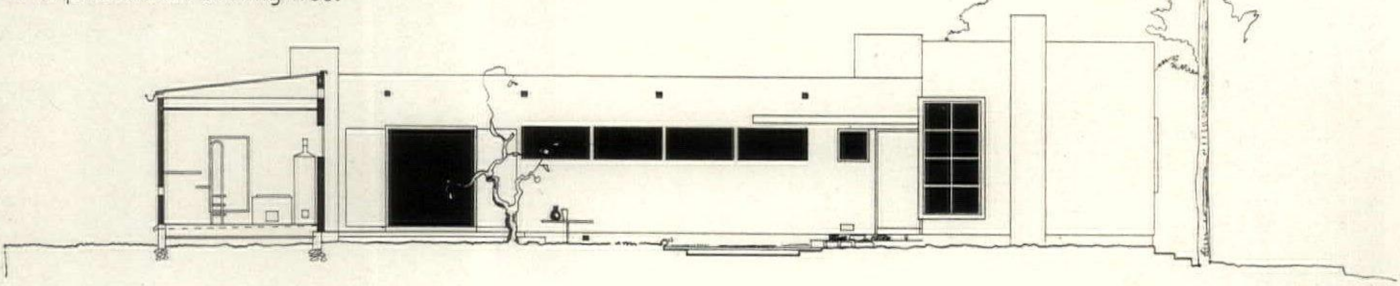
Photograph by Gustaf Velin

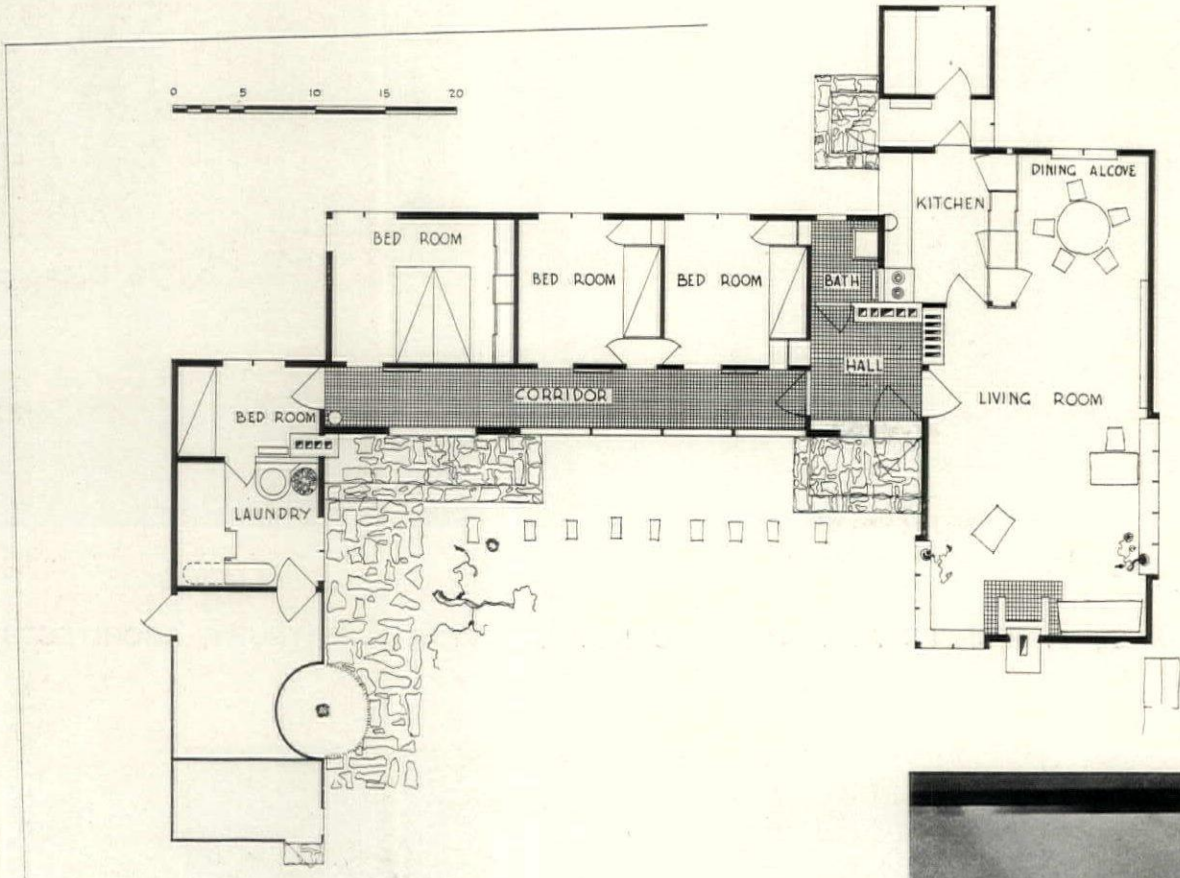
WEEK-END HOUSE OF DR. ERKKI WAREN AT RUNSALA IN FINLAND

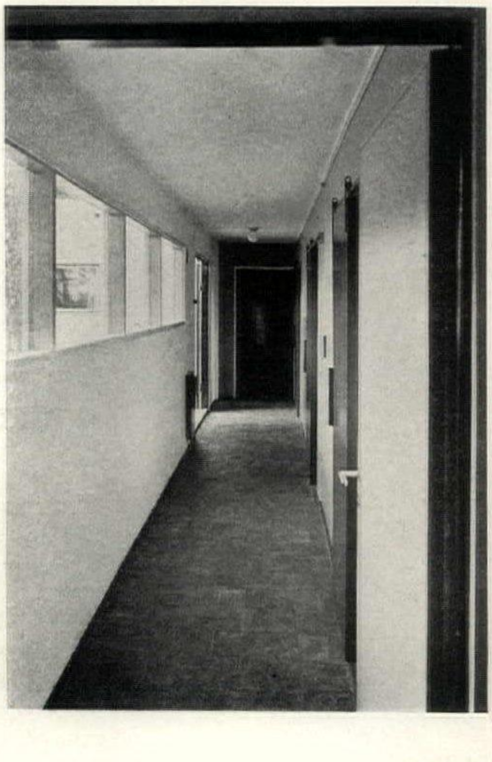


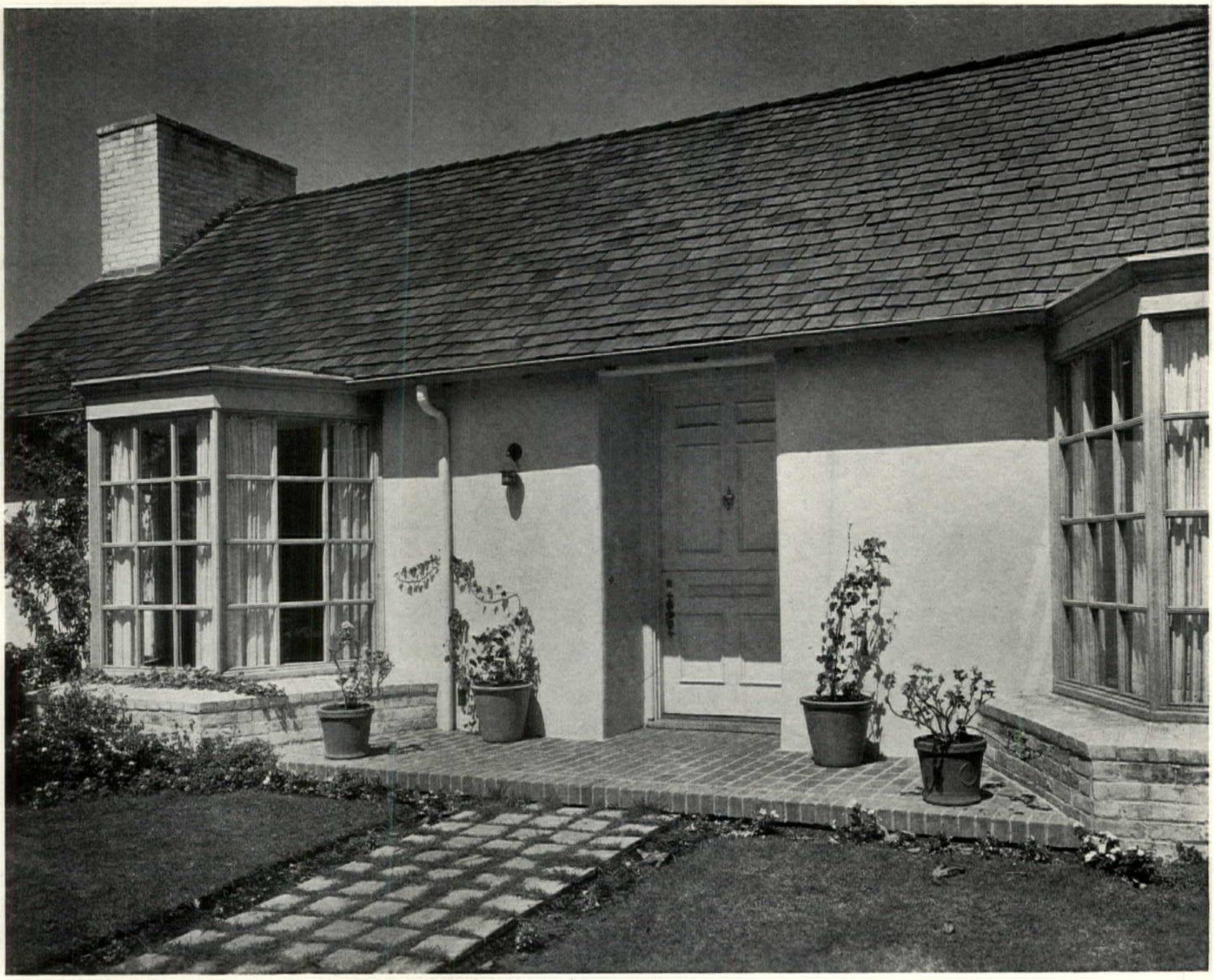
ERIK BRYGGMANN, ARCHITECT

This one-story house is built for week-end and summer use only, and is situated on the coast high up overlooking the water a few miles from Turku. It is constructed of a wood frame, lined with wallboard and plastered on the outside. The roof is also in wood lined with wallboard, and slopes at a flat angle away from the grass-covered entrance court. The semi-circular niche cut out of the workshop in one wing is to preserve an existing tree.

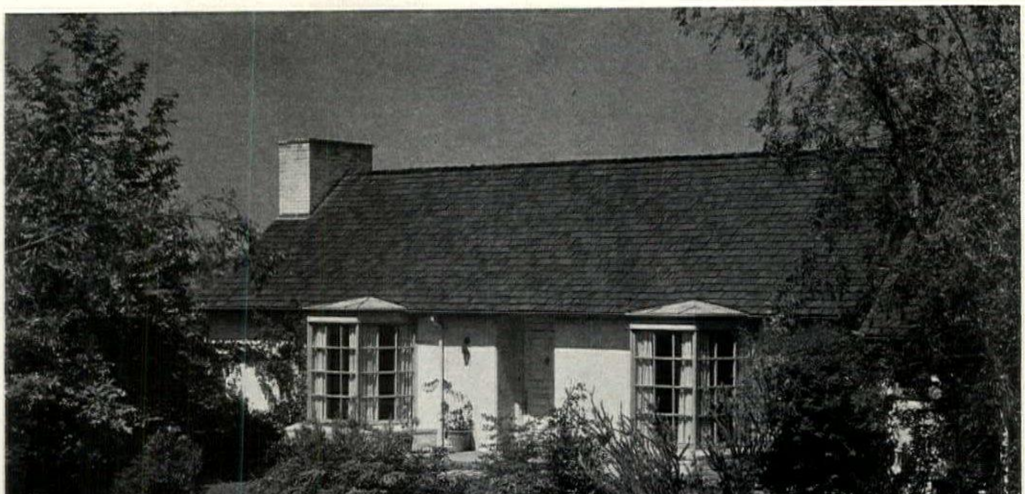








HOUSE OF DONALD P. NICHOLS AT POMONA, CALIF.—MARSTON & MAYBURY, ARCHITECTS



Photographs by Hiller Studio

THE
ARCHITECTURAL RECORD

A PRESENT-DAY OUTLOOK ON APPLIED ART

By CHARLES R. RICHARDS, Director, Museum of Science and Industry, New York

Architectural design in several countries in Europe has affected, or at least run parallel with, the design of commodities in the period since the World War to a greater extent than in the United States. Yet it is true today, as it has always been, that architectural design here as elsewhere must continue to exercise a guiding influence on applied design if we are to live in a harmonious physical world.

In late years the province of function in determining form has been greatly emphasized in architecture and in the design of household furnishings; and in the matter of surface treatment as well, both have gone far on the same road. If one walks north on Fifth Avenue from 59th Street it is easy to place chronologically the more important private houses erected between 1890 and 1926 by noting the lessening use of carved and molded ornament and increasing reliance on the beauty of plain stone surface for decorative effect.

Approach to the newer and more complex problem of the tall office building has followed a more varied and erratic course. Here legal requirements have, of course, played a large part, but the basic importance of function as the primary consideration in design has of necessity been increasingly recognized. In this field, however, treatment of the outside shell has varied from the banality of sheer bareness and stupid use of inappropriate ornament to splendid examples presenting fine dispositions of mass and outline with simple and subdued surface treatment. On the whole it is surely true that the tendency has been towards the suppression of meaningless ornament and reliance on the structural material for surface effects.

The contrast between such high peaks of architectural design as the Woolworth Building of more than 20 years ago and the Barclay-Vesey Building of the New York Telephone Company represents a change of attitude parallel with progress in the best of household design. In both cases economic considerations and aesthetic convictions have moved steadily forward in emphasizing the same general principles.

A LIVING ROOM
BY GILBERT ROHDE

Hedrich-Blessing

1

2

(1) Chair made in 1929 by Süe et Mare, leaders in modern design at the time of the Paris International Exposition of Modern Decorative and Industrial Art.

(2) The products of Eugene Schoen, in the author's judgment, combine the modern attitude toward applied design with the elegance stressed in this article.

In industrial design, however, meaning by that for the moment the design of useful commodities, practice has varied even more than in architecture. Here the two sets of ideas that divide the architects, viz., dependence upon tradition as the sole source of inspiration and the conviction that design should be thoroughly adapted to modern requirements and modern taste, have been and still are in strong conflict. In each camp one or the other of these ideas is held with such tenacity and intolerance of the other that real progress is severely handicapped.

On the one hand, paucity of imagination and limited vision on the part of manufacturers and designers together with the economic limitations of the professional decorator that operate in most cases to limit him to a mere purveyor of merchandise, serve to prevent the development of traditional forms into satisfying examples well fitted for the conditions of modern living.

On the other hand, among the protagonists of progress there has been in too many cases the failure to recognize the real significance of modernism as an emphasis and not a style. Pursued as a style, modernism becomes too often stark, eccentric, devoid of charm, alien to all tradition, and unassimilable with other expressions of design. Such a conception carries with it the illusion that a modern room must be composed entirely of objects distinctly and thoroughly modern in their quality of design, an illusion that M. Clouzot of the Musée Galliera in Paris has recently combatted. It is true that a room composed in a radical spirit hardly permits the company of old styles, but true modernism, or modernism with practical value, is by no means confined to radical conceptions.

If we conceive the real basis of the modern movement as an emphasis rather than a style, we are freed from dogmatism and intolerance. We no longer feel the need of condemning the old because it is old, but can bend our efforts solely to produce things thoroughly adapted for the requirements of modern life. If we look at our problem in this fashion

Hedrich-Blessing

A LIVING ROOM
BY EUGENE SCHOEN

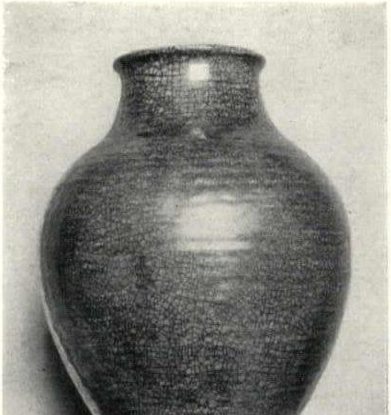
we see at once that there is much in traditional motives, as for instance in the simpler English and American furniture of the late eighteenth century, that is well fitted to serve as a basis for modern creations, both from the standpoint of utility and charm and from the ease with which they can be adapted to the requirements of quantity production.

There is at the same time plenty of opportunity for creations making use of new materials and new forms, but here the problem is more psychological than practical. Bathroom and kitchen equipment is built to meet functional requirements and represents a striking example of successful design in this respect, as truly modern as the motor car. Living rooms, dining rooms, and bedrooms bring forth other problems. Here we need something more than mere functional adjustments to bodily needs. We need to satisfy the human spirit with grace and charm and variety. We need also the familiar, and often the things dear to us by association.

It was remarked some years ago by the late M. Koechlin that the French designers, with all their notable achievements, had failed to produce a salon that rivalled those of the old styles. That statement pretty nearly holds true today, and applies equally to our own living rooms.

Modernism as conceived by its extreme exponents insisting upon purely functional considerations as the end and all of design, is likely to reduce our lares and penates to purely geometrical elements. It is true that simple, geometric forms are the easiest to produce, either with the hand tools of the craftsman or with the machines of today. They are the forms most readily made by the knife, the axe, the hand plane, the planing machine, and the turning lathe, but they are hardly the forms sufficing all the needs for companionship of the human spirit. They are simply the basis of usable forms that through all time man has labored to modify and enliven by added touches of interest and subtlety. Are these things to be barred from our lives because some misguided designers con-

1



2

(1) Copper bowl by the Chase Brass & Copper Co.

(2) A high-fire vase by Leon Volkmar.

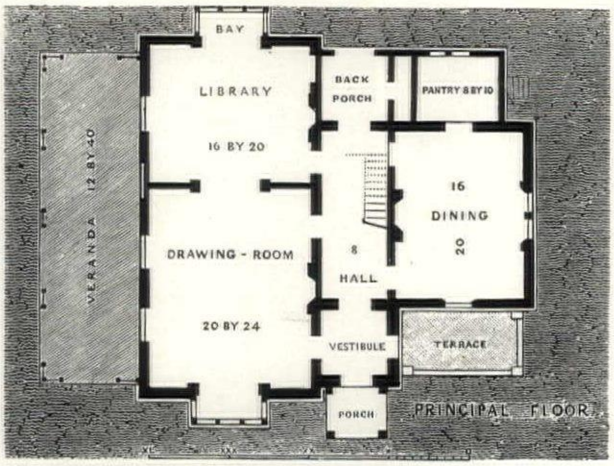
ceive their absence to be the only true expression of modernism? It is necessary only to ask this question to know the answer.

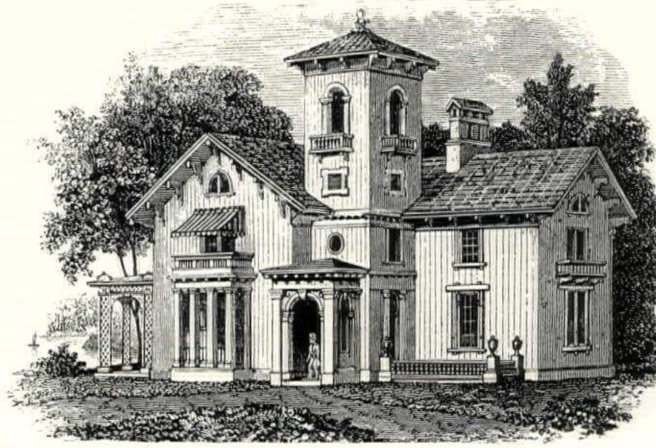
The radical attitude toward applied design is a natural and salutary reaction against the slavish dependence upon purely traditional forms that has marked all our creations well up to the last few years. This reaction has accomplished much, but it still has and will have its battles to fight until the slowly changing quality of public taste now evident has reached a much more general appreciation of the dignity and simplicity of straightforward design in household goods in contrast to mere decorative prettiness.

We have now reached a place, however, where it is desirable to consider both the achievements and weaknesses of the movement and to examine the situation with a view to greater unity and perhaps more intelligent effort in the future. Such an advance will inevitably come in time, as all the tendencies and evidences of modern life are continually rationalizing our point of view. To speed up this rapprochement we need to relinquish our extreme attitudes and bring the two opposing camps nearer together so that our best design talent will be brought nearer to a common working ground. One of the things most needed to permit this reconciliation would seem to be a recognition on the part of the leaders in the modern camp of the psychological element as one deserving as much attention and one in a sense as truly functional as the obvious physical considerations so often held to be all-sufficient.

One cannot leave a discussion of modern design in the applied arts without care to distinguish between the design of useful objects of three dimensions and the treatment of wall and floor surfaces, furniture coverings, and hangings. What has been said in this article relates to the former class and has sought to emphasize the importance of functional considerations and reliance upon the structural material for decorative effects rather than upon applied painted or carved ornament. On the other hand is the important field of textiles in which imagination has free scope to run the gamut of color and line, and to balance the austere trend of modern furniture with fantasy and movement.

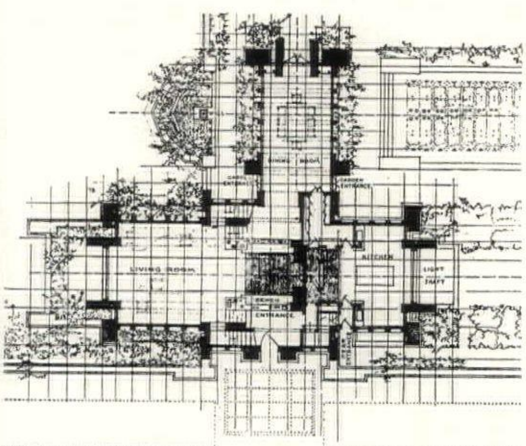
Low-priced furniture from the Chicago Workshops, Inc. The chair is reminiscent of the bentwood chairs first manufactured by Thonet Bros. in Vienna in 1853. These early chairs may be said to be the first modern chairs, as they departed entirely from traditional forms and technique, and were produced in a factory by mass production.

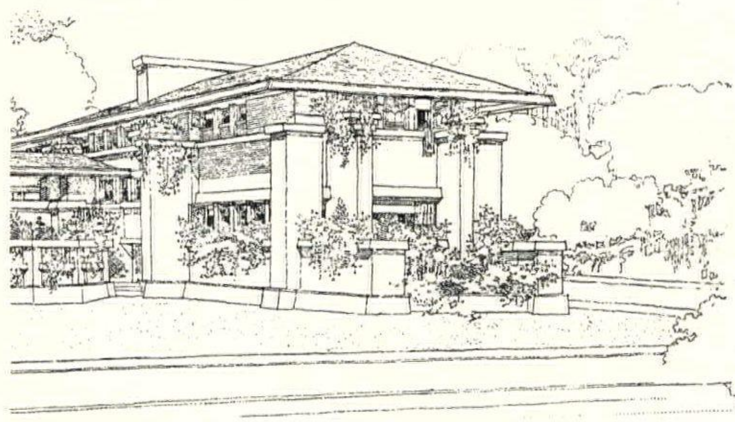




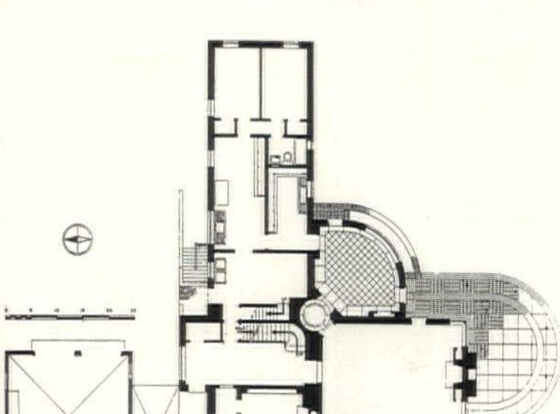
From COTTAGE RESIDENCES by A. J. Downing

1835 "A VILLA IN THE ITALIAN STYLE, BRACKETTED"





1900-10 HOUSE AT OAK PARK, ILLINOIS, BY FRANK LLOYD WRIGHT



1935 HOUSE AT AVON, CONNECTICUT, BY TALCOTT AND TALCOTT

Metropolitan Museum of Art

MID-VICTORIAN INTERIOR

INTERIOR ABOUT 1900

INTERIOR ABOUT 1920

CONTEMPORARY INTERIOR

INDUSTRIAL DESIGN AND THE ARCHITECT

By HARVEY WILEY CORBETT, Architect

In these days of specialization we are apt to think of industrial design as something very different from other forms of design, and therefore requiring a different approach, a different training, or a different technique. I think this is wrong: it indicates a misconception of the underlying principles of all design.

My readers may suppose that, speaking as an architect, I am endeavoring here to define abstractly the problems of a separate and distinct group, the industrial designers. This is not the case. I am an industrial designer myself. The objects of industry on which I expend my design efforts are office buildings instead of egg-beaters, but I fail to see wherein my background of training and experience does not equip me more effectively to design egg-beaters than the background of the egg-beater specialist qualifies him to design office buildings. Design is something generic and all-inclusive, not something special and limited to a fixed field.

Perhaps at this point a definition or two may be clarifying. Words are all too loosely used these days. "Art," as one of these words, can mean anything or nothing at all, according to one's point of view.

"Design" is another such word, possibly not with so wide a variety of interpretations but still surprisingly indefinite. In its application to this discussion we define "design" as being an effort to improve appearance, and in saying that I do not necessarily mean making an object more beautiful.

"Beauty" is another painfully indefinite word; all too often one man's notion of beauty is another man's horror. For centuries man has been trying to define beauty and to fix its limitations. He has not yet succeeded, and I doubt if he ever will. The most vital element in all art is the ever-changing standard of beauty.

We might, however, attempt to define the present purpose of design—whether it be a cathedral or a teacup. If the object is intended to last a long time, then the designer must be so guided and make sure that it will have an attractive appearance not only today but throughout the years. If, on the other hand, the object is only of fleeting duration, then it must be designed with reference to prevailing ideas of appearance, which the designer knows may not be lasting but will have immediate public appeal.

Fortunately at present a new and rational point of view has come into general acceptance. Practical use and function dominate the designer's work, and the bad logic of the past thirty or forty years—the thinking that "design" is something "added to," "stuck on," or "painted over" the practical functional form has been largely abandoned.

The great volume of industrial mass-produced articles coming on the American scene in recent years has developed peculiar and striking problems in design. The machine-made commodity has been not only cheaper, but functionally better than the hand-made commodity. It has not been necessarily attractive in appearance. Its appeal has been economic and practical rather than aesthetic, and little thought has been given to appearance until two or more manufacturers begin producing the same article, each practical and efficient, each about the same in cost. The manufacturer discovers that the purchaser is obliged to exercise a choice, not a choice based on practicability or on price, but on something else, and that something else is called "appearance."

Competitive merchandising forces manufacturers to give serious attention to design. This is the underlying reason why, in the field of industrial production, design has taken an ever increasingly important position.

Design follows many directions. It may aim simply to secure a shocking or arresting effect, or to create something inherently and lastingly beautiful; between these two extremes, we have a long scale of variations.

Fortunately there are several equally practical ways of accomplishing a given functional result. The trained designer must know these ways. He must understand his problem intimately; he must know his materials, his processes of manufacture; the economies effected through understanding of these processes. With this background of knowledge he can then make his choice. If he seeks a bizarre appearance, something strange, exotic, unusual, he makes one choice. If he seeks to secure an effect of stability, permanence and enduring value, he makes another choice. This procedure applies with equal force to architectural design as well as to design of the smallest and most inconsequential products.

Architects in the past few years have not been overburdened with work. Many of them have wondered if there is not some new field in which they can make use of their background of training and experience, and their talents in design. Just recently a leader in the merchandising field—a man who understands and appreciates the value of design in every product of industry—informed me that he prefers, whenever possible, to get designers who have had architectural training. He feels that they have the most rational approach to the design problem.

INDUSTRIAL DESIGN

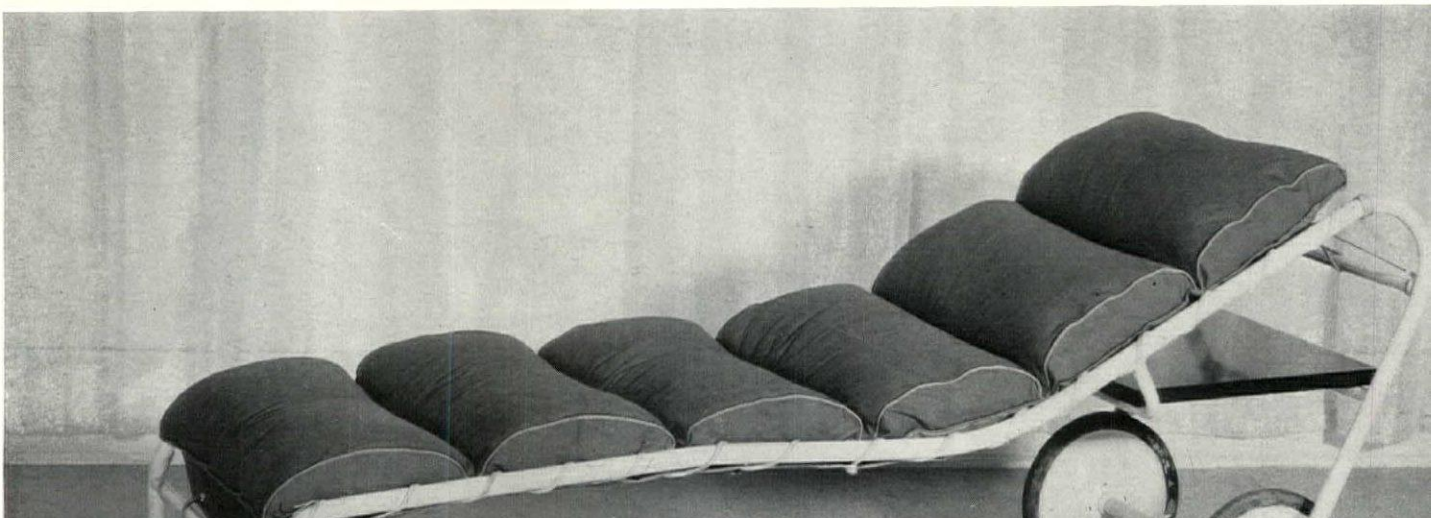
OFFICE FURNITURE. **Maximum convenience and minimum means.** **Heinrich Lauterbach, architect.**

Klettephoto

CHAIR with welded frame. Arm-rests of fabric. Cushioned seat and back. Designed by Le Corbusier, P. Jeanneret and Charlotte Perriand, architects.

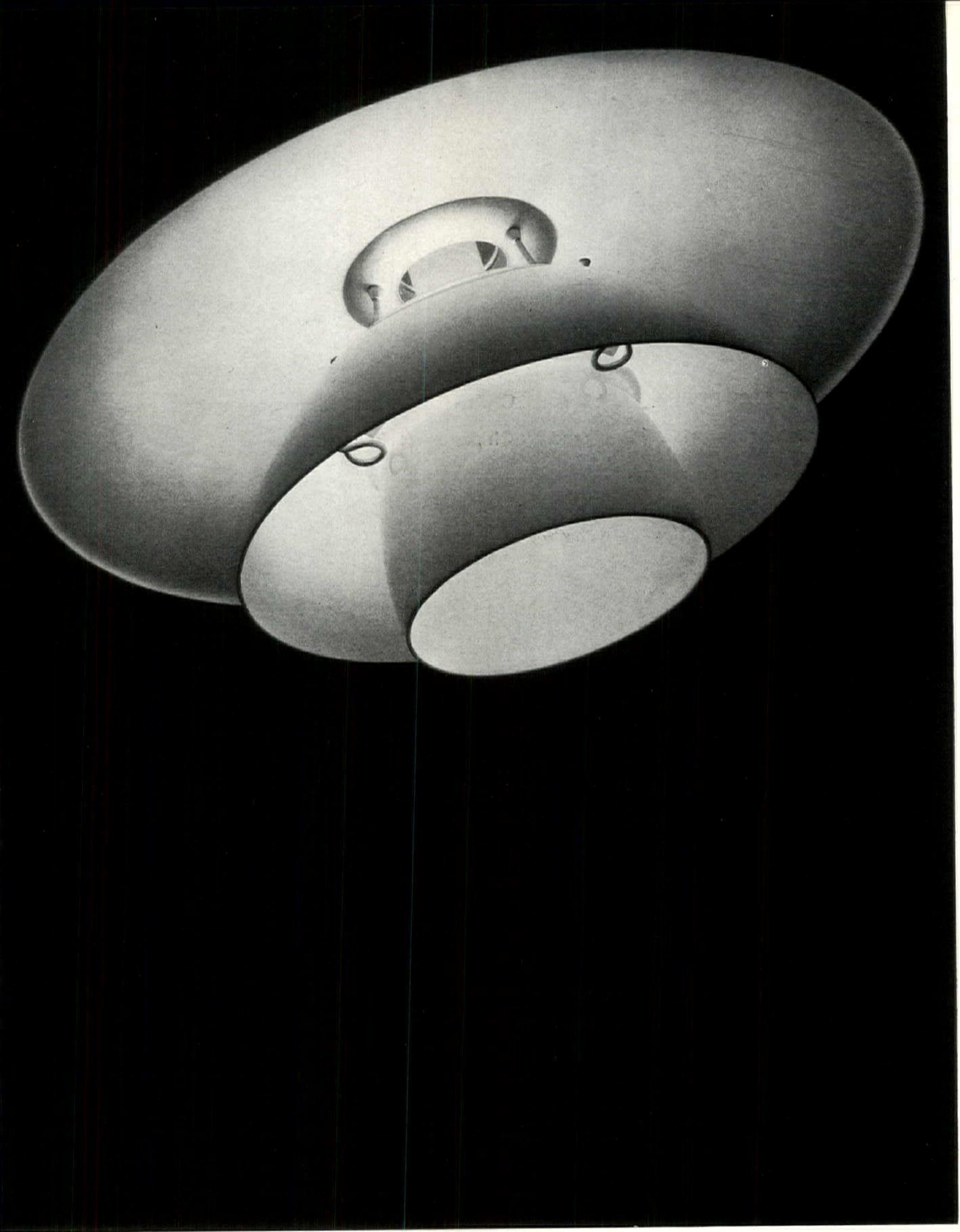
Photograph by G. Thirier

RECLINING COUCH that may be readily moved from place to place. Magazine shelf.



Photograph by Iversen Studio for Metallon Corp.

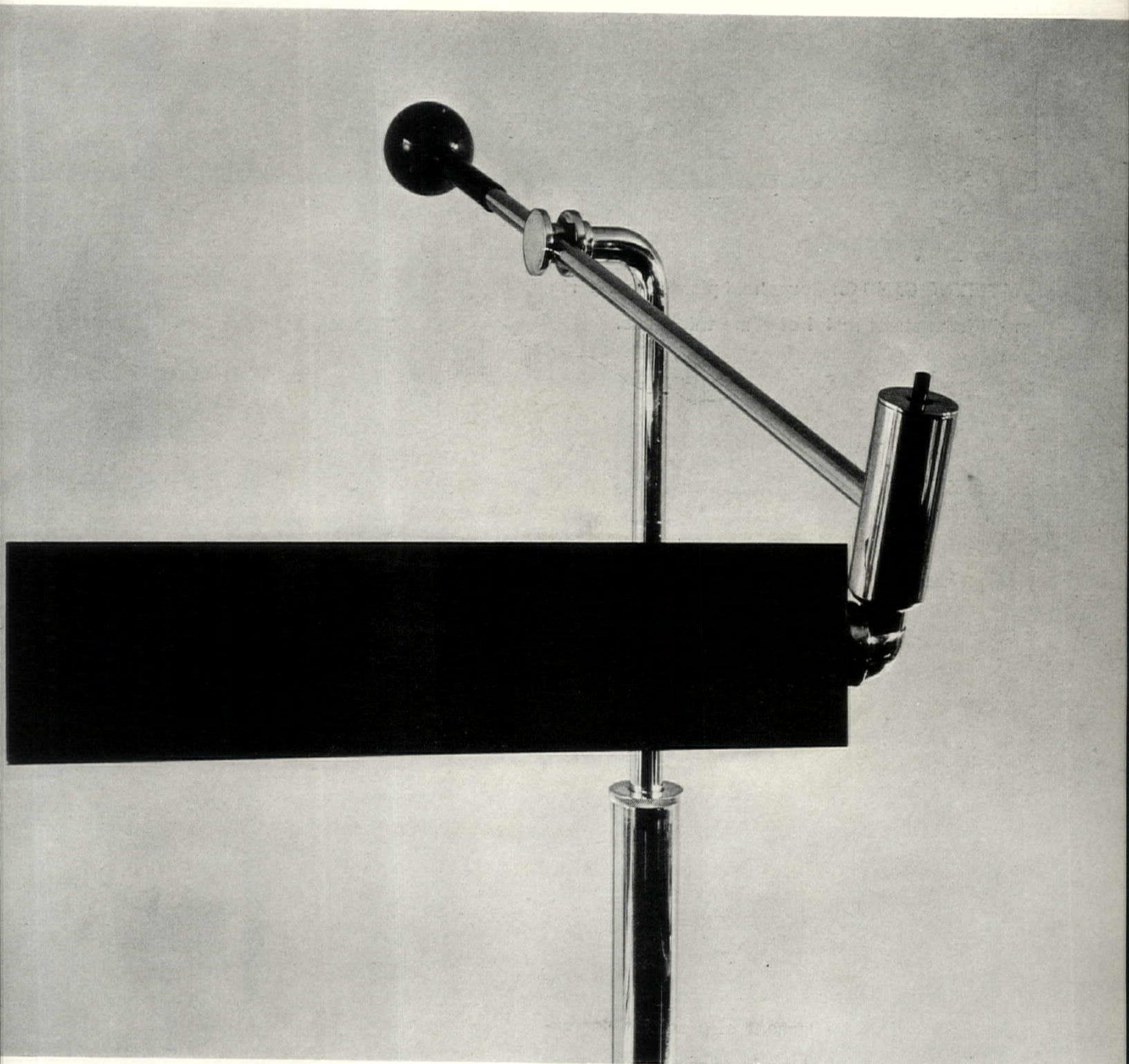
LOW-COST DINING TABLE AND CHAIRS of wood with seats upholstered in horsehair material. Designed by Chicago Workshops, Inc.

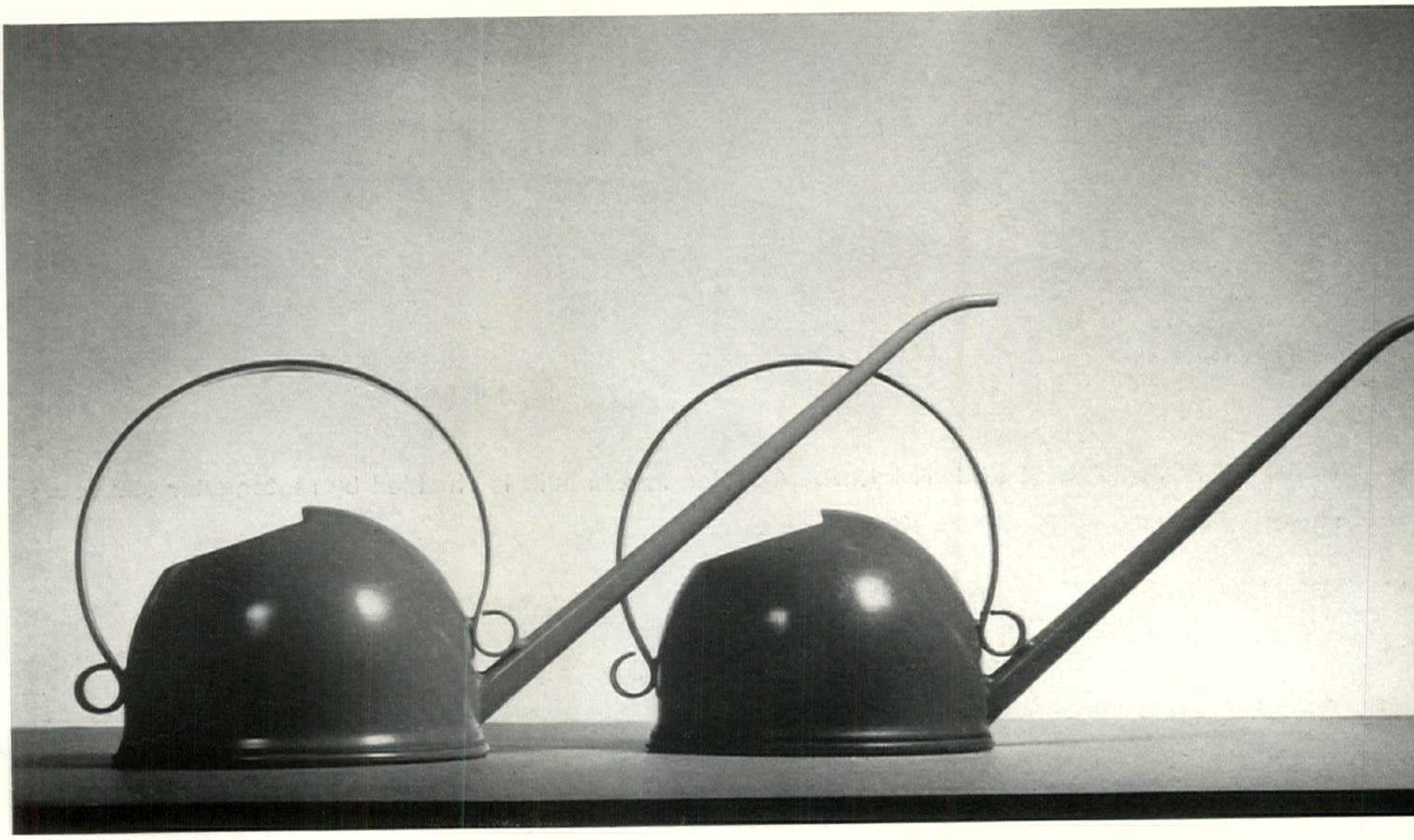


Photograph by F. S. Lincoln

P-H LIGHTING REFLECTOR. The glass reflectors are designed to conceal lighting bulb and to provide efficient glareless distribution of light.

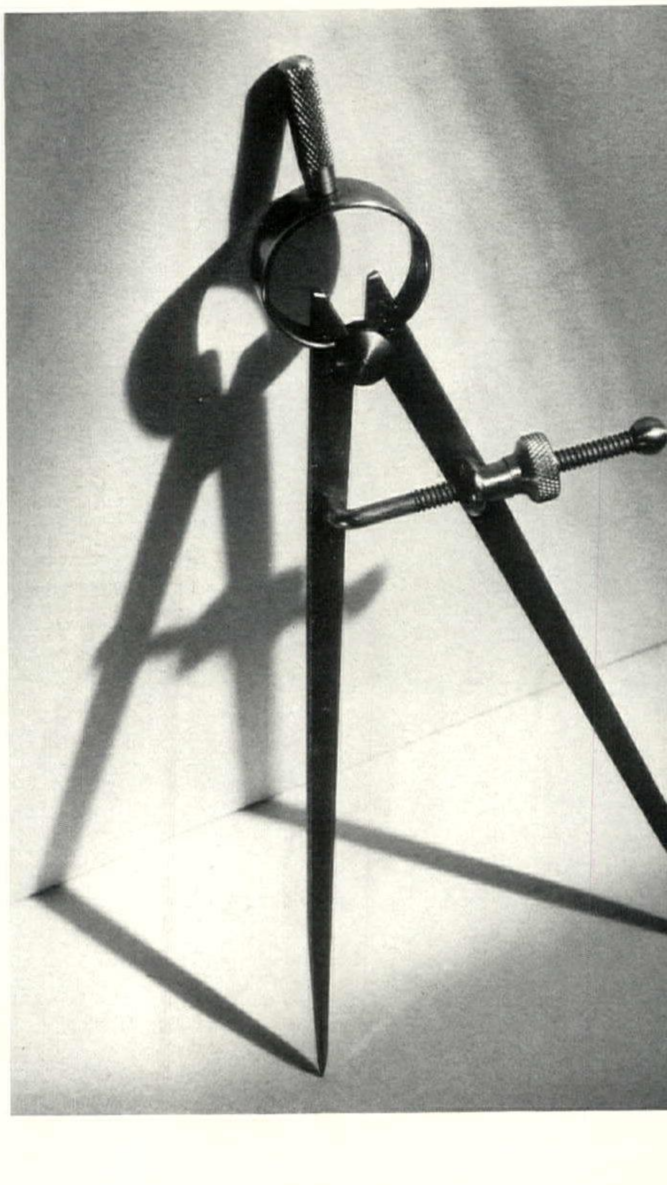
HEAD OF ADJUSTABLE FLOOR LAMP. Tubular mazda bulb is shielded by rectangular chromium sheet. Designed by Frederick Kiesler, architect.





Photographs by F. S. Lincoln

WATERING CANS for household plants. All parts made from sheet metal of same thickness.



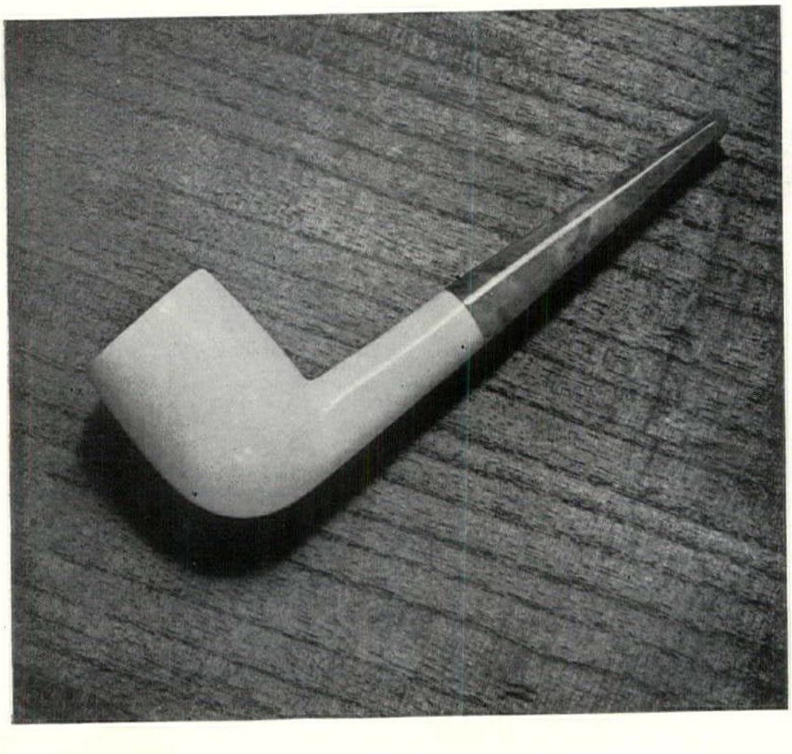
DIVIDERS. This instrument of precision demonstrates a mathematical basis of good proportion.

EGG SLICER. A factory-made product without any formal intention. The shape was conditioned by purpose and by natural process of manufacture.

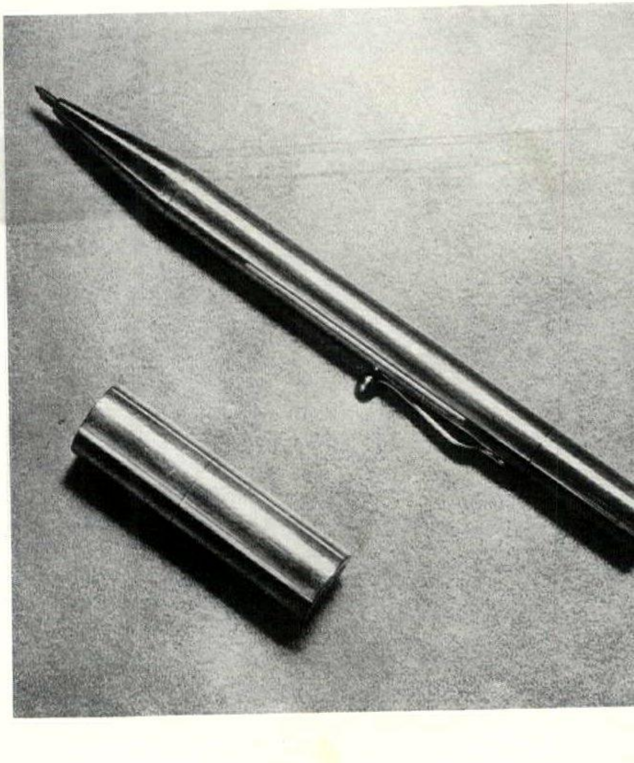
Photographs by Ruth Bernhard for Museum of Modern Art

GRADUATED MEASURES of non-oxydizing metal.

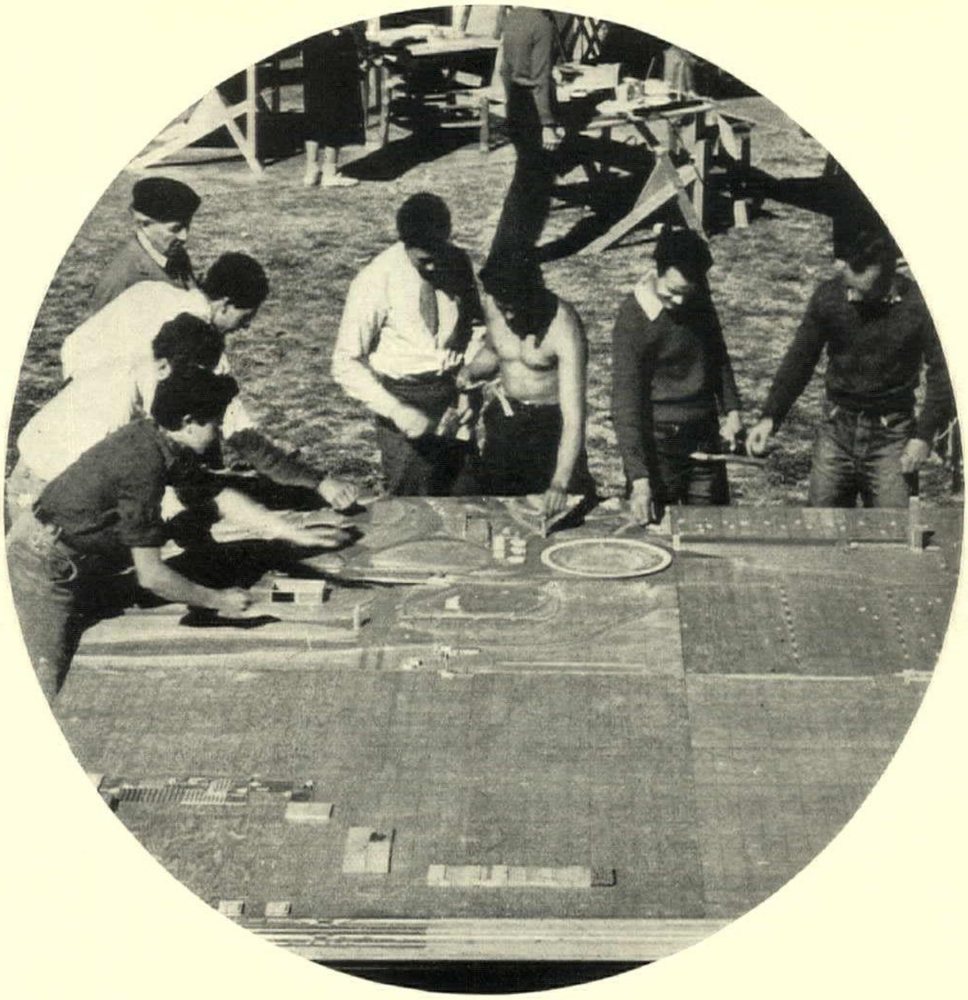
MEERSCHAUM PIPE by Dunhill. Only slight variations are possible in the proportions of a pipe.



PENCIL AND CIGARETTE LIGHTER of sterling silver.

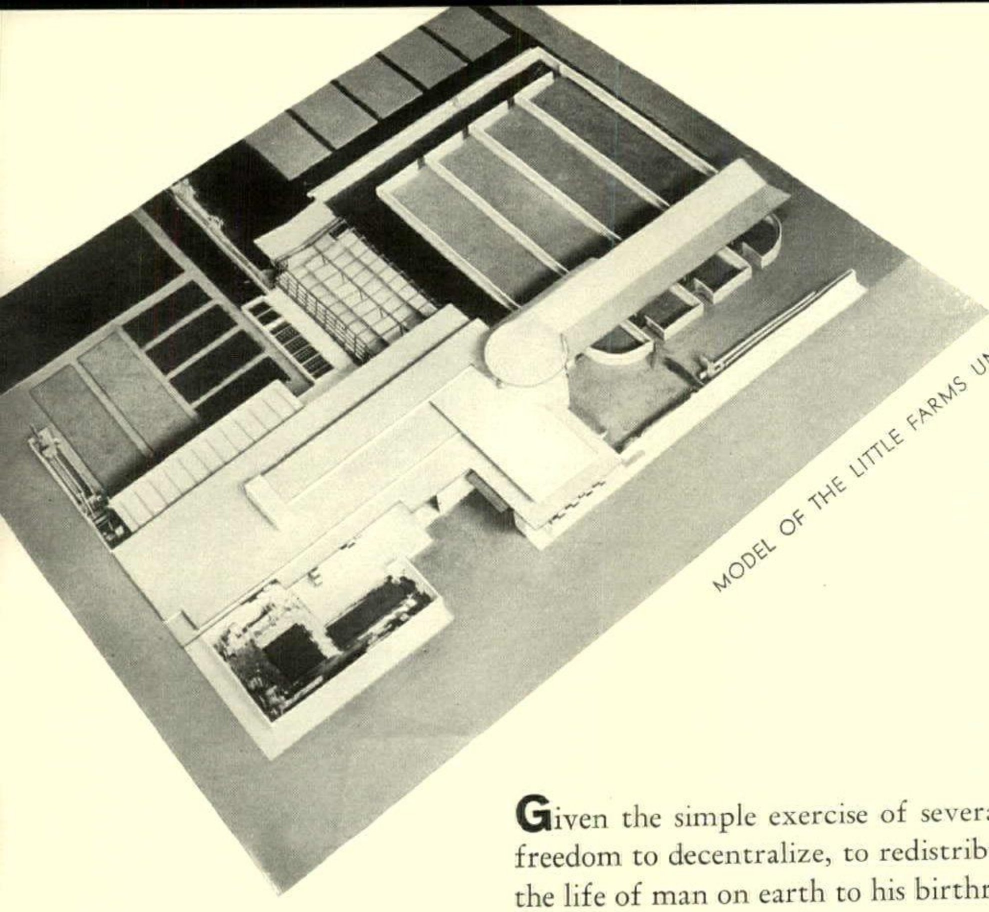


FRANK LLOYD WRIGHT
ARCHITECT



BROADACRE CITY: A NEW COMMUNITY PLAN

● In this article Frank Lloyd Wright describes his conception of Broadacres as the ideal community—"a general decentralization and architectural reintegration of all units into one fabric." A model illustrating the coordinated grouping of small farms, small factories, small homes, small schools, and small laboratories has been prepared by Mr. Wright and his student-apprentices of the Taliesin Fellowship (Taliesin, Wisconsin) in a winter session at Chandler, Arizona. It will be shown publicly for the first time April 15 to May 15 at the Industrial Arts Exposition in Rockefeller Center, New York City, under the auspices of the National Alliance of Art and Industry.



MODEL OF THE LITTLE FARMS UNIT

Given the simple exercise of several inherently just rights of man, the freedom to decentralize, to redistribute and to correlate the properties of the life of man on earth to his birthright—the ground itself—and Broadacre City becomes reality.

As I see Architecture, the best architect is he who will devise forms nearest organic as features of human growth by way of changes natural to that growth. Civilization is itself inevitably a form but not, if democracy is sanity, is it necessarily the fixation called "academic." All regimentation is a form of death which may sometimes serve life but more often imposes upon it. In Broadacres all is symmetrical but it is seldom obviously and never academically so.

Whatever forms issue are capable of normal growth without destruction of such pattern as they may have. Nor is there much obvious repetition in the new city. Where regiment and row serve the general harmony of arrangement both are present, but generally both are absent except where planting and cultivation are naturally a process or walls afford a desired seclusion. Rhythm is the substitute for such repetitions everywhere. Wherever repetition (standardization) enters, it has been modified by inner rhythms either by art or by nature as it must, to be of any lasting human value.

The three major inventions already at work building Broadacres, whether the powers that over-built the old cities otherwise like it or not are:

(1) The motor car: general mobilization of the human being.

(2) Radio, telephone and telegraph: electrical intercommunication becoming complete.

(3) Standardized machine-shop production: machine invention plus scientific discovery.

The price of the major three to America has been the exploitation we see everywhere around us in waste and in ugly scaffolding that may now be thrown away. The price has not been so great if by way of popular government we are able to exercise the use of three inherent rights of any man:

(1) His social right to a direct medium of exchange in place of gold as a commodity: some form of social credit.

(2) His social right to his place on the ground as he has had it in the sun and air: land to be held only by use and improvements.

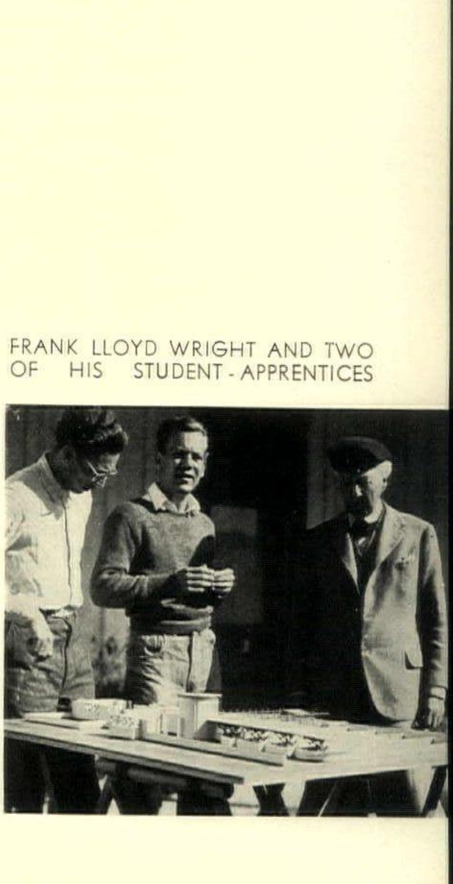
(3) His social right to the ideas by which and for which he lives: public ownership of invention and scientific discoveries that concern the life of the people.

The only assumption made by Broadacres as ideal is that these three rights will be the citizen's so soon as the folly of endeavoring to cheat him of their democratic values becomes apparent to those who hold (feudal survivors or survivals), as it is becoming apparent to the thinking people who are held blindly abject or subject against their will.

The landlord is no happier than the tenant. The speculator can no longer win much at a game about played out. The present success-ideal placing, as it does, premiums upon the wolf, the fox and the rat in human affairs and above all, upon the parasite, is growing more evident every day as a falsity just as injurious to the "successful" as to the victims of such success.

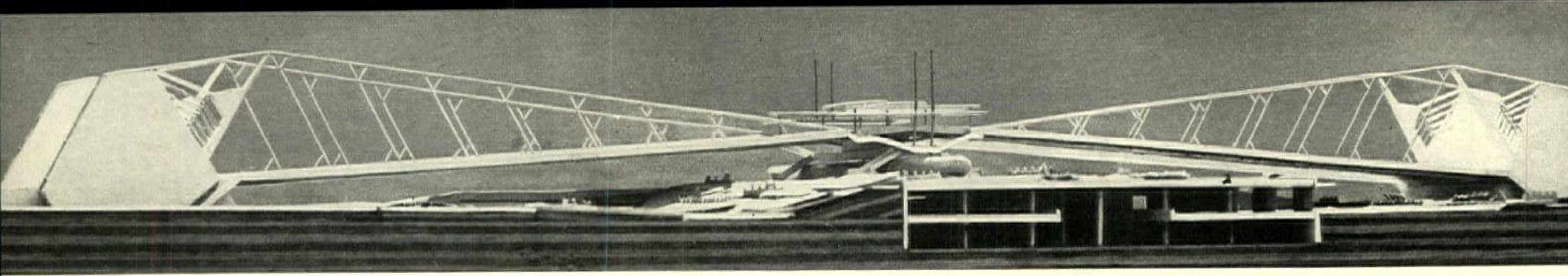
Well—sociologically, Broadacres is release from all that fatal "success" which is after all, only excess. So I have called it a new freedom for living in America. It has thrown the scaffolding aside. It sets up a new ideal of success.

FRANK LLOYD WRIGHT AND TWO OF HIS STUDENT-APPRENTICES



In Broadacres, by elimination of cities and towns the present curse of petty and minor officialdom, government, has been reduced to one minor government for each county. The waste motion, the back and forth haul, that today makes so much idle business is gone. Distribution becomes automatic and direct; taking place mostly in the region of origin. Methods of distribution of everything are simple and direct. From the maker to the consumer by the most direct route.

Coal (one third the tonnage of the haul of our railways) is eliminated by burning it at the mines and transferring that power, making it easier to take over the great railroad rights of way; to take off the cumbersome



Photographs by Dan Keller

BRIDGE PASS OVER THE GREAT ARTERIAL RIGHT OF WAY WHICH CONSISTS OF MANY LANES OF SPEED TRAFFIC ABOVE, MONORAIL SPEED TRAINS IN THE MIDDLE, AND TRUCK TRAFFIC ON LOWER SIDE LANES. WITHIN THE HIGHWAY STRUCTURE ARE STORAGE FACILITIES FOR RAW MATERIALS.

rolling stock and put the right of way into general service as the great arterial on which truck traffic is concentrated on lower side lanes, many lanes of speed traffic above and monorail speed trains at the center, continuously running. Because traffic may take off or take on at any given point, these arterials are traffic not dated but fluescent. And the great arterial as well as all the highways become great architecture, automatically affording within their structure all necessary storage facilities of raw materials, the elimination of all unsightly piles of raw material.

In the hands of the state, but by way of the county, is all redistribution of land—a minimum of one acre going to the childless family and more to the larger family as effected by the state. The agent of the state in all matters of land allotment or improvement, or in matters affecting the harmony of the whole, is the architect. All building is subject to his sense of the whole as organic architecture. Here architecture is landscape and landscape takes on the character of architecture by way of the simple process of cultivation.

All public utilities are concentrated in the hands of the state and county government as are matters of administration, patrol, fire, post, banking, license and record, making politics a vital matter to every one in the new city instead of the old case where hopeless indifference makes "politics" a grafter's profession.

In the buildings for Broadacres no distinction exists between much and little, more and less. Quality is in all, for all, alike. The thought entering into the first or last estate is of the best. What differs is only individuality and extent. There is nothing poor or mean in Broadacres.

Nor does Broadacres issue any dictum or see any finality in the matter either of pattern or style.

Organic character is style. Such style has myriad forms inherently good. Growth is possible to Broadacres as a fundamental form: not as mere accident of change but as integral pattern unfolding from within.

Here now may be seen the elemental units of our social structure: The correlated farm, the factory—its smoke and gases eliminated by burning coal at places of origin, the decentralized school, the various conditions of residence, the home offices, safe traffic, simplified government. All common interests take place in a simple coordination wherein all are employed: *little* farms, *little* homes for industry, *little* factories, *little* schools, a *little* university going to the people mostly by way of their interest in the ground, *little* laboratories on their own ground for professional men. And the farm itself, notwithstanding its animals, becomes the most attractive unit of the city. The husbandry of animals at last is in decent association with them and with all else as well. True farm relief.

To build Broadacres as conceived would automatically end unemployment and all its evils forever. There would never be labor enough nor could under-consumption ever ensue. Whatever a man did would be done—obviously and directly—mostly by himself in his own interest under the most valuable inspiration and direction: under training, certainly, if necessary. Economic independence would be near, a subsistence certain; life varied and interesting.

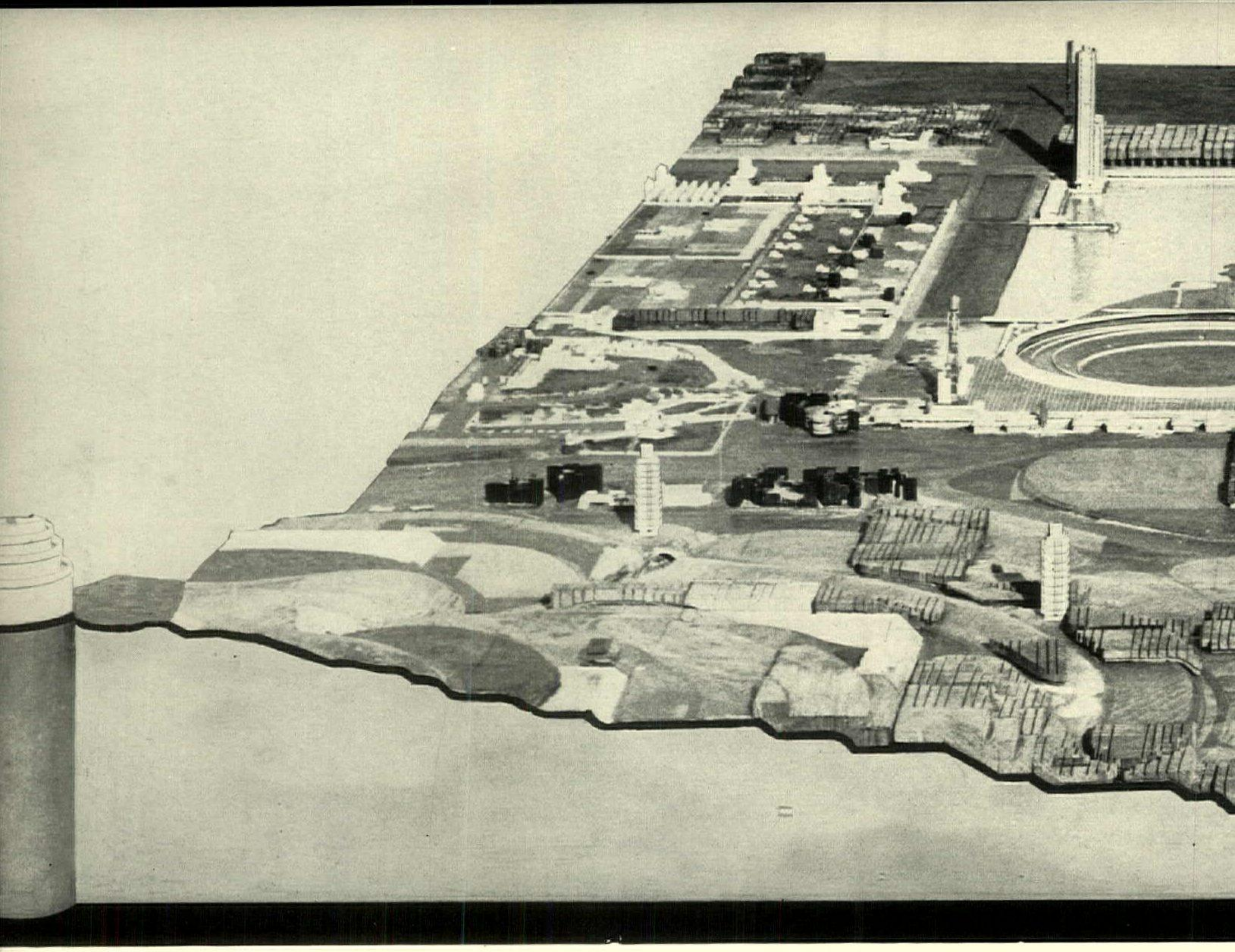
Every kind of builder would be likely to have a jealous eye to the harmony of the whole within broad limits fixed by the county architect, an architect chosen by the county itself. Each county would thus naturally develop an individuality of its own. Architecture—in the broad sense—would thrive.

In an organic architecture the ground itself predetermines all features; the climate modifies them; available means limit them; function shapes them.

Form and function are one in Broadacres. But Broadacres is no finality. The model shows four square miles of a typical countryside developed on the acre as unit according to conditions in the temperate zone and accommodating some 1,400 families. It would swing north or swing south in type as conditions, climate and topography of the region changed.

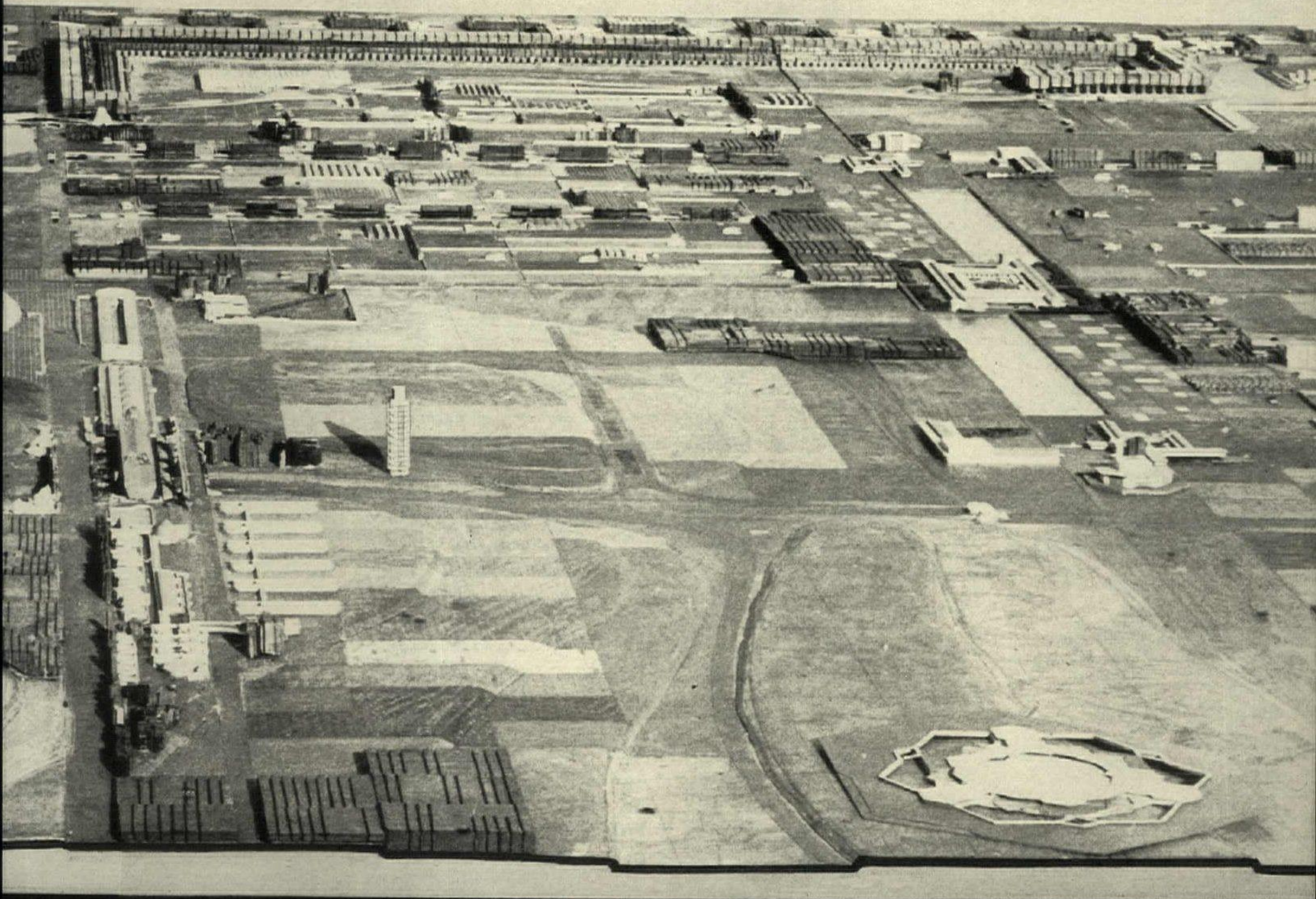
In the model the emphasis has been placed upon diversity in unity, recognizing the necessity of cultivation as a need for formality in most of the planting. By a simple government subsidy certain specific acres or groups of acre units are, in every generation, planted to useful trees,

COLLATERAL DETAIL MODELS: A TWO-CAR HOUSE, TWO MINIMUM HOUSES AND A MEDIUM HOUSE.



Photographs by Dan Keller

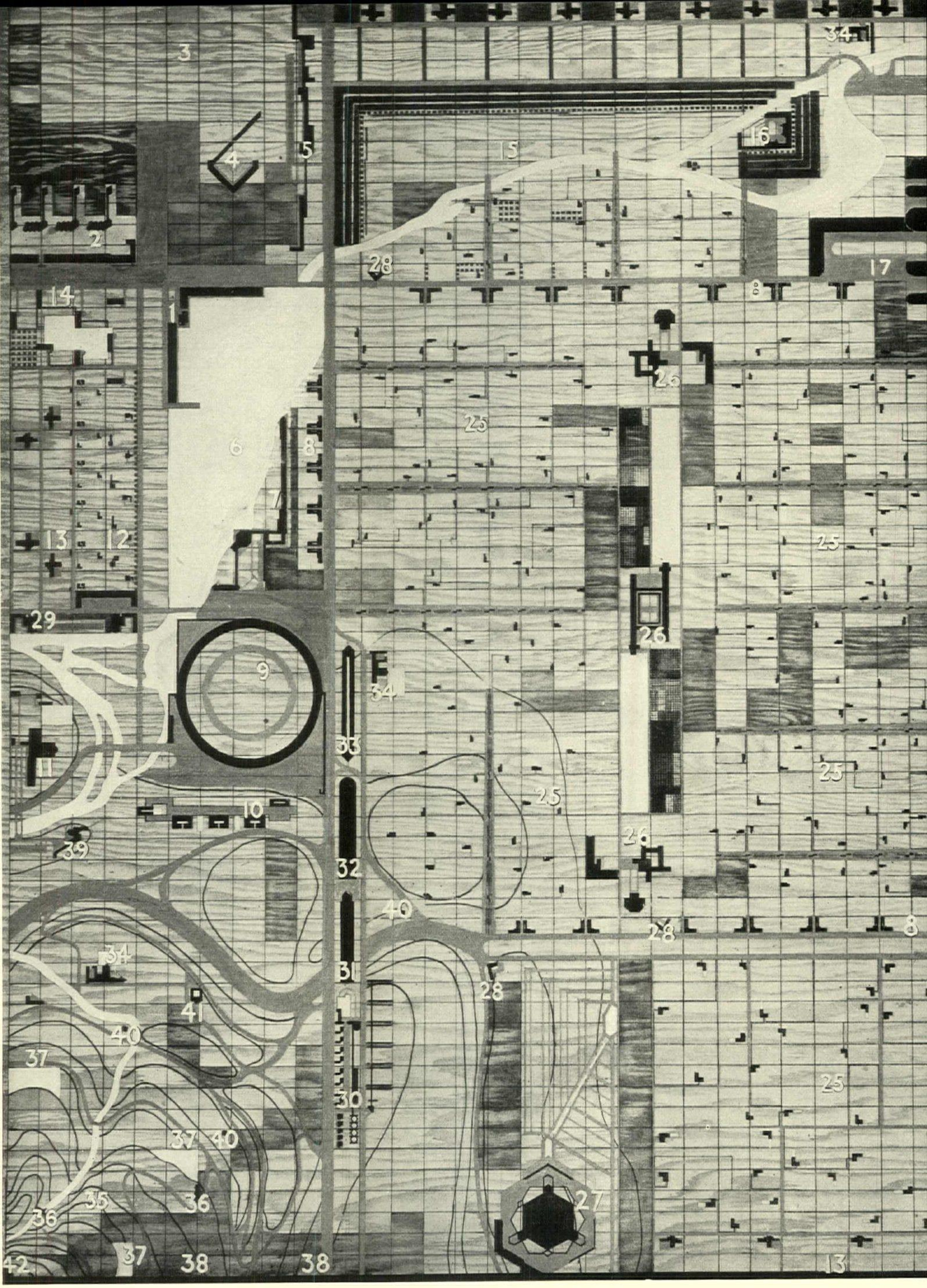
THE MODEL SHOWS FOUR SQUARE MILES OF A TYPICAL COUNTRYSIDE DEVELOPED ON THE ACRE AS UNIT ACCORDING TO CONDITIONS IN THE TEMPERATE ZONE AND ACCOMMODATING SOME 1,400 FAMILIES. IT WOULD SWING NORTH OR SWING SOUTH IN TYPE AS CONDITIONS, CLIMATE AND TOPOGRAPHY OF THE REGION CHANGED



meantime beautiful, giving privacy and various rural divisions. There are no rows of trees alongside the roads to shut out the view. Rows where they occur are perpendicular to the road or the trees are planted in groups. Useful trees like white pine, walnut, birch, beech, fir, would come to maturity as well as fruit and nut trees and they would come as a profitable crop meantime giving character, privacy and comfort to the whole city. The general park is a flowered meadow beside the stream and is bordered with ranks of trees, tiers gradually rising in height above the flowers at the ground level. A music-garden is sequestered from noise at one end. Much is made of general sports and festivals by way of the stadium, zoo, aquarium, arboretum and the arts.

The traffic problem has been given special attention, as the more mobilization is made a comfort and a facility the sooner will Broadacres arrive. Every Broadacre citizen has his own car. Multiple-lane highways make travel safe and enjoyable. There are no grade crossings nor left turns on grade. The road system and construction is such that no signals nor any lamp-posts need be seen. No ditches are alongside the roads. No curbs either. An inlaid purfling over which the car cannot come without damage to itself takes its place to protect the pedestrian.

In the affair of air transport Broadacres rejects the present airplane and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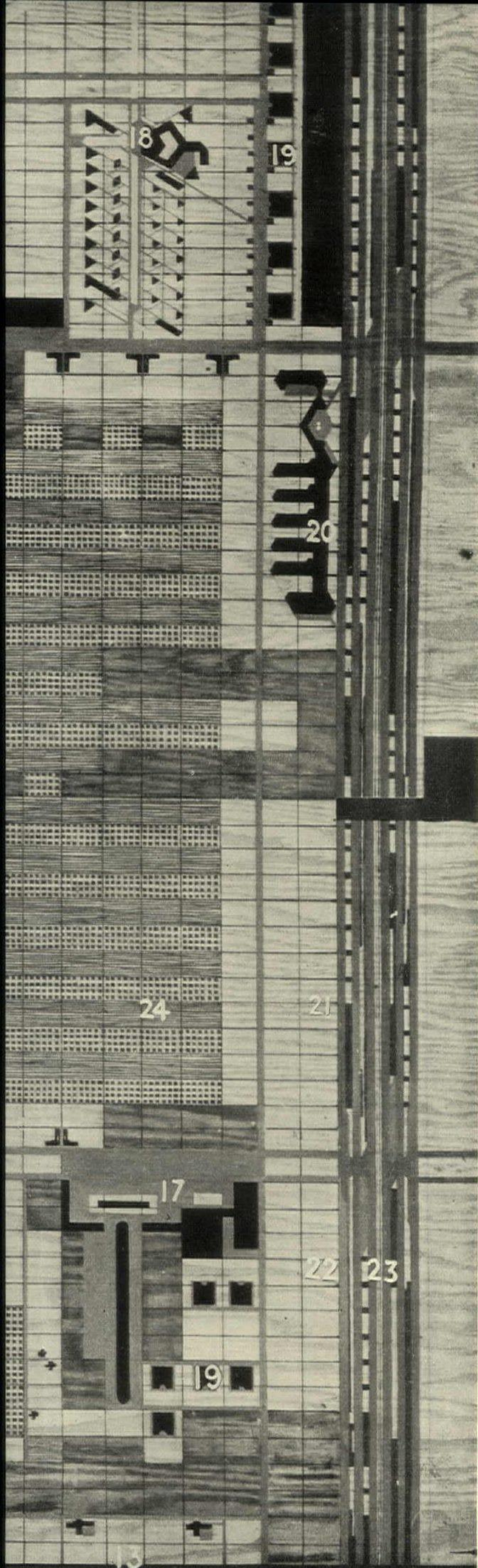
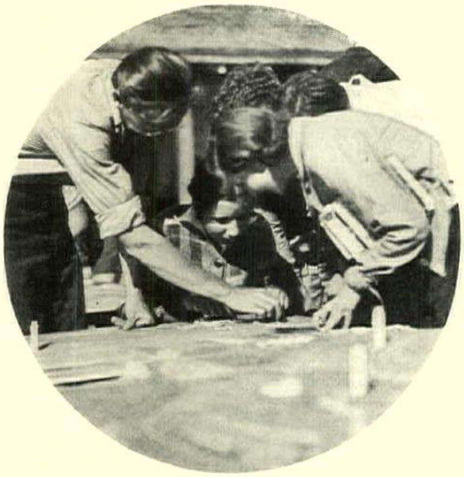


CHART TO PLAN OF BROADACRES

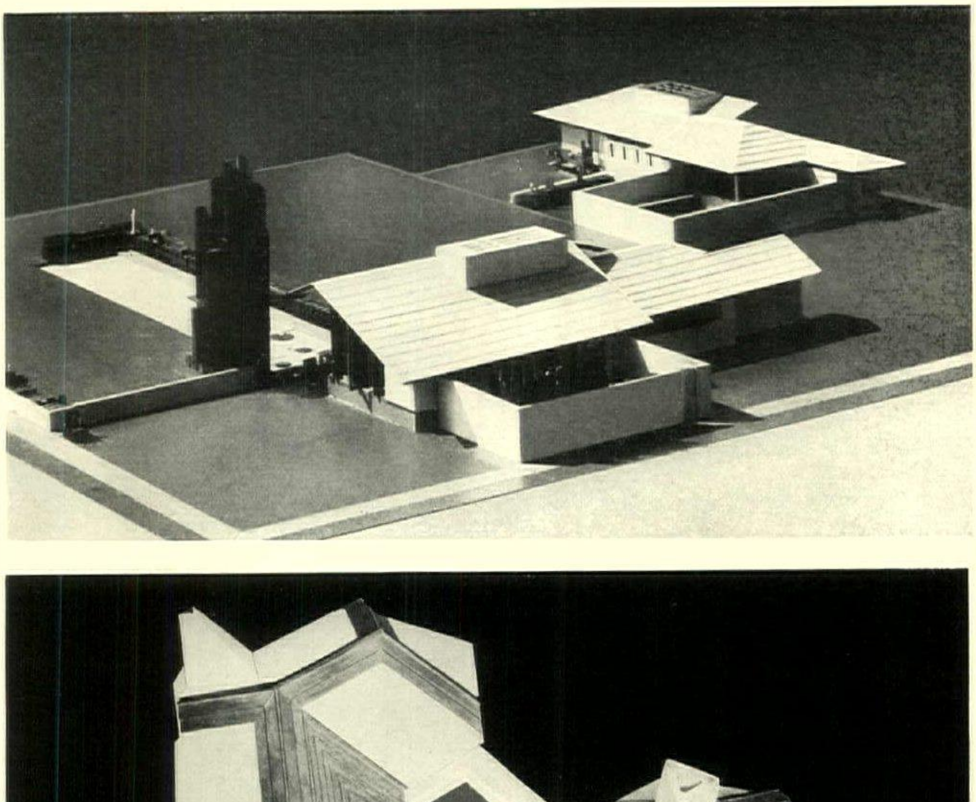
(1) County Seat—Administration. (2) Aerotor—Post Port and Administration. (3) Polo. (4) Baseball. (5) Clubs. (6) Lake and Stream. (7) Crafts and County Architects. (8) Professionals. (9) Stadium. (10) Hotel. (11) Sanitarium. (12) Small Industry. (13) Small Farm Units. (14) Small Apartments. (15) Interior Park. (16) Music Garden. (17) Merchandising. (18) Automobile Inn. (19) Little Factories with Dwellings Above. (20) Factory Assembly. (21) Aerotor Service. (22) Aerotor Factory. (23) Main Arterial (the Present Railway). (24) Vineyards and Orchards. (25) Homes. (26) Schools. (27) Temple—Columbarium and Cemetery. (28) Neighborhood Guests Houses. (29) Baths and Dressing Rooms. (30) Scientific and Agricultural Research. (31) Arboretum. (32) Zoo. (33) Aquarium. (34) Luxurious Dwelling (House on the Mesa). (35) Taliesin (Equivalent). (36) Luxurious Homes. (37) Water Supply. (38) Forest Cabins. (39) Country Club. (40) Apartment Houses. (41) Small School for Small Children. (42) Automobile Objective.

NOTE

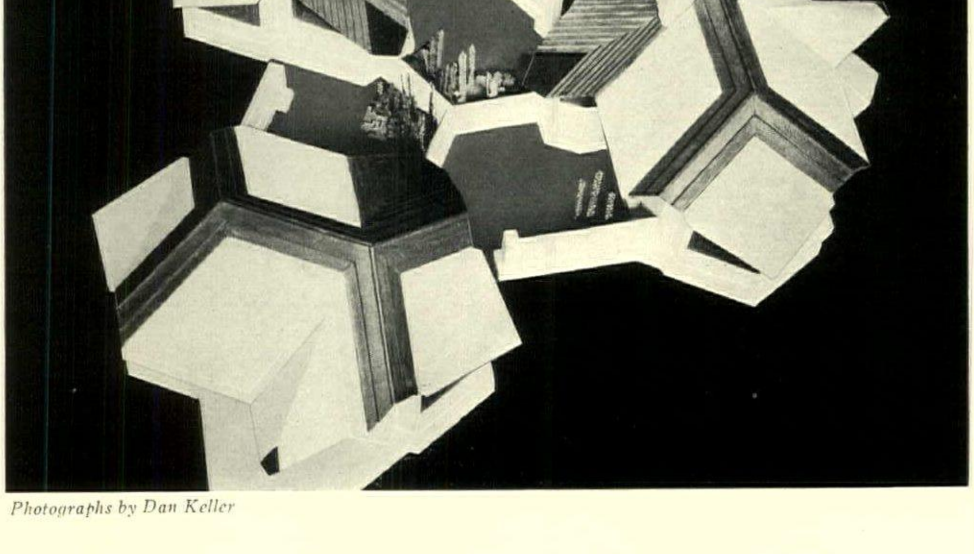
Plot—two miles square. Unit of division—one acre: 1,648 by 264 feet. Transportation and garage system—semi-dark bands. Left turns, crossings and overpasses (see detail photographs). Reforestation: dark acreage.



AN APPRENTICE GROUP AT WORK



COLLATERAL MODEL OF
TWO MINIMUM HOUSES



A GROUP OF BLACK AND
CANVAS CABINS IN THE
AUTOMOBILE INN

Photographs by Dan Keller

substitutes the self-contained mechanical unit that is sure to come: an aerotor capable of rising straight up and by reversible rotors able to travel in any given direction under radio control at a maximum speed of, say, 200 miles an hour, and able to descend safely into the hexacomb from which it arose or anywhere else. By a doorstep if desired.

The only fixed transport trains kept on the arterial are the long-distance monorail cars traveling at a speed (already established in Germany) of 220 miles per hour. All other traffic is by motor car on the twelve lane levels or the triple truck lanes on the lower levels which have on both sides the advantage of delivery direct to warehousing or from warehouses to consumer. Local trucks may get to warehouse-storage on lower levels under the main arterial itself. A local truck road parallels the swifter lanes.

Houses in the new city are varied: make much of fireproof synthetic materials, factory-fabricated units adapted to free assembly and varied arrangement, but do not neglect the older nature-materials wherever they are desired and available. Householders' utilities are nearly all planned in prefabricated utility stacks or units, simplifying construction and reducing building costs to a certainty. There is the professional's house with its laboratory, the minimum house with its workshop, the medium house ditto, the larger house and the house of machine-age-luxury. We might speak of them as a one-car house, a two-car house, a three-car house and a five-car house. Glass is extensively used as are roofless rooms. The roof is used often as a trellis or a garden. But where glass is extensively used it is usually for domestic purposes in the shadow of protecting overhangs.

Copper for roofs is indicated generally on the model as a permanent cover capable of being worked in many appropriate ways and giving a general harmonious color effect to the whole.

Electricity, oil and gas are the only popular fuels. Each land allotment has a pit near the public lighting fixture where access to the three and to water and sewer may be had without tearing up the pavements.

The school problem is solved by segregating a group of low buildings in the interior spaces of the city where the children can go without crossing traffic. The school building group includes galleries for loan collections from the museum, a concert and lecture hall, small gardens for the children in small groups and well-lighted cubicles for individual outdoor study: there is a small zoo, large pools and green playgrounds.

This group is at the very center of the model and contains at its center the higher school adapted to the segregation of the students into small groups.

This tract of four miles square, by way of such liberal general allotment determined by acreage and type of ground, including apartment buildings and hotel facilities, provides for about 1,400 families at, say, an average of five or more persons to the family.

To reiterate: the basis of the whole is general decentralization as an applied principle and architectural reintegration of all units into one fabric; free use of the ground held only by use and improvements; public utilities and government itself owned by the people of Broadacre City; privacy on one's own ground for all and a fair means of subsistence for all by way of their own work on their own ground or in their own laboratory or in common offices serving the life of the whole.

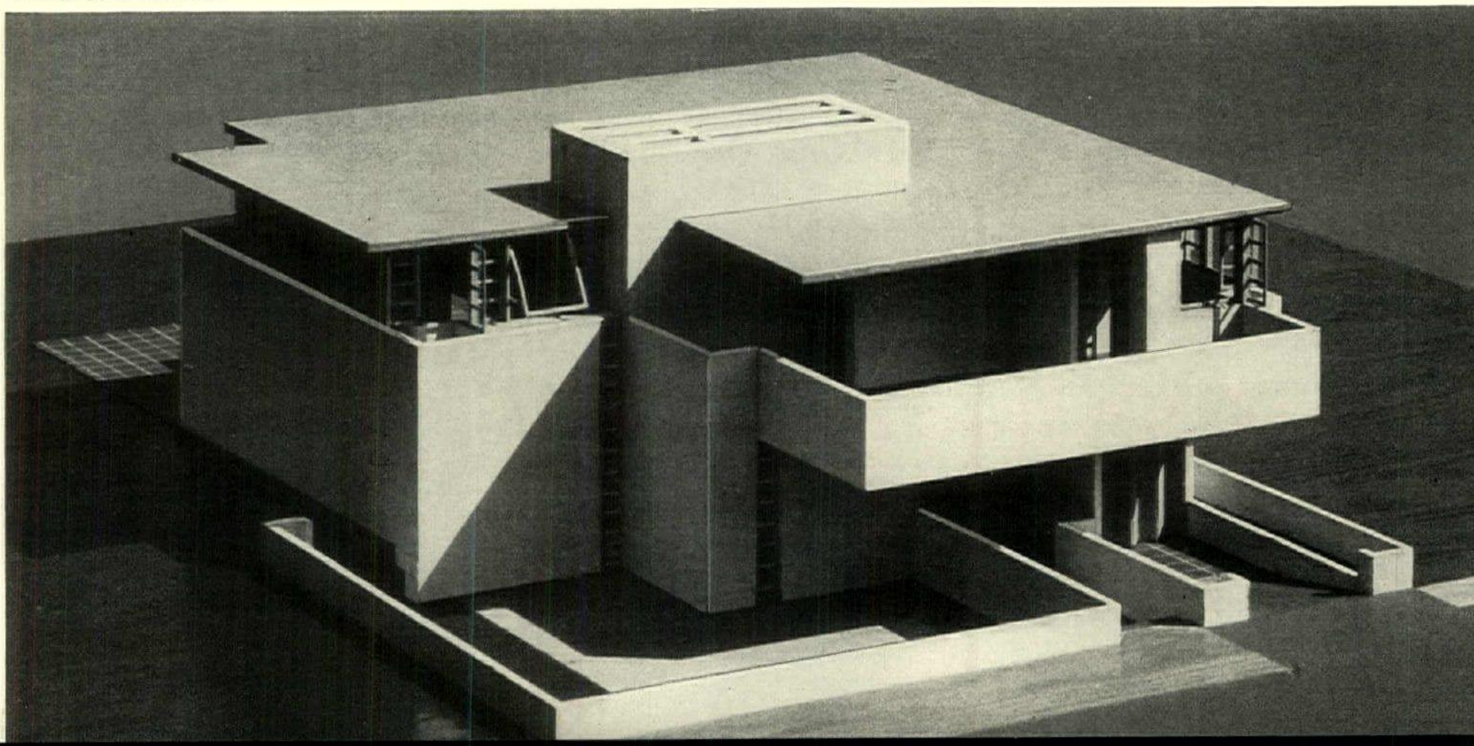
There are too many details involved in the model of Broadacres to permit complete explanation. Study of the model itself is necessary study. Most details are explained by way of collateral models of the various types of construction shown: highway construction, left turns, crossovers, underpasses and various houses and public buildings.

Any one studying the model should bear in mind the thesis upon which the design has been built by the Taliesin Fellowship, built carefully not as a finality in any sense but as an interpretation of the changes inevitable to our growth as a people and a nation.

Individuality established on such terms must thrive. Unwholesome life would get no encouragement and the ghastly heritage left by overcrowding in overdone ultra-capitalistic centers would be likely to disappear in three or four generations. The old success ideals having no chance at all, new ones more natural to the best in man would be given a fresh opportunity to develop naturally.

MODEL OF THE 2-CAR HOUSE

Photograph by Dan Keller

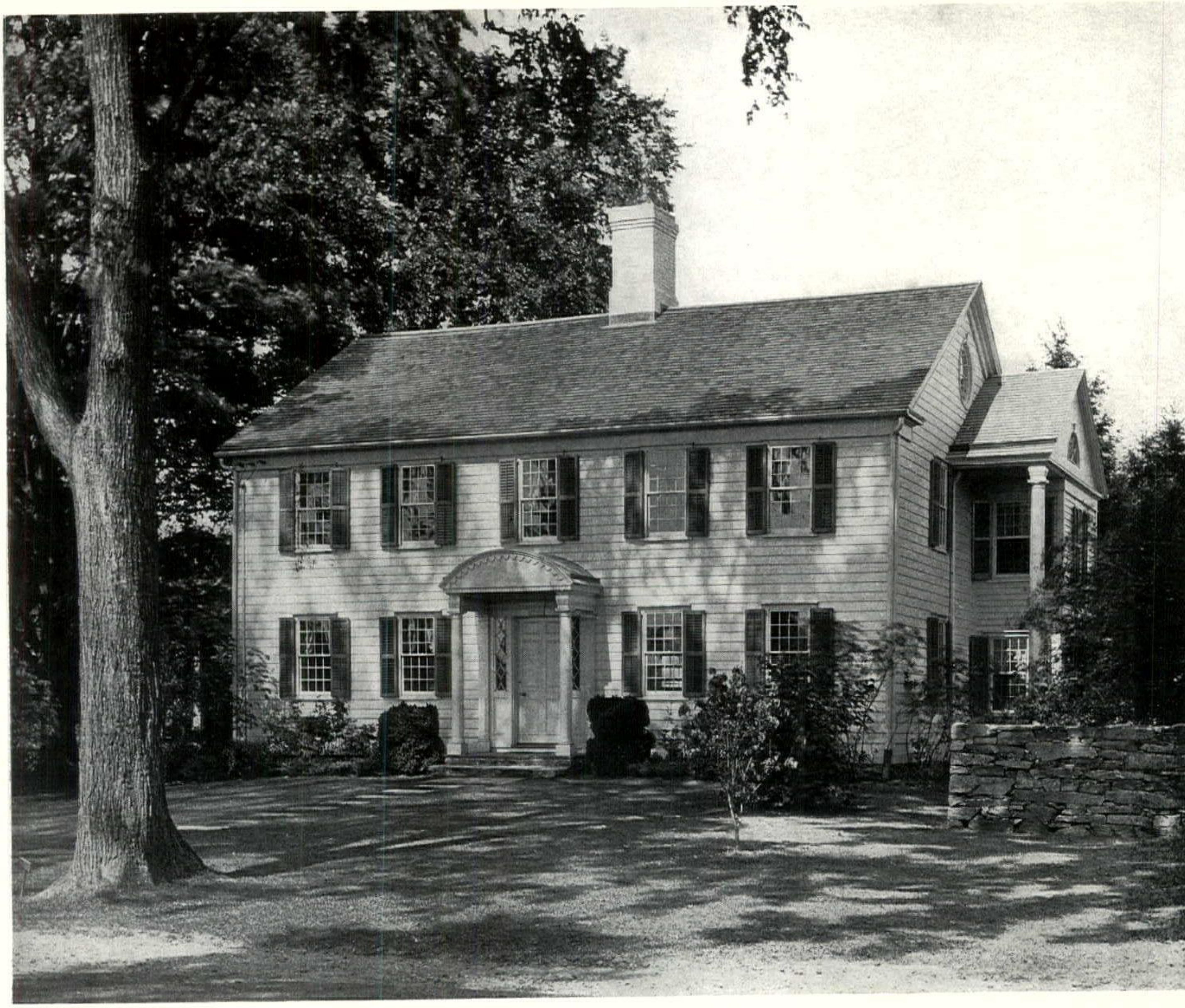


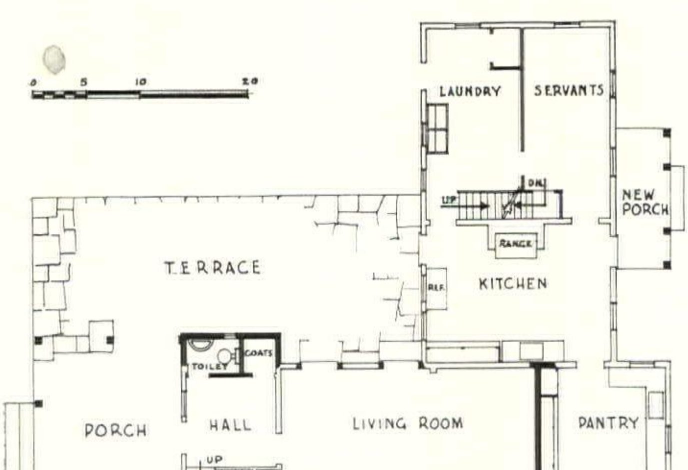
PORTFOLIO

OF CURRENT ARCHITECTURE

REMODELED HOUSE

OF CHARLES DUPEE AT SOUTHPORT, CONNECTICUT — CAMERON CLARK, ARCHITECT

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TOILET
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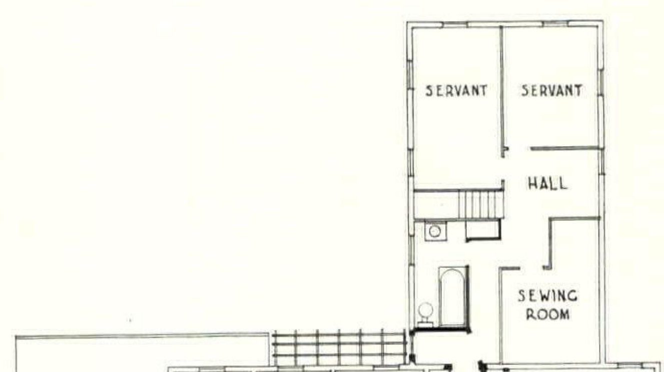
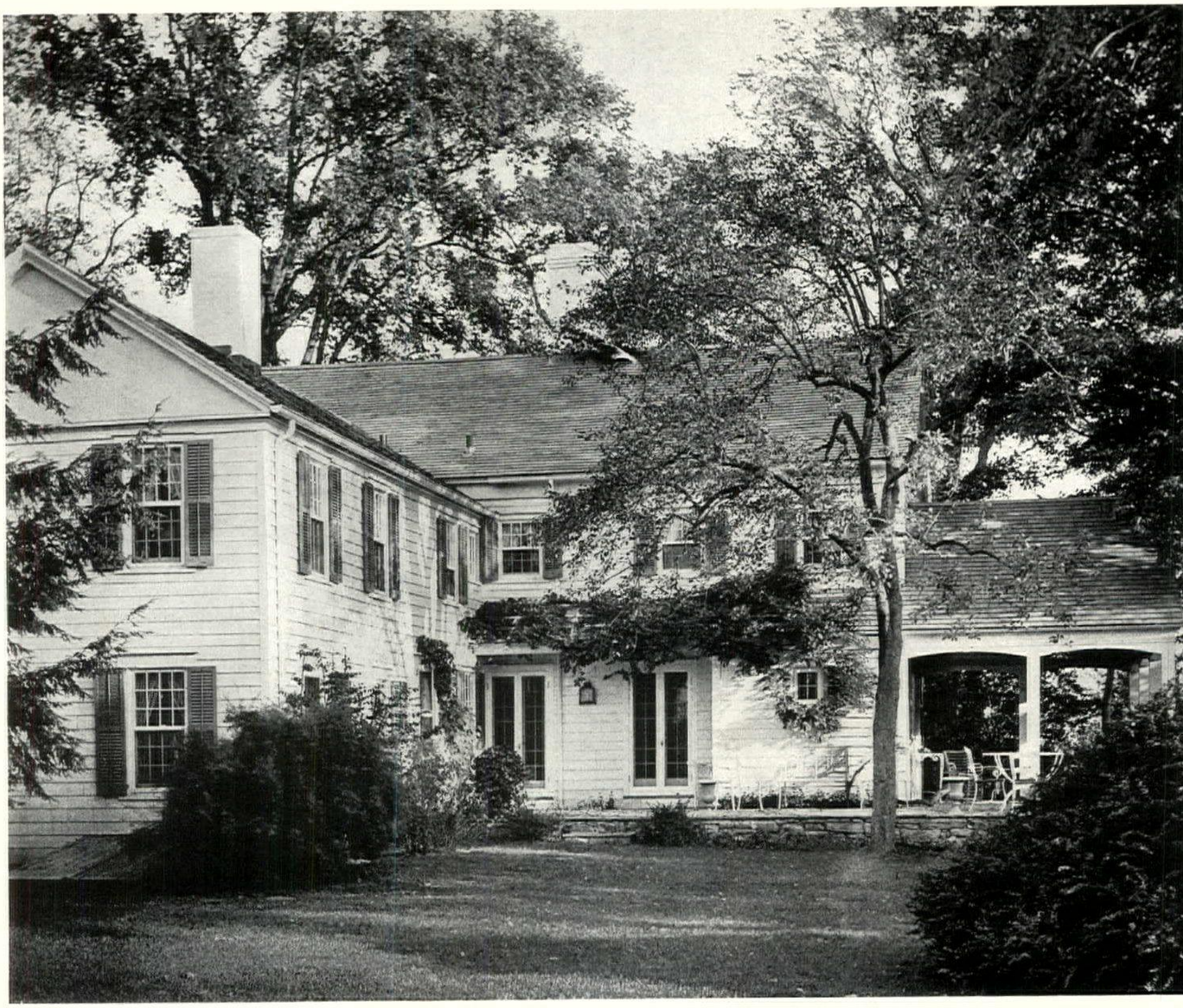
PORCH
HALL
LIVING ROOM
PANTRY
UP
CLOS.
LIVING ROOM
DINING ROOM
UP
ENTRANCE HALL


SERVANT
SERVANT
HALL
SEWING ROOM
CLOSET
DRESSING ROOM
BATH
BATH
BED ROOM
DOWN
HALL
UP
BED ROOM
BED ROOM
DN
HALL

HOUSE OF CHARLES DUPEE AT SOUTHPORT, CONNECTICUT — CAMERON CLARK, ARCHITECT



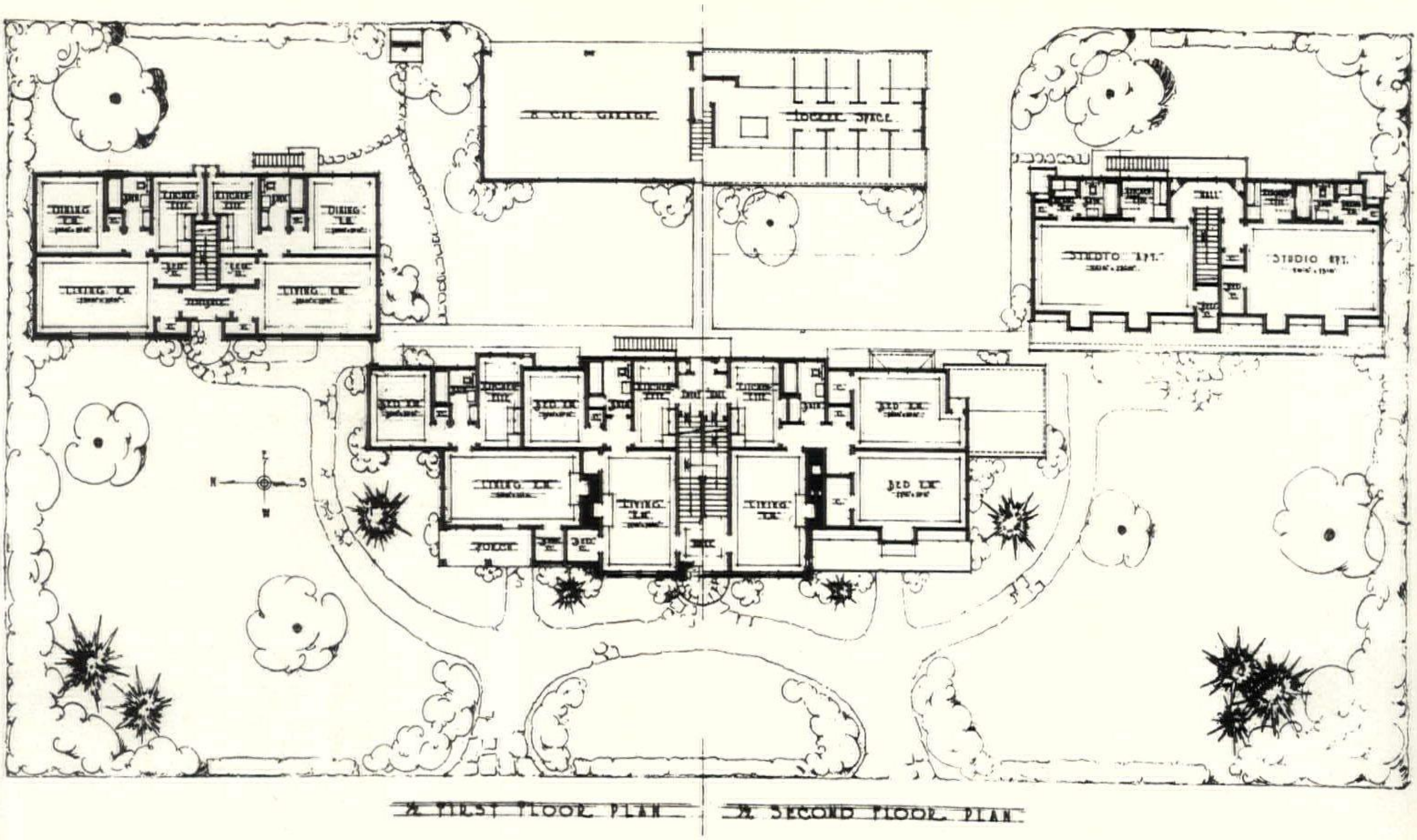
HOUSE AFTER ALTERATIONS

HOUSE BEFORE ALTERATIONS

HOUSE OF CHARLES DUPEE AT SOUTHPORT, CONNECTICUT — CAMERON CLARK, ARCHITECT

THE ELLIOTT APARTMENTS FOR FRANK E. BALL AT MUNCIE, INDIANA

The group includes four buildings containing, in all, fourteen apartments. The center building has six apartments, four of which are entered from the main entrance, and the remaining two have private side porticos. Two smaller buildings are set back and contain four apartments each, all opening into a center entrance and stairhall. In the rear is an 8-car garage with spacious locker space overhead for storage use. Cost of apartments: $62,000, inclusive of all equipment, but exclusive of cost of lot. The construction above ground is frame, completely fire-stopped and insulated with rock wool. The first floor is reinforced concrete. The buildings are heated by vapor in concealed radiation, supplied by a stoker-fired boiler in basement; center portion of the main building only is excavated. Exterior materials are local stone in varying shades of blue, gray, cream to brown, laid with wide white joints; common brick; shingle siding and tongue and groove siding. The roof is slate in weathering greens, grays, sea greens and blacks. The shutters are painted bottle green. All wood and brickwork are painted flat white.

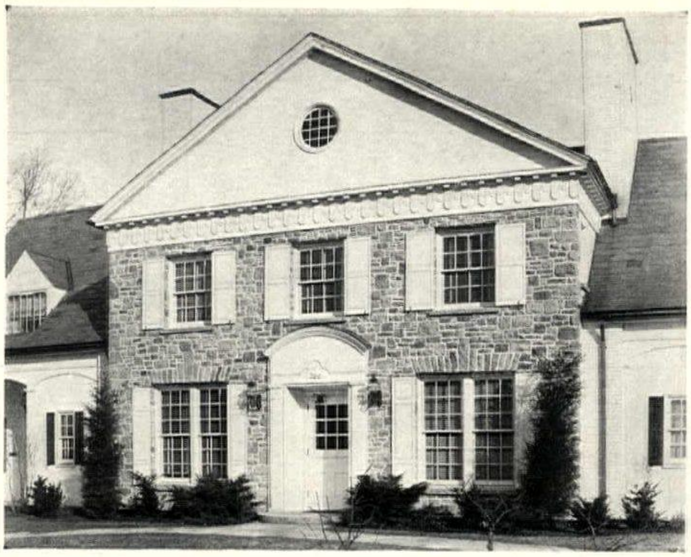


DEVOL ERNST, LANDSCAPE ARCHITECT

HERBERT F. SMENNER, ARCHITECT

ELLIOTT APARTMENTS

MUNCIE, INDIANA



HERBERT F. SMENNER

ARCHITECT

HOUSE OF ROBERT M. BROWN AT CHESTNUT HILL, PHILADELPHIA

In building this house materials were studied for beauty, permanence and easy fabrication. Wood was chosen as the most flexible and pleasing, as well as the most economical. Many details associated with boat construction were used, giving a compact solidity in construction with a minimum loss of useful space. Wherever possible, structure and finish were combined in the same material. Twelve-inch redwood boards screwed horizontally to light framing combine pleasing appearance with considerable structural value, as well as being extremely durable as finish and moderate in cost. The window construction is an adaptation of the idea of prefabricated wall panels, and combines the wall structure with both interior and exterior finish. The steel casements were placed after erection, but could easily have been installed before. All millwork was fabricated at the site by the owner (the designer) and one assistant on two simple machines, permitting careful selection of material. Many special woods were used.

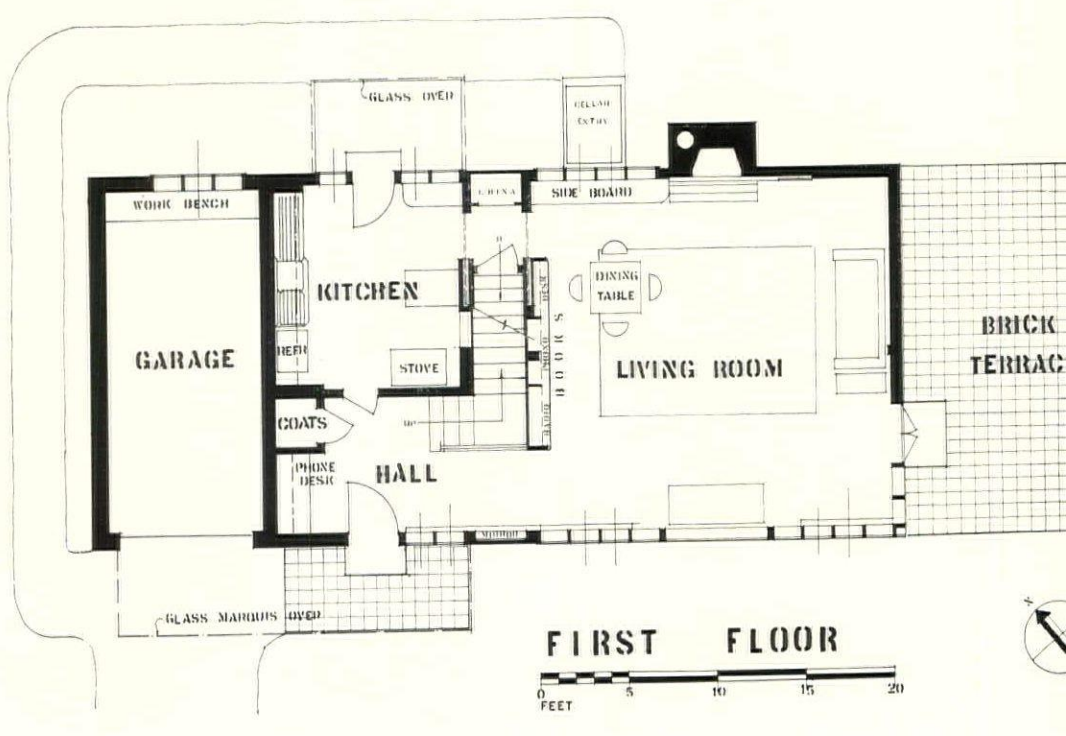
Photographs by F. S. Lincoln

Photographs by F. S. Lincoln

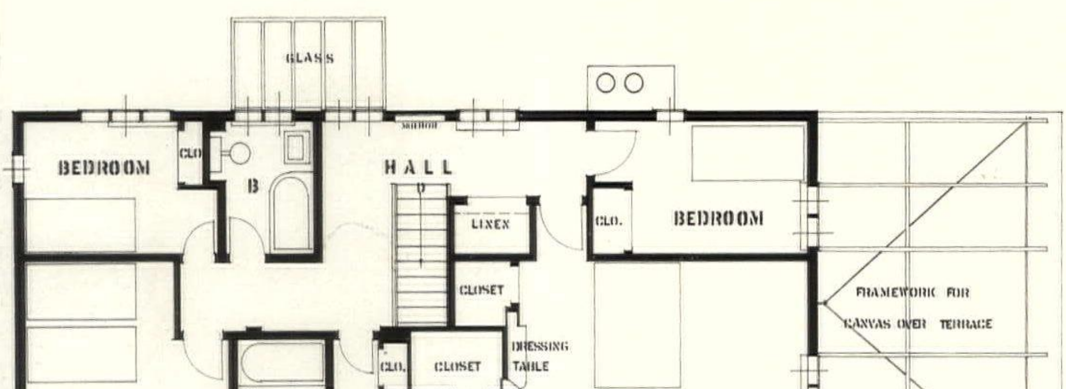
ROBERT M. BR

DESIGNER—BUIL

The living room, its relation to the rest of the house and the outside, is the main feature of the design. A separate dining space was considered unnecessary and undesirable. The hallway and stairs were placed with a view to gaining privacy in the living room and access upstairs from the kitchen. A combined recreation room, bar, and workshop, occupying most of the basement, provides secondary living space.



HOUSE AT CHESTNUT HILL, PHILADELPHIA



The owner's bedroom, dressing room and bath are of comfortable size and provide ample facilities, while the other bedrooms and bath are held to rigidly minimum dimensions. The positioning of bathrooms and kitchen centralizes all plumbing, reducing the cost and minimizing the damage from possible pipe failure. Copper water tubing is used throughout.

Photographs by F. S. Lincoln

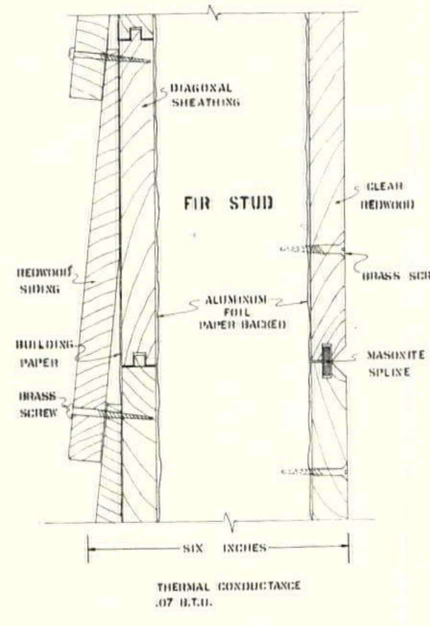
OWNER'S BEDROOM

HOUSE AT CHESTNUT HILL, PHILADELPHIA

VIEW INTO LIVING ROOM

ROBERT M. BROWN, OWNER, DESIGNER AND BUILDER

TYPICAL WALL SECTION



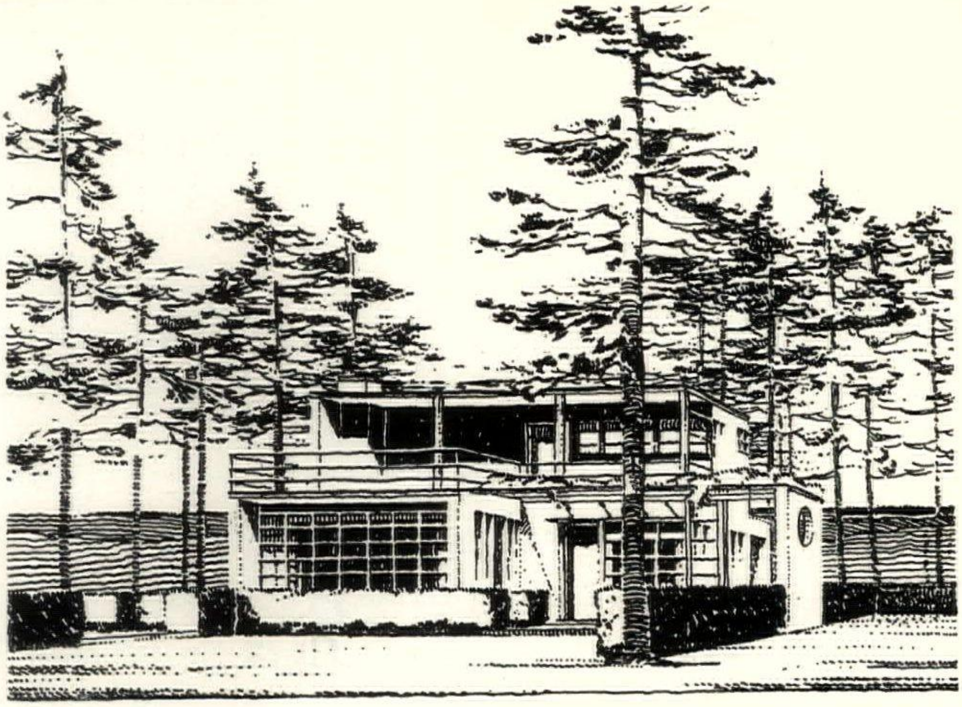
HOUSE DESIGNED, BUILT AND OWNED BY ROBERT M. BROWN
CHESTNUT HILL . . . . PHILADELPHIA

The structural design of stairs and surrounding framing was worked out in conjunction with the placement of recessed mirrors, roof drainage line, cupboards, bookcase, and radio speaker. The framework of horizontal bookshelves and cabinets below was used as the structural foundation for finish in the stairs, reducing the wall thickness to less than 2 inches. The slag roof is pitched very slightly (1/8" in 1') to a central drain, and structural provisions have been made for later development of an exterior stairway and tiled roof terrace. There is no parapet and all roof flashing is eliminated by using a galvanized steel angle iron to make the joint between roof and sidewall.

Floors: Diagonal subfloor laid over entire areas of first and second floors (there are no bearing partitions) in casein glue and nailed; half-inch sound deadening board; then finish floor (wide plank—white oak downstairs, pine painted upstairs) is screwed through insulating board to subfloor.

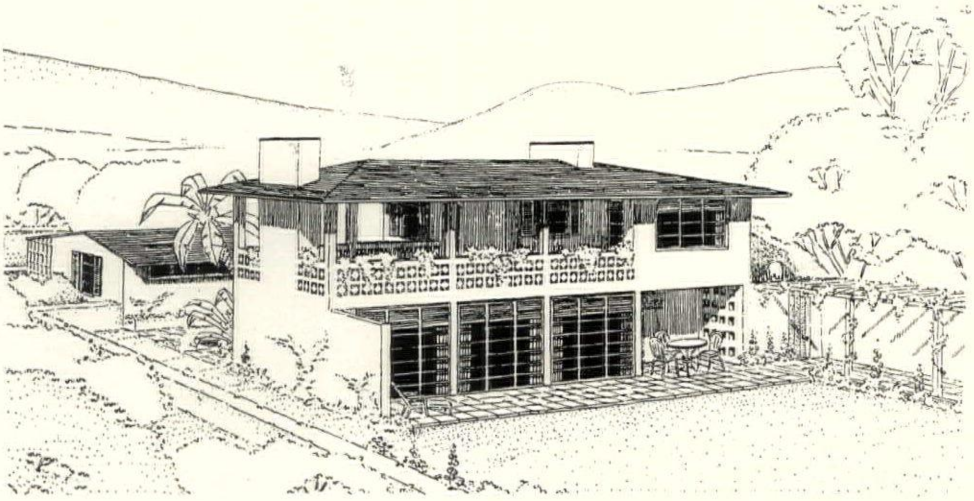
Interior walls: Kitchen: 3/4" plywood. Master bath: carrara glass. Second bath: tempered Presdwood, spar varnished and enameled. Bedrooms: 12" redwood, painted. Living room and halls: 12" redwood—brass screws and natural wax finish. All ceilings: painted Homasote.

Aluminum foil on paper backing (Reynolds) is used throughout to provide maximum insulation at low cost. The fuel cost is extremely low. Heating is by hot water, low temperature system, using concealed indirect radiation, burning low-cost coal without blowers or pumps. Two standard 10" steel pipes 18' long, with lower ends flanged and anchored in masonry eliminate all fire hazard and leakage 6' above grade. Aluminum hoods, projecting 8 inches over windows, stop vertical summer sun and pass horizontal winter sun. Hoods over front and back doors: oak and steel frame, with half-inch rough plate glass over. Flat, truck cover canvas is stretched and roped on redwood and aluminum tube frame over terrace in spring, removed in autumn. Cost: About $8,000.



GRAND PRIZE IN CLASSES A AND B

HAYS AND SIMPSON ARCHITECTS



GRAND PRIZE IN CLASSES C AND D

PAUL SCHWEIKHER, THEODORE W. LAMB ARCHITECTS

GENERAL ELECTRIC COMPETITION AWARDS

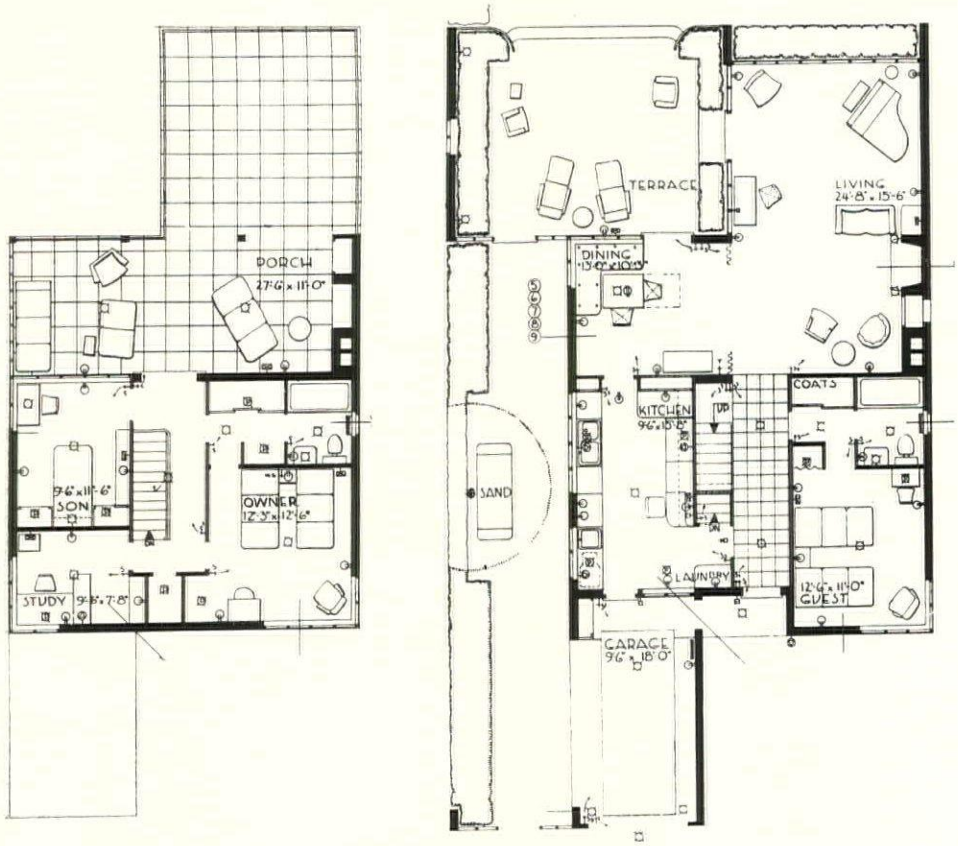
Architectural firms in Cleveland and Chicago shared the two grand prizes and architects in New York carried off the two first awards in the home electric architectural competition sponsored by the General Electric Company in cooperation with the Federal Housing Administration. The contest opened January 1, continued 10 weeks, and more than 2,000 sets of plans were submitted from every state in the union.

A total of $21,000 was awarded in 52 prizes. The two grand prizes, each for $2,500, were awarded to Hays and Simpson of Cleveland and to Paul Schweikher and Theodore Warren Lamb of Chicago. The two first prizes, each for $1,500, were awarded to Stephen J. Alling, a young architect who finished his studies at the Massachusetts Institute of Technology a year and one half ago, and to J. Andre Fouilhoux and Don E. Hatch, jointly, both of New York. Mr. Fouilhoux was a partner with Raymond Hood, until the time of the latter's death, and it was during this association that this firm designed many of the country's famous buildings, such as the Chicago Tribune tower, the Daily News building, Radio City, and the McGraw-Hill building in New York.

Four second prizes, each for $1,250, were awarded to Ralph H. Burkhead, Richard C. Hoyt and Angelo Messina, jointly, of New York; John Ekin Dinwiddle of San Francisco; Arthur Martini and Jonas Pendleburg, jointly, of Flushing, L. I.; and to Richard J. Neutra of Los Angeles.

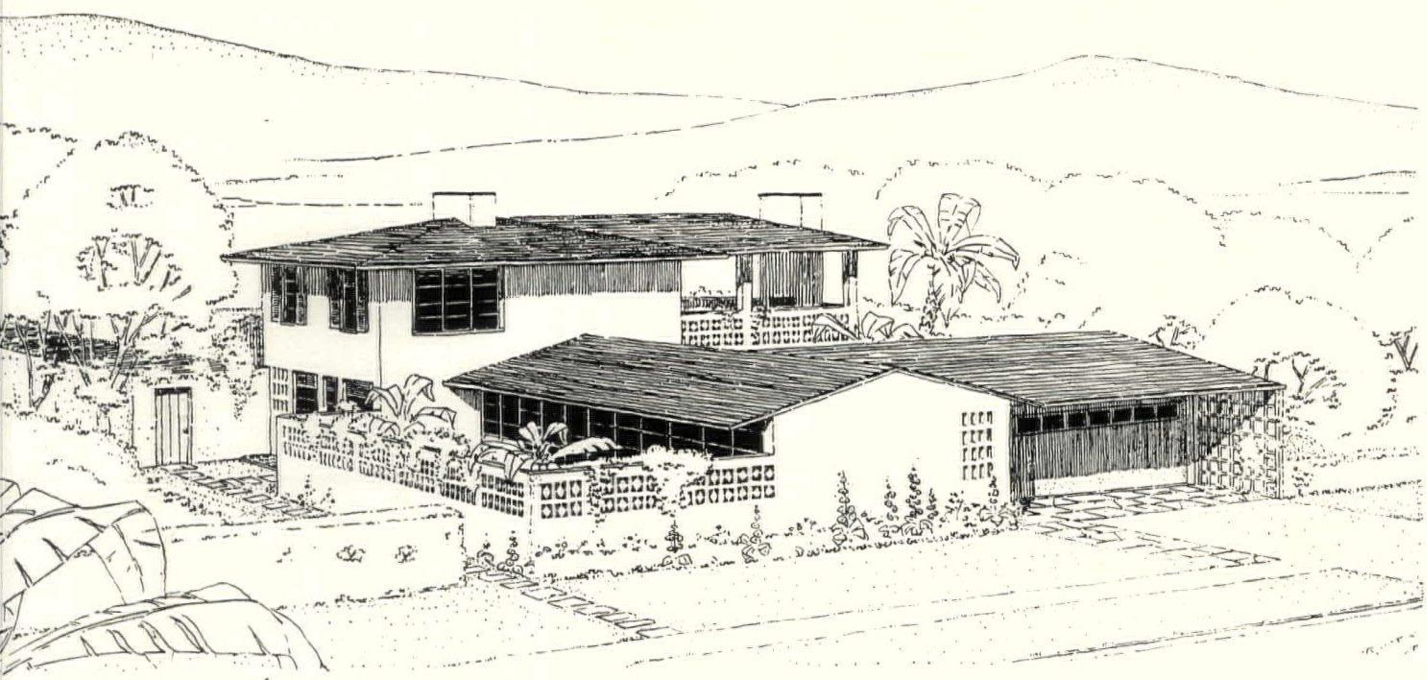
Four third prizes, each for $1,000 were awarded to Verner Walter Johnson and Phil Birnbaum, jointly, of New York; Herman A. L. Behlen, Ardsley, Pa.; John Hironimus, of New York, and John Donald Tuttle, of New York.

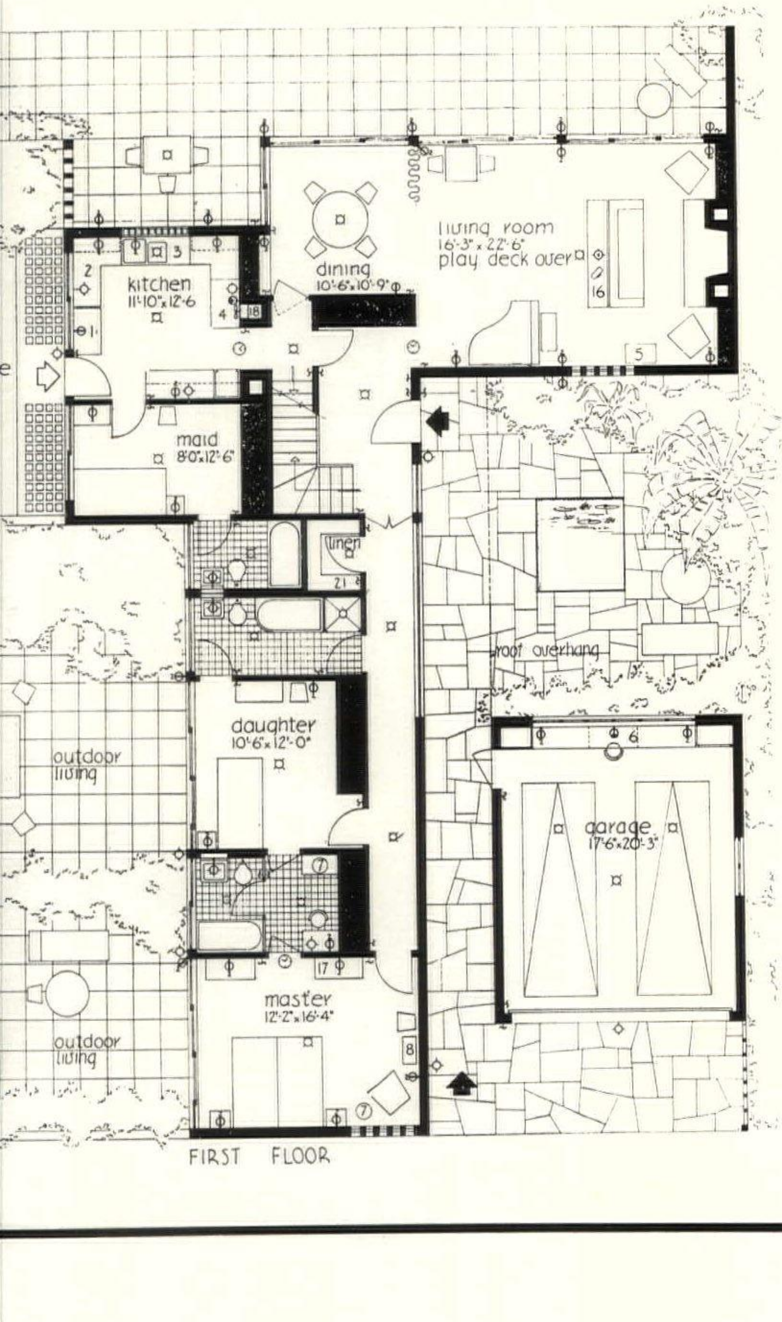
(Continued on page 292)



GRAND PRIZE
CLASSES A AND B

HAYS AND SIMPSON
ARCHITECTS—CLEVELAND





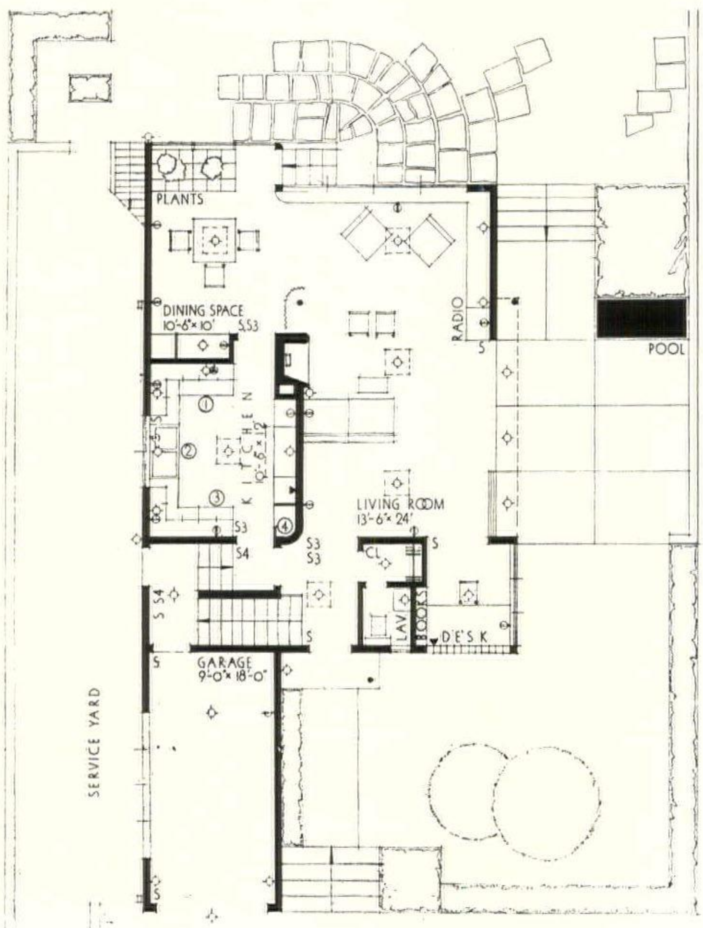
FIRST FLOOR

GRAND PRIZE
CLASSES C AND D

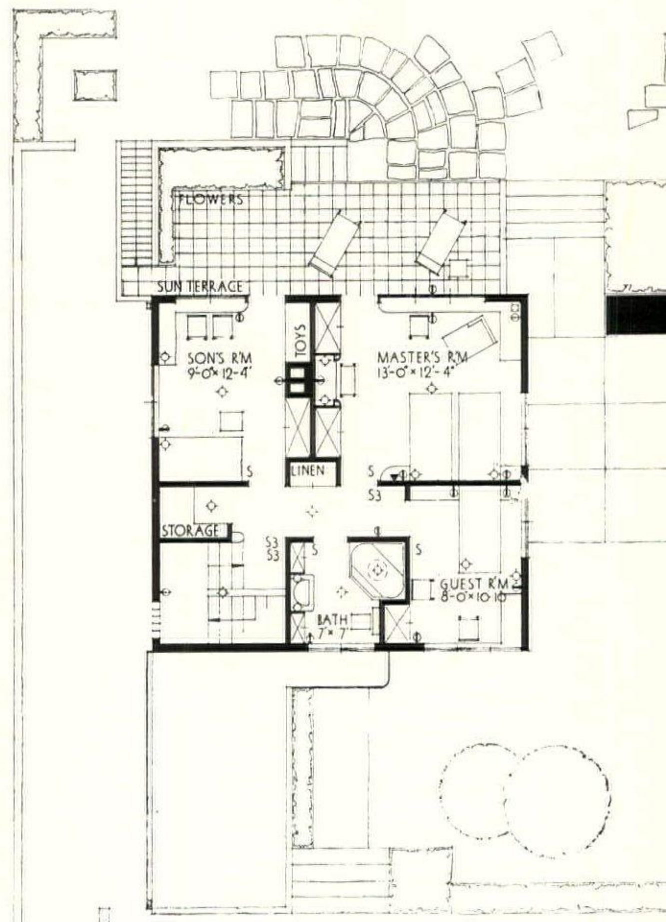
PAUL SCHWEIKHER
THEODORE W. LAMB
ARCHITECTS — CHICAGO

FIRST PRIZE — CLASS A

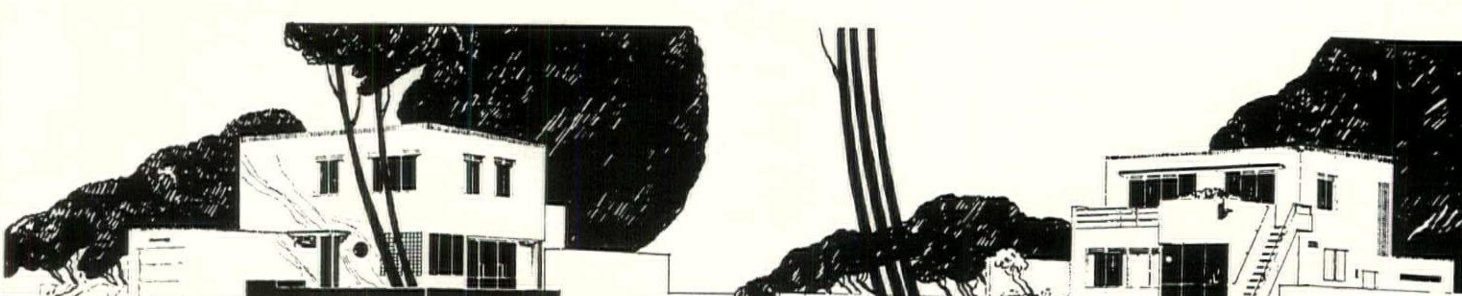
STEPHEN J. ALLING, ARCHITECT

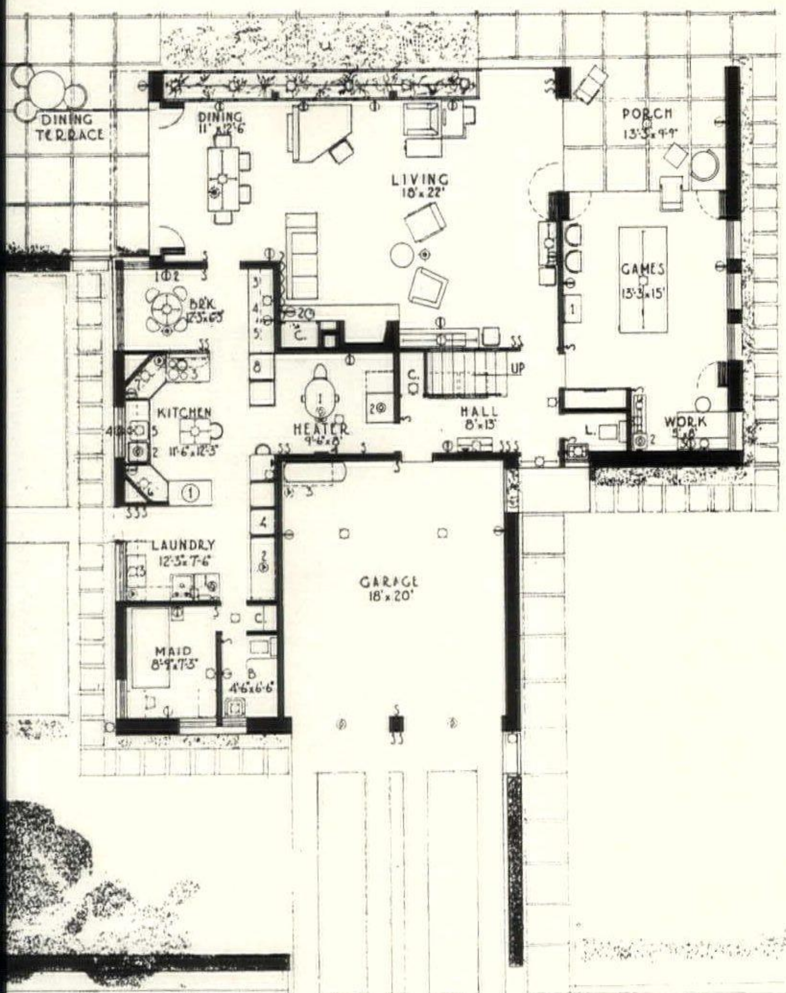


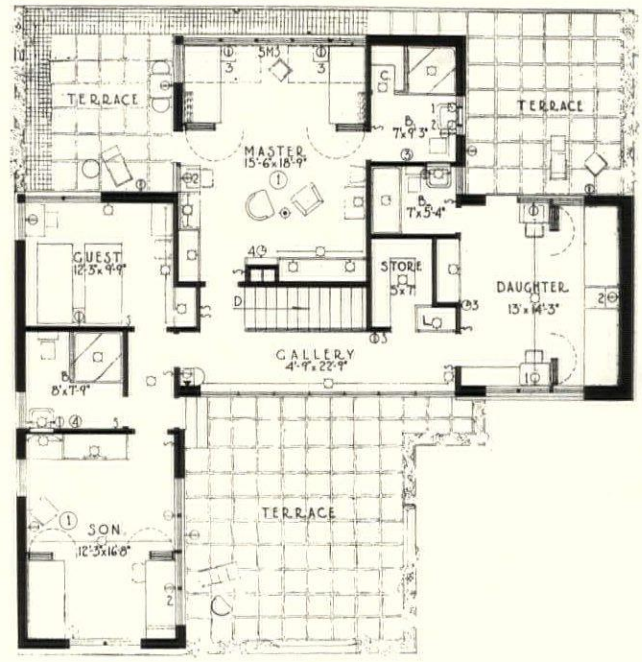
FIRST FLOOR PLAN



SECOND FLOOR PLAN

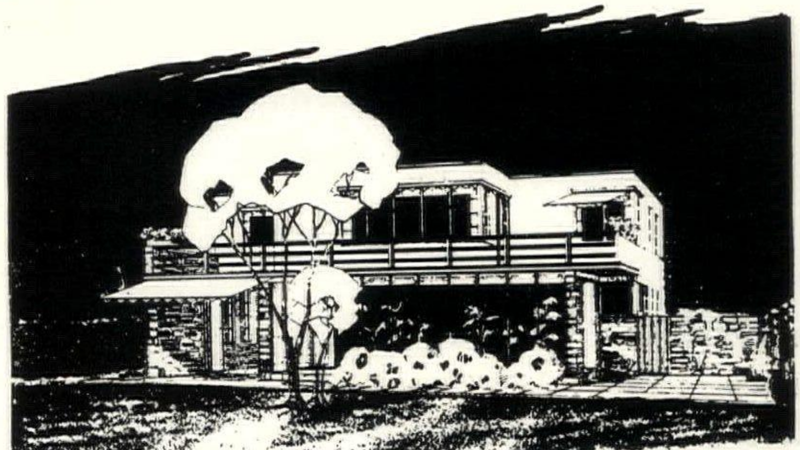




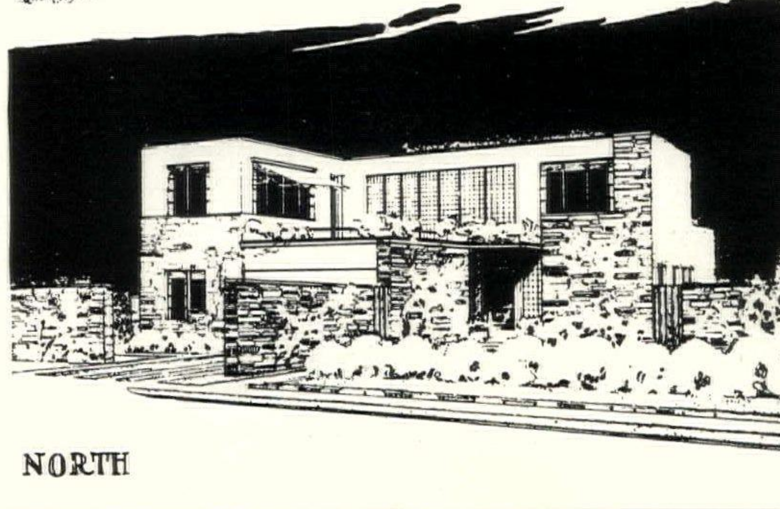


FIRST PRIZE — CLASS C

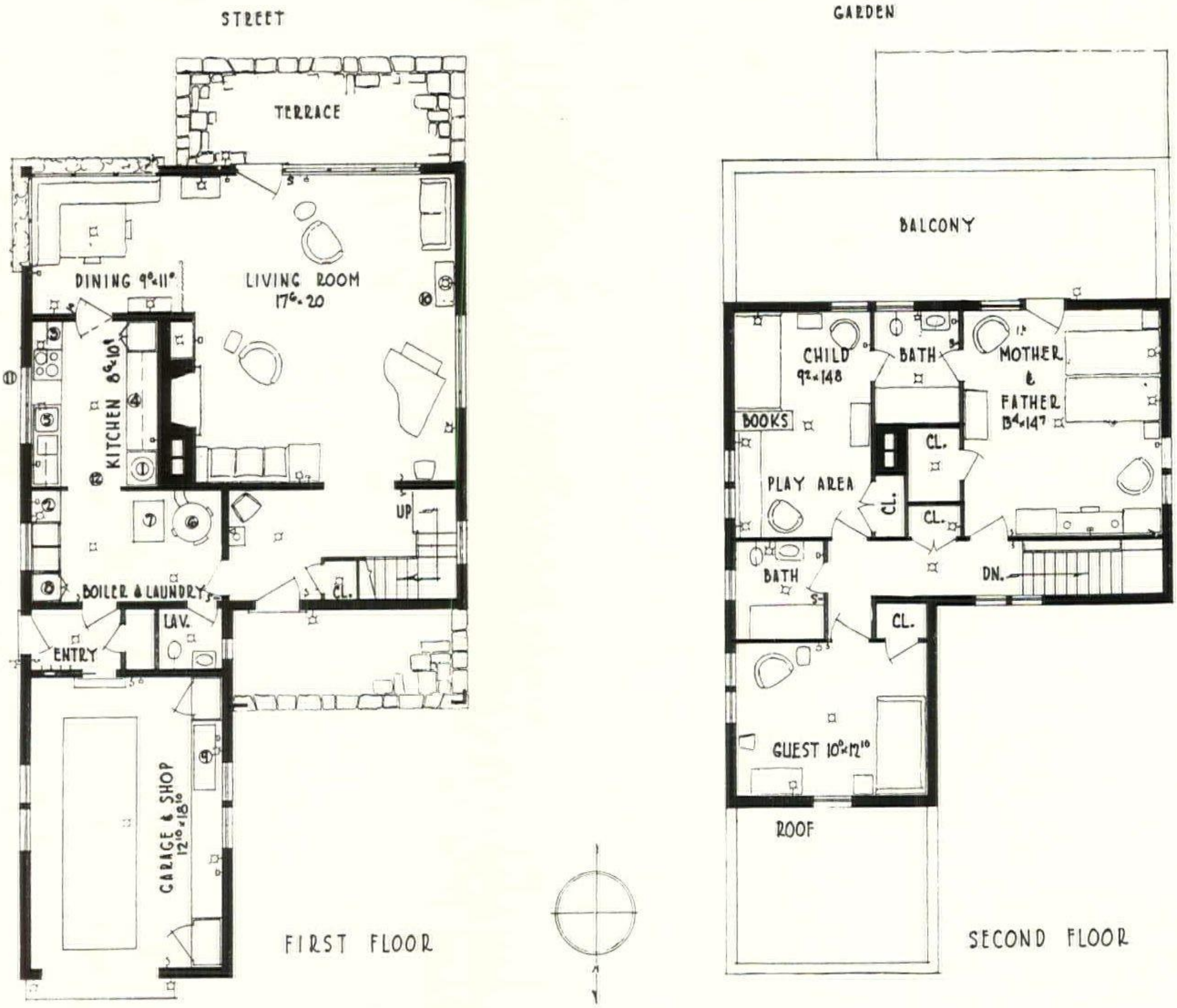
J. ANDRE FOUILHOUX AND DON E. HATCH, ARCHITECTS



SOUTH

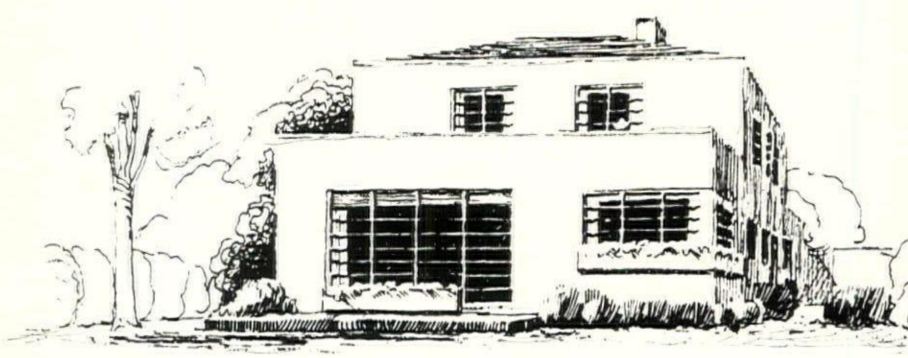


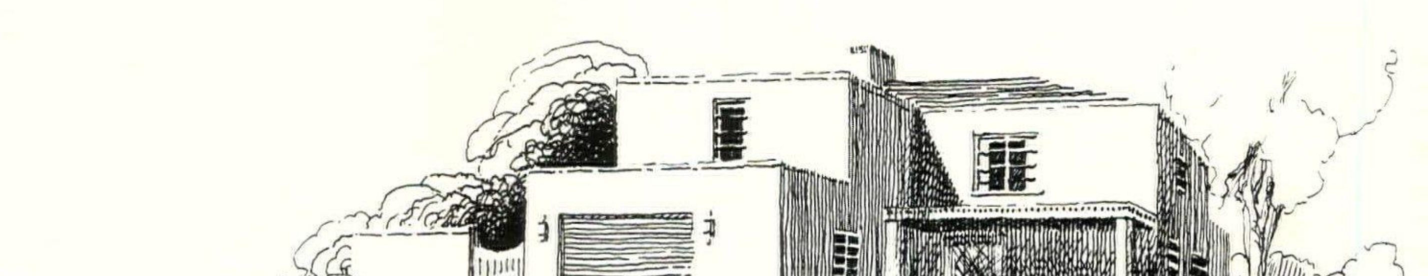
NORTH

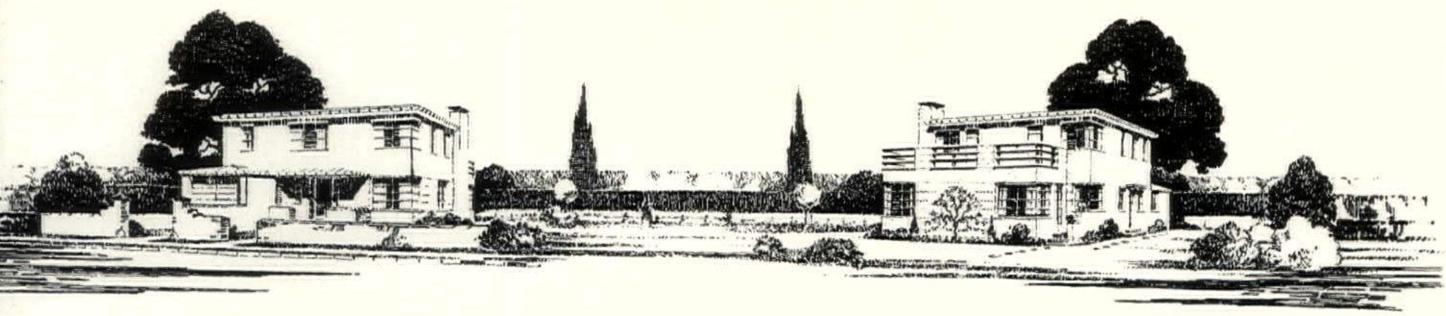


SECOND PRIZE IN CLASS A

RALPH H. BURKHEAD RICHARD C. HOYT AND ANGELO MESSINA, ARCHITECTS

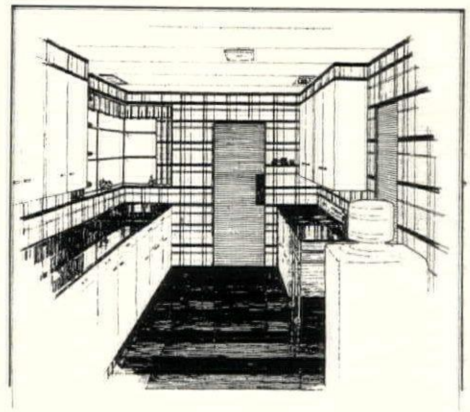




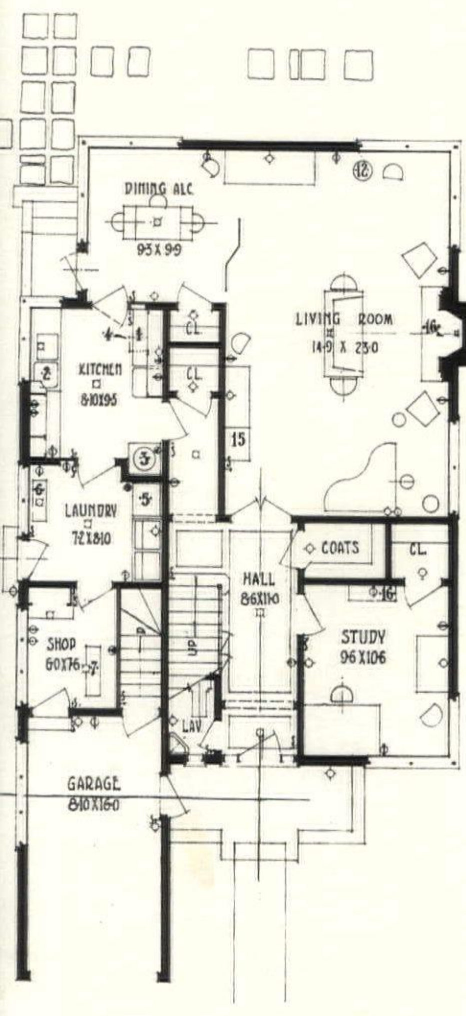


SECOND PRIZE — CLASS B

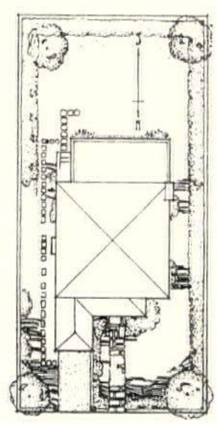
JOHN EKIN DINWIDDIE, ARCHITECT



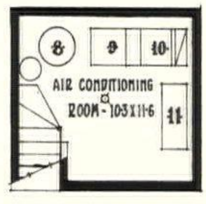
PERSPECTIVE OF KITCHEN



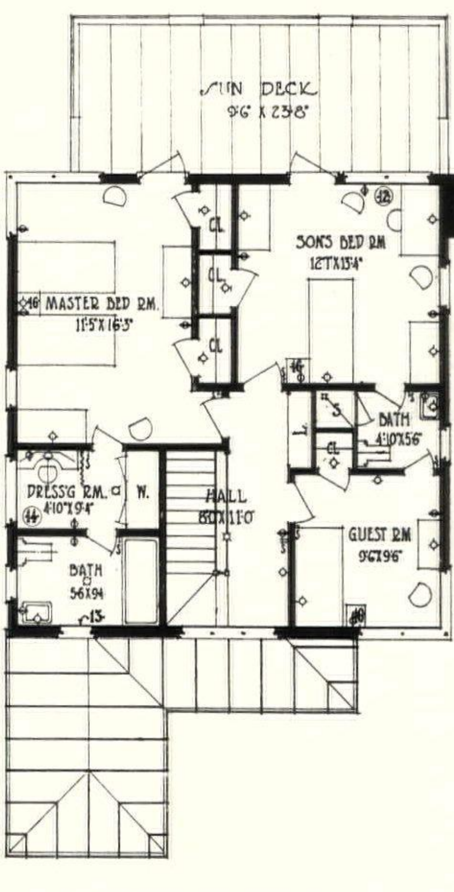
FIRST FLOOR PLAN



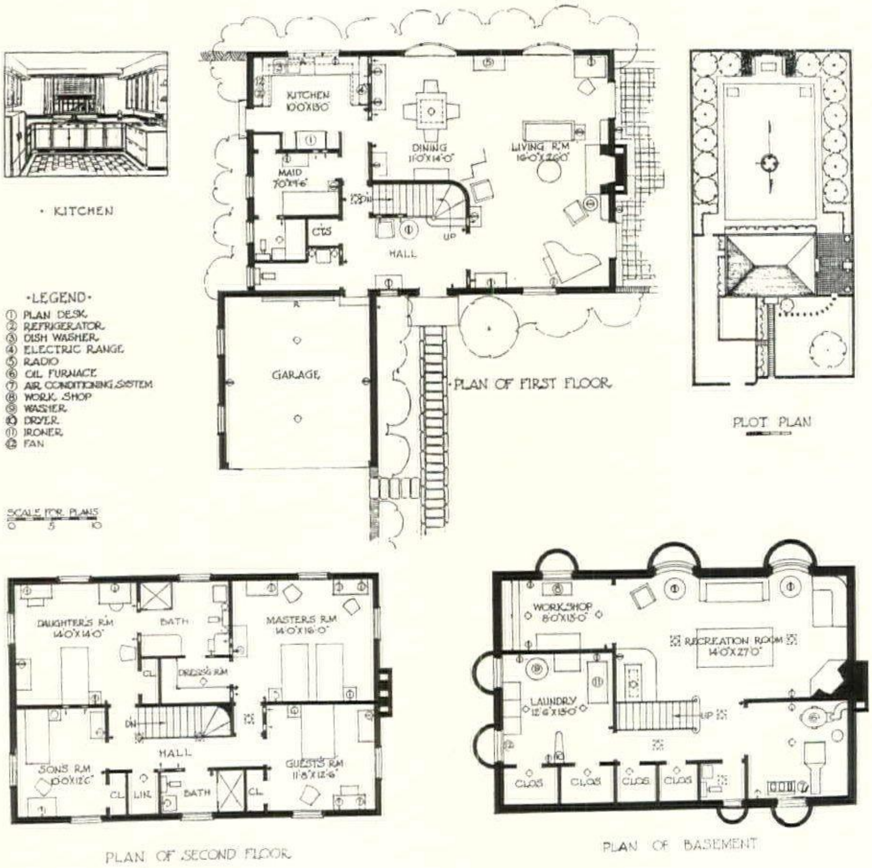
·PLOT · PLAN·



BASEMENT PLAN

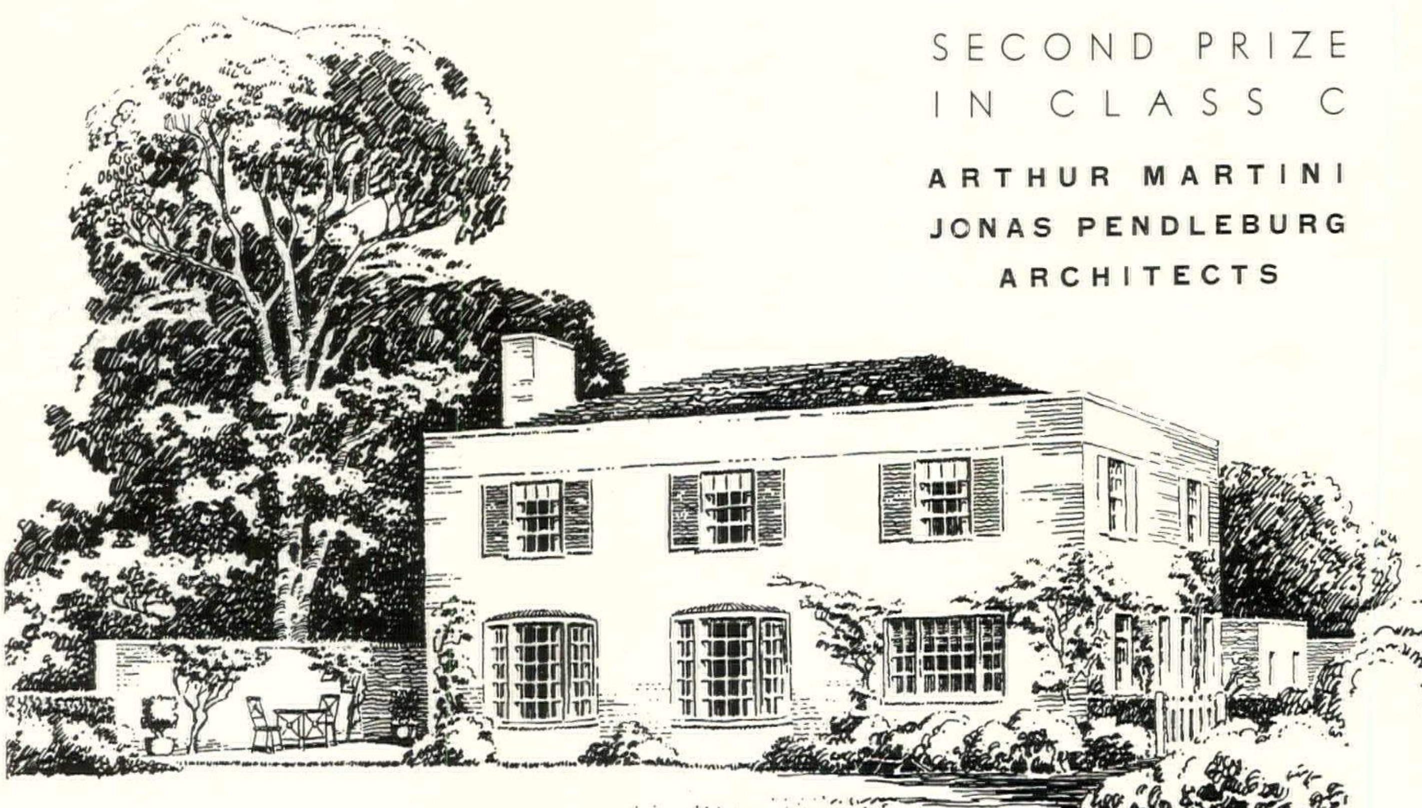


SECOND FLOOR PLAN



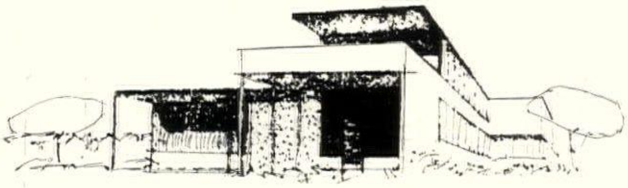
SECOND PRIZE
IN CLASS C

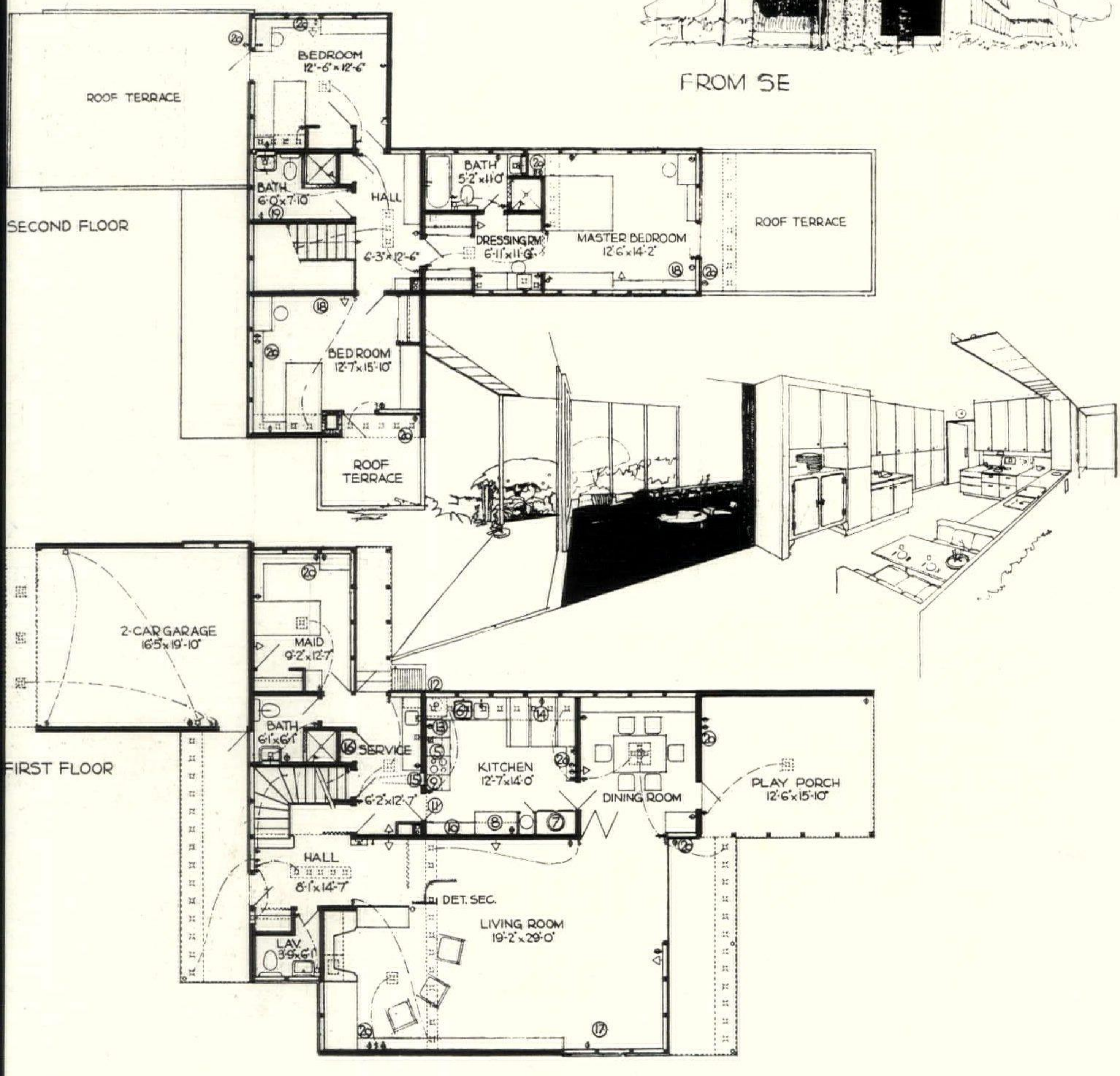
ARTHUR MARTINI
JONAS PENDLEBURG
ARCHITECTS

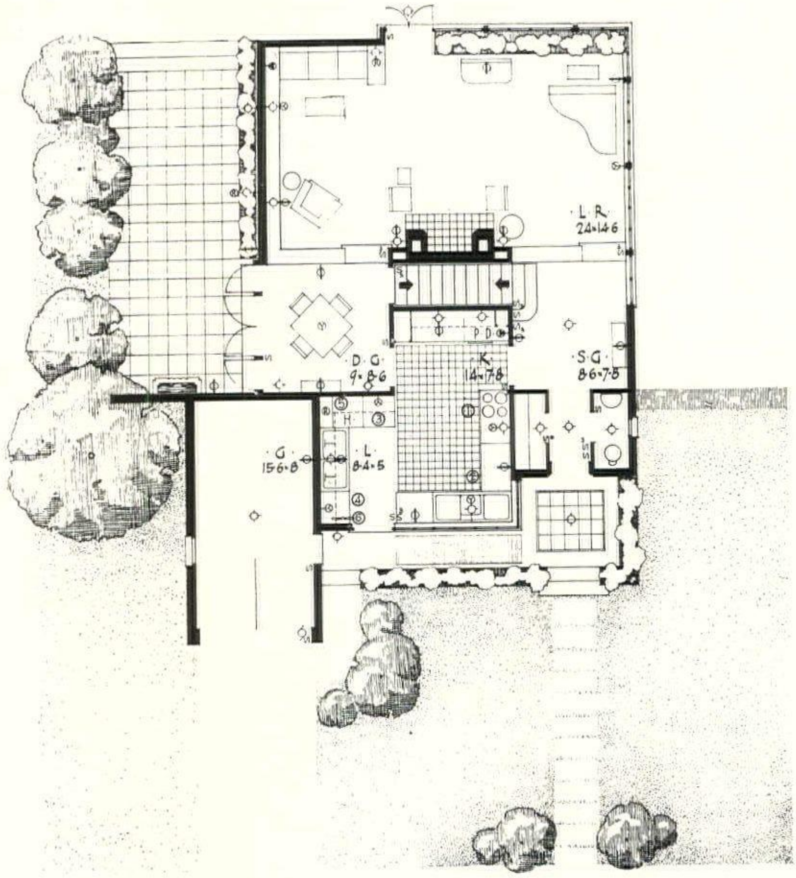


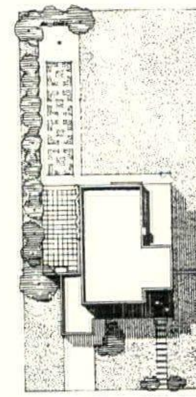
SECOND PRIZE — CLASS D

RICHARD J. NEUTRA, ARCHITECT

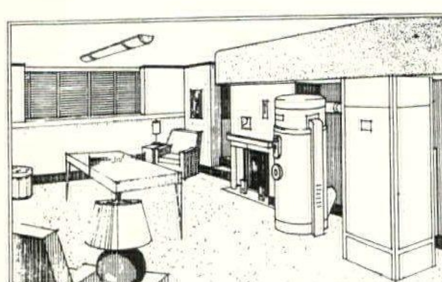








L·R·LIVING·ROOM·
D·G·DINING·GALLERY
S·G·STAIR GALLERY
K· KITCHEN
L· LAUNDRY
G· GARAGE
R·R· RECREATION RM·
ST·CL· STORAGE CLOSET
P·D· PLAN DESK
H· HAMPER
T· WASH TUB
DUPLEX RECEPTACLE
RADIO OUTET

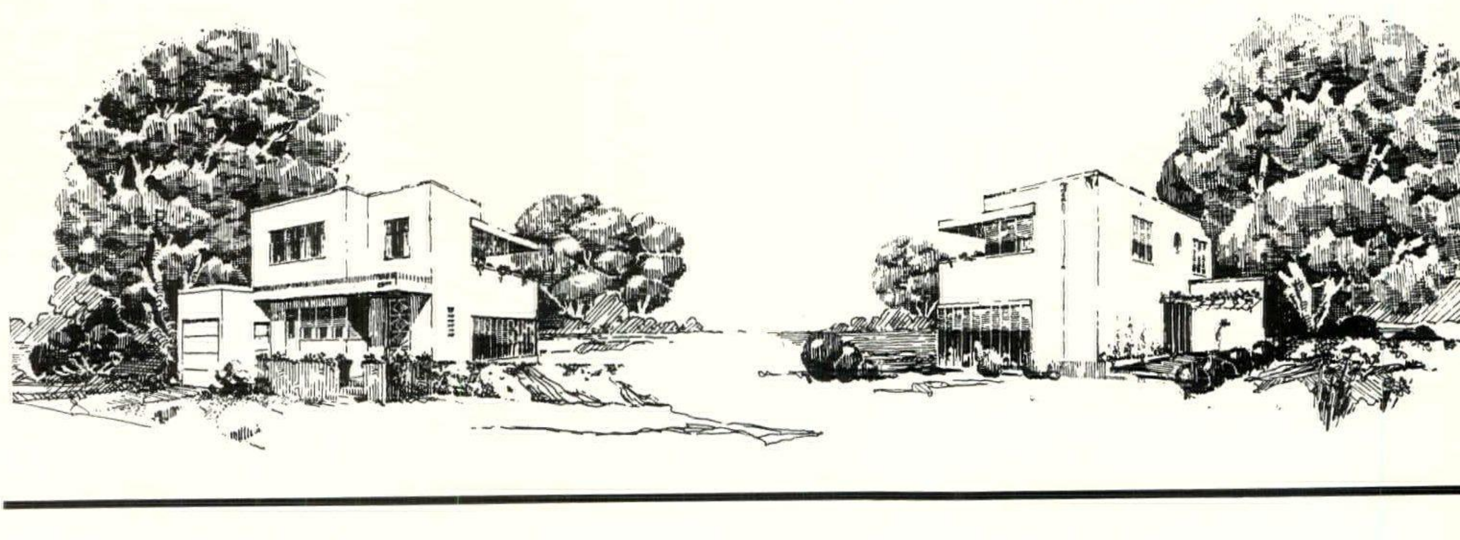

·RECREATION·ROOM·

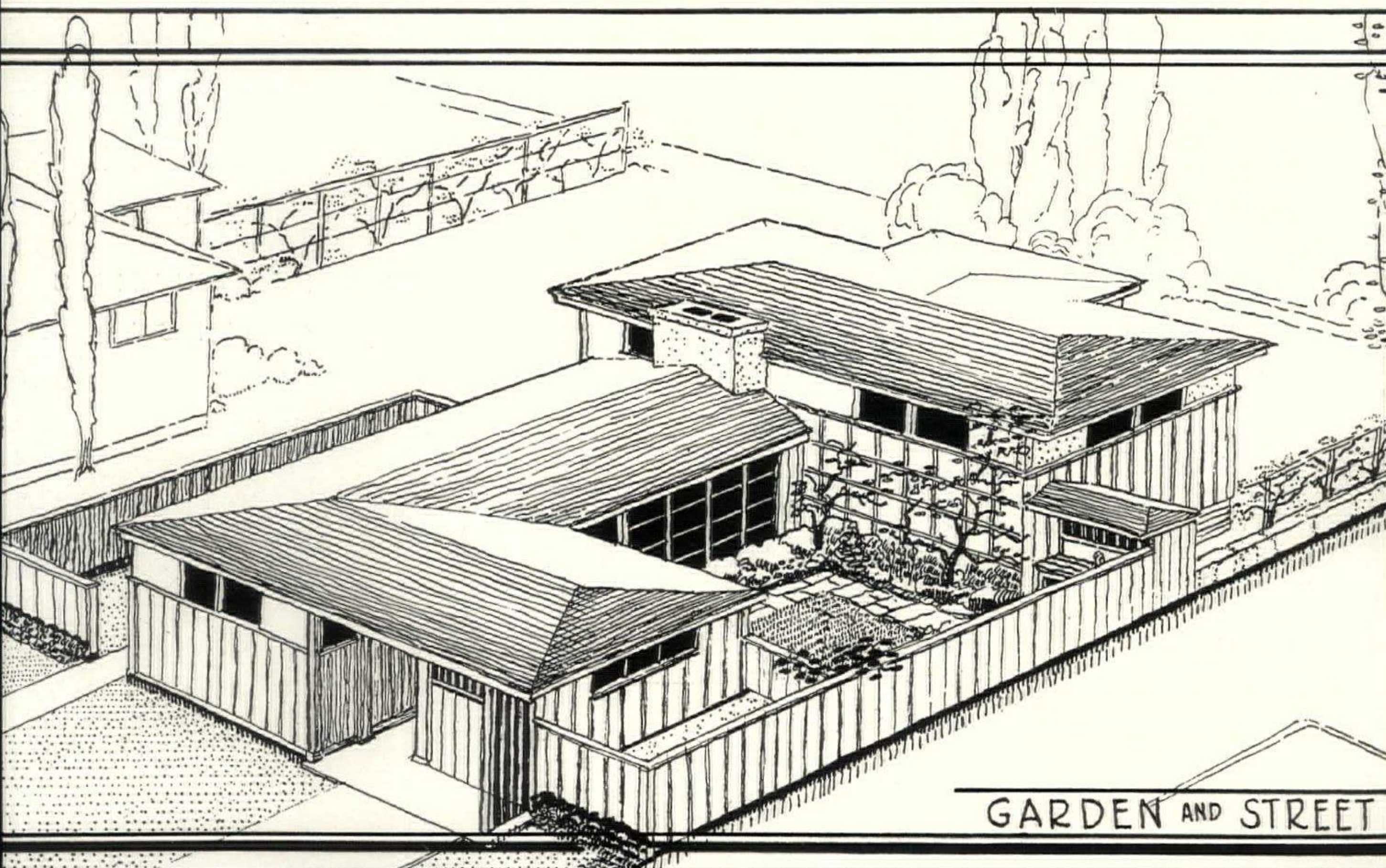
THIRD PRIZE IN CLASS A

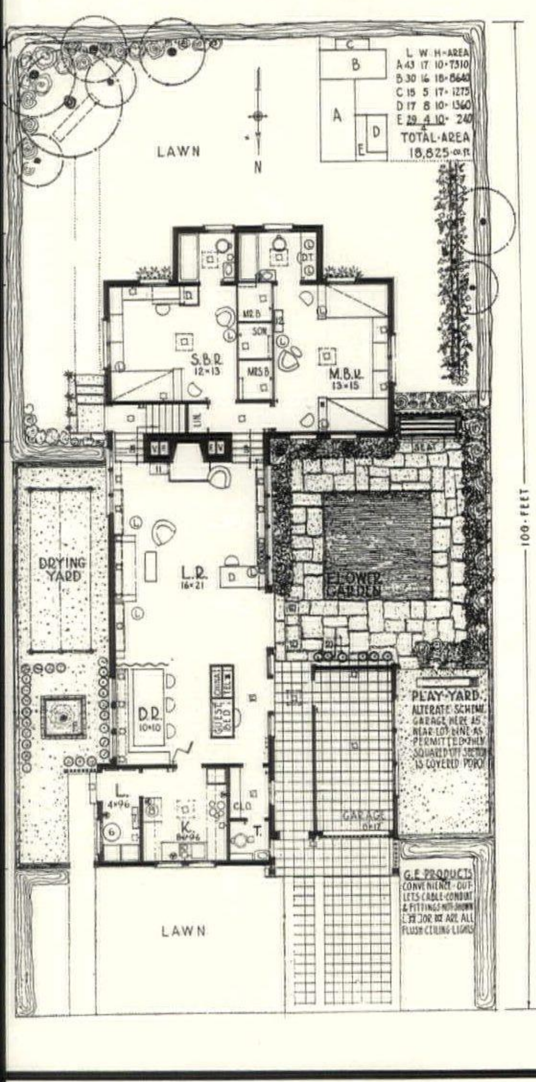
VERNER W. JOHNSON
PHIL BIRNBAUM
ARCHITECTS

GE·APPLIANCES
① RANGE
② DISHWASHER & SINK
③ REFRIGERATOR·
④ WASHING MACHINE
⑤ FLAT PLATE IRONER·PORT·
⑥ VENTILATING·FAN
⑦ OIL FURNACE·
⑧ AIR CONDITIONER
⑨ LATHE COMBINATION

·KITCH BASE CABINETS
·KITCH WALL CABINETS
·PERSONAL RADIO·
·CONSOLE RADIO·
·VACUUM CLEANER
·CLOCKS·ALL ROOMS
·SUN LAMPS
·INFRO·RED LAMPS
·HOT POINT·KITCH·ACCESS·





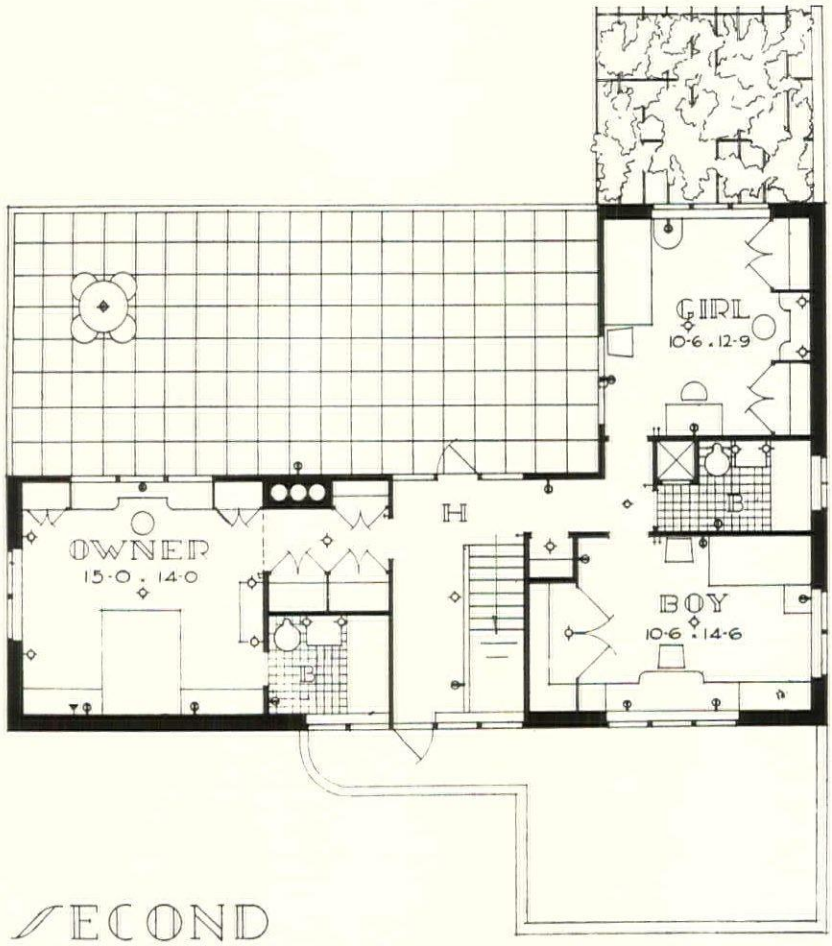


THIRD PRIZE — CLASS B

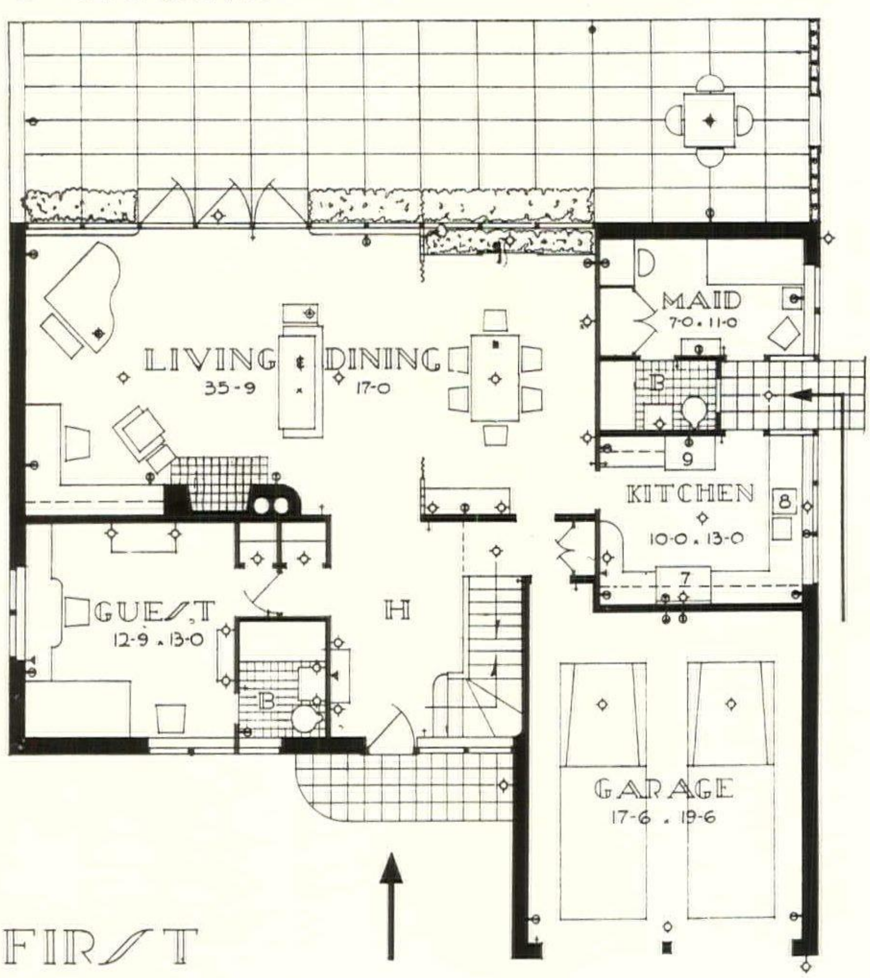
HERMAN A. L. BEHLEN, ARCHITECT

THIRD PRIZE
IN CLASS C

JOHN HIRONIMUS
ARCHITECT



SECOND



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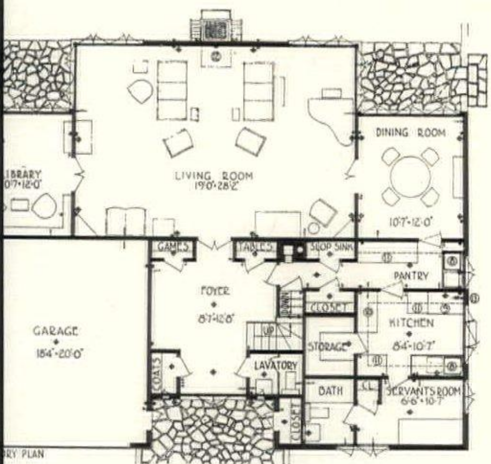
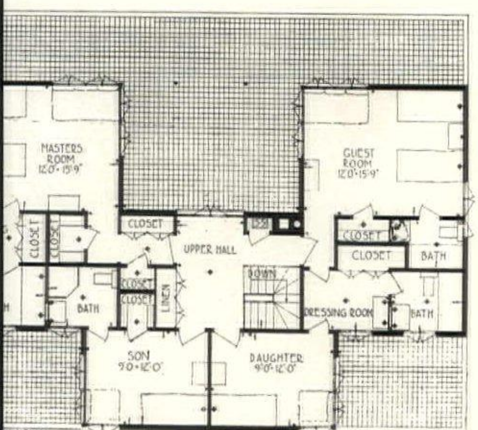
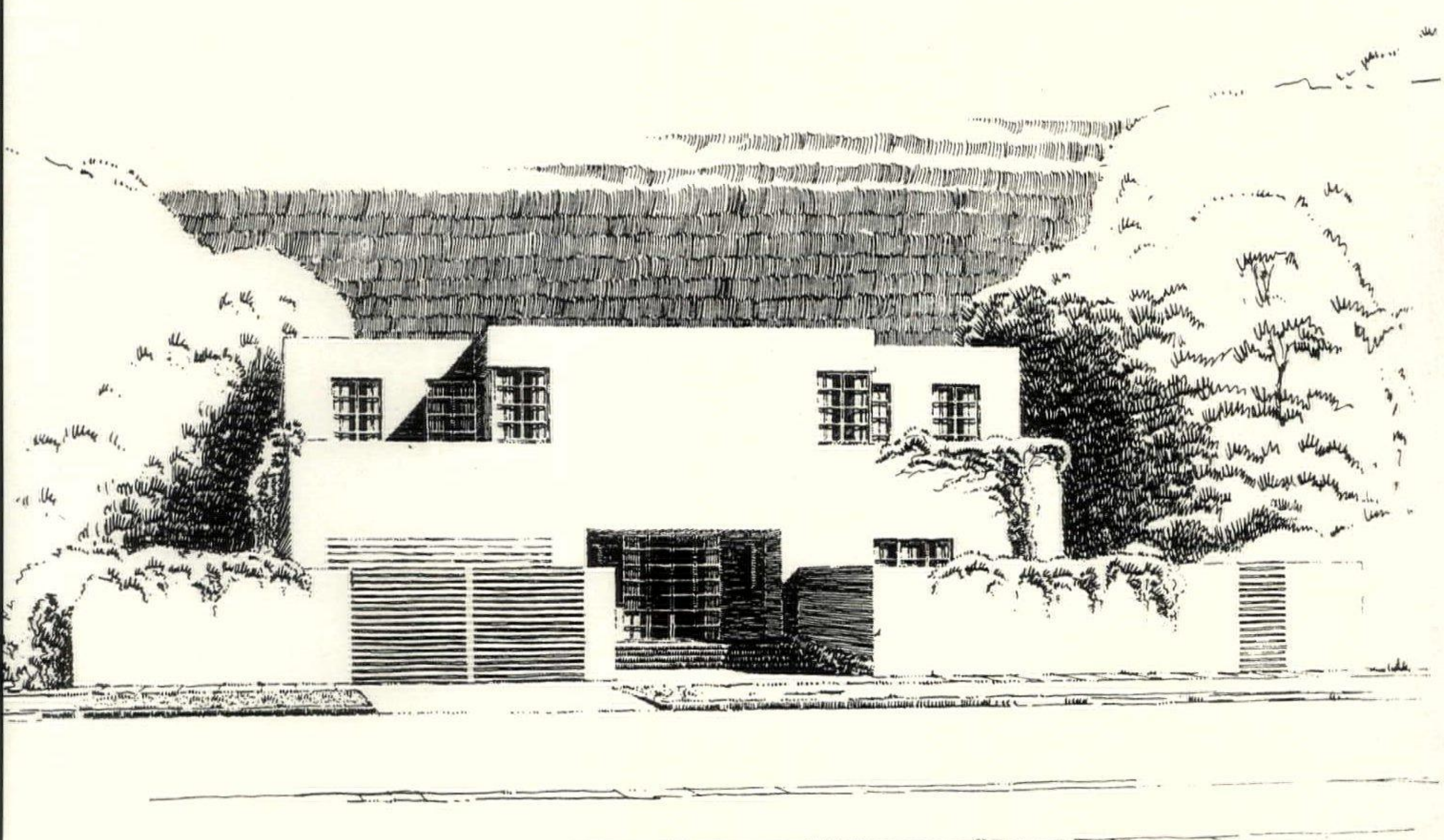




THIRD PRIZE — CLASS D

JOHN DONALD TUTTLE, ARCHITECT



GENERAL ELECTRIC COMPETITION AWARDS

(Continued from page 279)
Forty who received honorable mention and checks for $100 each were Geoffry N. Lawford of New York; Jonas Pendlebury of Scarsdale, N. Y.; Kenneth Kassler of Princeton, N. J.; H. Lee Smith, of Toledo; Frederick M. Moss of Washington, D. C.; Paul Schweikher of Chicago; Roy E. Nelson of E. Cleveland; Phillip D. McFarland of Seattle, Wash.; Constantin A. Pertzoff of Boston; Walter H. Bruber of New York; R. Raymond Carter of Stillwater, Okla.; Phillip Sanfilippo of Brooklyn; Albert W. Ford of Long Beach, Calif.; Louis A. Thomas of Los Angeles; Arthur R. Hutchason of Los Angeles; Burton A. Bugbee of New Rochelle, N. Y.; J. R. Sproule of Seattle, Wash.; J. V. Wilson of Pittsburgh, Pa.; Stanley C. Reese of Chattanooga; J. D. Tuttle of New York; H. T. Lindeberg of New York; Melville Nauheim of New York; Charles F. Pope of Park Ridge, Ill.; Herman Frenzel of St. Paul; Byron E. Laidlaw of New York; W. E. Campbell and F. T. Hogg of Boston; A. R. Hutchason of Los Angeles; W. D. Lambdin of Baltimore; Howard A. Topp of Los Angeles; John D. Grisdale of Philadelphia; Harvey Stevenson of New York; George Palm, Jr., of Cleveland; W. K. Oltar Jevsky and N. T. Montgomery of New York; Jason S. Trespel of New York; Cecil Claire Briggs of New York, and Walter L. Moody of Los Angeles.

The Jury of Awards consisted of eleven members; seven architects representing the different sections of the United States; one expert in child training; one domestic science expert; one general contractor; and one realtor. Ralph T. Walker, of Voorhees, Gmelin and Walker, New York, was chairman; Kenneth K. Stowell, A.I.A., and former editor of Architectural Forum, was professional adviser; John F. Quinlan, of General Electric, was manager of the competition. Architects on the jury of awards were Franklin O. Adams, of Tampa, Fla.; Ernest A. Grunsfeld, Jr., of Chicago; Charles T. Ingham, of Pittsburgh; H. Roy Kelley, of Los Angeles; Charles W. Killam, of Cambridge, Mass.; and Eliel Saarinen, of Bloomfield Hills, Mich.

Other jury members were Katharine Fisher, Director of Good Housekeeping Institute; Harold D. Hynds, engineer of New York City; Dr. Grace Langdon, child training expert and Director of Educational Advisory Service, New York; Hugh Potter, realtor of Houston, Texas, and president of the National Association of Real Estate Boards; and Henry F. Richardson, engineer, of New York City.

Fully 75 per cent of the plans depicted the flat roof, modern type of house, somewhat as displayed at the Century of Progress in Chicago. Many designs placed the garage at the front of the house with the kitchen adjoining, and the living room across the rear, facing the yard and garden. All plans gave particular attention to the layout of the yard with its shrubbery and flowers.

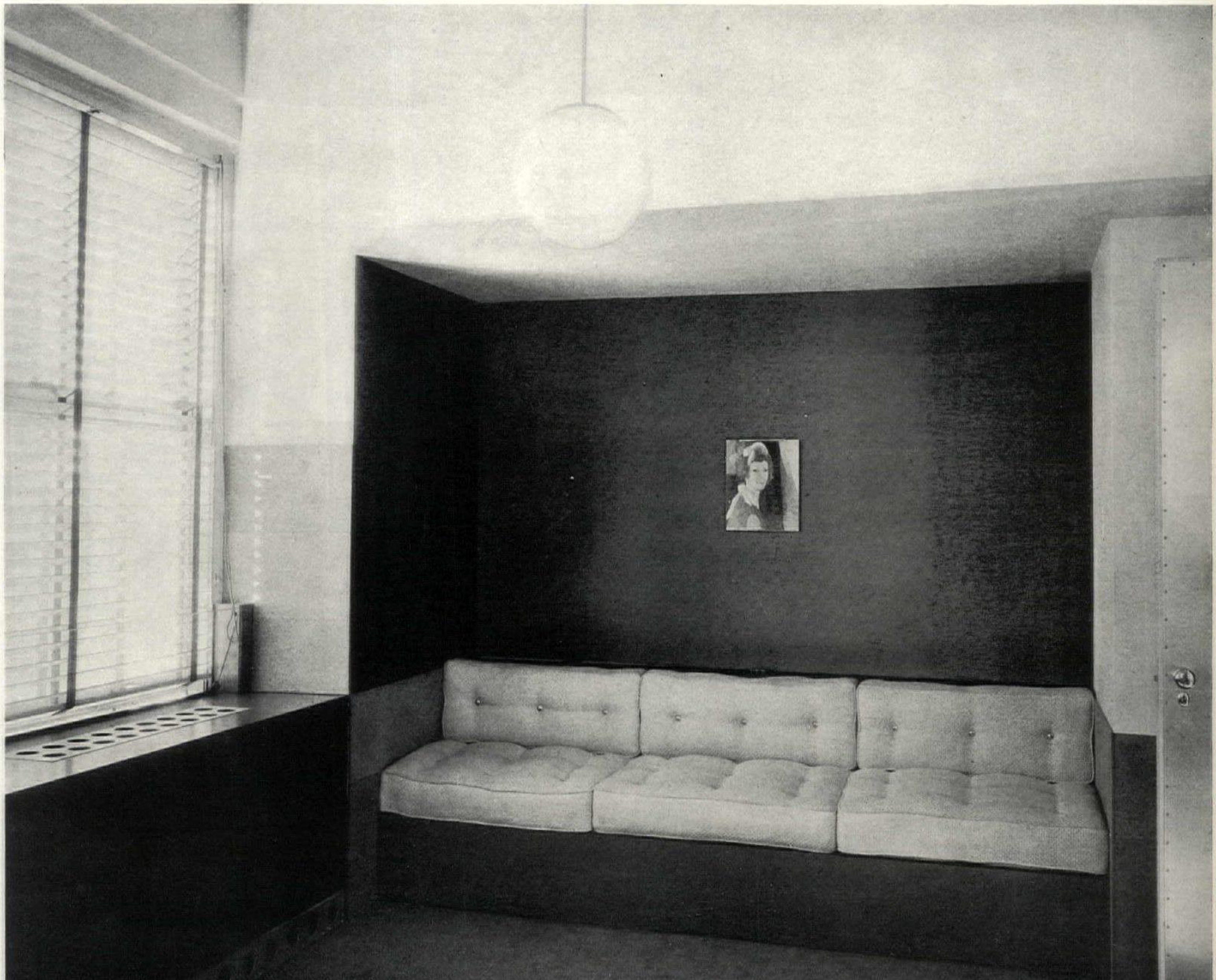
Greater utilization of the cellar or basement, now commonly used for the furnace and perhaps the laundry, was also brought out in the many designs. This space is used for a recreation or play room for children. This is made possible by the use of automatic heat, such as supplied by the oil or gas furnace. The drawings showed that time-saving, step-saving, and labor-saving had been the rule in the studies of the architects.

TECHNICAL NEWS AND RESEARCH

PAINT—A PARTNER IN ILLUMINATION

By RALPH BENNETT and T. J. MALONEY

OFFICE OF NATHAN HORWITT, HEAD OF DESIGN ENGINEERS, INC., NEW YORK CITY



Rotan

SIX FACTORS IN GOOD SEEING

(1) *General illumination* sufficient to overcome sharp contrasts with light sources and to afford eye comfort. The degree of illumination should give consideration to room functions.

(2) *Supplementary light sources* for special tasks where general illumination is inadequate—as for reading or other close visual tasks. Sufficient intensity of light, with suitable diffusion, to afford abundant illumination without glare.

(3) *Complete absence of glare* from direct sunlight, exposed or inadequately diffused artificial light, or reflection of light from polished surfaces and mirrors, and from bright light against dark backgrounds.

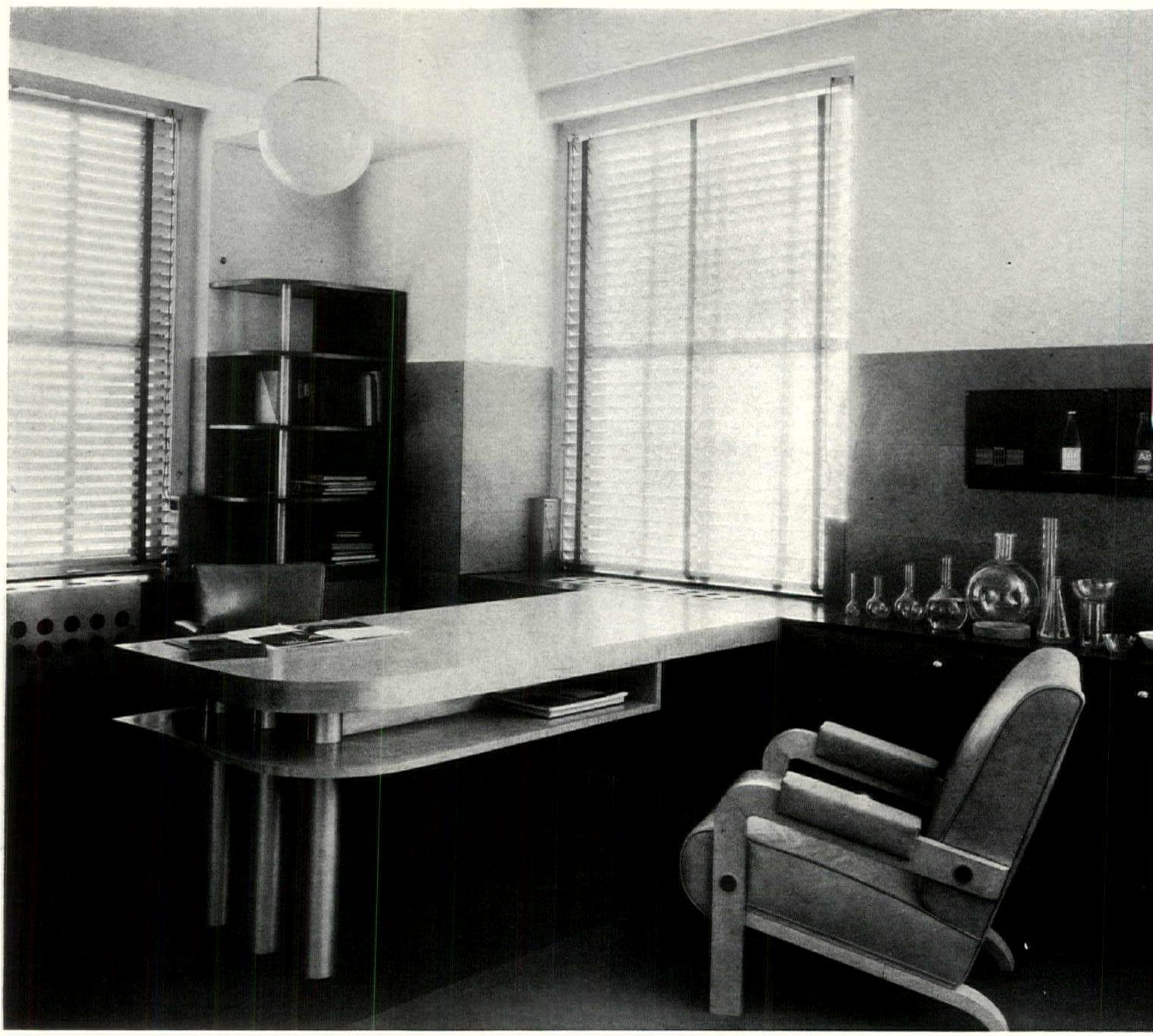
(4) *Utilization of reflecting surfaces*—walls, ceilings or reflectors—that do not absorb appreciable amounts of light, and are sufficiently matte or textured to scatter or diffuse light.

(5) *Daylight quality*—white light. Reflecting surfaces for artificial illumination favoring white or blue-white to minimize the fatiguing yellow of tungsten lamps. Opal glass diffusers or blued filter lenses are sometimes recommended.

(6) *Intensity of light* varying according to the object to be seen. Dark surfaces, reflecting less light, require more light to be seen. Light useful in seeing is that reflected from an object and not that falling upon it.

TANGIBLE RESULTS OF PROPER ILLUMINATION

(1) Elimination of eye strain.
(2) Elimination of fatigue and nervous tension.
(3) Reduction of accident rate.
(4) Improved morale.
(5) Increased efficiency of personnel.



Rotan

FACTORS IN GOOD SEEING

From the standpoint of adequate and suitable illumination, and the relationship between primary and secondary light sources—that is, between daylight or artificial light and reflecting surfaces of the right finish and a suitable color—paint becomes a salient factor. The decorative and psychological aspects of illumination calling for a specialized use of color are augmented by an increasing demand for radically improved seeing conditions—which is a threefold problem involving:

(1) The utilization and control of daylight from windows.

(2) The utilization and control of artificial lighting.

(3) The utilization of secondary sources—walls and ceilings with high reflection coefficients, to refine and distribute light.

MEASUREMENTS OF LIGHT

In utilizing and controlling light, we are aided in determinations of light intensity and quality by several contributions of science.

The *foot-candle or sight meter,* an instrument which enables us to measure, on a given plane, the quantity of direct light or light reflected by painted surfaces.

The *photo-electric recording spectro-photometer,* developed by Professor Hardy of M. I. T. This instrument measures the physical properties of a material which when illuminated gives rise to a sensation of color. It also measures the relative amounts of all wave lengths of light reflected from variously colored surfaces.

Finally, the *photometer and reflectometer,* which measures the reflection values of surfaces under different light sources and painted with different colors.

Left: Office of Nathan Horwitt, head of Design Engineers, Inc., New York City. Ceiling and upper walls are painted white for light reflection.

Right: Apartment of P. Immo Gulden, New York City, designed by William Muschenheim, architect. Color scheme: gray ceiling; white walls; blue radiator inclosure; dark blue curtains; black, blue and gray carpet.

F. S. Lincoln

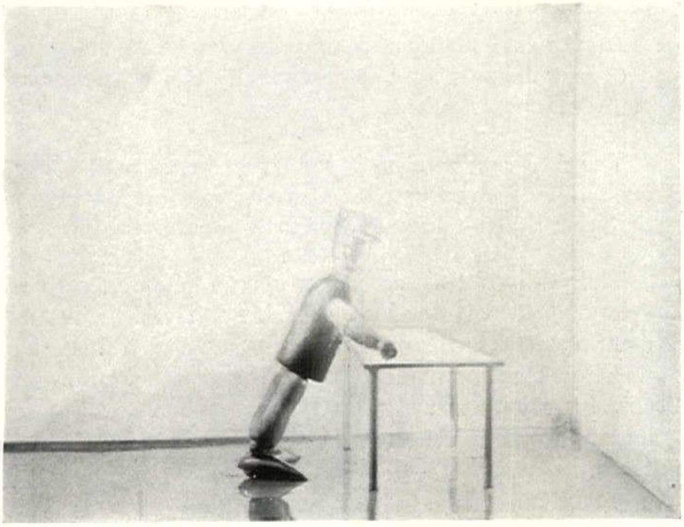


Figure 1

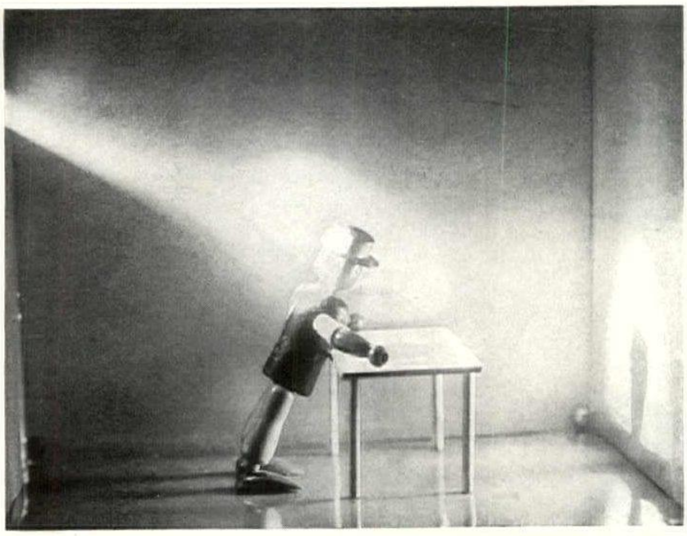


Figure 2

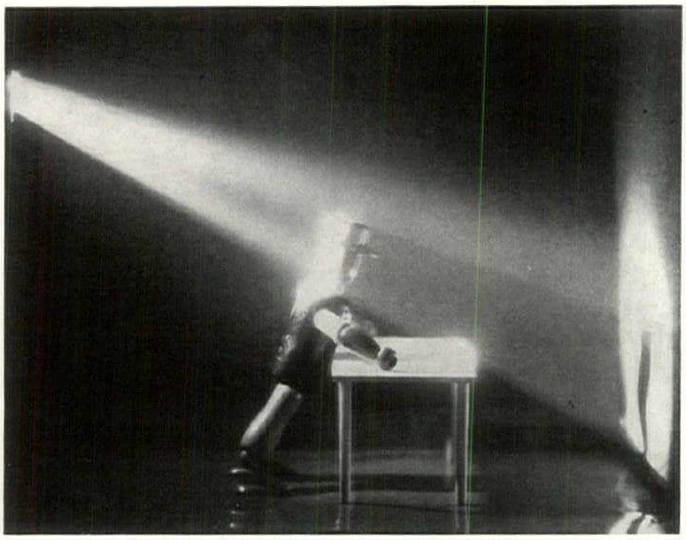


Figure 3

Figures 1, 2 and 3 illustrate the relationship between light sources and reflecting surfaces. Where good seeing is the objective, complete diffusion of light over the working plane is essential. In attempting to give depth or character to a design too much diffusing light may have a flattening effect. (Fig. 1) White paint on walls and ceiling affords a high degree of reflection and diffusion of light. (Fig. 2) Metallic paint, because of its lower reflection value, diffuses less light, resulting in sharper contrasts and shadows. (Fig. 3) The identical room painted black results in a searchlight effect and glare from the light source against the dark background.

PAINT A PARTNER IN ILLUMINATION

The relationship between light sources and reflecting surfaces is very close. One aspect of it can be shown graphically by three miniature rooms constructed and photographed in the laboratories of the Sherwin-Williams Co. In each case the light source was identical, and the conditions were the same save for the color of paint applied.

Fig. 1: The interior was painted white. The resulting high degree of reflection and diffusion or scattering of light eliminates all glare spots and shadows, and the luminous flux or brightness is high for all parts of the room.

Fig. 2: Metallic paint was applied. Owing to greater specular reflection, there is a drop in luminous flux. Glare spots appear. The source of light becomes more apparent, and a shadow is cast from the robot.

Fig. 3: The same room painted black. The light absorbing and low reflecting powers of black reduce the luminous flux to a minimum for the light source used. A searchlight effect results, and glare from the contrast of light and dark, together with the shadows cast from the robot combine to afford a virtually impossible seeing condition.

CONTROLLING ELEMENTS

Given a suitable light source, it is apparent:

(1) The quantity of good, usable light is directly proportional to the reflection values of surrounding surfaces.

(2) The quality of illumination is dependent upon the nature of the reflecting surfaces and the color.

REFLECTION VALUES OF PAINT

Considering the above two factors in order: The reflection values of paint colors become a prime consideration in developing color schemes in any room where good visibility is important. A balance between high and low reflecting paints must be established where color is to play a decorative rôle, and preference should be given to paints with high coefficients of reflection for upper walls and ceilings.

The reflection values for different colors in paint, based upon a comparison with magnesium oxide (not a paint pigment) as the standard of reflection at 98 per cent, are:

The following table* shows paint colors and the amount of light they reflect:

White	84%
Cream	70.4
Light Pink	69.4
Ivory	64.3
Yellow	60.5
Flesh	56.
Buff	55.4
Light Green	54.1
Light Gray	53.6
Light Blue	45.5
Sage Green	41.
Aluminum Gray	41.9
Brown	23.6
Dark Red	14.4
Dark Green	9.8
Dark Blue	9.3
Black	10.

*Readings made by the Munsell Color Co., Inc., for the New Jersey Zinc Co.

MEASUREMENT OF QUALITY

By means of a foot-candle or sight meter we can obtain a direct reading of actual light values in any part of a room, as effected by the color of paint on wall and ceiling surfaces. The unit of measurement is the foot-candle—defined as the amount of light resulting from a candle flame one foot in any direction from the light source. An average of one foot-candle of light on a surface one foot square constitutes one lumen, and is referred to as the luminous flux.

Figures 4, 5, and 6 are identical miniature rooms designed to illustrate the increase in luminous flux in terms of foot-candles where the light source remains constant and room surfaces alone differ. Figure 4 represents an unpainted room, and only one foot-candle is recorded by the sight meter. Figure 5 is a poorly painted room, and dirt has reduced the reflection value of the paint; a reading of but 4 foot-candles results. Figure 6 is painted with a white paint having a high coefficient of reflection; the foot-candle meter jumps to 22½. In the industrial field practical determinations in the reduction of lighting costs and improvement in the intensity or quantity of light have been made by similar tests and with overwhelming evidence in favor of paints with high reflection values.

A range up to 22½ foot-candles of light from an artificial source is normally ample for most seeing conditions.

General illumination should range from 4 to 12 foot-candles, according to conditions or effect desired. The lower levels are favored for corridors, lounge rooms, auditoriums, hospital lobbies, hotel dining rooms, etc.; higher levels for kitchens, reading and writing rooms. Close work in offices, prolonged and more difficult reading and other special visual tasks require 18 to 30 foot-candles. Inasmuch as the eyes see by reflected light and not by light falling upon an object, darker objects require higher light intensities to give clear definition. With higher intensities of artificial lighting it becomes increasingly important to shield the light source and thoroughly diffuse the light.

Inasmuch as the eyes see an object by light reflected from it and not by the light falling upon it, the foot-candle meter should be made to read higher where dark objects are to be seen. Clear definition requires increased illumination.

QUALITY OF LIGHT

The second important consideration—quality of light—involves:

(1) Types of reflection from surfaces—specular, spread, and diffuse.

(2) Color, in obtaining artistically or psychologically desirable effects or suitable illumination.

TYPES OF REFLECTION

Specular reflection results from light rays striking a high gloss paint, or from polished metal surfaces, glass top desks, and mirrors. This type of reflection causes annoying glare if in the field of vision, and should be avoided from the standpoint of good seeing. Gloss paint applied to a finely textured surface tends toward spread or diffuse reflection, and is therefore less glaring.

If the light source is of the concealed type and provided with a diffusing glass or, where exposed,

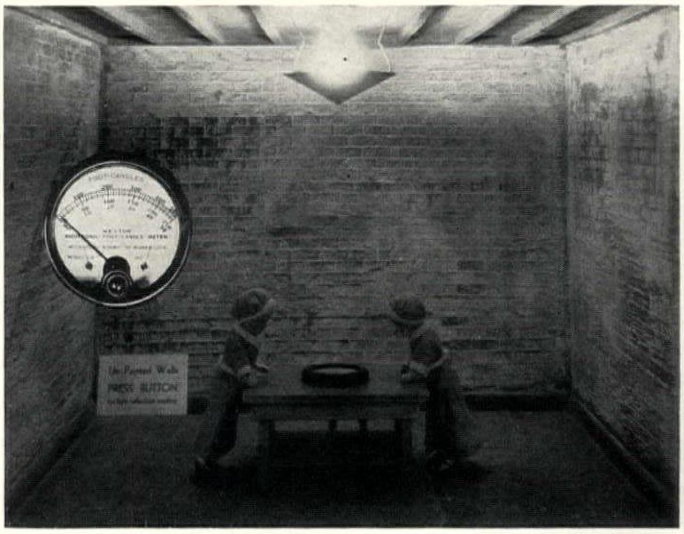


Figure 4

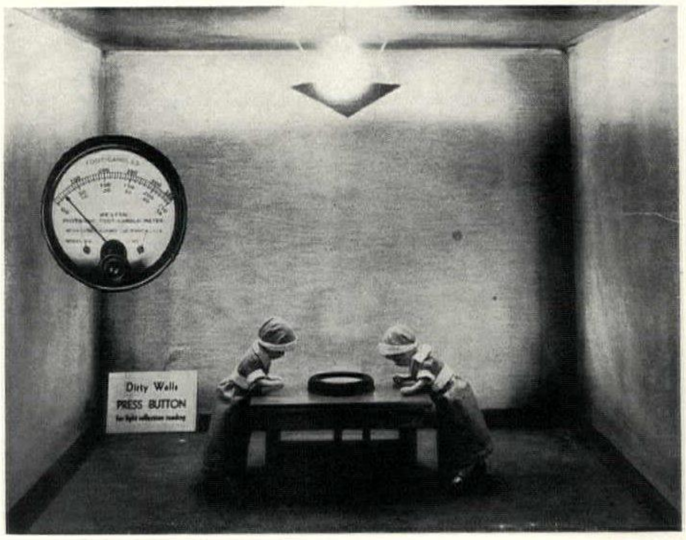


Figure 5

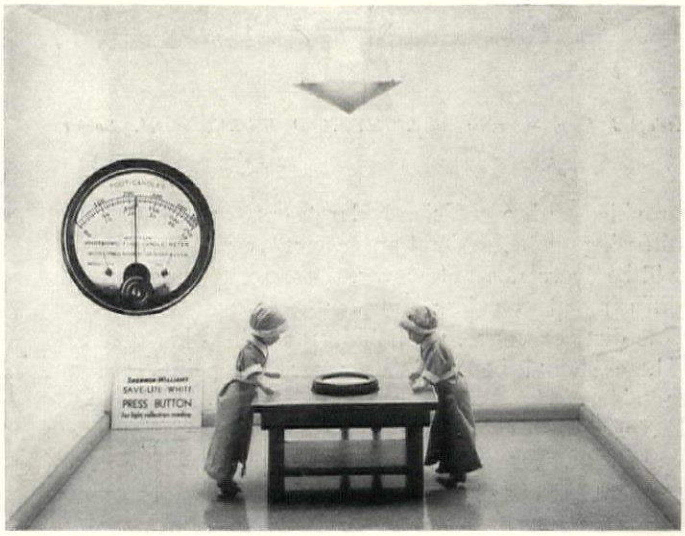
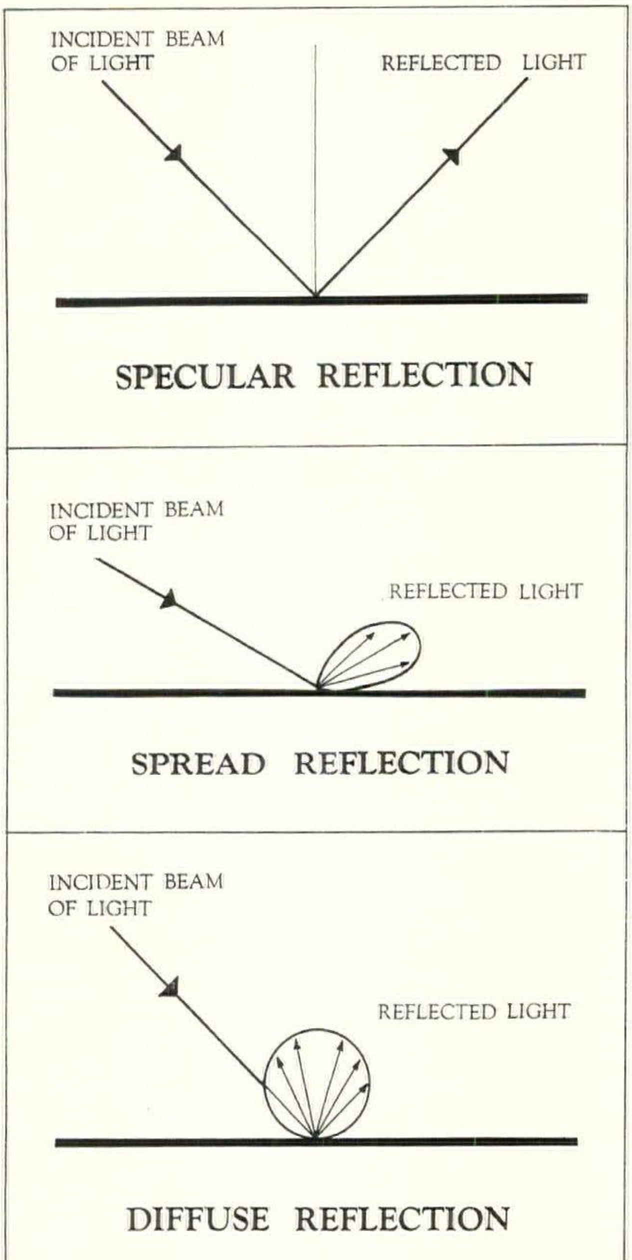


Figure 6

Figures 4, 5 and 6 show the relative reflection values of white painted surfaces and other finishes. Three miniature rooms, identical except for the wall and ceiling surfaces, were given a Sight-Meter test by the Sherwin-Williams Company laboratory. Figure 4 is an unpainted brick wall. The Sight-Meter registered only one foot-candle. In Figure 5 the room is painted, but dirty and dingy. The Sight-Meter showed but 4 foot-candles. In Figure 6 the room was painted white. The foot-candle meter jumped to 22½, though the light source remained the same.



Adapted from diagrams in LIGHT AND WORK, by M. Luckiesh

provided with a sufficiently large opal or other type of diffusing globe, serious annoyance from gloss finishes will be overcome. However, there are types of slightly diffusing gloss paints and semi-gloss paints that combine dirt resistance, washability and diffusing qualities. These should be used wherever flat paints are not suitable.

Spread reflection is the type usually resulting from spun metallic surfaces and metallic paints. The ray of incident light striking the many polished edges or particles is reflected in one general direction but not in an exact line as in the case of specular reflection. This type of reflection is not especially annoying except where the light source is of high intensity and the reflection is cast in the field of vision. This may be controlled by suitable placement of artificial light sources, but the problem becomes more complicated with respect to daylight.

Diffuse reflection is by far the most desirable type from the standpoint of good seeing. Matte or flat and textured surfaces break up light rays, scattering them in different cross directions instead of in parallel or radiating lines. The resulting diffusion avoids harsh glare spots and shadows, and gives a more even distribution of light.

Complete diffusion would require a perfect reflecting surface of a diffusing type. For offices, stores, schools, and practically every type of industrial work, the degree of diffusion afforded by white or light colored ceilings and upper walls is a distinct asset in increasing the efficiency of individuals and in reducing eye fatigue. Objects or areas upon which the eye will be focused over a period of time should always be painted colors sufficiently off white to be restful, however.

Too complete a diffusion of light, especially where indirect luminaries are used against a low relief design on a ceiling sometimes results in a flattening effect undesirable from an architectural standpoint. Where the desire is to give accent or form to architectural details, it may be advantageous to adopt cornice or other types of lights obscured from the field of vision and of sufficient intensity to give depth. The lighter painted area can be planned to direct the greatest volume of light to the decorative objects or areas. Different shades of color may also be used effectively in giving accent or depth to relief designs.

RELATION TO INDIRECT ILLUMINATION

Frequently, as in offices and department stores and the like, the principal objective is to obtain abundant diffused light over the floor areas and to hold peoples' attention there.

Figures 7 and 8 illustrate by contrast how this may be effectively accomplished by substituting indirect luminaries placed above the eye level behind counters and on center cabinets. Stippled, convex glass cover plates placed over the light sources eliminate ceiling striations. The ceiling illustrated is painted white, the columns buff, and the floor a gray marble. Indirect illumination is dependent entirely upon the reflection values of white or light tints of paints on the upper walls and ceiling.

The distinct advantages in a department store resulting from the adoption of indirect illumination, supplemented by white paint, are:

(1) Customers' attention is taken from the ceiling lights and directed to the well-lighted counters displaying merchandise.

(2) The brighter interior has the psychological effect of creating a cheerful state of mind conducive of increased buying.

(3) Better illumination is obtained without added lighting load.

(4) A more inviting atmosphere results from the improved appearance.

In schoolrooms, the abundant diffusion of light has been proven to increase the alertness of pupils, and definitely to increase the number eligible for promotion, making it a particularly important consideration and a real economy.

FUNCTIONS OF COLOR

"In the visible spectrum, one of the most striking phenomena is that of selective absorption, together with its concomitant phenomena of selective reflection and


Photographs courtesy Nela Park Engineering Dept., General Electric Co.

7 8

Figures 7 and 8 illustrate a practical demonstration of the relationship of paint and light. Indirect and semi-indirect illumination are especially dependent upon the light reflection values of white paint. Figure 7 shows the Gimbel Department Store before adopting indirect illumination supplemented by white painted ceilings. Figure 8 shows the same floor area using indirect luminaries placed above eye level behind counters.

selective transmission. To these are due all color effects in opaque and translucent bodies."*

Our present knowledge of colors, combinations and effects, opens up vast possibilities for their use to good advantage and with consideration to daylight and artificial illumination.

Any treatment of illumination or decoration must give consideration to the emotional qualities and decorative aspects of colors as well as reflection values. This can be accomplished without serious sacrifice of any one desirable quality. Generally speaking, lower levels of illumination and colors of a more subdued, neutral or restful sort should be used in lounge rooms, lobbies, theaters and other places designed for relaxation. Brighter illumination and more stimulating colors should naturally be favored where the objective is to inspire activity or an active state of mind.

This selection of suitable colors is of extreme importance. In hospitals, convalescence may be speeded by the emotional state created by one color scheme, or retarded by another. Ceilings are of especial importance. In the operating room where eyes are strained, white is considered objectionable; straw color or soft greens are usually recommended.

In offices, in stores, schools, hotel lobbies, and certain types of dining rooms where the aim is to create animation, brighter colors and illumination are of definite value.

CONSIDERATIONS

Inasmuch as the emotional responses usually associated with given colors may be radically altered in particular applications, consideration must be given to:

(1) The color scheme or treatment.
(2) The design employed.
(3) The light source.

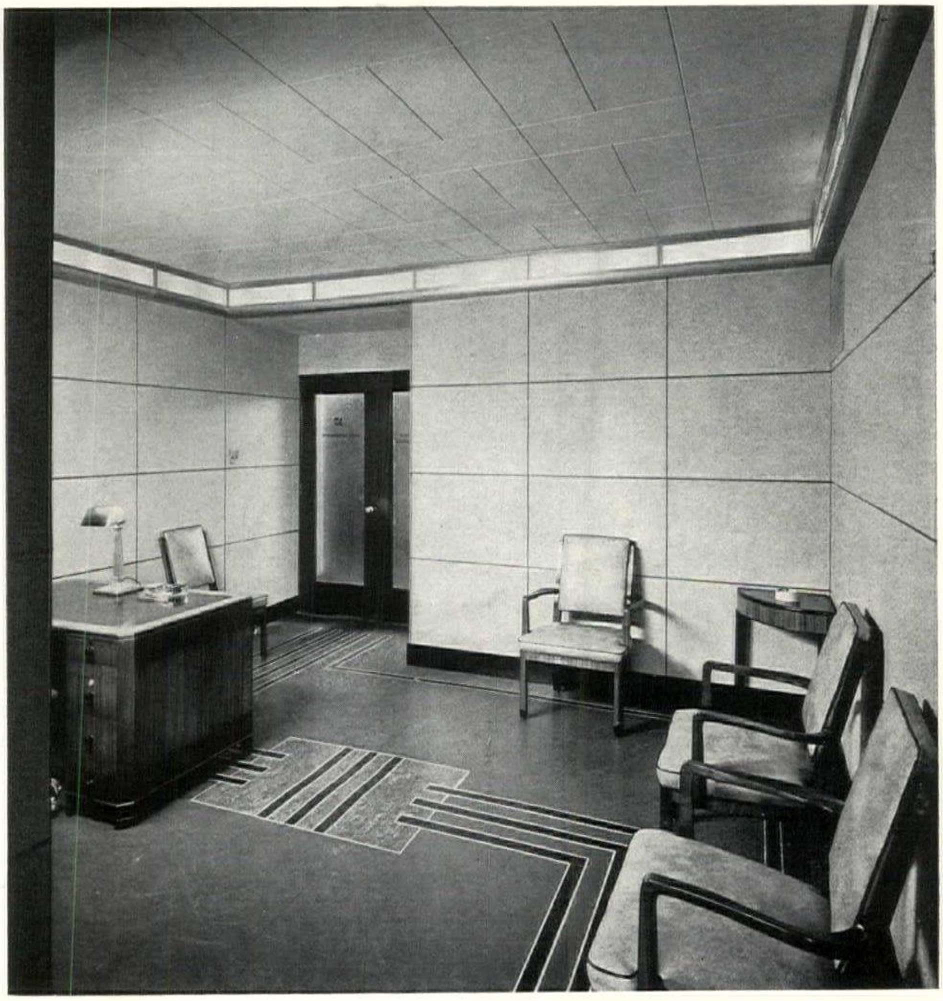
Black, usually classified as depressing and heavy, may assume life and snap with but slight relief from bright colors or designs that lend motion. Brilliant or subdued illumination will also alter the atmosphere considerably, irrespective of other factors.

LIGHT AND COLOR

In specifying colors consideration must always be given to the type of artificial light to be used and to the effect of both day and artificial light on the shade of color. Certain shades of blue and green become almost indistinguishable under the tungsten illumination. Reds, oranges, yellows, and browns tend to become richer. Blue becomes darker under artificial lighting, and appreciably brighter and a really pure color under daylight. Fabric colors are especially susceptible to the color values of different light sources, and may effect the entire color scheme. Colors for a room should therefore be picked with respect to day or night occupancy, or the effect of either type of light on the colors for day and night.

If a colored surface is flooded with intense light as from spotlights or indirect luminaries, a paling or flattening effect will be produced. This condition can be avoided by directing the light against white or tinted surfaces, or by diffusing the light at the source by means of opal or other types of diffusing glass.

*"Modern Lighting"—Radiation & Color by Caldwell.



Reception room of the Johns-Manville Corporation, New York City, designed by Shreve, Lamb and Harmon, architects. Acoustic tile ceiling finished in baked enamel for light reflection.

COLOR AND LIGHT

The use of reflectors or shades that favor a white or blue-white reflecting surface will facilitate simulating daylight quality.

When indirect or semi-indirect illumination is to be used and the light intensity must be sufficient for good seeing conditions, white or light tints should predominate the color scheme—especially on upper walls and ceilings. Daylight received from limited window sources is also dependent upon paint surfaces of high reflection values.

Perhaps it is because of long association with the fireplace, and the warm red-yellow of candle flames that the natural yellow of tungsten lamps is so accepted and the natural yellow is often increased by the use of yellow, brown, or red shades or painted reflecting areas. From the standpoint of seeing, especially for reading, or performing other close visual tasks the light resulting from lamps so treated is both harmful and fatiguing to the eyes.

In this respect we may expect to find increased attention being paid to the quality of light from artificial sources, and reflected from paint surfaces—for paint surfaces reflect their own color predominantly. Artificial daylighting on a large scale is not entirely practical from the standpoint of initial and operating cost. The only really satisfactory daylight quality obtained by artificial methods at the present time is by using lenses over tungsten lamps which whiten the light by selective transmission. These should be of the power of Corning and Macbeth lenses to produce a light quality closely simulating daylight.

BALANCE IN COLORS

Balance between areas giving light reflection and those lending color is important. The proportion of each must be governed to suit the mood of the occupant and with respect to activities in a particular room.

"STREAMLINED" COLORS

A particularly successful treatment of color in relation to light is the color scheme recently developed in the color studios of The Sherwin-Williams Co. and being carried out in the new streamlined trains of the New York, New Haven & Hartford Railroad. Indirect illumination is used. The ceiling proper of the car and the sloping cornices are painted white or just off white to reflect as much of the light as possible, downward and over the chairs. A very soft pastel shade of the color selected for the car is then carried from the cornice to the window heads. This very light shade overcomes the absorption of the light by upper areas and avoids the flat effect common to dark colors receiving strong illumination.

Windows are brought together by a color band of a deeper, restful, and lower reflecting shade of the theme color. Frames and mullions are painted the same color. Below the sills, the pure color selected is applied, which gives strength and definiteness. The chairs and floors are done in harmonizing shades. The use of pastel shades on upper portions gives brightness and cheerfulness, and the color innovation marks a happy departure from the drab and depressing interiors so frequently associated with railway cars.

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M A Y

T H E

ARCHITECTURAL RECORD

FURNISHING THE INTERIORS

By WILLIAM MUSCHENHEIM, Architect

The purpose of all domestic architecture is the provision of spaces for living, sleeping, eating, reading, studying and entertaining. These spaces have to be furnished, and this can be done either by haphazardly filling a room with chairs, tables and lamps, or—more desirably—by integrating the furnishings with the whole architectural scheme.

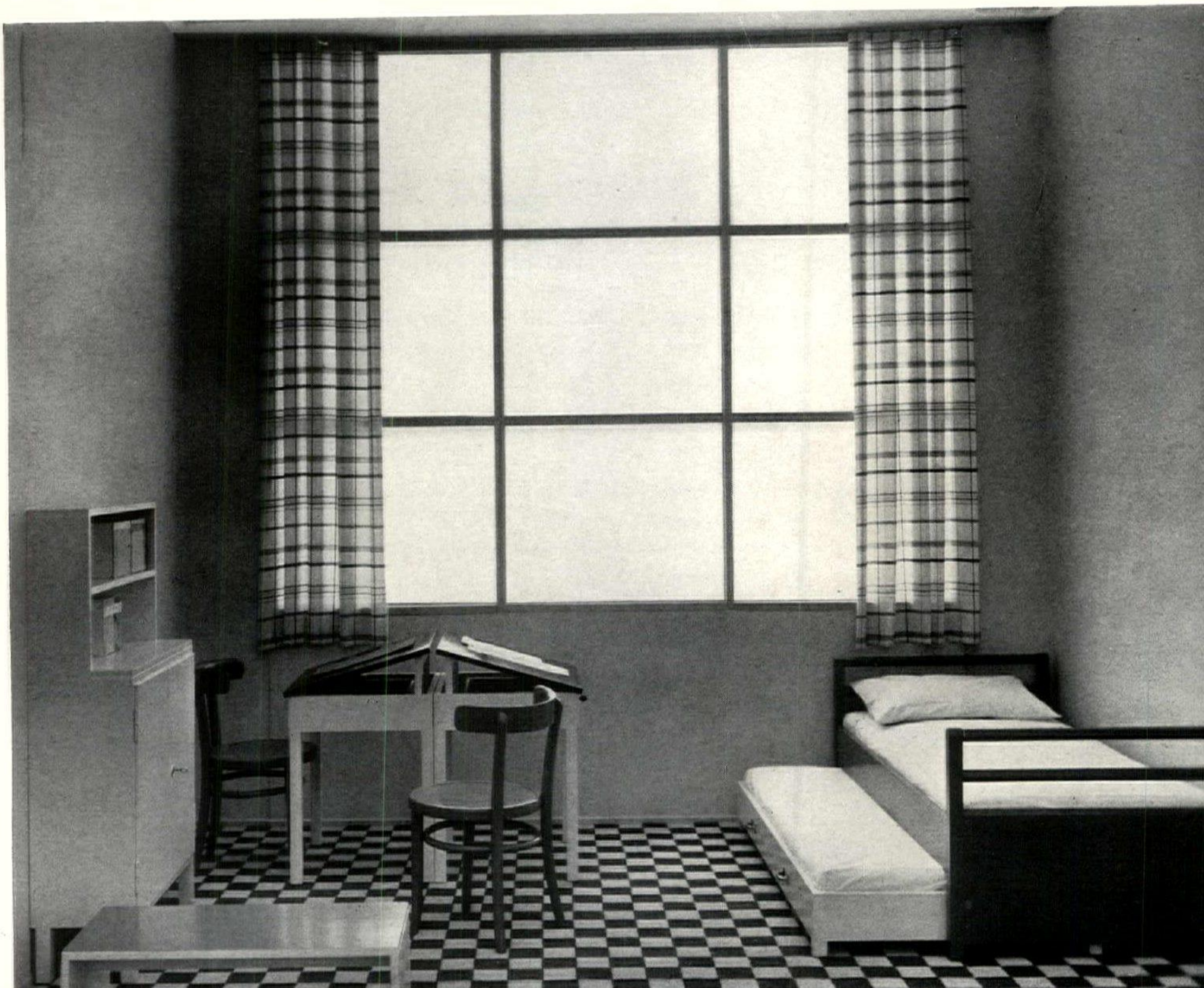
In considering any particular space, we have to deal with certain elements which will determine the design or selection and arrangement of furniture. Such are wall areas, windows and other openings, all of which are variables in most instances. Consequently, the design problem consists of choosing and grouping the furniture in relation to these elements so that fullest use can be made of their potentialities. Only in this way can the best results be obtained in convenience.

Furniture available on the market, and designed with respect to modern manufacturing technique, modern materials and modern ideas of comfort, may fit in part. This line is limited, however, and certain pieces should be specially designed. It is not necessary, although sometimes desirable, that such pieces be built into the room. As a rule, it is more practical to design demountable units so that future arrangements can be made. Lighting fixtures and mechanical appliances, such as telephones and radios, can often be incorporated in the furniture designs. Furniture coverings, floor coverings and curtains, the colors of walls and ceilings, the wood and metal finishes should then be chosen so that the entire room scheme will be harmonized and articulated, and made a suitable background for human occupancy as well as for movable objects such as books, plants, pictures and china.

The range of possible combinations is limitless. If carefully studied for proportions and spatial interrelations, the final result will be as pleasing as any good work of architecture. The furniture and the architecture will, in fact, be each a part of the other.

PORTFOLIO
OF APPLIED DESIGN

GERMAN HOUSING EXPOSITION IN MUNICH . . **CHILDREN'S ROOM**



DINING ROOM . . DESIGNED BY WOLFGANG VON WERSIN, ARCHITECT

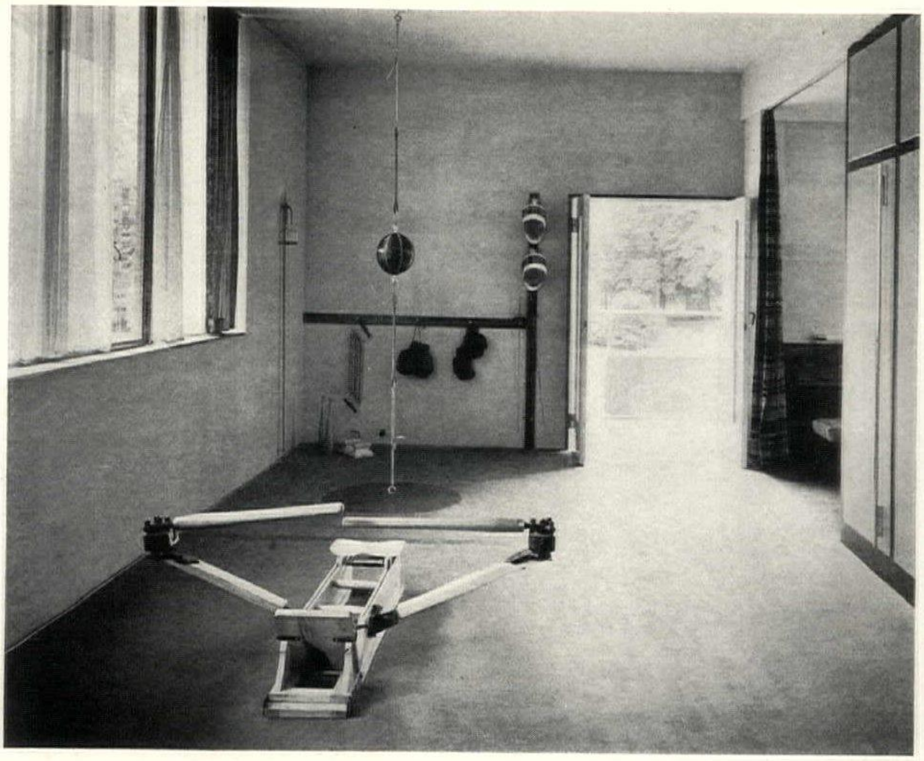
WRITING ROOM

TWO ROOMS AT GERMAN HOUSING EXPOSITION IN MUNICH — DESIGNED BY WOLFGANG VON WERSIN

BACHELOR'S ROOM

A GYMNASIUM
IN AVIATOR'S HOUSE

MILAN BUILDING
EXPOSITION — ITALY



APARTMENT
IN NEW YORK

BY WILLIAM
MUSCHENHEIM
ARCHITECT

CONVERTIBLE TABLE

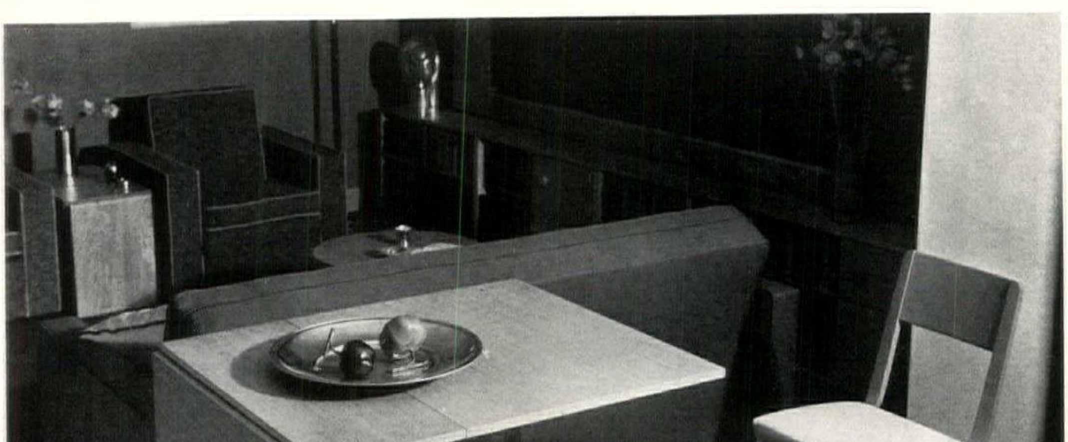


Table measures 12" x 33" closed
64" x 33' open. Solid oak bas
has two drawers lined for silver
one drawer for linen, and a cab
inet for bottles or toaster. Ply
wood oak top, finished natura
with colorless lacquer. (Als
made in gray-stained oak.)

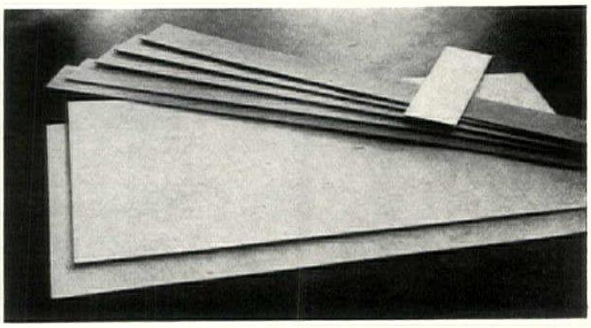
Photograph by Hedrich-Blessing Studio

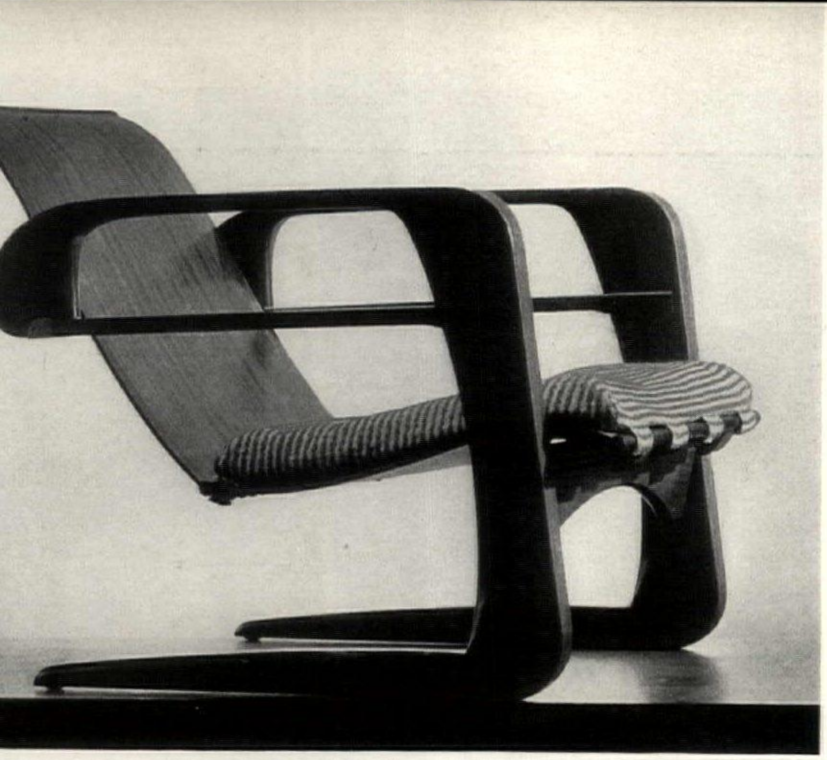
GILBERT ROHDE, DESIGNER

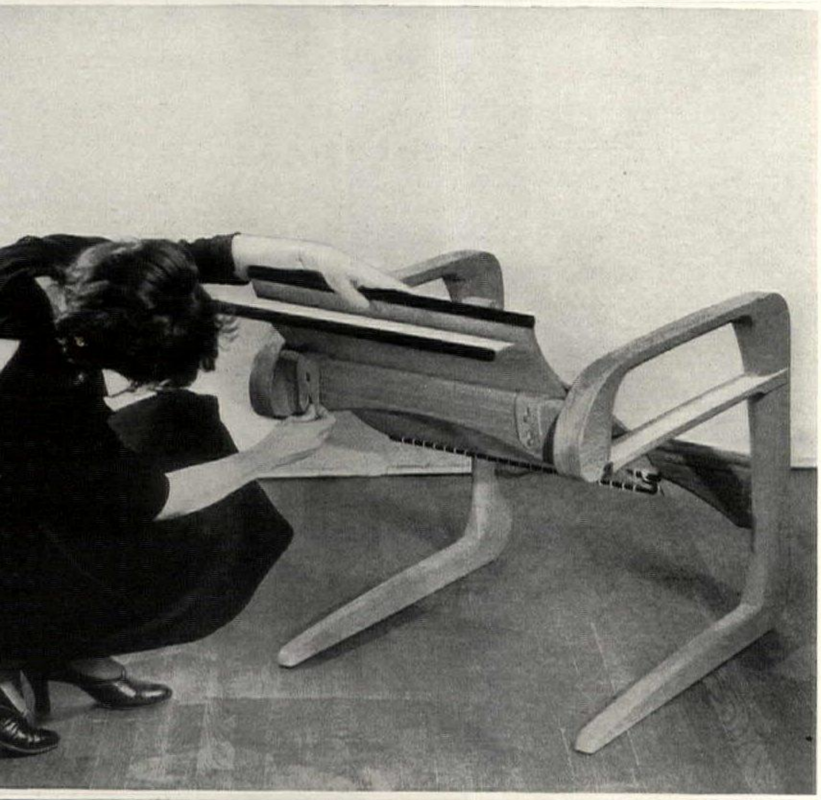
Bent wood chairs have no glued joints at points of stress. They are made of beech, finished to match oak and covered in white lacquered fabric. (Also made with frames finished in colored lacquer.) Room colors: brown wallpaper and dark brown carpet.

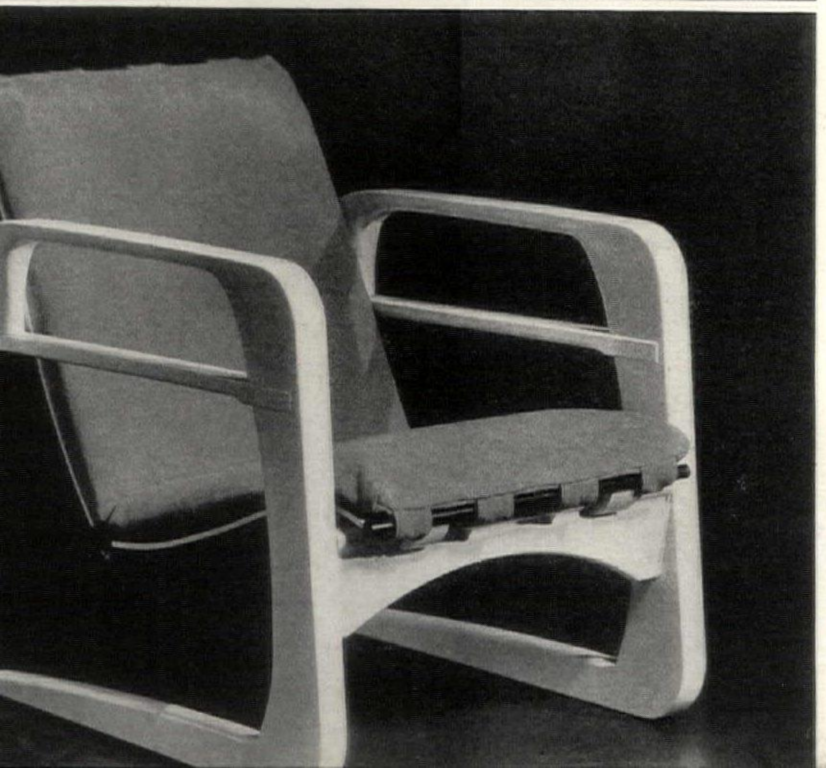
PRESSED PLYWOOD FURNITURE

A. AALTO, ARCHITECT, FINLAND







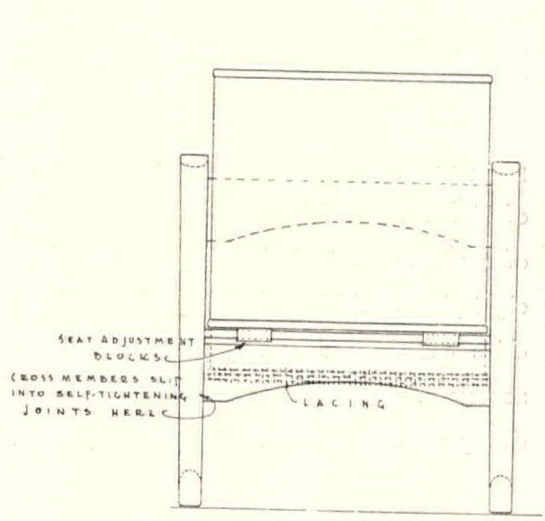


AIRLINE CHAIR OF WOOD BY KEM WEBER

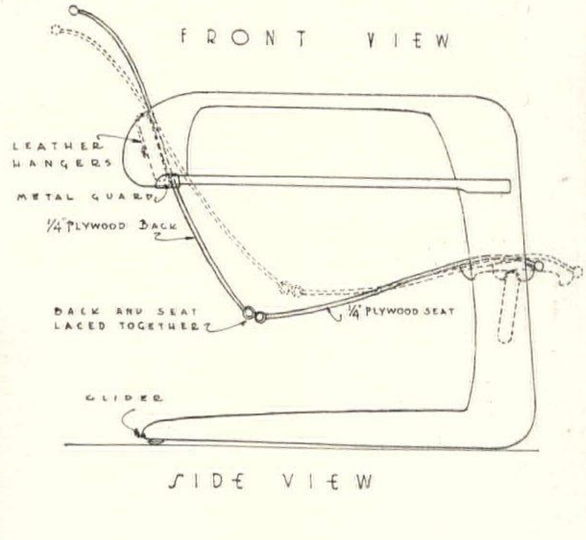
The two upper horizontal rails are not constructed as a solid frame, but get their strength through a logical transformation of stresses. The rear block of the upper rail is structurally solid with the rail and as it moves down when pressure is applied, the distance between the lower end of the block, where the second rail is located, and the front of the chair is decreased. There is an open space between the lower rail and the block to allow free movement. With a pressure of about 300 pounds the space is closed, transforming the breaking stress into tension on the upper rail and compression on the lower.

This principle in connection with the bow construction of hickory lamination on the tension side of all surfaces is said to give this chair strength far out of proportion to the lightness of the individual parts.

(Photographs by Will Connell)



FRONT VIEW



SIDE VIEW

PLANNING THE HOUSE INTERIOR

STUDY PLAN FROM POINT OF VIEW OF "WHAT GOES ON IN THE HOUSE."

SEPARATE COOKING AND DINING SPACE FROM LIVING ROOM SPACE. SIMILARLY SEGREGATE SLEEPING ROOMS AS A SUITE. See accompanying diagrams prepared for Milan Building Exposition for House Planning.

BEDROOMS, KITCHENS AND BATHROOMS CAN BE EXACTLY DETERMINED IN SIZE BY DIMENSIONS OF STATIONARY EQUIPMENT AND THEIR DEFINITE USE.

DINING AND LIVING ROOMS OFTEN SERVE DIVERSE PURPOSES AND SHOULD BE OF AMPLE SIZE TO ALLOW FOR DINING, ENTERTAINING, AND IN SOME CASES AS PLAY SPACE FOR CHILDREN.

FURNISHINGS SHOULD PARTICIPATE IN THE CREATION OF ROOMS.

RESTRICT FURNITURE TO ESSENTIAL PIECES. A Committee of Home Economists recommends that "in the interest of economy the typical dining room set be reduced to eight pieces—sideboard, dining table and six chairs. The china cabinet and serving table being considered unnecessary."* For further economy, two chairs from the dining set could be used in the living room.

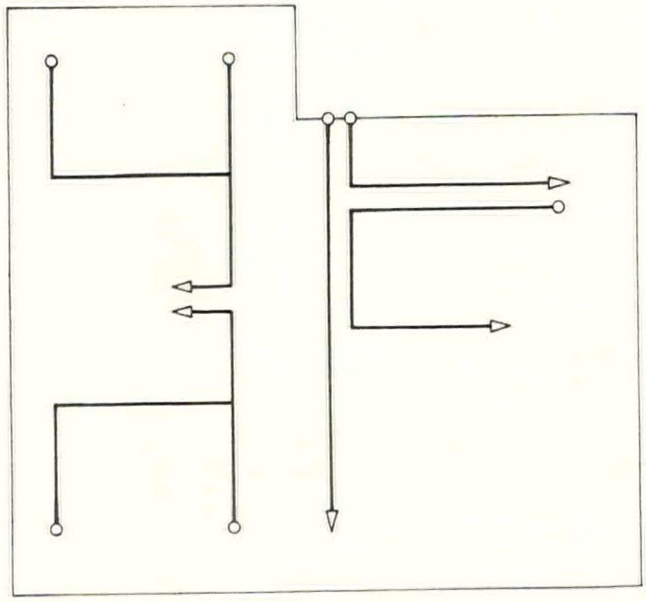
CABINETS MAY DIVIDE ROOMS IN PLACE OF PARTITIONS.

CABINETS SHOULD BE DESIGNED SO AS TO ALLOW FOR:

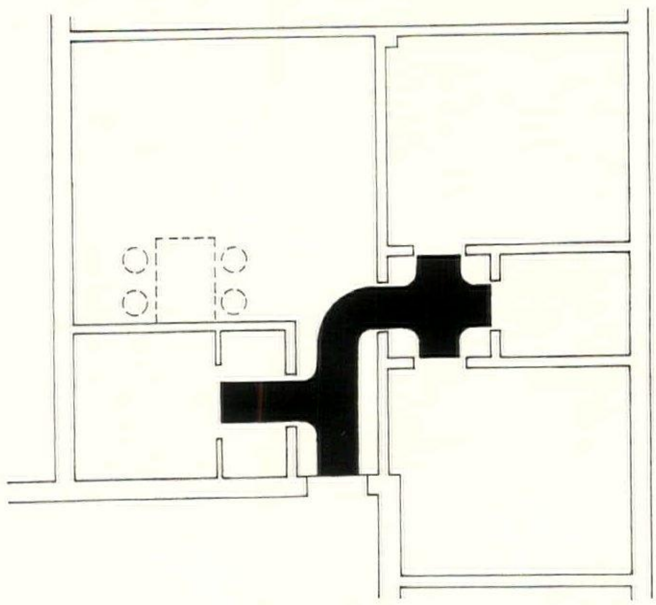
Expansion of storage space.

Variety of storage purposes.

* Homemaking, Home Furnishing and Information Centers. President's Conference on Home Building and Home Ownership. p. 131.

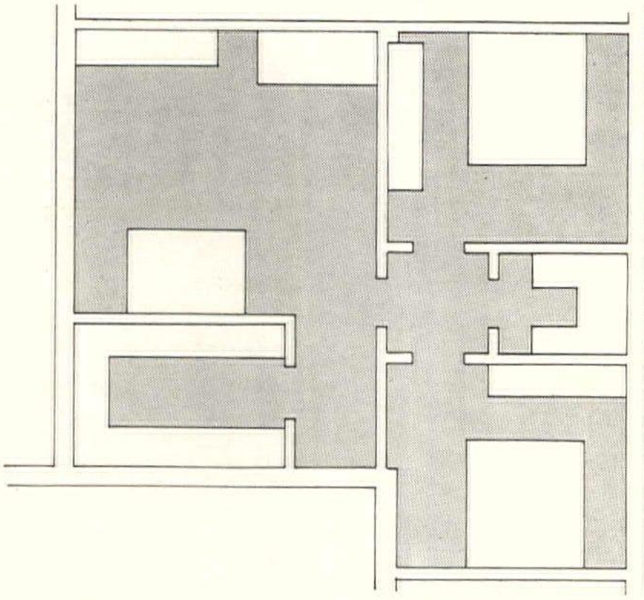


(1) LINES OF COMMUNICATION FOR THE HOUSEHOLD. THE THREE GROUPS OF LINES CORRESPOND WITH THREE MAJOR ACTIVITIES: COOKING-DINING; SITTING-RELAXING; SLEEPING-WASHING. THEY SHOW THE SEGREGATION OF EACH USE, NO INTERFERENCE WITH EACH OTHER, SHORT AND DIRECT RELATONS.

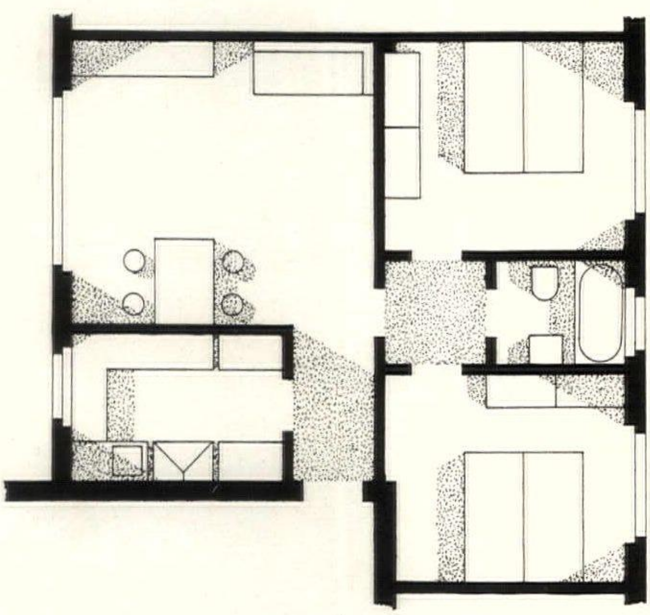


(2) CIRCULATION BETWEEN GROUPS. PATH OF TRAFFIC SHOWS CENTRALIZATION, SHORT DISTANCE FROM ONE GROUP TO ANOTHER, NO OBSTACLES TO AVOID, EASY ACCESS AND FLOW OF WALKING PATH ARE THE BASIS OF EFFICIENT HOUSEKEEPING.

GRAPHIC METHOD FOR DETERMINI



(3) FURNITURE LOCATION AND FREE AREAS. THERE IS AMPLE FREE SPACE AFTER THE PLACING OF NECESSARY FURNITURE. THE CONCENTRATED LIVING AREA MAKES FOR CONVENIENCE AND A MINIMUM OF PHYSICAL EXPENDITURE. THE SLEEPING AREA FORMS A SEPARATE SUITE.



(4) INTERIOR AND DAYLIGHT. WINDOWS WITH DESIRABLE RELATION TO ROOMS, PARTITIONS AND FURNITURE. CONSIDER DESIRABLE DAYLIGHT ON WORK SURFACES AND GOOD VISION FOR ALL PARTS OF A ROOM FOR BOTH CLEANLINESS AND TO FAVOR A GENERAL IMPRESSION OF CHEERFULNESS.

EFFICIENCY OF DWELLING PLANS

FURNITURE SHOULD BE LIGHT IN WEIGHT FOR MOVING.

Adjustable or convertible to different uses.

Small in bulk and correct in heights.

BUILT-IN FURNITURE REQUIRES LESS SPACE, IS EASIER TO KEEP CLEAN, GATHERS LESS DUST.

ANY PART OF FURNITURE THAT COMES IN CONTACT WITH HANDS, ARMS, LEGS, OR ANY OTHER PART OF THE HUMAN BODY SHOULD BE OF MATERIAL THAT IS WARM TO THE TOUCH.

HORIZONTAL SURFACES SHOULD BE OF WASHABLE, NON-TARNISHABLE MATERIAL, STAINLESS, FIREPROOF (PROTECTED AGAINST CIGARETTES) AND COLOR-FAST.

COLOR IN FURNISHINGS SELECTED FOR PRACTICAL USE, NON-GLARING, RESTFUL TO EYES, INTENSE COLORS RESTRICTED TO PARTS WHERE ATTENTION SHOULD BE ATTRACTED.

AVOID DUST-GATHERING CORNERS AND SURFACES. AVOID ROUGH SURFACES AND HORIZONTAL SURFACES ABOVE EYE LEVEL.

AVOID SHARP EDGES AND CORNERS.

CEILINGS WHITE OR IN PALE SHADES TO REFLECT LIGHT. WALLS OF CLEAR COLORS OR NEUTRAL SHADES.

FLOOR COVERINGS WITHOUT PATTERN AND OF SHADES SUCH AS TAUPE, GRAY AND SAND.

WALLS SMOOTH, HARD AND OF SANITARY FINISH.

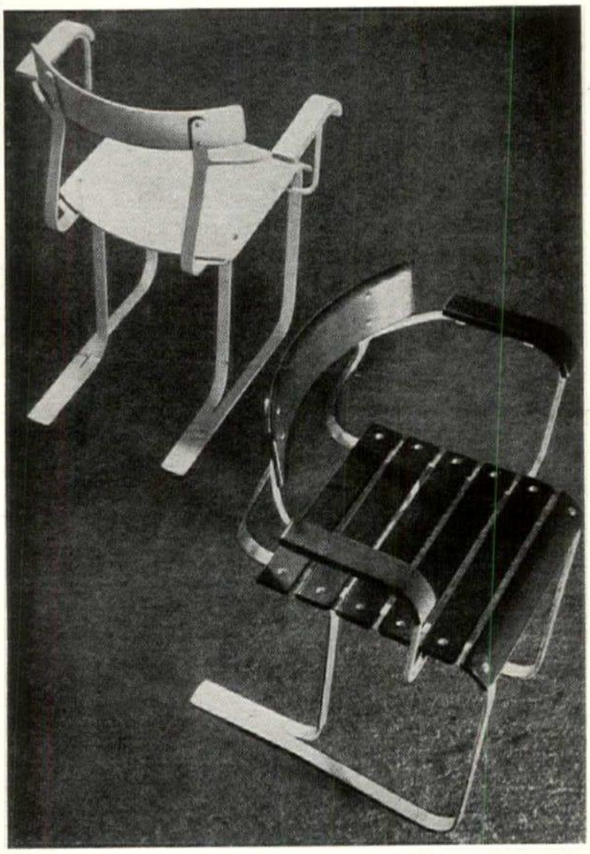
Hard plaster, plywood panels, made in wall-board sizes, which can be varnished, stained or waxed; fabric; plastic materials.

CHAIR DESIGNS BY MARCEL BREUER, ARCHITECT

The chairs illustrated were submitted in an international competition for the best aluminum chairs of the world. Two independent juries unanimously awarded the first two prizes to the executed designs by Marcel Breuer.

Aluminum was previously considered too soft and brittle for the structure of furniture. With a new structural system involving the stamping of metal as flat parallel springs, the desired strength was attained.

These chairs were designed primarily for comfort with extreme simplification in shape. They are unusually light in weight; are of homogeneous material with an integral surface that does not stain.



1

2

CHAIRS WITH ARM RESTS

1 STEEL FRAME AND OF MINIMUM COST.
2 CHAIR OF STEEL, TREATED SURFACE, SLAT SEAT, SUITED TO PORCH OR GARDEN.

UPHOLSTERED CHAIRS WITH AND WITHOUT ARM REST FOR GENERAL USE IN HOUSE. FRAME OF STAMPED ALUMINUM, NON-CORRODING SURFACE, WATERPROOF FABRIC.

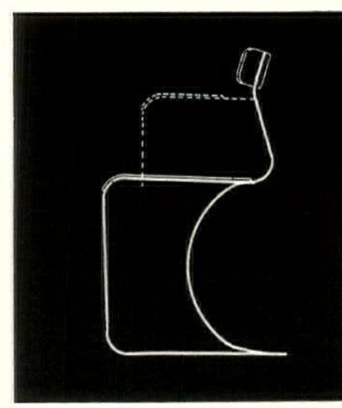
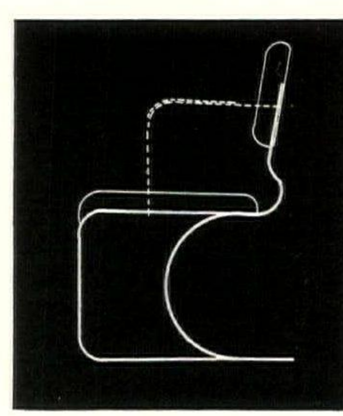


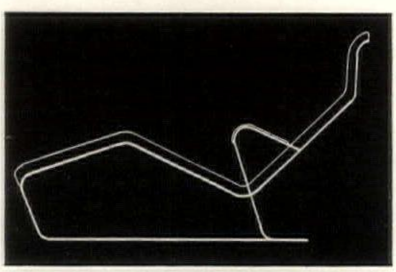
DIAGRAM OF CHAIR DESIGNED FOR RESTAURANTS AND OFFICES.



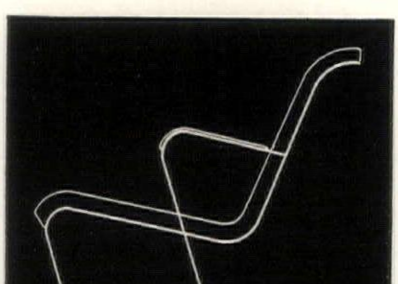
SECTION OF CHAIRS AT LEFT.

DETAIL OF HEADREST.

RECLINING CHAIR FOR LIVING ROOM AND PORCH. THE SAME MODEL USED FOR GARDEN TERRACE IS LIGHTER IN WEIGHT AND HAS WATERPROOF UPHOLSTERY. ALUMINUM OR STEEL FRAME.

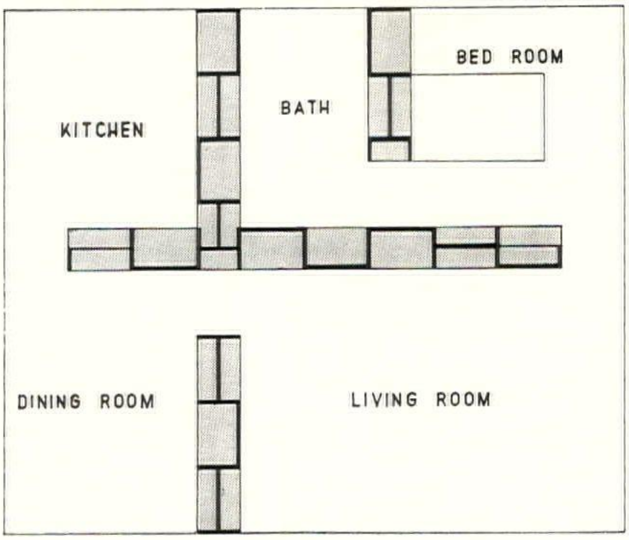


SECTION OF RECLINING CHAIR FOR RESIDENCE INTERIOR AND PORCH.

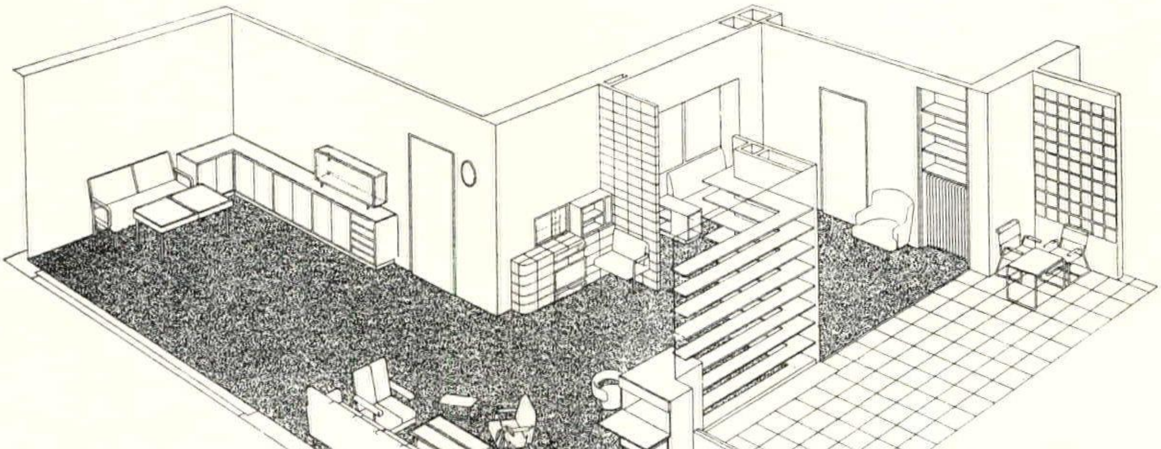


SECTION OF CHAIRS AT RIGHT.

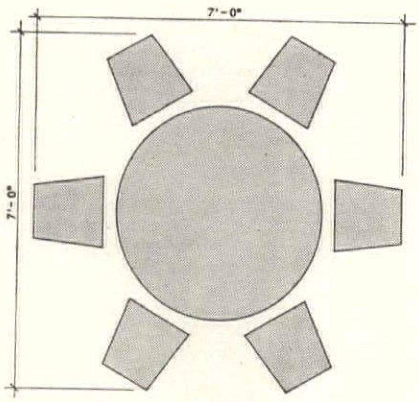
CHAIRS DESIGNED FOR GARDEN AND PORCH USE, WATERPROOFED UPHOLSTERY, NON - CORRODING SURFACE FOR STEEL OR ALUMINUM FRAME.



FLOOR PLAN IN WHICH ROOMS ARE SUBDIVIDED BY CLOSETS AND CABINETS OF STANDARD SIZE, INSTEAD OF BY PARTITIONS. SUCH AN ARRANGEMENT CAN BE ECONOMICAL TO CONSTRUCT AND CAN GIVE UNITY OF APPEARANCE TO ROOMS. THE ARRANGEMENT OF ROOMS CAN BE READILY CHANGED.



ISOMETRIC OF APARTMENT. LIVING ROOM AND HALL COMBINED, WITH EASY ACCESS TO TERRACE. MOVABLE AND STATIONARY FURNITURE ARE IN CLOSE RELATIONSHIP. THE FURNITURE GROUPS CREATE AREAS FOR READING, ENTERTAINING AND WORK. L. KOZMA, ARCHITECT, FROM "L'ARCHITECTE," PARIS.



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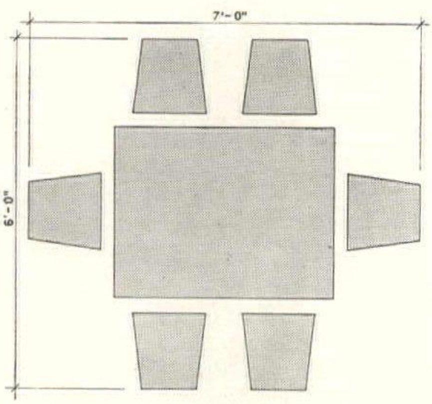

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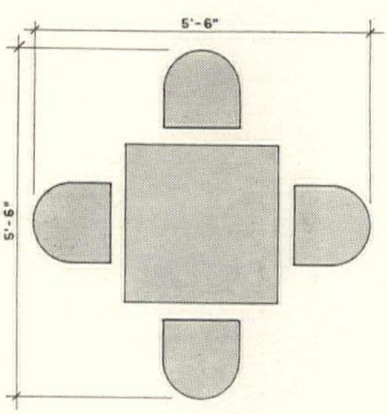

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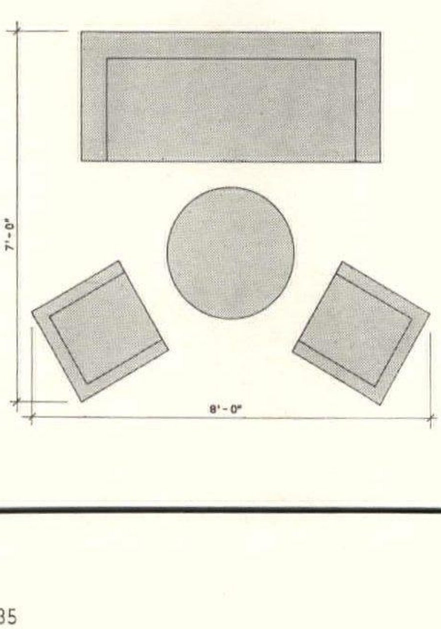


4

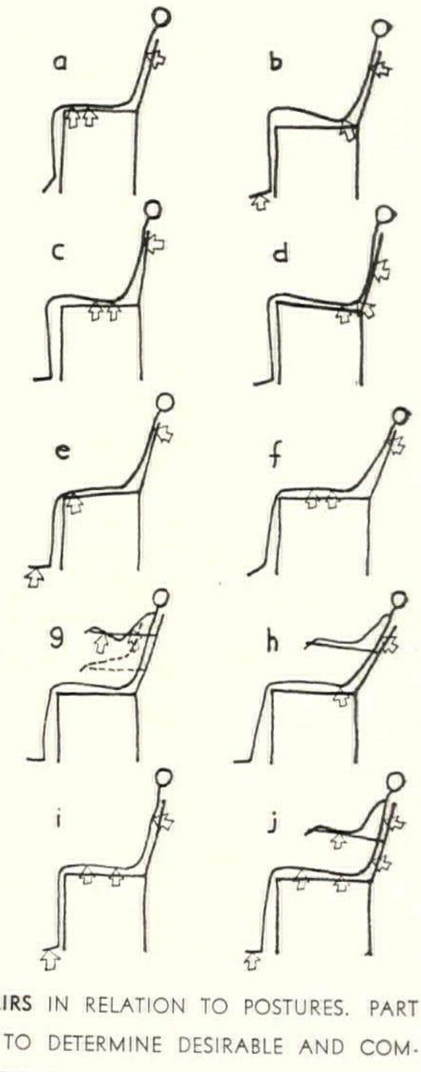
IN PLANNING ROOMS CONSIDERATION IS GIVEN TO THE AREA REQUIRED FOR FURNITURE WHEN IN USE. THE DIMENSIONED AREAS AT THE LEFT ARE FOR COMBINATIONS OF CHAIRS AND TABLES. The designer of a dining room arrangement usually allows 2 feet for clearance between chair back and wall or from chair back to other furniture.

(1) Dining table 4'-0" in diameter requires a room 11'-0" in width as minimum.

(2) Rectangular table of same seating accommodation requires 6-foot width for chairs and table.

(3) Required floor area for bridge table with chairs.

(4) The conventional grouping of settee, smoking table and chairs requires 7' x 8' with 4 additional feet needed for comfortable width.



DIAGRAMS OF CHAIRS IN RELATION TO POSTURES. PART OF INVESTIGATION TO DETERMINE DESIRABLE AND COMFORTABLE CHAIR HEIGHTS, DEPTHS, AND SLOPE FOR SEAT AND BACK. RESEARCHES FOR PROTOTYPE OF CHAIRS, GOVERNMENT BUREAU OF INDUSTRIAL ART, JAPAN. FROM "KOKUSAI-KENCHIKU" MAGAZINE.

Photograph by Hedrich-Blessing Studio

APARTMENT OF WILLIAM ROSENFIELD
IN CHICAGO — DESIGNED BY DONALD DESKEY

NON-FEDERAL LOCAL PUBLIC WORKS

The greater part of this issue is devoted to non-Federal local public works. These consist of building and engineering projects undertaken by States and their political subdivisions—counties, cities, school districts and so on. Non-Federal local public works, being initiated, designed and constructed by local political action through local professional and business channels merit preferred consideration as a means of stimulating recovery in the building industry. They are real estate improvements which, supplying new or superior communal services, tend to attract population or business and, consequently, to promote private real estate activity.

Under authority of Title II of the National Industrial Recovery Act, approved by the President on June 16, 1933, the Public Works Administration has made loans at 4 per cent and granted subsidies of 30 per cent of the cost of labor and materials for non-Federal local public works. Elsewhere in this issue will be found a list of the types of work financed. The list is based upon a press release of some 90 pages itemizing all non-Federal public works financed wholly or in part by PWA during the 21 months of its existence, up to April 1, 1935.

A total of $747,757,000 in loans and grants had been made to local public bodies for 4,040 projects completed or under construction. PWA has recently been reselling at a profit through the Reconstruction Finance Corporation some of the bonds accepted as security for loans and it is estimated that municipalities which applied for grants only have marketed about $40,000,000 in bonds to cover the cost of projects above the grants.

In view of the improvement which has taken place in the bond market, it seems likely that under the Work-Relief Act approved by the President on April 8, PWA may purchase a smaller proportion of bonds than it did under the old program and make a larger proportion of grants. At any rate, the Work-Relief Act omits the provision which limited a grant to 30 per cent of the cost of labor and materials. Legally the grant may now cover the entire cost of a project. A statistical comparison of the old and the new program is given on another page.

Practically all of the non-Federal local public works shown in this issue were designed by architects. Wherever a local improvement is needed there is a double advantage to tax payers in having the work done as part of the PWA program. There is, first, a low financing cost and, secondly, a reduction in the local cost of relief through reemployment. In many communities groups of architects have as citizens shared in the preparation of community plans and indicated how commissions for architectural services on individual jobs may be equitably distributed. A typical procedure, followed in San Diego, Calif., is described by William Templeton Johnson.

TYPES OF NON-FEDERAL LOCAL WORKS CONSTRUCTED UNDER TITLE II OF THE NATIONAL INDUSTRIAL RECOVERY ACT APPROVED JUNE 16, 1933

Abattoir
Administration Building
Agricultural Building
Airport
Alleys
Almshouse
Archives
Armory
Arts Building
Assembly Hall
Asylum
Auditorium
Auditorium Gymnasium
Auditorium Library
Barn
Barracks
Bathing Beach
Bell Tower
Board Walk
Boys' Home
Bridge Approach
Bridges
Canal
Capitol Annex
Car Lines
Cemetery
City Hall
Civic Building
Club Building
College Buildings
Comb. Sewer
Comfort Station
Community Building
Cottages
County Home
Courthouse
Creamery
Culvert
Curbs

Dam
Deaf-Dumb Institution
Detention Building
Dining Hall
Disposal Plant
Dock Improvement
Dormitory
Drainage
Economics Building
Electric Distribution
Electric Plant
Equipment Building
Filtration Plant
Fire Alarm System
Fire Exits
Fire-Police Station
Fire Protection
Fire Station
Flood Control
Garbage Disposal
Gas Distribution
Gas Mains
Gas Plant
Golf Course
Guard Rail
Gymnasium
Hangar
Harbor Improvement
Harbor Railroad
Health Building
Heat Power
Heating System
High Schools
Highway Bridge
Highway Railroad Crossing
Highways
Home for the Aged
Horse Barn
Hospitals

Housing
Hydrants
Incinerator
Industrial Building
Infirmary
Irrigation
Jail
Juvenile Court
Laboratory
Laundry
Library
Locker Room
Machine Shop
Market
Mausoleum
Medical Building
Memorial Building
Municipal Building
Museum
Nurses' Home
Park Development
Passageway
Penal Institution
Physical Building
Pier Sheds
Police Radio
Police Station
Poor Farm
Prison Buildings
Pump Plant
Railroad Bridge
Record Building
Reformatory
Refrigeration Plant
Reservoir
Roads
Sanitarium
Sanitary Sewers
School Buses

School Garage
Schools
Science Building
Sea Wall
Service Buildings
Ship Channel
Shop
Shop Building
Sidewalks
Smoke Stack
Sprinkler
Stadium
State Building
Stock Barn
Storehouse
Storm Sewers
Street Lights
Streets
Sub-Station
Subway
Swimming Pool
Terminal
Town Hall
Training School
Tunnel
University Buildings
Viaduct
War Memorial
Ward Buildings
Warehouse
Water Building
Water Meters
Water Pump
Water Sewer
Water Tank
Watermains
Waterworks
Well
Well Pumps
Wharf

Construction completed this year; reinforced concrete walls, cement plastered; tile roof.

DISTRICT X OFFICE BUILDING FOR THE DIVISION OF HIGHWAYS, STOCKTON, CALIFORNIA
STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS—GEORGE B. McDOUGALL, STATE ARCHITECT

ARCHITECTS DEVELOP A PROJECT FOR SAN DIEGO

About ten years ago San Diego, California, commissioned John Nolen, city planner of Cambridge, Mass., to make a general study plan for the development of the town. One of Mr. Nolen's recommendations was the construction of a civic center group on the water front which is controlled by the city under a grant from the state of California.

San Diego has a shabby, old civic hall and an entirely inadequate county court house forty years old and besides this, with the expansion of official functions, space has been rented by the city and county in various buildings throughout the city to such an extent that the yearly rentals amount to about $45,000.

To remedy this condition and to house the offices of the city and county in adequate quarters, a joint committee was appointed by the city planning commission and the county planning commission to make recommendations for the development of a civic and county group. This joint committee proposed the utilization of the water front lines of the city for the development of the civic center and studies were made for the general arrangement of a group of public buildings.

At this stage the local chapter of the American Institute of Architects offered its services to prepare without cost to the city and county preliminary plans for a city and county building with the idea of passing a bond issue and obtaining government aid under the Public Works Administration. Three architects were chosen by ballot by the San Diego chapter to prepare these drawings in consultation with the city administration and the planning commissions and they have been carried along far enough to make an intelligent estimate cost. No details are yet available as to the exact basis upon which the financing with the government will be consummated.

The San Diego chapter of the American Institute of Architects recently voted that the three members who donated their services for the preparation of the preliminary plans should be recommended to the city and county administrations for construction of the building if the financing is successfully carried out.

William Templeton Johnson, *Architect*

LOCAL PUBLIC WORKS: THE NEW PROGRAM

By L. SETH SCHNITMAN
Chief Statistician
F. W. Dodge Corporation

Since July 1933 about 4,000 non-Federal construction projects—buildings and public works of states and their subdivisions—have been made possible by PWA funds. These are of almost every description, from airports to zoo buildings, and were additional to some 15,000 so-called Federal projects that were undertaken by the national government from the same appropriations. (This article treats only with non-Federal construction.)

About 1,200 non-Federal projects are already completed. In fact, roughly three-fourths of the total number of local projects are (May 1) either completed, under construction, or under contract. On the basis of estimated cost, less than half of the total old non-Federal program has reached these stages. Thus, of an estimated total cost of about $1,080,000,000 that has been made possible by PWA loans and grants, only about $500,000,000 has actually been under construction.

A new program of non-Federal construction is now being undertaken. $900,000,000 of Federal funds have been appropriated as compared with about $765,000,000 under the old. Should the new funds be allotted in the same manner as the old, this would produce a total of local public improvements of about $1,275,000,000. Together, the old and the new programs have an indicated size of about $2,300,000,000. Federal funds under the new legislation will be available until June 30, 1937.

All charts are based upon data from the Public Works Administration and Dodge Statistical Research Service.

LOCAL IMPROVEMENTS DOT THE NATION . . .

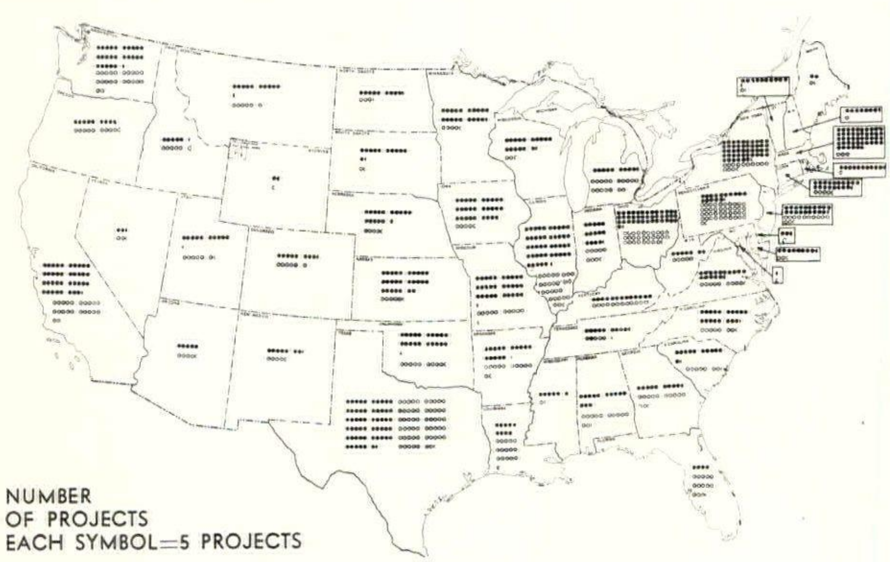
Under the provisions of the NIRA (Act of June 16, 1933) the President was authorized, through the Administration of Public Works, "to make grants to States, municipalities, or other public bodies for the construction, repair, or improvement of any such project (public works), but no such grant shall be in excess of 30 per centum of the cost of the labor and materials employed upon such project."

As a result of this legislation no State has been without allotments, in the form of loans and grants, for the construction of what will henceforth be referred to as non-Federal or local public projects. PWA allotments for these projects exceeded $750,000,000. Though an additional amount of approximately $200,000,000 was allocated for construction loans to railroads, much of which incidentally went into new equipment, none of this total will be considered here. Roughly one-third of the PWA construction fund was earmarked for loans and grants to finance the construction of projects of States, municipalities, and other local public bodies.

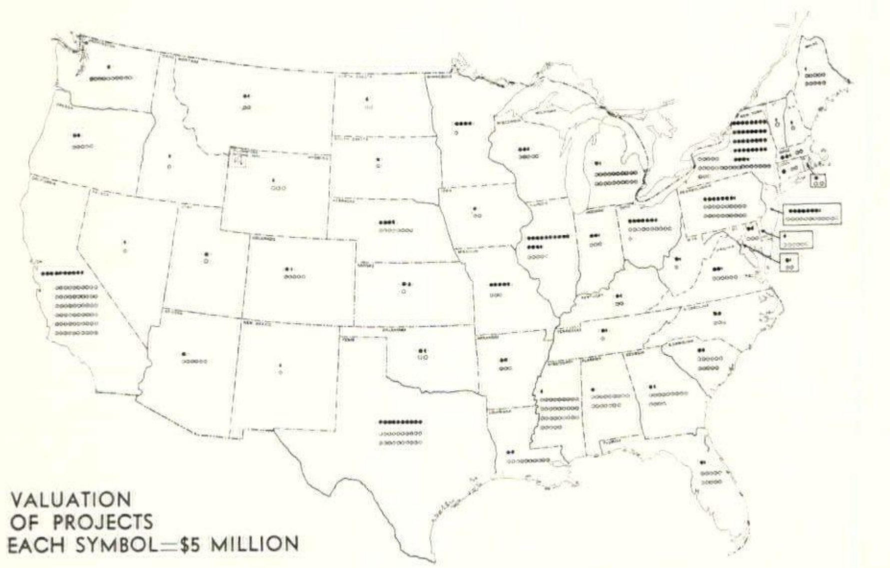
In the first map each symbol represents 5 non-Federal projects or fraction thereof; in the second map each symbol represents $5 million or fraction thereof. On each map the black dots signify actual allotments; the white dots designate projects on which planning was well advanced when, for lack of funds, allotments under the old program were stopped.

On the following pages are given some of the more salient features of the old program. Likely developments under the new program which has been provided for in the Emergency Relief Appropriation Act of 1935 (Act of April 8, 1935) are also portrayed. Under this legislation the sum of $900,000,000 has been set aside for "loans or grants, or both, for projects of States, Territories, possessions, including sub-divisions and agencies thereof, municipalities, and the District of Columbia, and self-liquidating projects of public bodies thereof, where, in the determination of the President, not less than 25 per centum of the loan or the grant, or the aggregate thereof, is to be expended for work under each particular project."

There is no limit as to the size of the grant whereas under the old law grants were limited to 30 per cent of the cost of materials and labor.

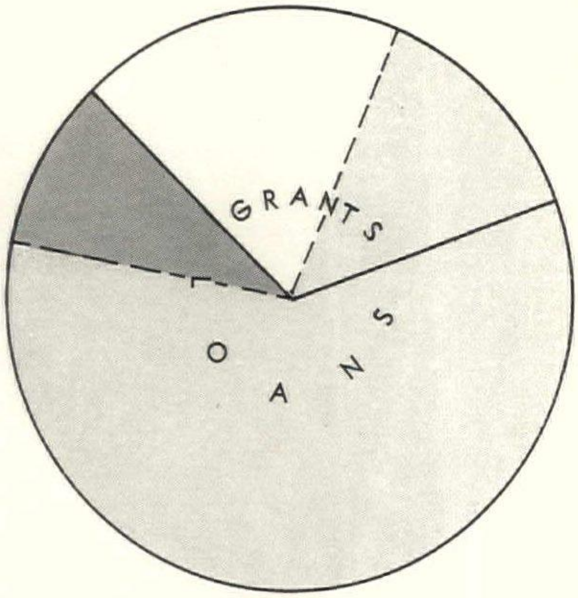


Black dots signify projects allotted; white dots pending projects.



Maps copyrighted by American Map Co., New York—Authorized reproduction No. 5025

LOANS AND GRANTS UNDER OLD PROGRAM



GRANTS WITHOUT LOANS

LOANS WITHOUT GRANTS

LOANS WITH GRANTS AND GRANTS WITH LOANS

Of the approximate total of $765,000,000 which was allotted for loans and grants by the PWA to further the construction of non-Federal projects (exclusive of railroads), some $505 million, or roughly two-thirds of the aggregate, represented loans to public bodies on their bonds at interest of 4 per cent. The remaining amount, approximating $260 million, represented grants.

According to Circular No. 1 of the Federal Emergency Administration of Public Works the test for eligibility for a grant was "the social and economic significance of the project and its relative importance in the comprehensive national program of public works contemplated by the act, and the extent its construction will provide employment and purchasing power in the vicinity."

The regulations also stated: "The following classes of projects will be preferred as to the grant: (1) waterworks projects not unduly burdening the community with debt and necessary for its health and convenience; (2) sewer projects of the same character; (3) sewage disposal projects sufficiently comprehensive to render a river or lake system, used by many communities, safe as a water supply, and other sewage disposal projects; (4) other projects which, like the foregoing, are regenerative, i. e., tend to stimulate further projects, such as highways, bridges, and tunnels, opening of new territory for homes and industry, projects for the transmission of electrical energy into territories not now served. The President, in determining whether to allow or withhold the grant, will also consider to what extent the budget of the applicant is balanced or in process of balancing and will prefer those public bodies which put their finances in order."

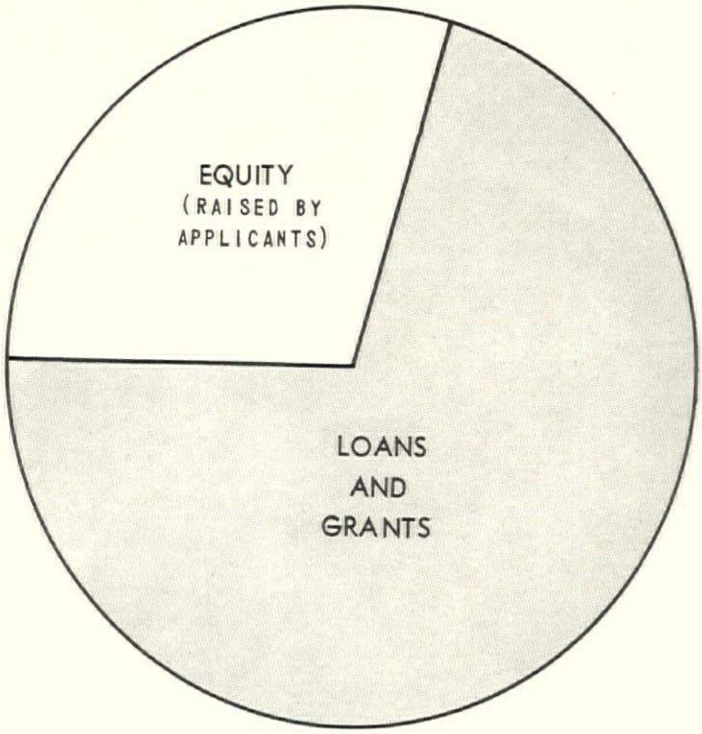
In the light of these regulations promulgated in July 1933, it is of interest to note that of the 1,200 or so non-Federal projects that are already completed, approximately 23 per cent are water supply systems; some 20 per cent are streets and local highways; about a like percentage represents educational facilitis; about 18 per cent are sewers and sewage disposal plants; the remainder are miscellaneous types.

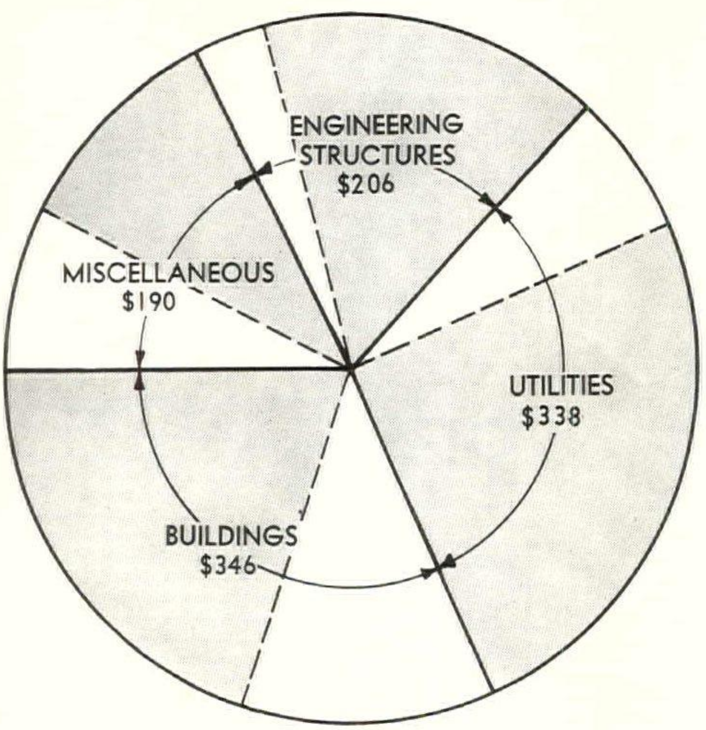
It is also of interest that, of the total allotment for grants amounting to about $260 million, little more than $100 million represented grants to public bodies which did not find it necessary to borrow from the PWA. Ostensibly, these public bodies either had their own funds or could sell their bonds in the market on a basis more attractive than that offered by the PWA.

Of the total amount of loans allotted approximately 85 per cent was in connection with grants, the remainder being loaned to public and quasi-public bodies, such as limited-dividend housing projects and toll bridges, which under the law were not eligible to grants.

DISTRIBUTION BETWEEN FEDERAL AND LOCAL MONEY

If all projects for which loan and grant allotments were made reach fruition, some $1,080 million of local construction and improvement projects will have been provided. From this it appears that local public bodies will have supplied approximately $315 million as their share of the total cost. Thus for each dollar of Federal money, roughly 40 cents of local or equity money will have been provided, as raised either out of current revenues or bond sales or both. This applies generally but not necessarily for any community. The relationship between Federal money by way of loans and grants— and local or equity money is shown by the chart to the right. On the following page a further breakdown as between types of construction is given.





OLD PROGRAM CLASSIFIED BY TYPE

In the chart to the left is pictured the approximate distribution of t major classifications of local or non-Federal construction which was ma possible by the old program. The unshaded portions of the chart indica the segments for which local or equity money has been or will be suppli under each major class; the shaded segments designate the total amour for which Federal funds have been allotted. (No attempt has here be made to separate loans from grants.)

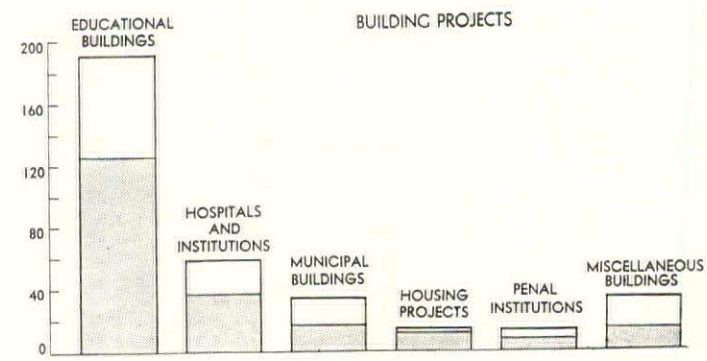
The figures denote millions of dollars and include, in each instance, bo the Federal or PWA allotments and the local or equity money, the co bined total of all of which, as has already been shown, approximat $1,080,000,000.

Thus, of the total amount of probable construction, about 32 per ce represents building types, architecturally designed; almost a like percenta represents public utilities of all descriptions, exclusive of water pow almost 20 per cent will go into engineering structures, such as bridg viaducts, tunnels and subways; and the remainder in miscellaneous typ chiefly of engineering designs.

BUILDING PROJECTS . . . .

Educational buildings formed by far the most important category of building types provided for by the PWA non-Federal allotments. Here, as above, the unshaded portions of the chart represent equity money locally raised, while the shaded segments designate PWA allotments, both loans and grants. On all building projects the borrower or the applicant hires the architect. Fees were usually 6 per cent of the cost of the project and include plans, specifications, preliminary sketches, supervision and necessary travel expenses.

In this chart, municipal buildings embrace city halls, courthouses, fire and police stations, and armories. Housing projects include both limited-dividend housing and sundry other residential building erected as incidental to other projects. Under the miscellaneous classification all other building types not specially shown have been grouped.



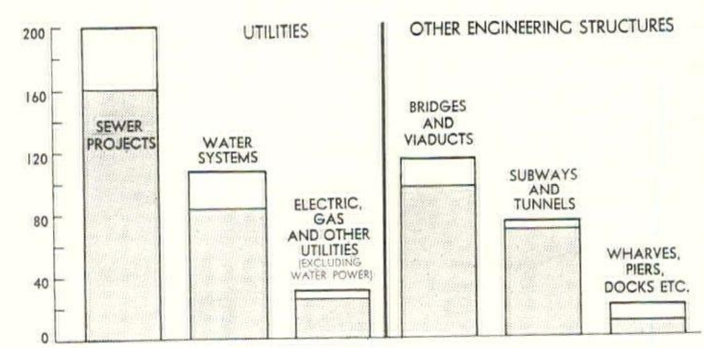
OTHER CLASSIFICATIONS . . . .

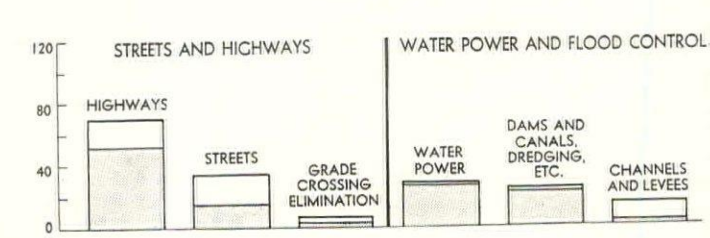
Here is given a detailed classification of the remaining major construction classifications, with the unshaded portions of the bars likewise indicating local or equity money raised by the applicants.

Just as educational facilities outranked all other classes in the case of building types, so, in the engineering division, the utilities outranked all other types. Of the utility types sewer projects are the most important, exceeding somewhat in total estimated cost the value of educational buildings. It is of interest, too, that for sewers less equity money, both in the aggregate and relatively, is to be raised by the applicants than is the case in educational buildings.

For water systems, with a total estimated cost almost double that for hospitals and institutions, the equity money in each is just about on an even base. For municipal buildings, with a total approximate cost not far different from that for electric, gas and other utilities (exclusive of water power), the equity money is about twice as great.

A fairly complete picture of the probable results under the existing program construction of non-Federal projects by major divisions has thus been afforded.





APPRAISING THE NEW PROGRAM

Since the old program is still a considerable distance from completion, it is obviously difficult even to attempt an approximation of the new. Two facts, however, stand out prominently under the old program and may be helpful in assaying the new program:

(1) Grants approximated $260 million, while loan allotments were about $505 million, making an approximate total of $765 million in PWA allotments for non-Federal projects.

(2) These allotments are estimated to produce a construction total of approximately $1,080,000,000, allowing for equity money.

All that is known about the new program is that the law provides for $900,000,000 (see page 322) and even here the law states that "not to exceed 20 per centum of the amount herein appropriated ($4,000,000,000) may be used by the President to increase any one or more of the foregoing limitations (including the $900,000,000) if he finds it necessary to do so to effectuate the purpose of this joint resolution."

With these difficulties in mind, the best basis for appraising the new program is probably to be found in the likely results under the old which are now fairly well defined. The chart indicates the old program in solid outline, superimposed on which is the new program in broken outline in the ratio of $765 million to $900 million. This has been done on the premise that the system of loans and grants under the old program will be substantially followed in the execution of the new one.

In the lower chart the same procedure was followed. In this instance the broken circle includes the equity money on the assumption that the same proportion of equity to loans and grants as in the old program will prevail in the new. Thus the aggregate estimated cost of local improvements under the new program, on this assumption, would be approximately $1,275,000,000, as against $1,080,000,000 under the old. On this basis, the new program would be just about the size of the old, inclusive of loans to railroads for construction and equipment purchases.

The Executive Committee of the Construction League of the United States recently recommended to the Administration that it follow a schedule of diminishing grants with reference to the $900 million fund authorized in the new law. Under this schedule it was suggested that no loans be made at all by the Federal government and that the entire fund be given as grants according to the following:

(1) 50 per cent of the actual cost of the local projects where work thereon has been undertaken before December 31, 1935.

(2) 30 per cent of the actual cost of the projects where work has been undertaken in 1936, but before September 30.

(3) 20 per centum of the actual cost of the projects where work has been undertaken thereafter.

In this manner, the League suggests, $900,000,000 of grants would mean a construction volume from two to three times the total possible under the old plan of loans and grants. Construction would be accelerated materially by the arbitrary time limits as set up in the above schedule on the diminishing scale of grants.

In his recent radio address, President Roosevelt stated that he will recognize the following six principles with respect to the new program and from these there is no indication that the President intends to accept the recommendations of the Construction League:

(1) The projects should be useful.

(2) Projects shall be of a nature that a considerable proportion of the money spent will go into wages for labor.

(3) Projects which promise ultimate return to the Federal Treasury of a considerable proportion of the costs will be sought.

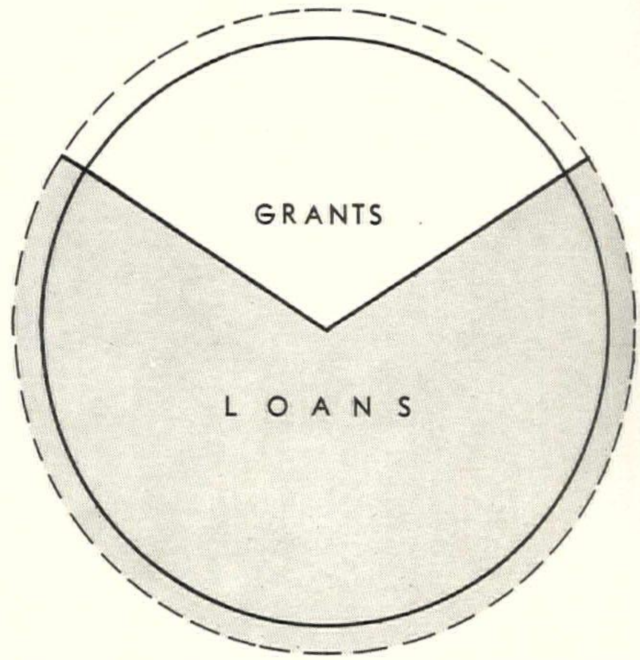
(4) Funds allotted for each project should be actually and promptly spent and not held over until later years.

(5) In all cases projects must be of a character to give employment to those on the relief rolls.

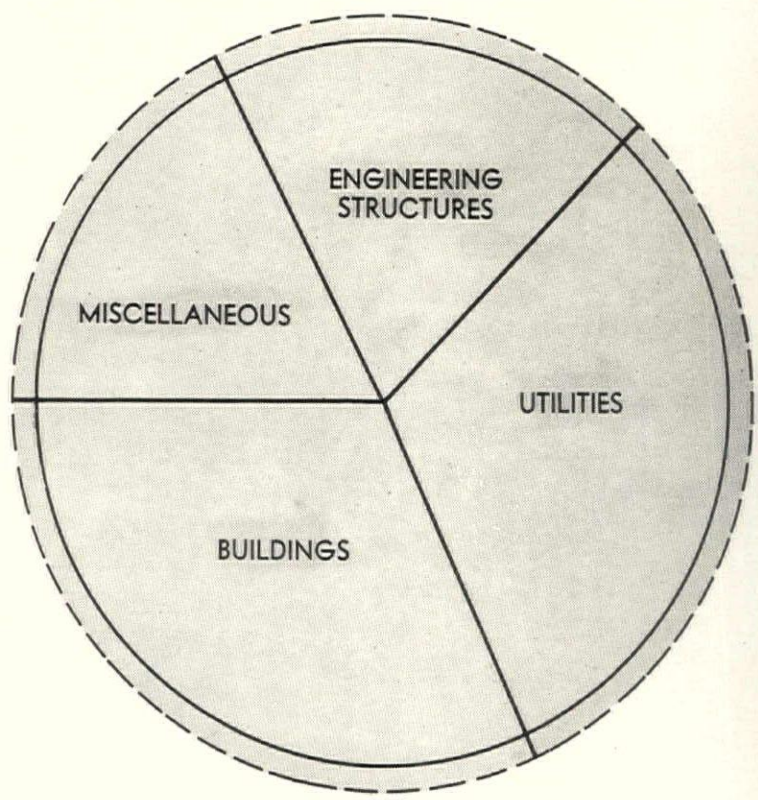
(6) Projects will be allocated to localities or relief areas in relation to the number of workers on relief rolls in those areas.

COMPARING THE OLD AND THE NEW

In charts below, the circle in solid line represents the old program, the circle in broken line represents the new.



TOTAL LOANS AND GRANTS



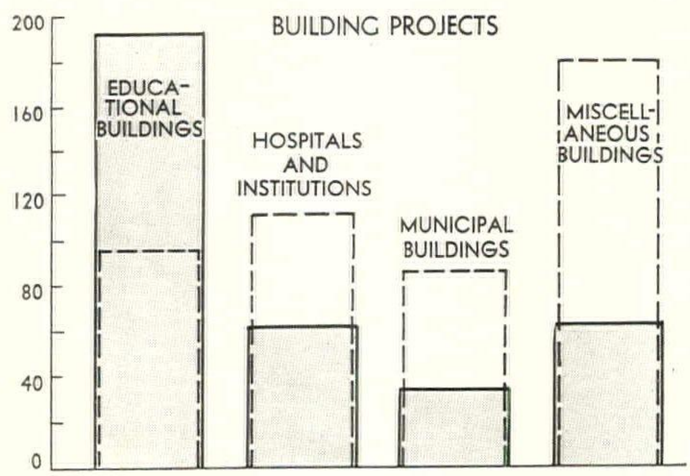
TOTAL CONSTRUCTION

PROBABILITIES UNDER THE OLD POSSIBILITIES IN THE NEW

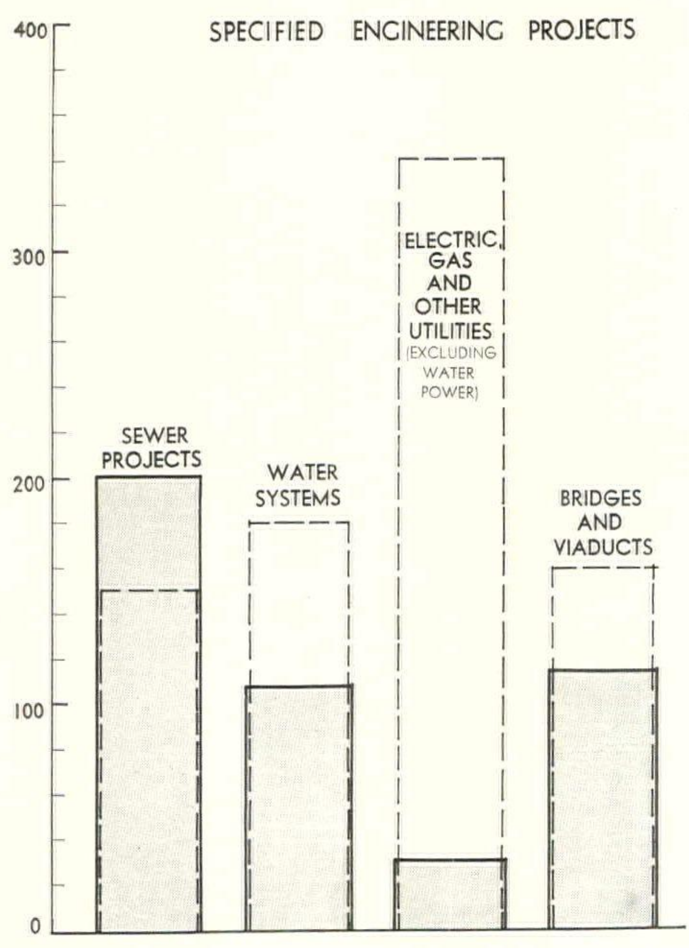
Almost two billion dollars in applications were pending for non-Federal projects in the PWA when allotments under the old program were stopped more than a year ago for lack of funds. This probably represented projects with an estimated cost of at least $2½ billions. For the most part these were well advanced as to planning and included some 2,500 individual jobs of practically every building and engineering type, and well distributed geographically.

On the basis of the inventory of potential construction projects undertaken in February of this year by the PWA, there were approximately 100,000 projects, chiefly non-Federal, estimated to cost in excess of $15 billions on which construction is locally considered as desirable. PWA officials have been quick to indicate, however, that many of these could not qualify under existing stringent PWA requirements as to legality and financial soundness.

Somewhere between the extremes of $900 million and let us say $15 billion lies the probable answer to the question: How large is the new non-Federal program likely to be?

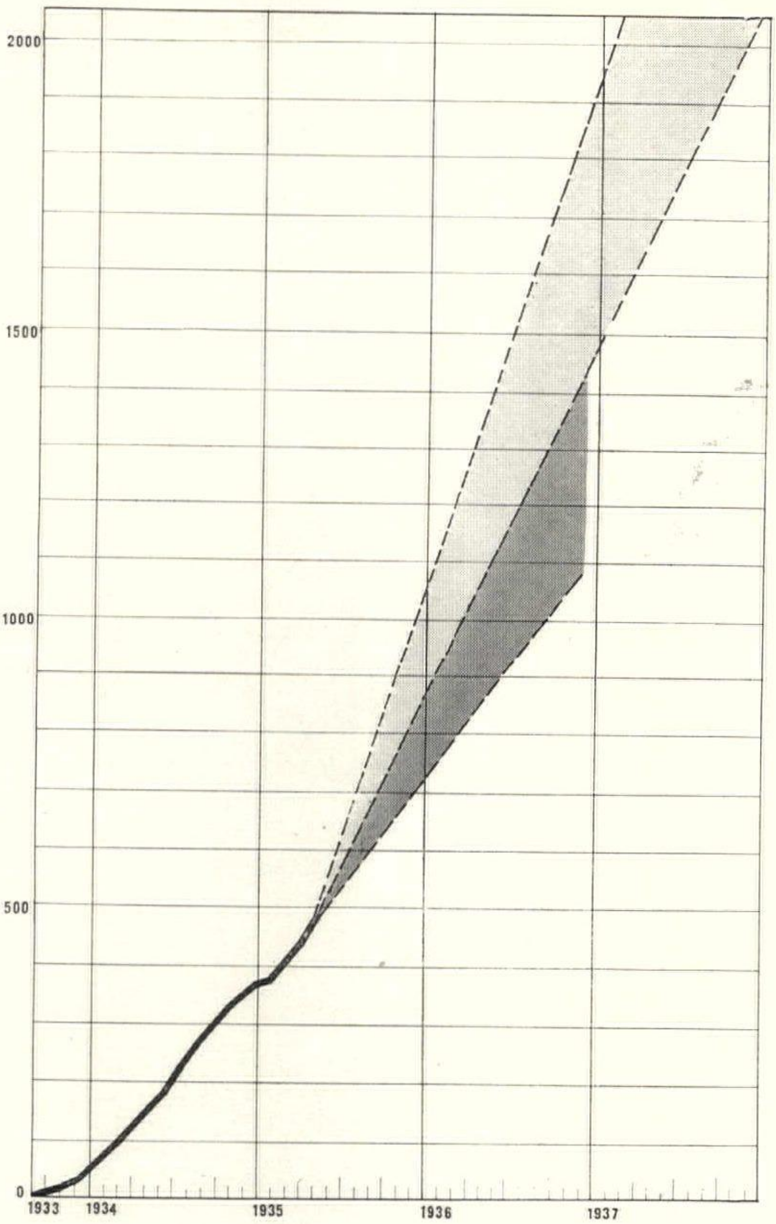


In an attempt to aid the reader in answering this question there is given in the charts to the left a comparison between the old non-Federal program and the new as it may unfold. The solid outline surrounding the shaded area indicates the estimated cost of the building types under the old; the broken outline represents the estimated cost of non-Federal buildings for which planning was well advanced when funds under the old program had all been allotted.



In the chart showing specified engineering projects the shaded portions, as explained above, likewise indicate the estimated cost of the projects under the old program. For mechanical reasons, not all engineering types have been shown; important omissions include local roads, flood control, reclamation, water works, dams, canals, channels, levees, and the like.

Singularly for both educational buildings and sewer projects the amount of planned structures likely to proceed under the new program was less than their respective estimated cost totals under the old non-Federal allotments. For electric, gas, and other utilities (excluding water power) planning had proceeded the furthest but it is here that actual construction is least likely to be materially different from results under the old program because of adverse court decisions with respect to municipally-owned gas and electric power plants.



GENERAL CONCLUSIONS

As has been indicated elsewhere, roughly $500 million of the estimated cost of all non-Federal projects made possible by the PWA program which was started in July 1933 is now either completed or under construction. More than half yet remains to get under way.

The solid line in the chart on this page represents the cumulative line of construction to May 1, 1935. This line is then arbitrarily projected on the basis of the growth indicated for the early months of 1935. On this basis of projection it would take virtually all of 1936—a period of 19 months—for the remaining projects under the old program to get under construction. The total would then be about $1,080,000,000.

But now we have a new program which has just been authorized. If the line of construction on this program cumulates at the rate of the old, starting on May 1, it would take the remainder of 1935, all of 1936 and 1937 for the two programs to be either completed or under construction. The darkly-shaded segment between the dash-lines indicates the increment added by the new only if it proceeds at the rate of the old.

Under the Act of April 8, 1935, however, the funds are available only until June 30, 1937. Hence, in order to fulfill the requirements of the legislation the new program of non-Federal construction projects would have to proceed much more rapidly than the old. For this reason the chart depicts, by the topmost dash-line of extension, the cumulative line of construction which would be formed were the current rate to continue on the old program through 1936 and the new program at twice the current rate beginning with May 1. The light shading indicates the effect of this hypothetical speeding-up, while both shaded areas together would indicate the increment due to the new program. This is all on the assumption that the $900 million fund may be employed along approximately the same lines as the $765 million under the old but is not intended as a forecast.

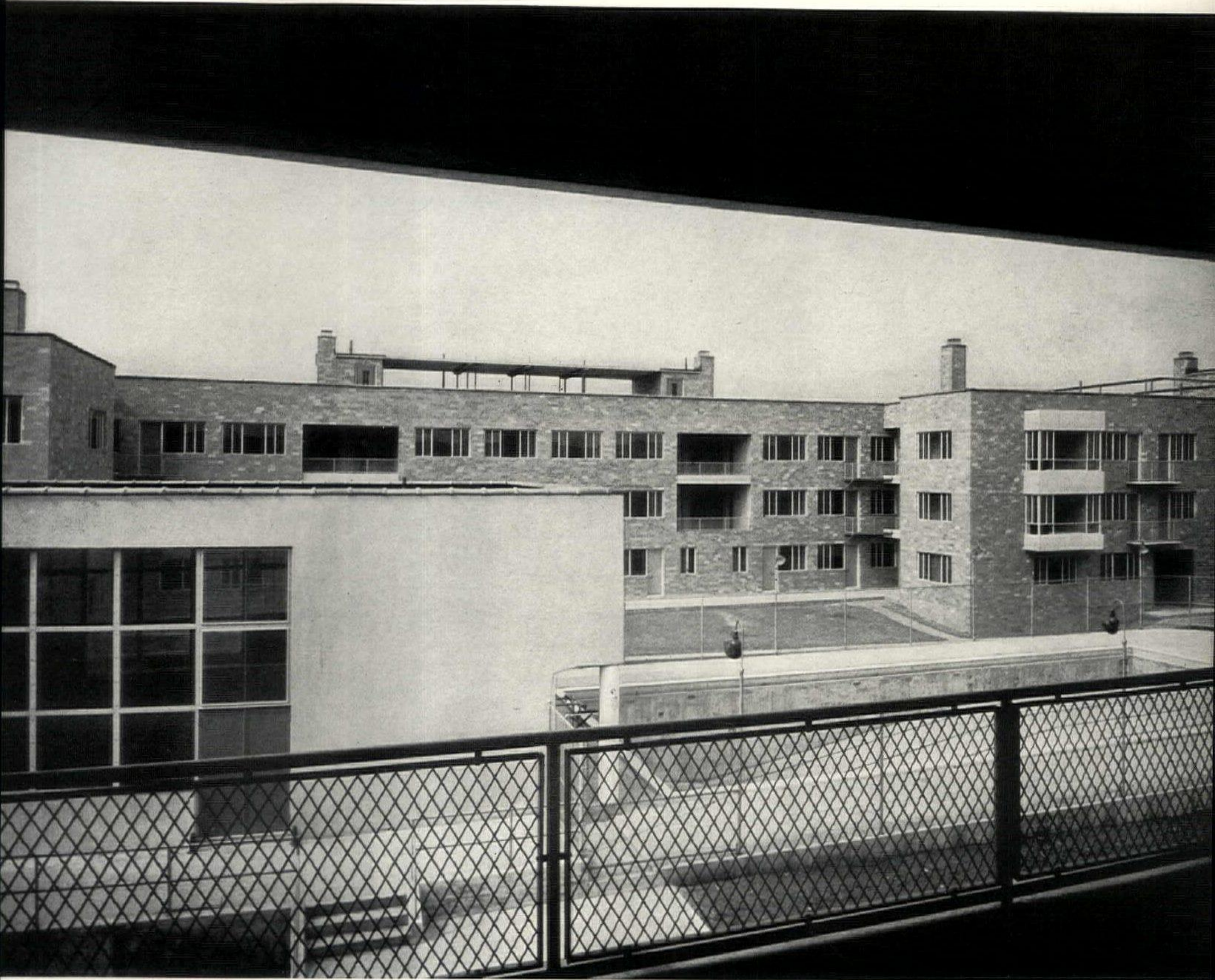
Photographs by F. S. Lincoln

LOW-RENT HOUSING

JUNIATA PARK HOUSING CORPORATION PROJECT IN PHILADELPHIA

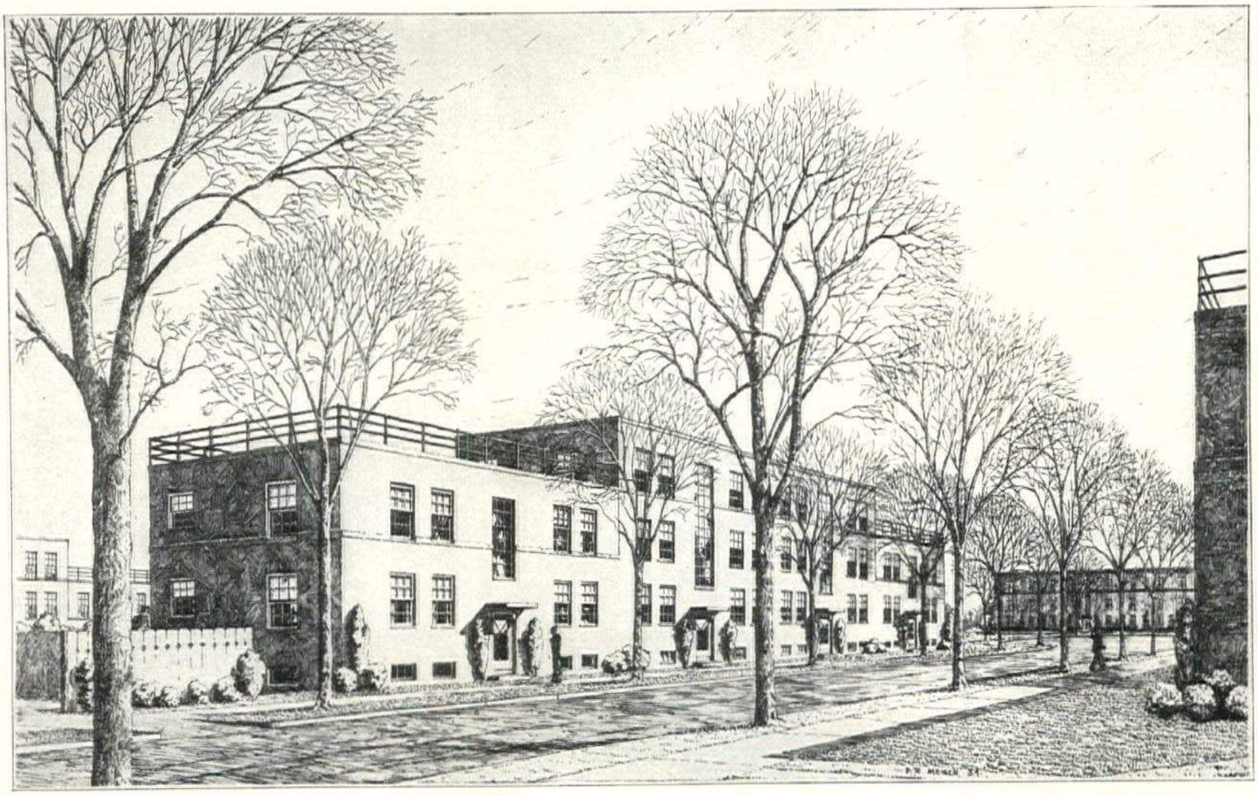
W. POPE BARNEY, ARCHITECT . KASTNER AND STONOROV, ASSOCIATES

Approximately 284 living units (1,085 rooms). PWA loan: $1,039,000.



CEDAR-CENTRAL LOW-RENT HOUSING PROJECT IN CLEVELAND — A $3,044,000 PWA DEVELOPMENT
WALTER R. McCORNACK, JOSEPH L. WEINBERG, CONRAD AND TEARE, ASSOCIATED ARCHITECTS

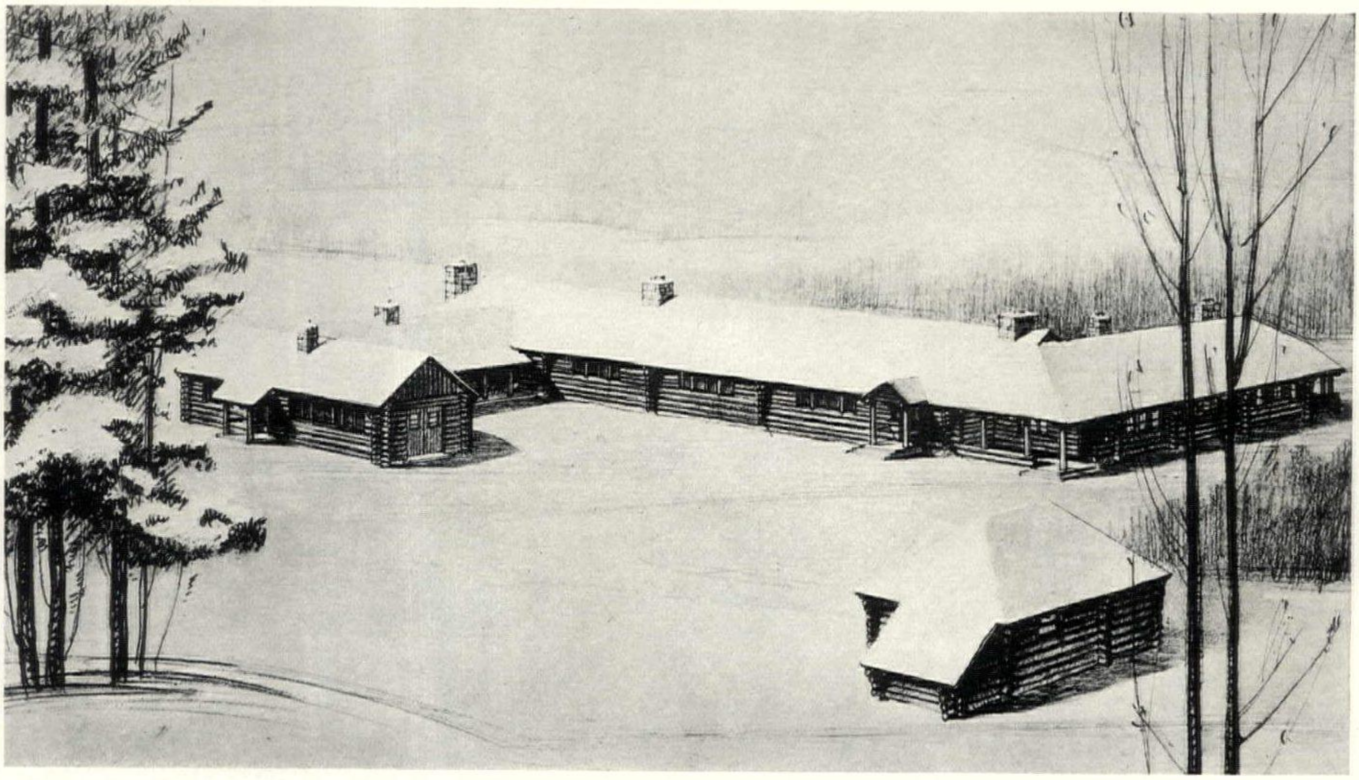
ELLIOT PARK NEIGHBORHOOD—A PROPOSED LOW-COST HOUSING PROJECT
FOR MINNEAPOLIS—STRAUS, DORR, BERSBACK AND CHAPIN, ASSOCIATED ARCHITECTS



(1) SAWMILL SCHOOL, SOUTHERN NAVAJO (ARIZONA)

(2) HOGAN DAY SCHOOL, NORTHERN NAVAJO — MAYERS, MURRAY AND PHILLIP, ARCHITECTS

Construction on the Navajo Indian Reservation in Arizona is being financed by a Public Works Administration allotment of $950,000. The old Navajo architecture is being adapted to the construction of the new buildings. The same materials which the Indians have always used—mud, stones, sticks and logs—will be employed exclusively in the work. It is an old Indian tradition that there shall be no doors and windows on the north side of the hogans, and that the entrance door shall always face the east.



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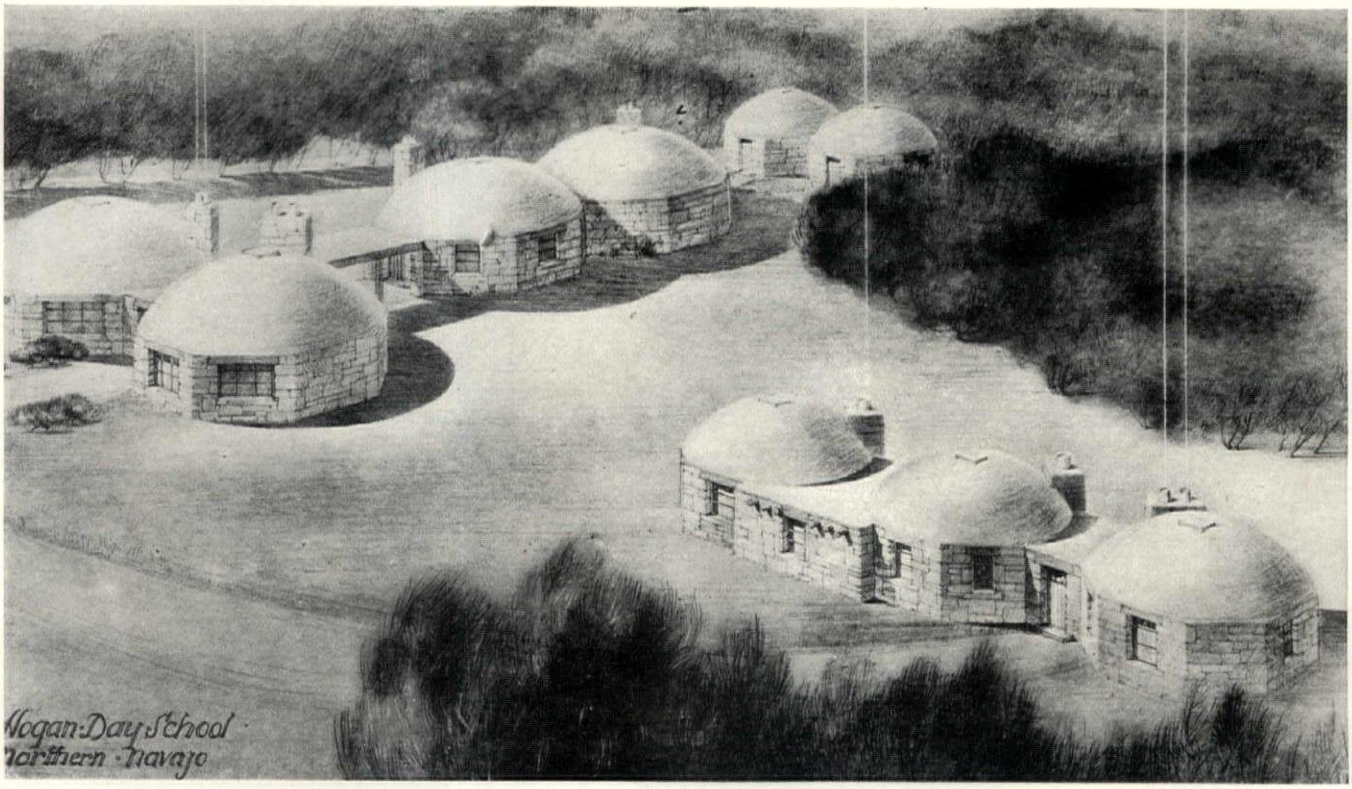
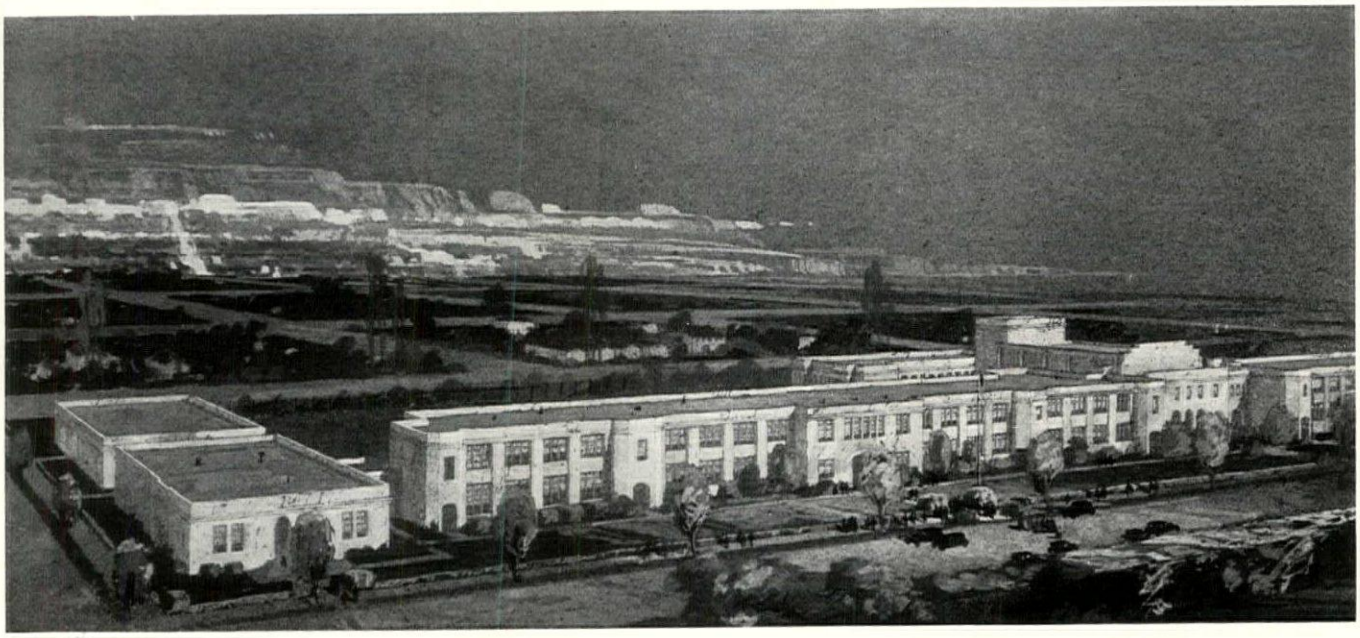


2

THOMAS A. EDISON JUNIOR HIGH SCHOOL, LOS ANGELES — A. R. WALKER AND P. A. EISEN, ARCHITECTS
(1) EXTENT OF PWA SCHOOL RECONSTRUCTION . (2) EXTERIOR OF COMPLETED SHOP BUILDING

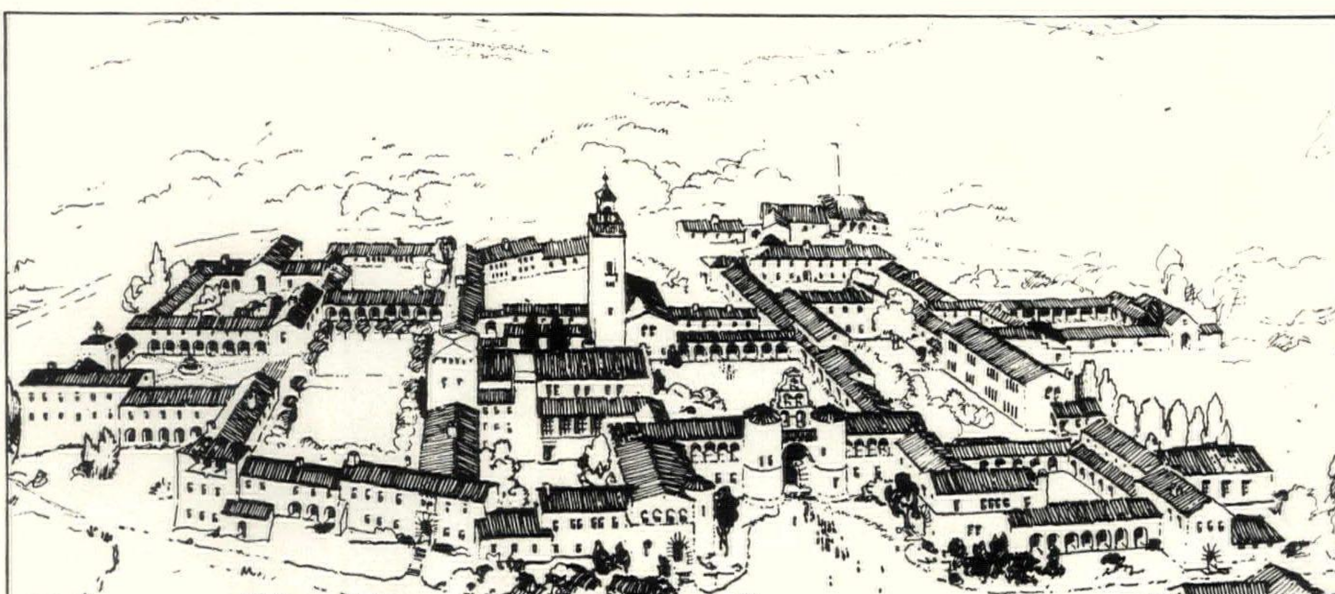

1


2

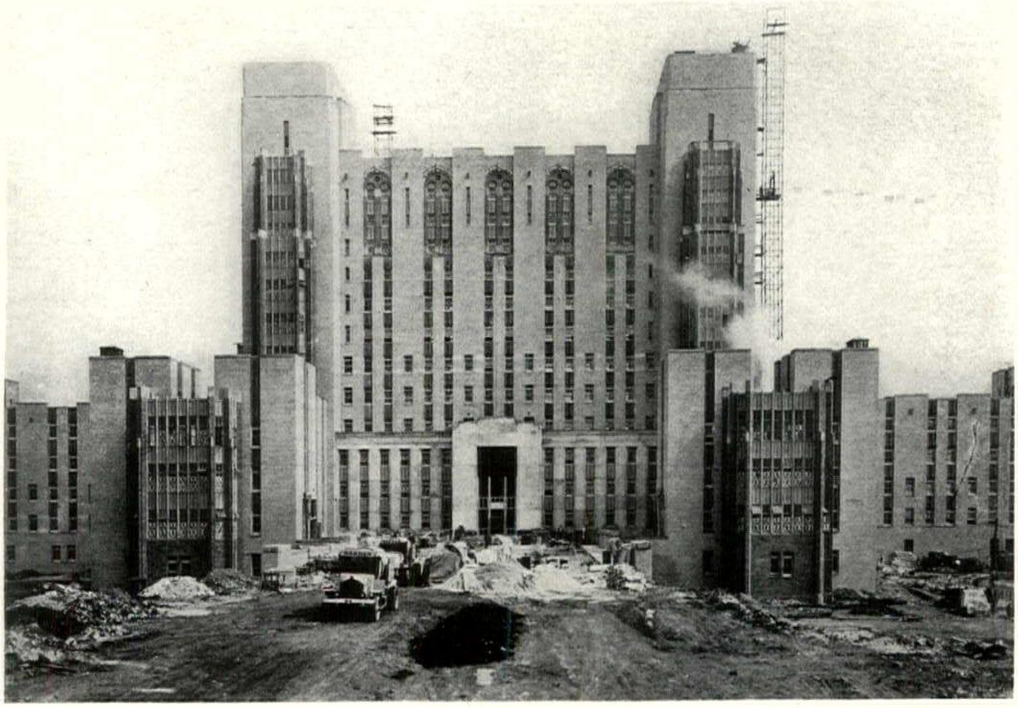
NEW DISTRICT GRADE SCHOOL BUILT BY THE GOVERNMENT AT BONNEVILLE DAM, 40 MILES EAST OF PORTLAND, OREGON

More than half the schools constructed in 1934 were financed by PWA allotments. Returns from State departments of education in 24 States show that 9,828 school building projects at an estimated cost of $241,285,254 are needed in rural areas, and returns from 1,026 cities of 2,500 population and over, or 52 per cent of the number to which questionnaires were sent by PWA, show that 2,965 building projects at an estimated cost of $384,713,768 are needed in urban areas.

NEW SAN DIEGO STATE TEACHERS COLLEGE — CALIFORNIA STATE DEPARTMENT OF PUBLIC WORKS
PRELIMINARY STUDY SHOWING PROPOSED DEVELOPMENT — GEORGE B. McDOUGALL, STATE ARCHITECT

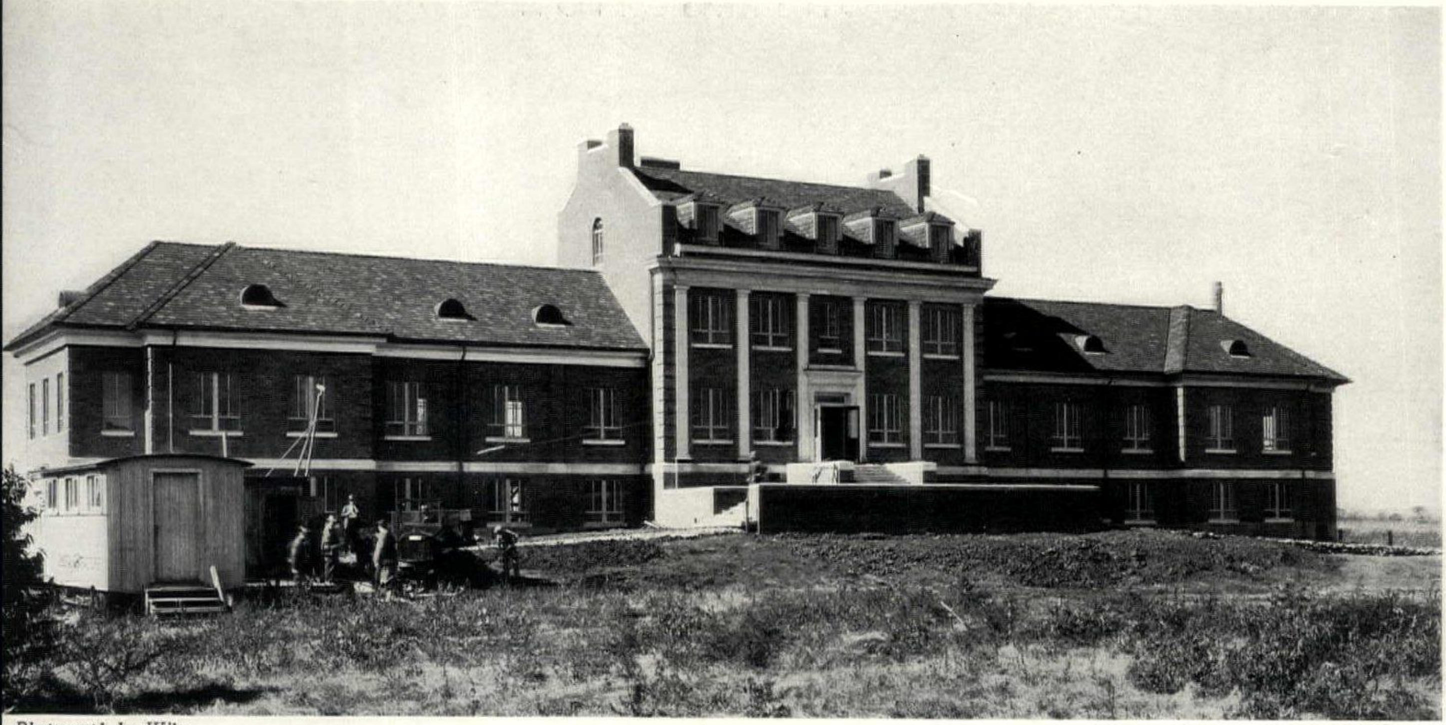


NAVY HOSPITAL, PHILADELPHIA—WALTER T. KARCHER AND LIVINGSTON SMITH, ARCHITECTS



HOSPITAL BUILDING FOR THE McLEOD INFIRMARY FLORENCE, S. C.

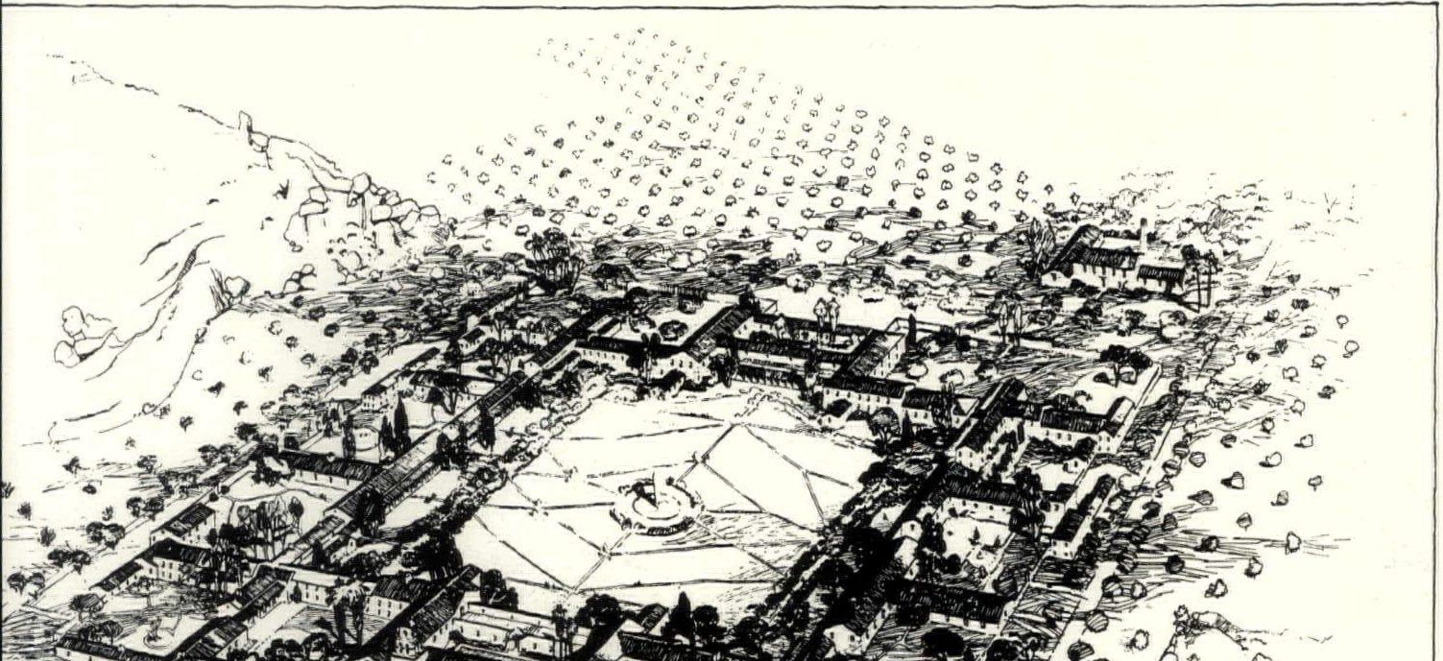
LAFAYE AND LAFAYE ARCHITECTS
F. V. HOPKINS, ASSOCIATE



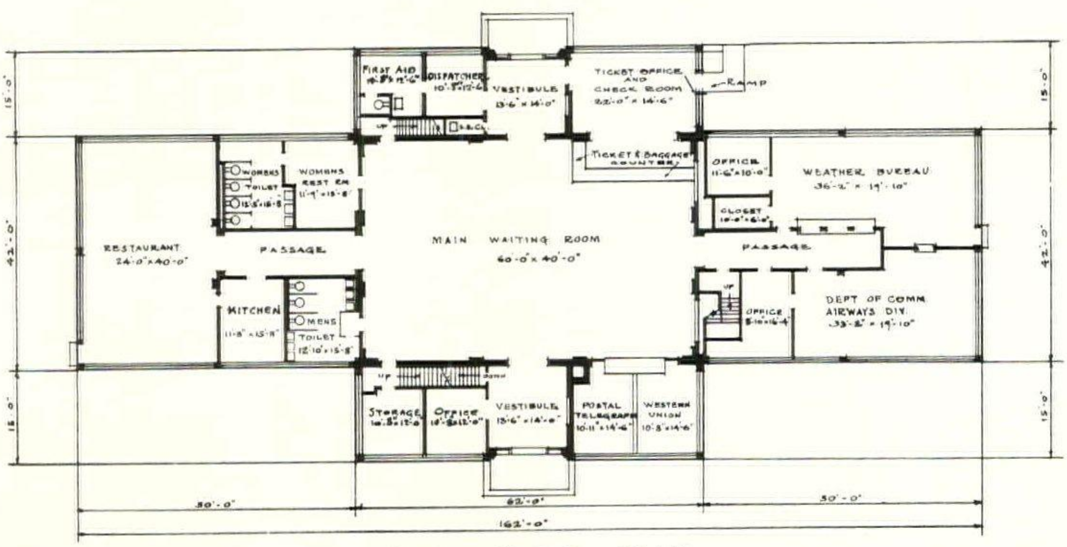
Photograph by Wiles

JOSEPH B. KNOWLES MEMORIAL HOME FOR AGED COLORED PERSONS AT NASHVILLE, TENN.
PWA GRANT: $57,400 . . . . DONALD W. SOUTHGATE, ARCHITECT

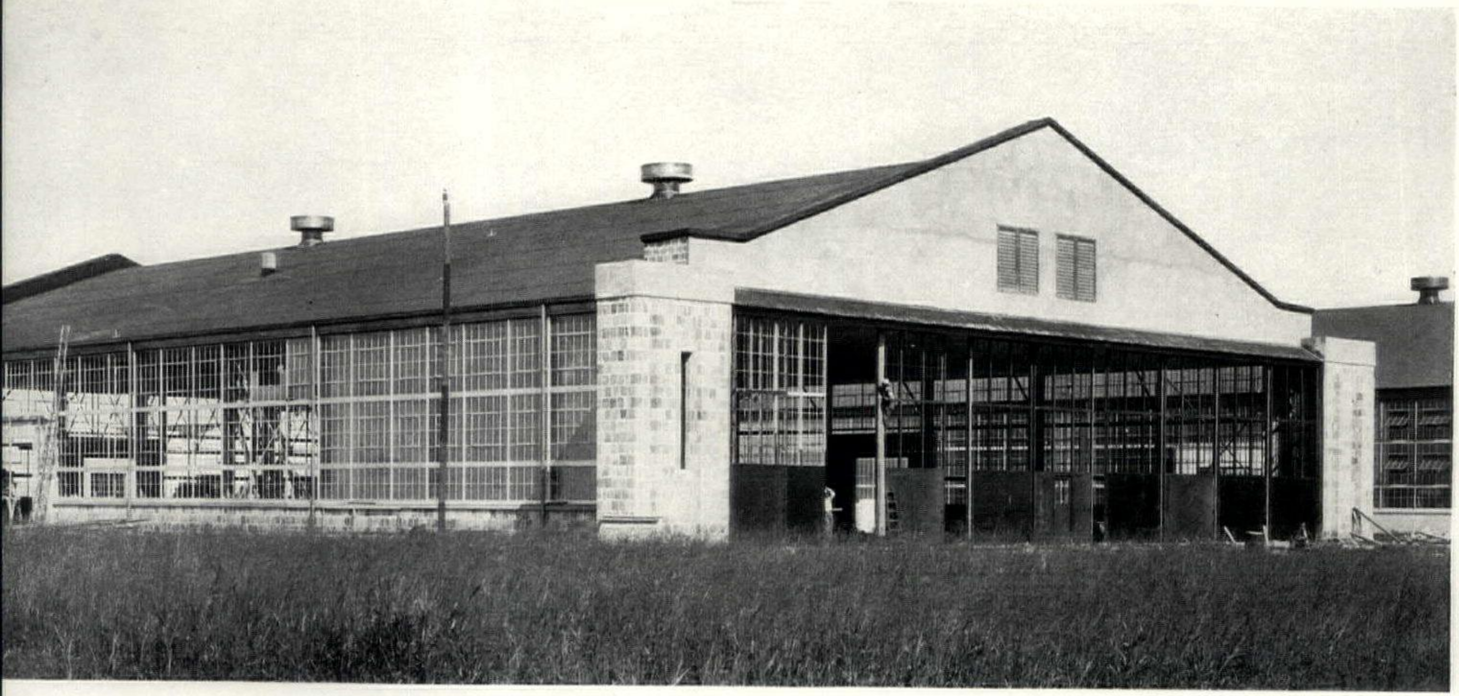
CAMARILLO STATE HOSPITAL — CALIFORNIA STATE DEPARTMENT OF PUBLIC WORKS



CHICAGO MUNICIPAL AIRPORT . . . . . PAUL GERHARDT, JR., CITY ARCHITECT

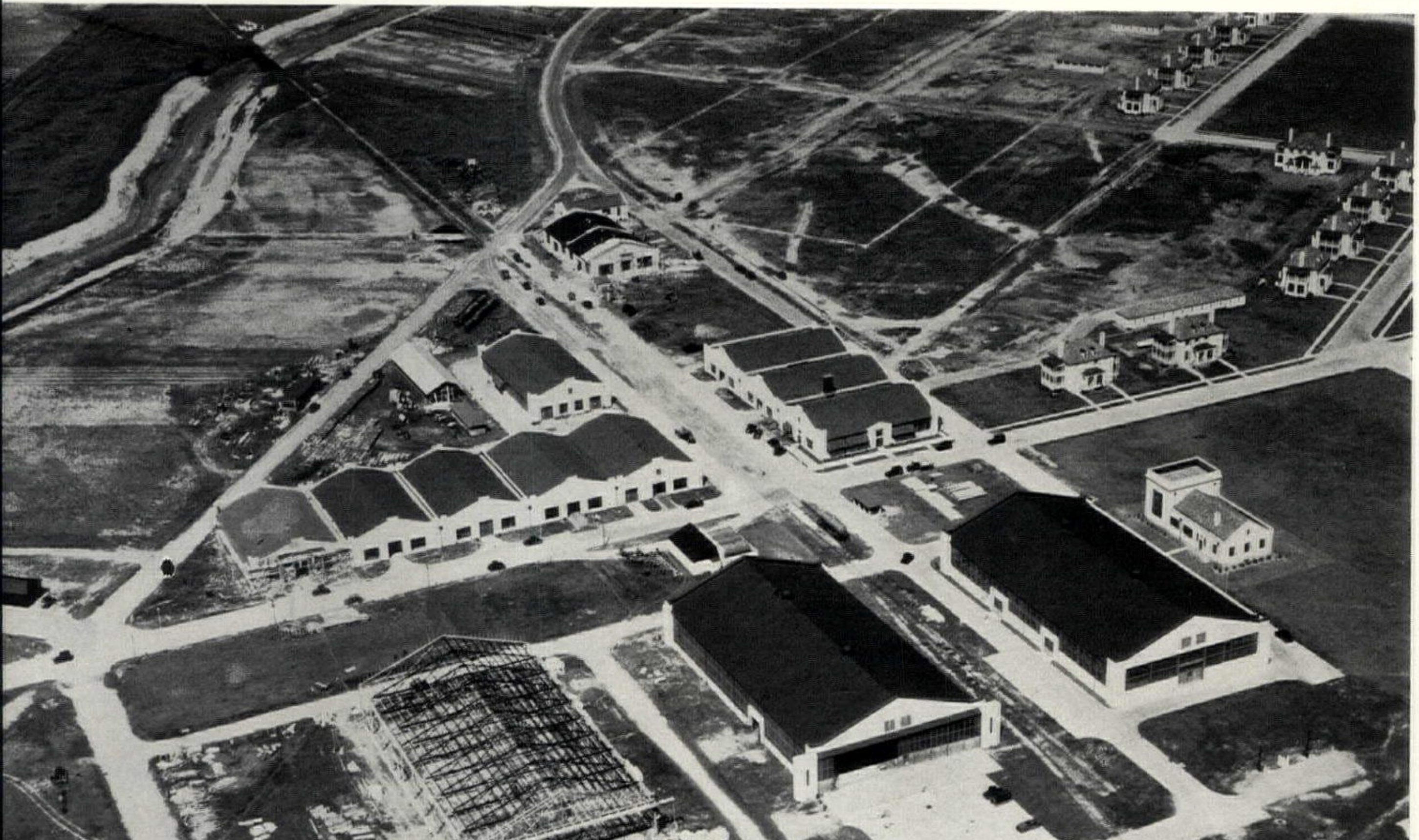


·FIRST FLOOR PLAN·

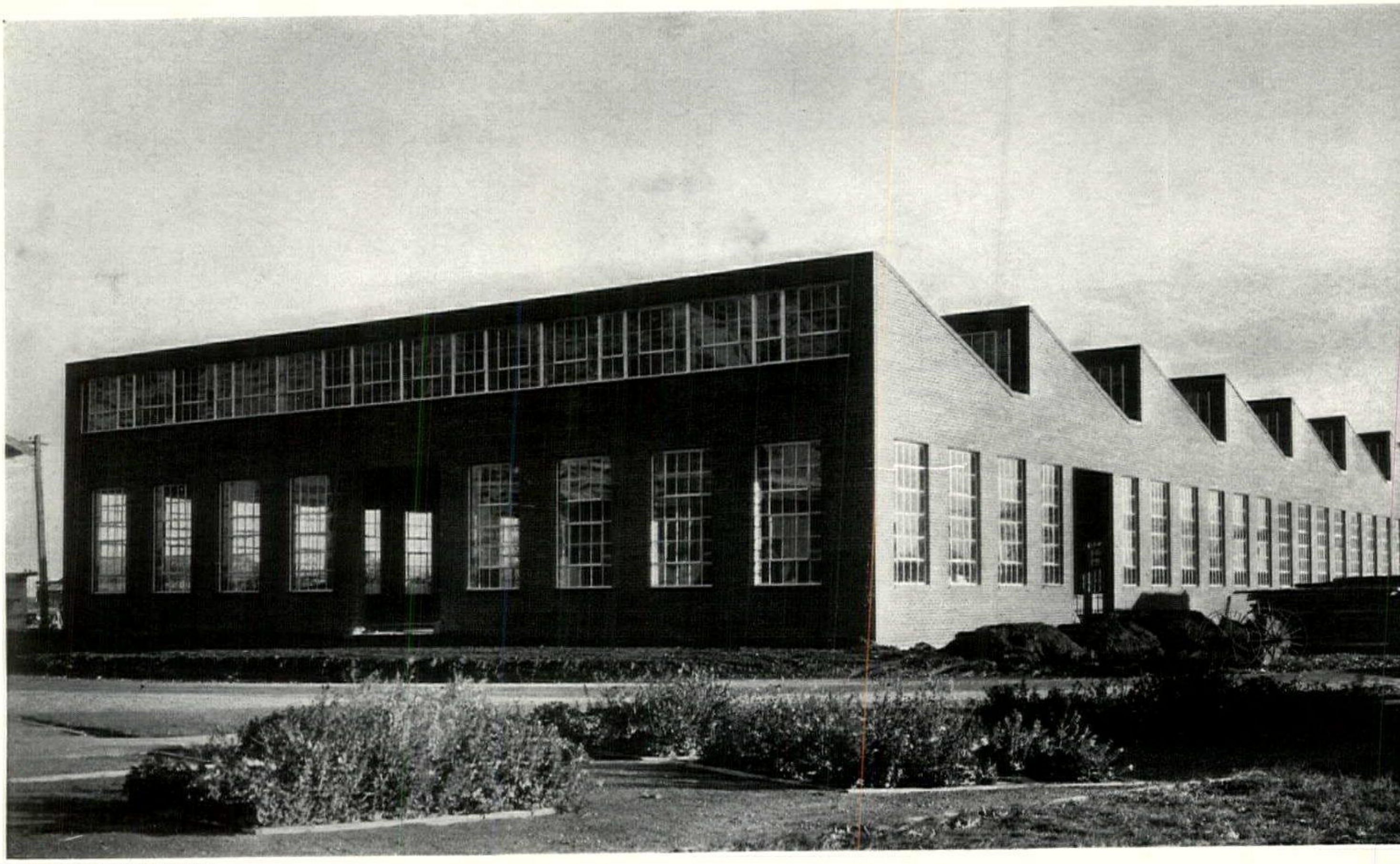


The greatest peacetime construction program in the history of the United States Army, enabled by a Public Works Administration allotment of $65,000,000 for non-military purposes, is rapidly nearing completion. Benefits of the program have been spread through 65 stations, posts and camps, located in practically every state. The program has been devoted chiefly to improving the lot of the Army's notoriously ill-housed officers and enlisted men.

BARKSDALE FIELD



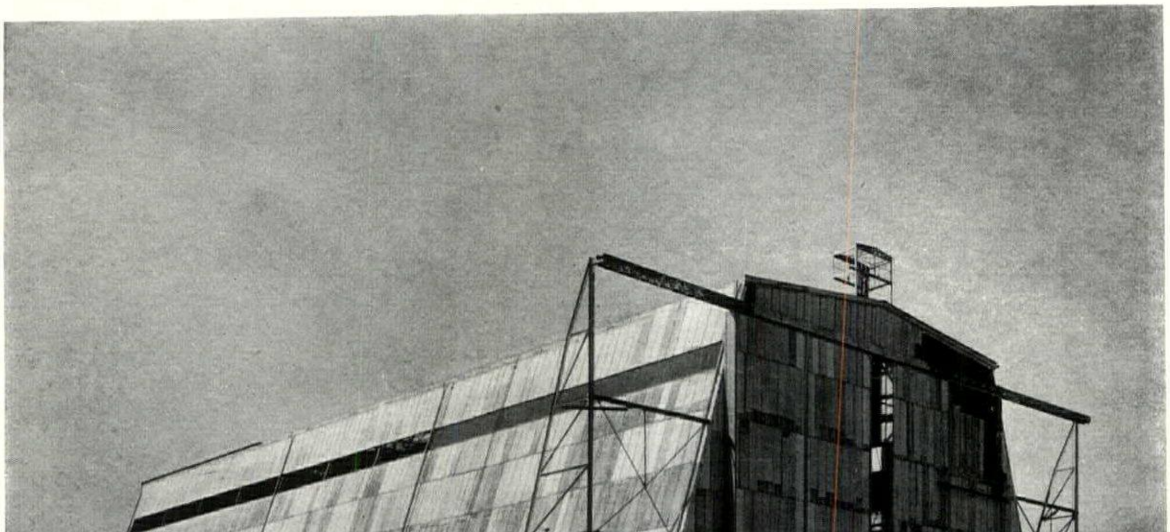
Photographs by U. S. Army Air Corps



Photograph by Cole & Co.

SIGNAL CORPS LABORATORY AT FORT MONMOUTH, NEW JERSEY — UNITED STATES ARMY

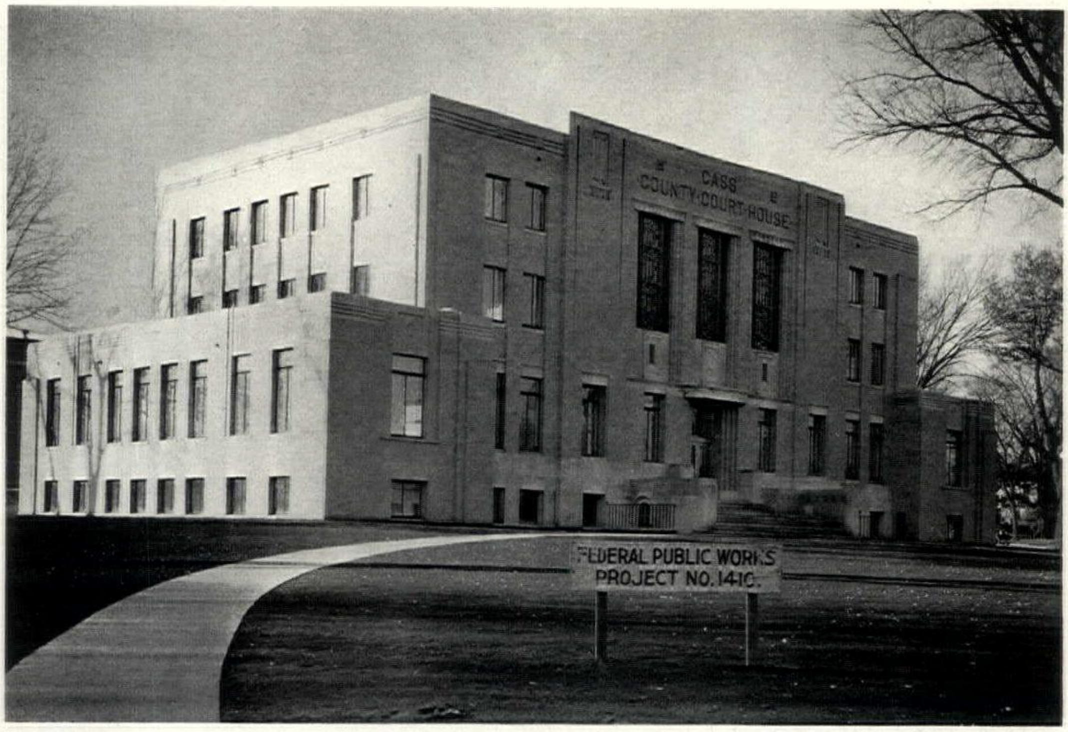
Of the total PWA apportionment to the Quartermaster General's Office, $8,300,000 was set aside for improving the plant of the Army air corps. New quarters for officers and enlisted men have been built, landing fields graded and improved, new hangars and service buildings erected.



BALLOON HANGAR
AT POPE FIELD
NORTH CAROLINA

(1) CASS COUNTY COURTHOUSE IN IOWA — PWA GRANT: $36,500
DOUGHER, RICH AND WOODBURN, ARCHITECTS AND ENGINEERS

(2) GARFIELD COUNTY COURTHOUSE AND JAIL AT ENID, OKLAHOMA
PWA GRANT: $57,000 HAWK AND PARR, ARCHITECTS



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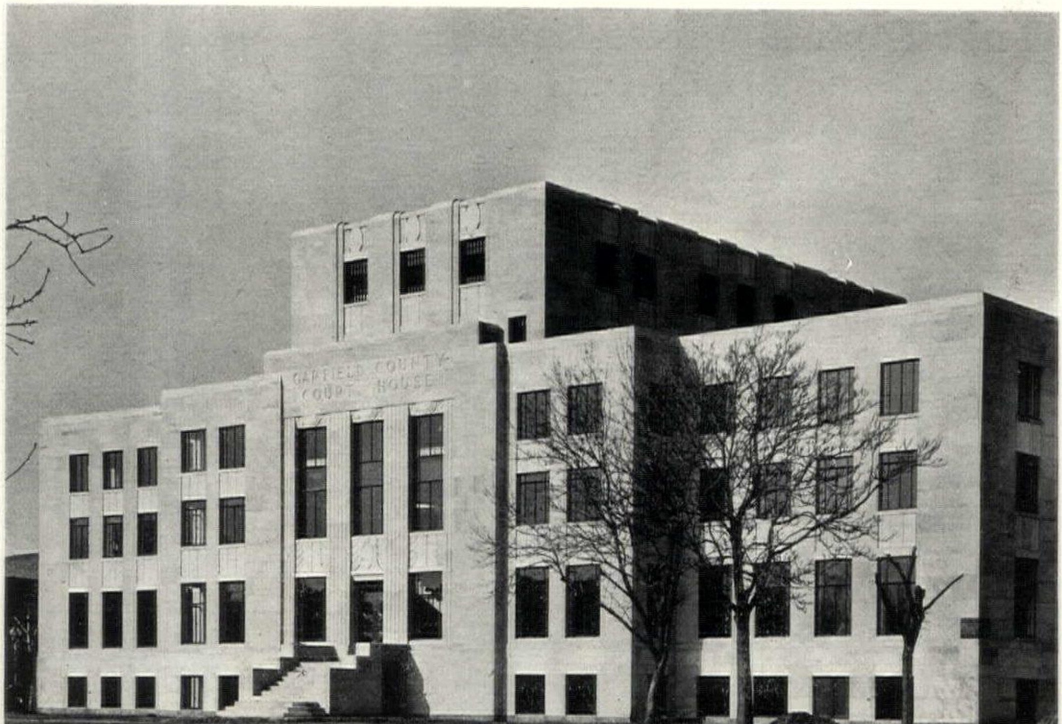
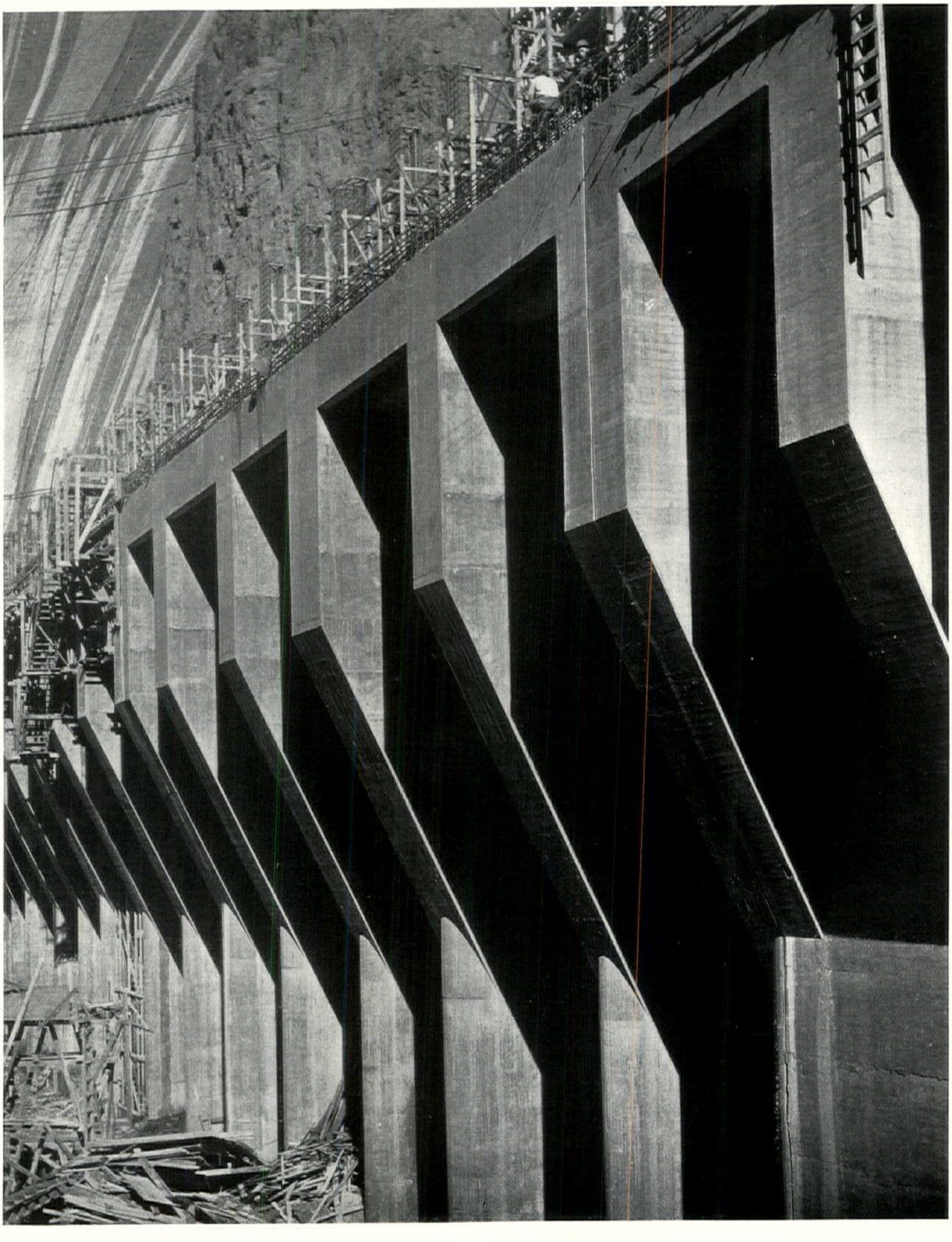
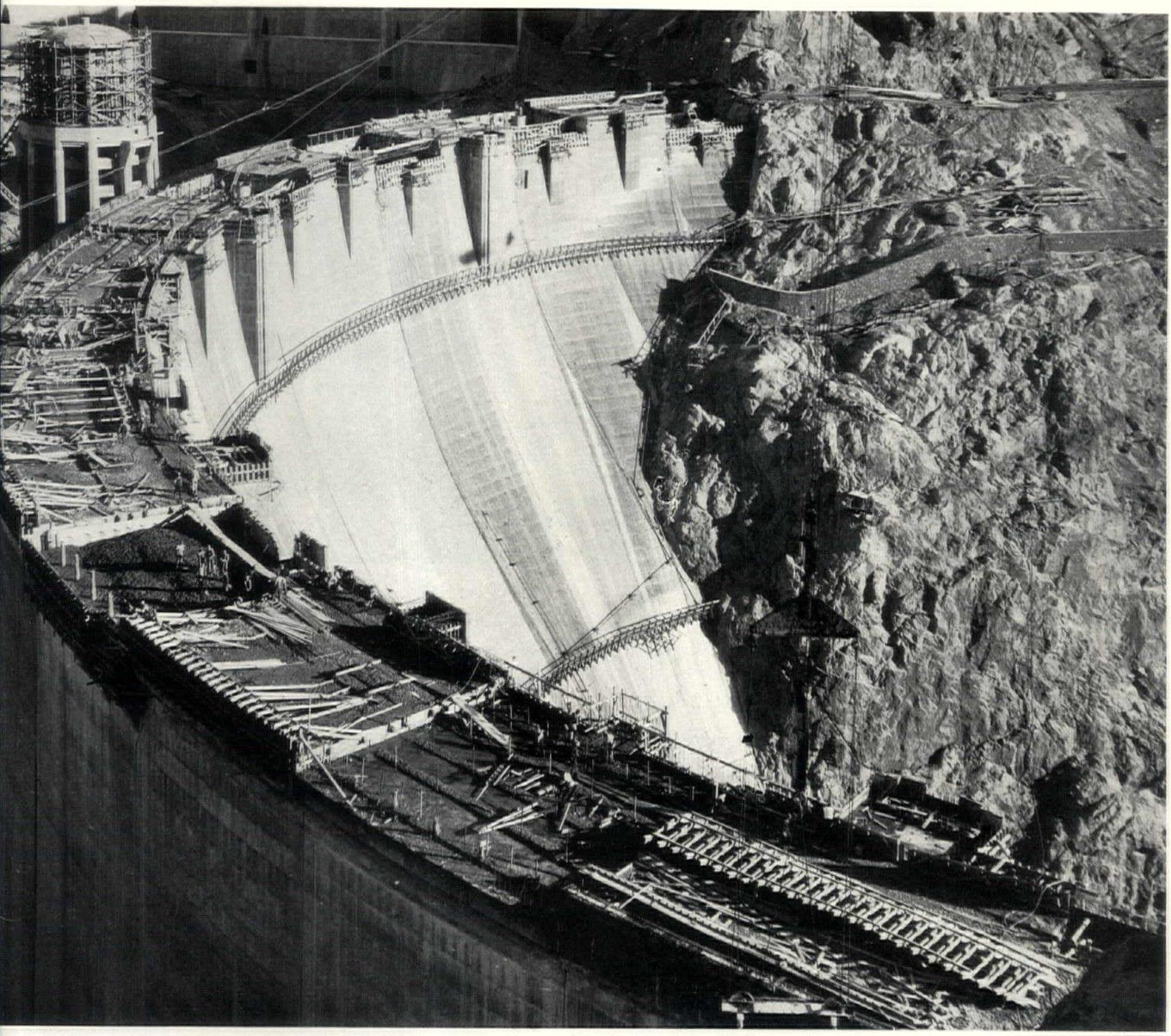


2

DRAFT TUBES OF THE POWER PLANT UNDER CONSTRUCTION AT BOULDER DAM

PWA has made allotments totaling $192,518,900 which will result in the generation and distribution of cheap electricity by publicly owned power plants and distribution systems. $146,250,000 of this money is being spent for five giant projects: the Bonneville and Grand Coulee dams and power plants on the Columbia River in the Pacific northwest section of the country, the Fort Peck dam on the Missouri River in Montana, the Boulder dam and power plant, and the Casper-Alcova project in Wyoming.

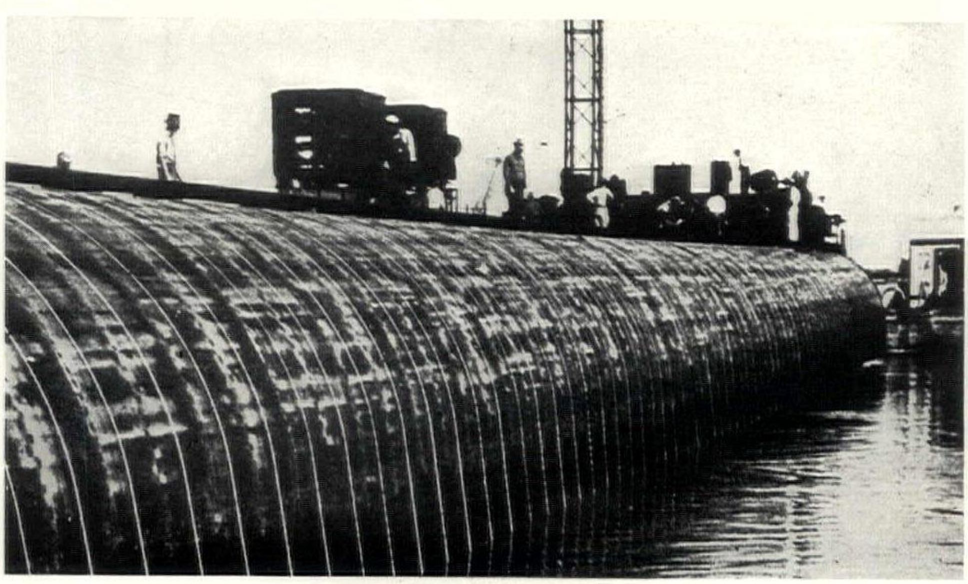


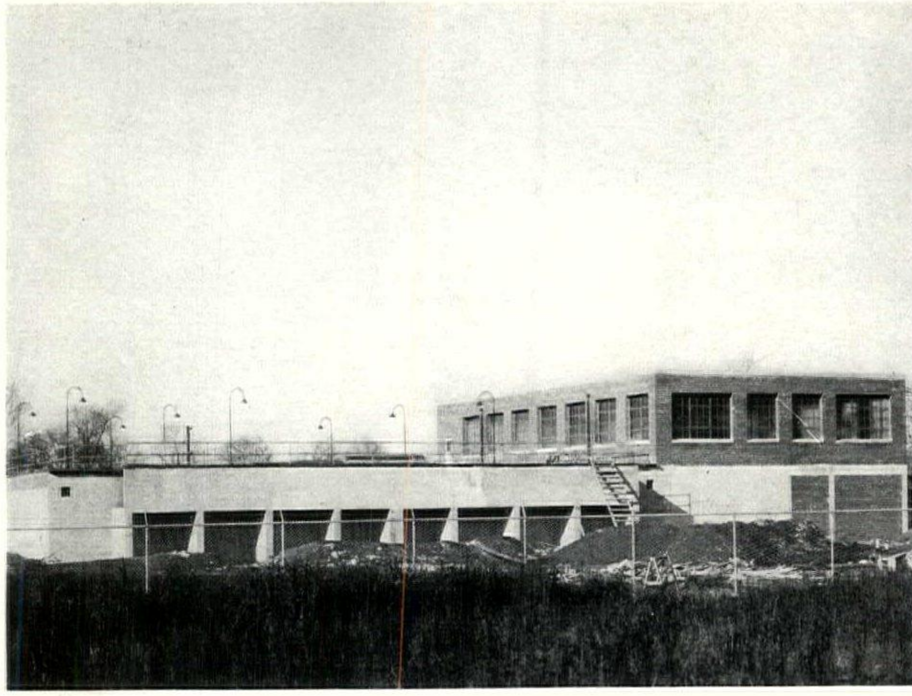


BOULDER DAM, BUILT BY BUREAU OF RECLAMATION, DEPARTMENT OF INTERIOR, WITH PWA FUNDS

SINKING AN ASPHALT MATTRESS TO PROTECT BANKS OF THE MISSISSIPPI RIVER NEAR NEW ORLEANS

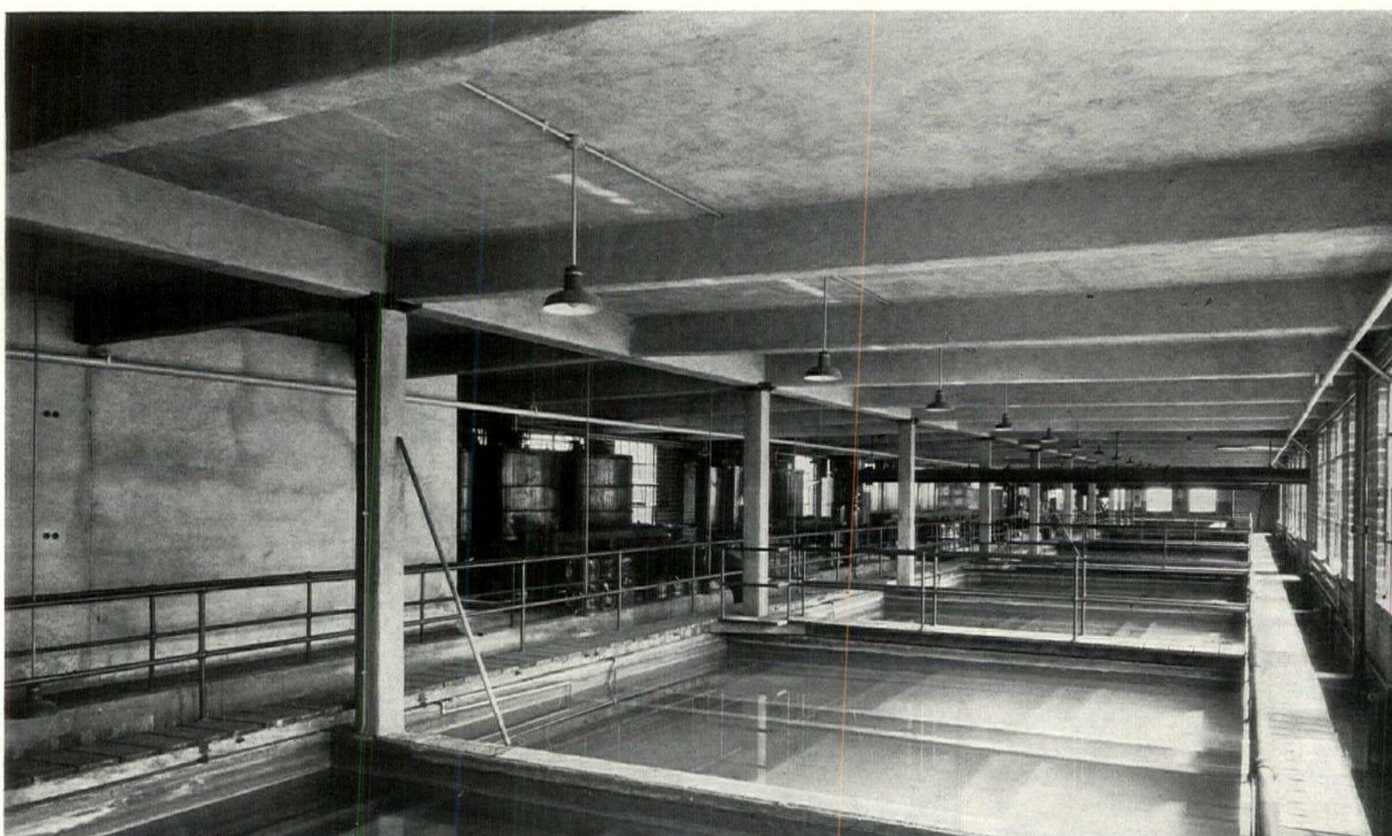
Through the allocation of $98,-500,000 in PWA funds, residents of seventy per cent of the lower Mississippi districts have been insured against disastrous floods, while in the upper river a six-foot channel has been guaranteed. A complete system of waterways will connect the Gulf and the Great Lakes and Minnesota's Twin Cities by the Mississippi; Sioux City, Iowa, and the main watercourse by the Missouri; and Pittsburgh and the Mississippi by the Ohio River.



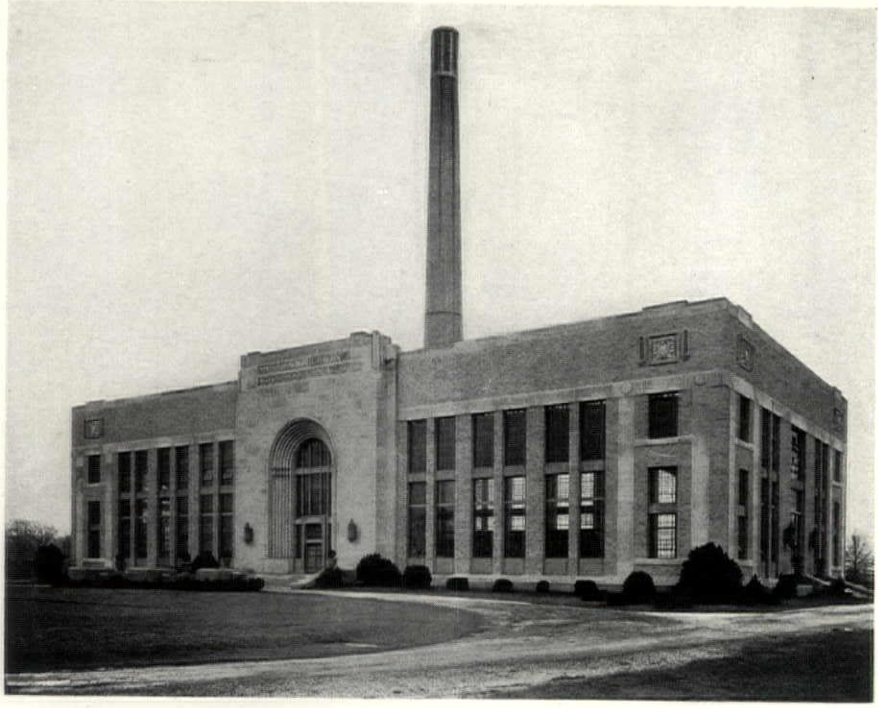


SETTLING BASIN AND FILTER PLANT . . . . . . AT ROME, GEORGIA

INTERIOR VIEW OF FILTER PLANT AT ELIZABETHTON, TENNESSEE — LOCKWOOD GREENE ENGINEERS, INC.

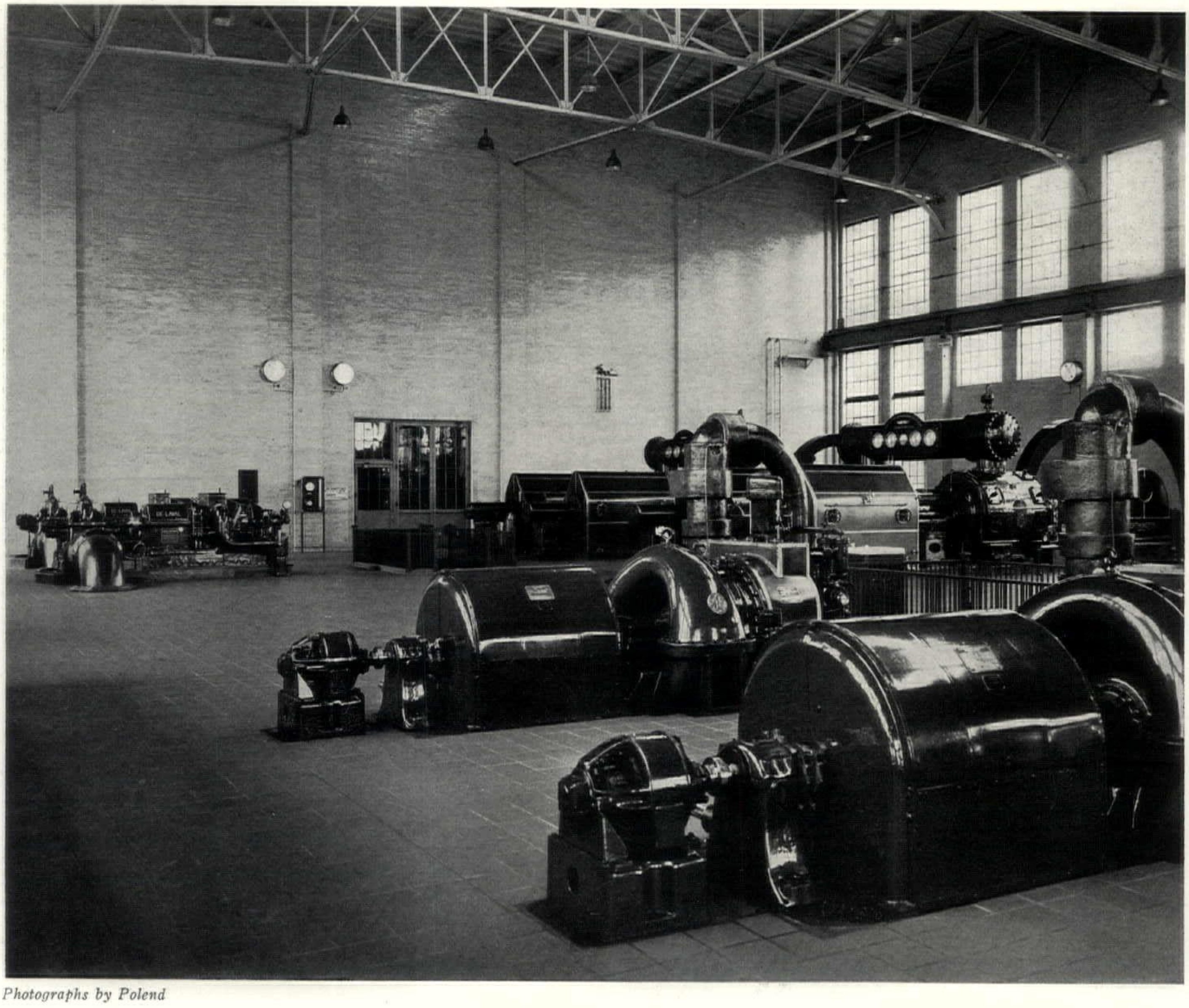


PUMPING STATION

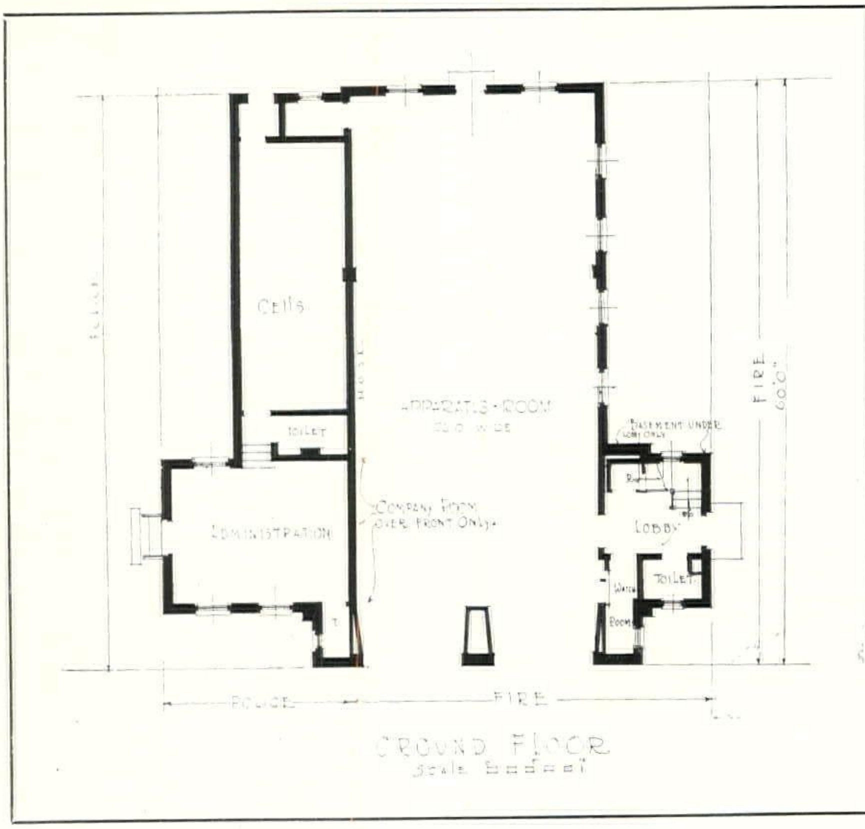


SHEAHAN PUMPING STATION . . . . AT MEMPHIS, TENNESSEE

JONES, FURBRINGER AND JONES, ARCHITECTS — FULLER & McCLINTOCK, THOMAS H. ALLEN, ENGINEERS

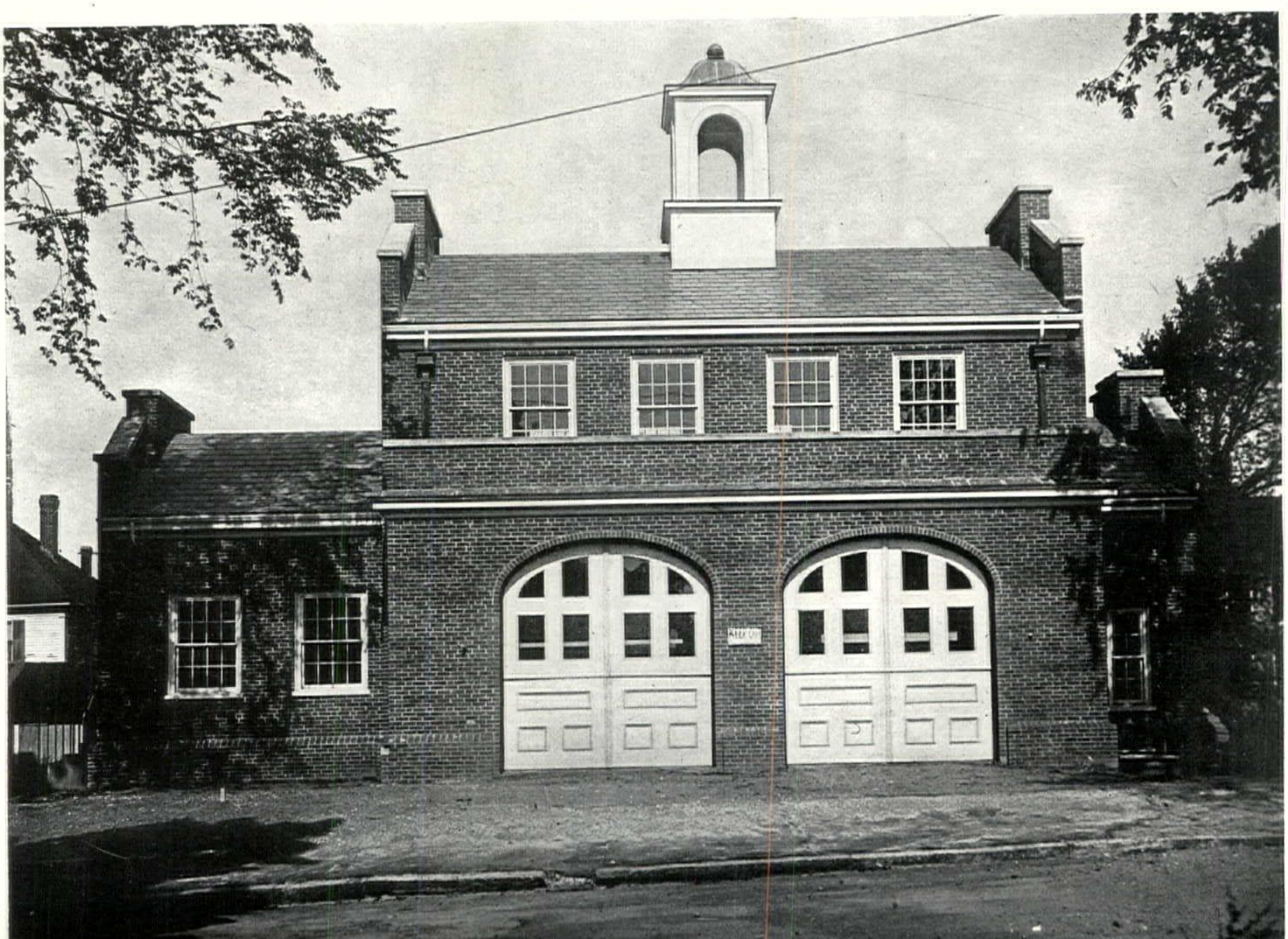


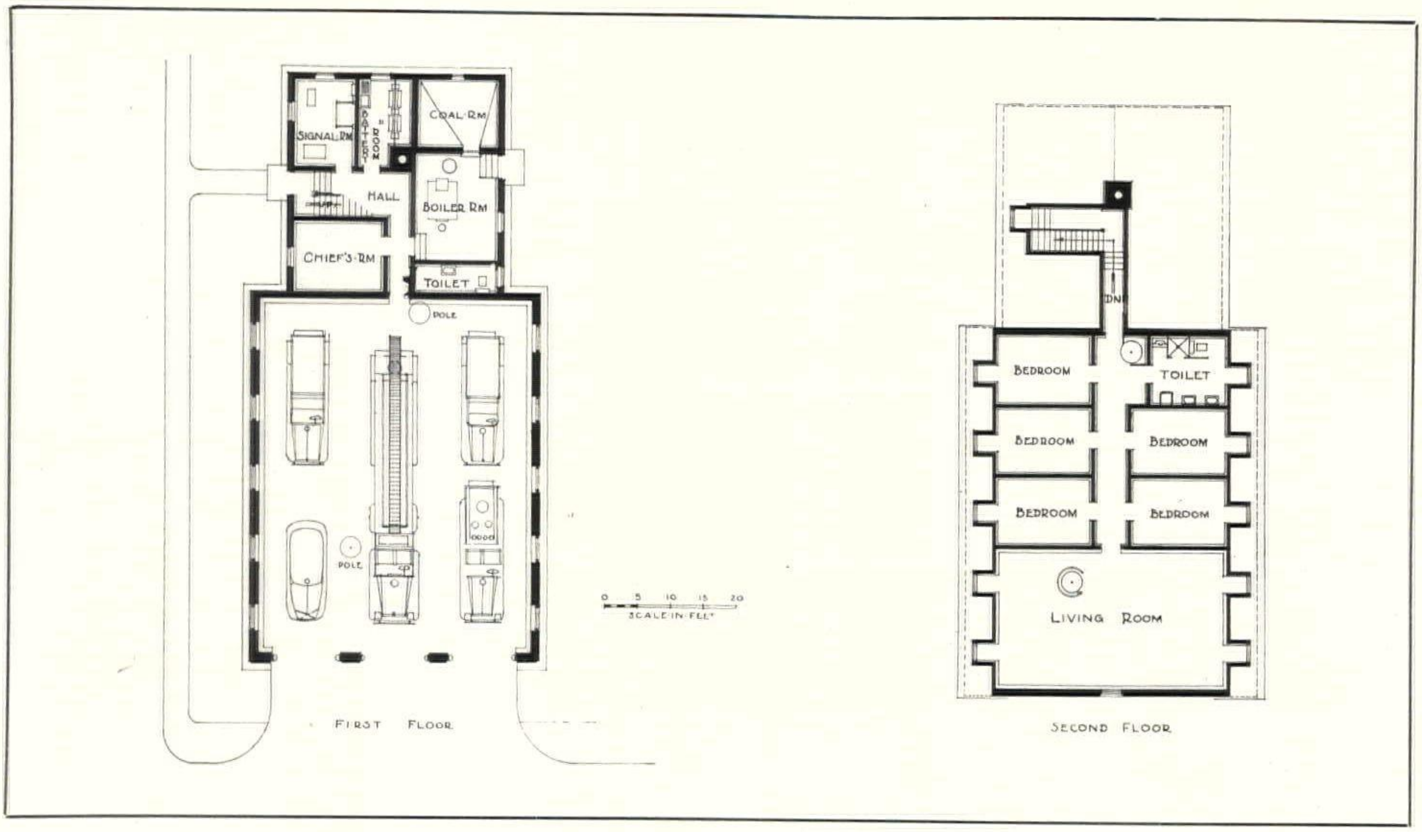
Photographs by Polend



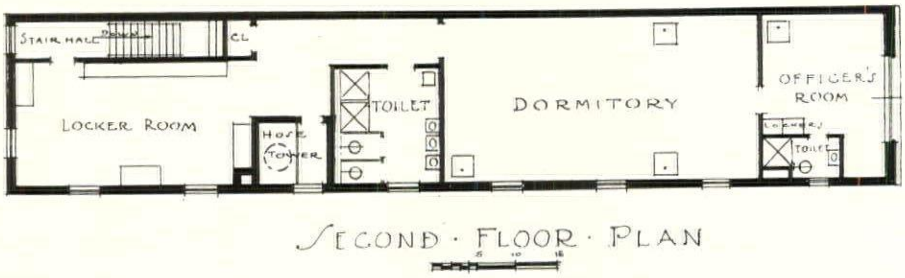
The building cost $20,000 and was built with CWA funds. It was completed in November, 1934.

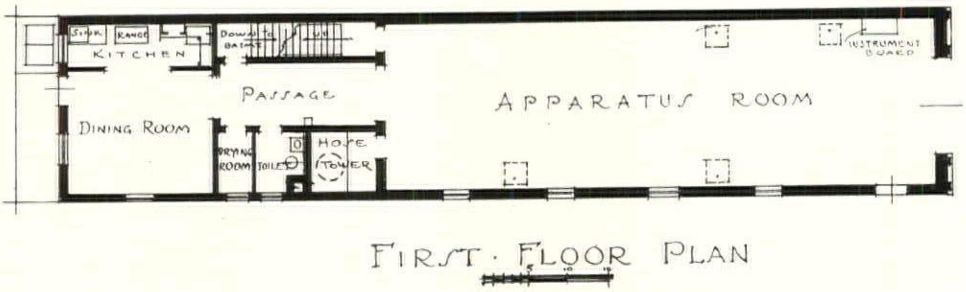
FIRE STATION AT AYER, MASSACHUSETTS . . . . . DESIGNED BY GEORGE ERNEST ROBINSON, ARCHITECT

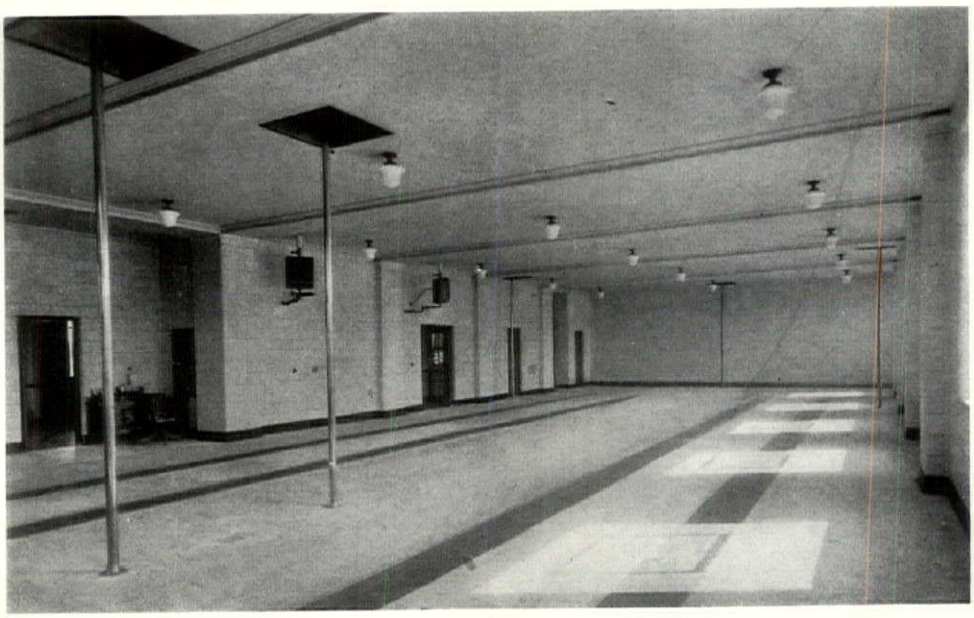




CENTRAL FIRE STATION AT NANTUCKET, MASSACHUSETTS . . . . LITTLE AND RUSSELL, ARCHITECTS

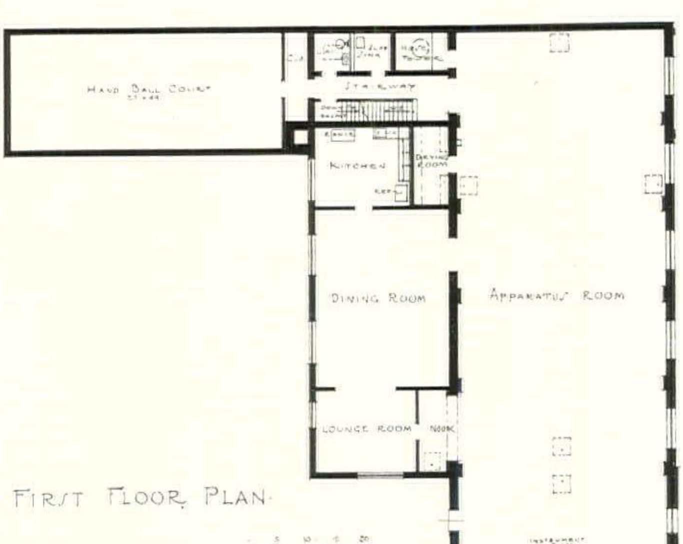


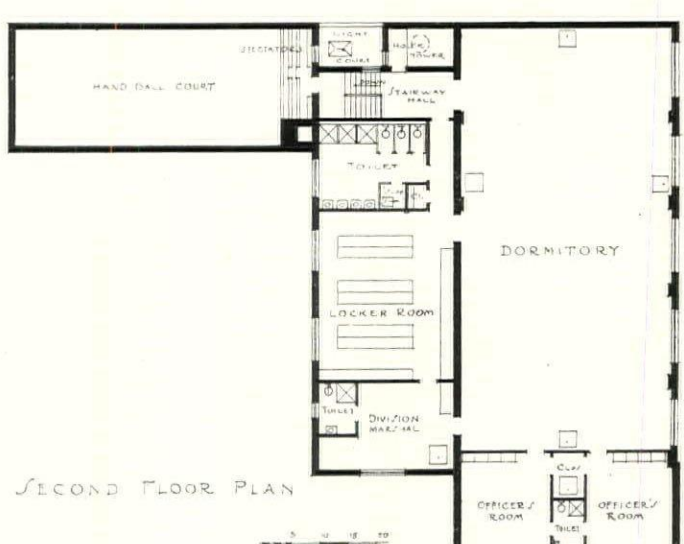


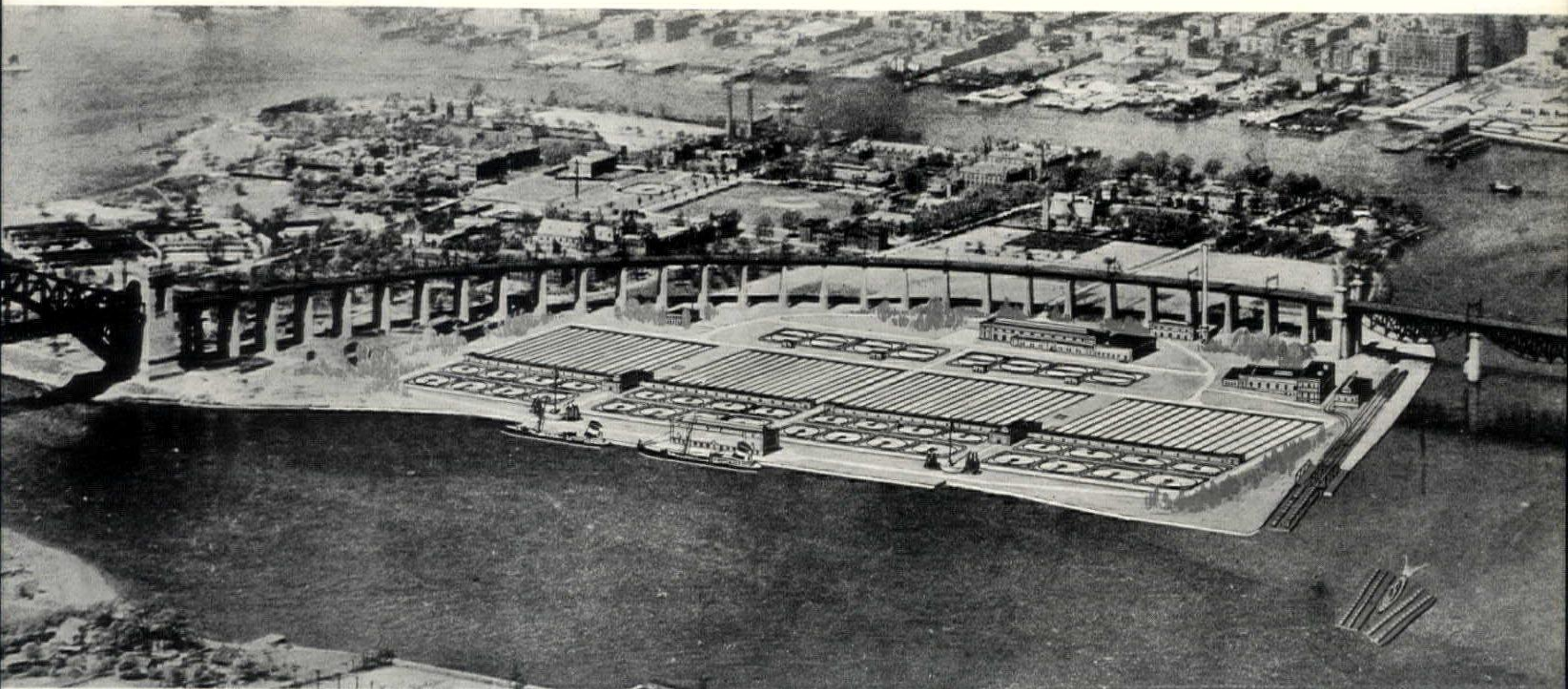


INTERIOR AND PLANS OF FIRE STATION AT 4911 BELMONT AVENUE, CHICAGO

PLANS OF FIRE STATION AT 9311 SOUTH CHICAGO AVENUE, CHICAGO — PAUL GERHARDT, JR., CITY ARCHITECT



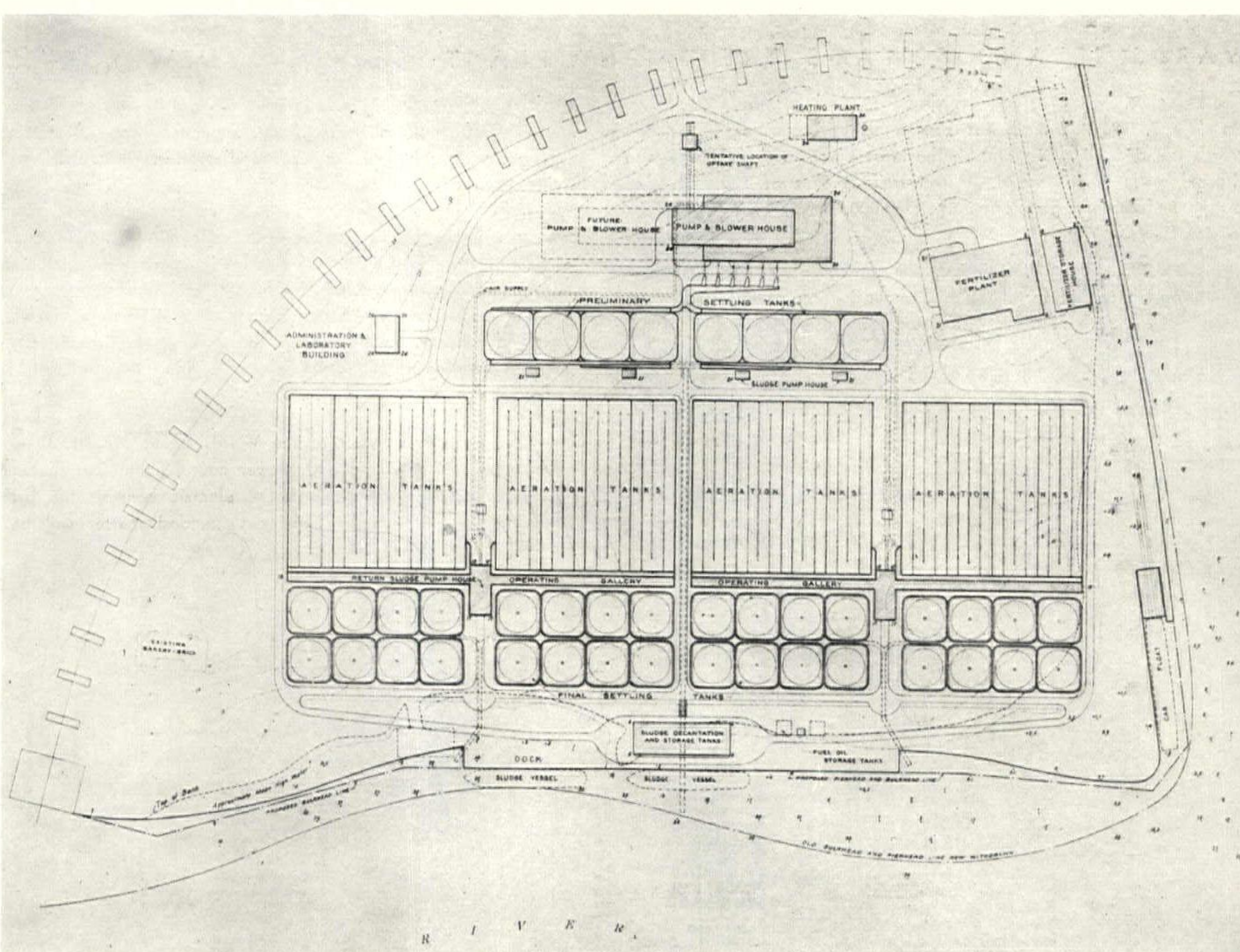


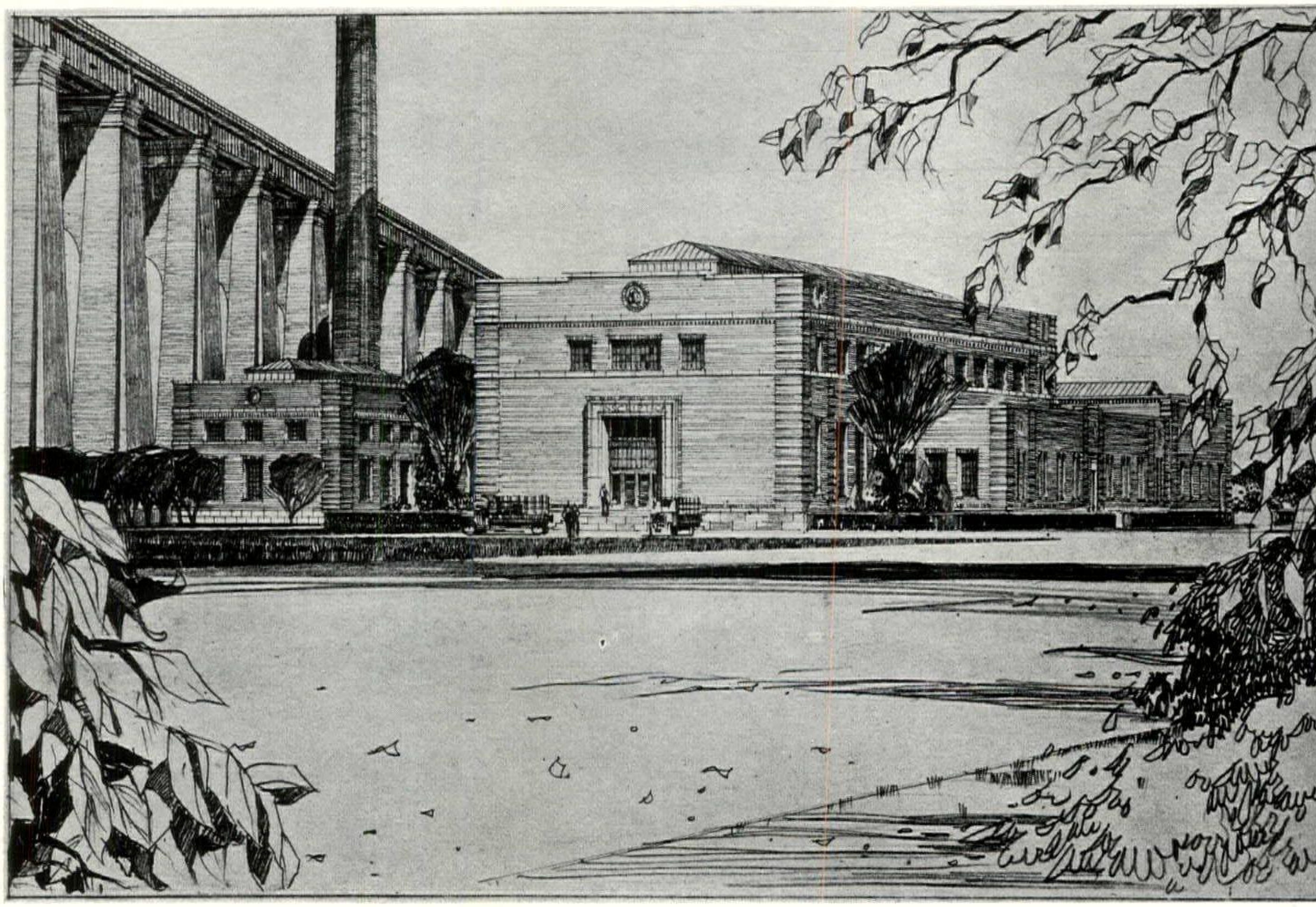


WARDS ISLAND SEWAGE TREATMENT WORKS, NEW YORK CITY

DETAILED DESIGN BY FULLER & McCLINTOCK IN COLLABORATION WITH CITY'S ENGINEERS

SLOAN AND ROBERTSON, ARCHITECTS — NOEL CHAMBERLIN, LANDSCAPE ARCHITECT





HEATING PLANT AND PUMP AND BLOWER HOUSE

WARDS ISLAND SEWAGE TREATMENT PLANT . . . . . NEW YORK CITY

On July 7, 1931, ground was broken for the construction of the Wards Island plant, which will be the largest activated sludge sewage disposal works in the world. It will treat a flow of 180 m.g.d. of sewage and serve a population of 1,350,000, nearly one-fifth that of greater New York.

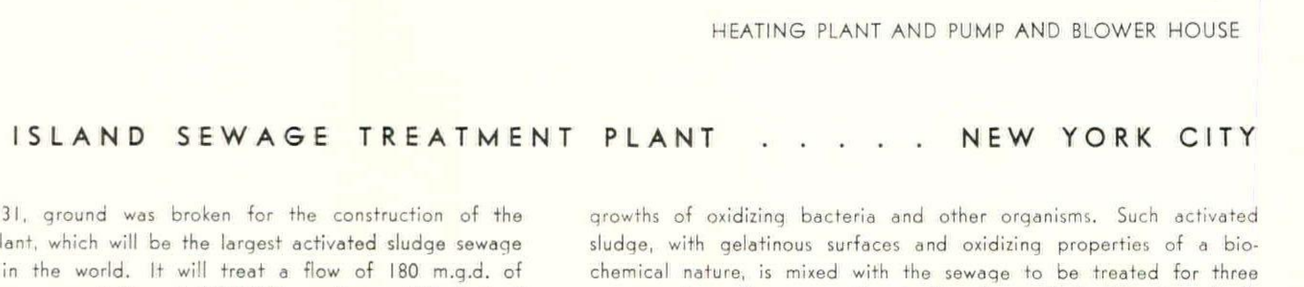
This $30,000,000 plant, with its collecting works, is the first part of a program calling for the ultimate purification of all the sewage entering New York Harbor. The volume of domestic and industrial waste and of spent water now entering the harbor approaches a billion and a half gallons daily.

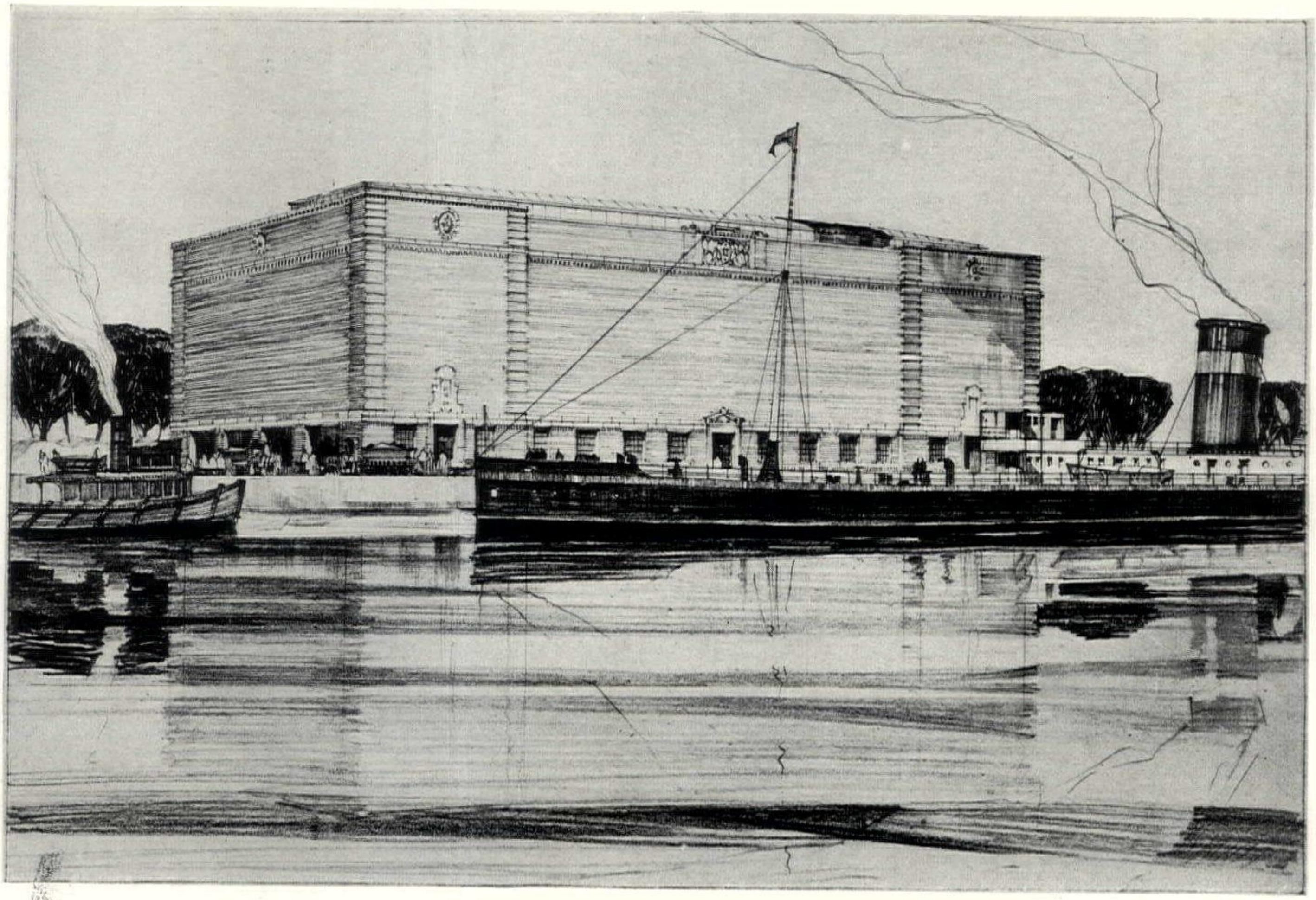
The activated sludge process and plant, as described by George W. Fuller in a paper presented before the American Society of Civil Engineers:

"Sludge is activated by aerating sewage for a sufficient time to permit the solid particles to become coated and impregnated with growths of oxidizing bacteria and other organisms. Such activated sludge, with gelatinous surfaces and oxidizing properties of a bio-chemical nature, is mixed with the sewage to be treated for three or more hours in an aerating tank well supplied with atmospheric oxygen. Here the suspended and colloidal matter in the sewage becomes attached to the activated sludge particles, and the dissolved organic matter is oxidized by the bacteria and their enzymes. The sludge is then separated by sedimentation, leaving a clear and well purified effluent. A portion of the sludge is returned to the inlet of the aeration tank and the excess is dried for use as a fertilizer, or otherwise disposed of . . . .

"In the general layout of the Wards Island project, the principal structures are the pump and blower house, containing the main sewage pumps, the blowers, and the electric control; the preliminary settling tanks, where the heavier suspended matter will be settled

CROSS-SECT





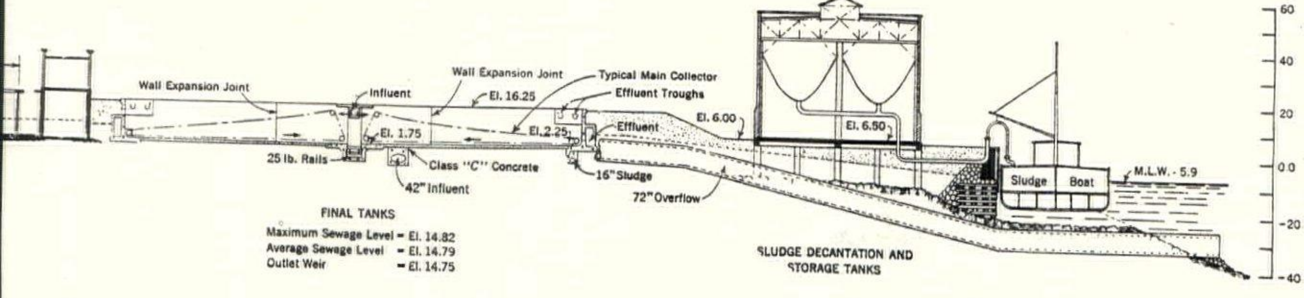
SLUDGE DECANTATION AND STORAGE BUILDING

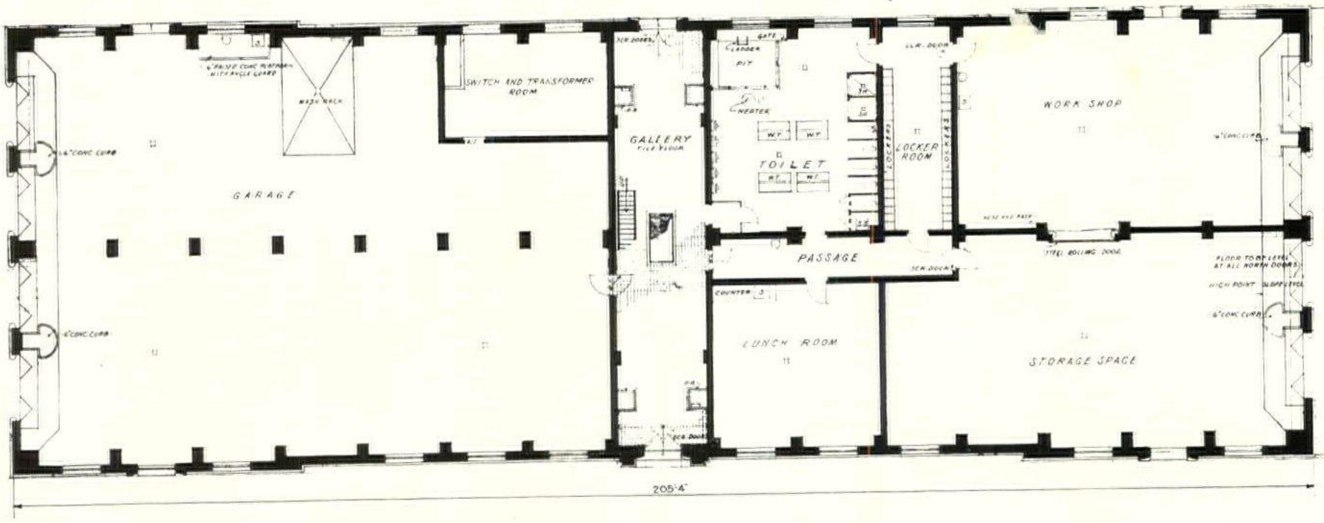
FULLER & McCLINTOCK, ENGINEERS • SLOAN AND ROBERTSON, ARCHITECTS

out; the preliminary sludge pumping stations, housing grease and scum ejectors, and pumps for removing the settled sludge from the preliminary tanks; the aeration tanks, where air is admitted to the mixture of sewage and return sludge for agitation and aeration; the final settling tanks, where the remaining solids are separated from the liquid; the return sludge pumping stations, housing the pumps which return the sludge from the final tanks back into the system for recirculation, and which move the excess sludge to the sludge storage tanks or to the proposed fertilizer plant; the operating galleries, which house the gates and meters for controlling the flow to and from the aeration tanks and for regulating the withdrawal of sludge from the final tanks; and the sludge storage and decantation building, housing the tanks in which the excess sludge is stored previous to loading on the sludge boats and for decantation. In addition there are a dock; a central heating plant, with oil-fired boilers; an administration building, housing the administrative offices and the laboratory for plant control; and a fertilizer plant, for demonstration purposes.

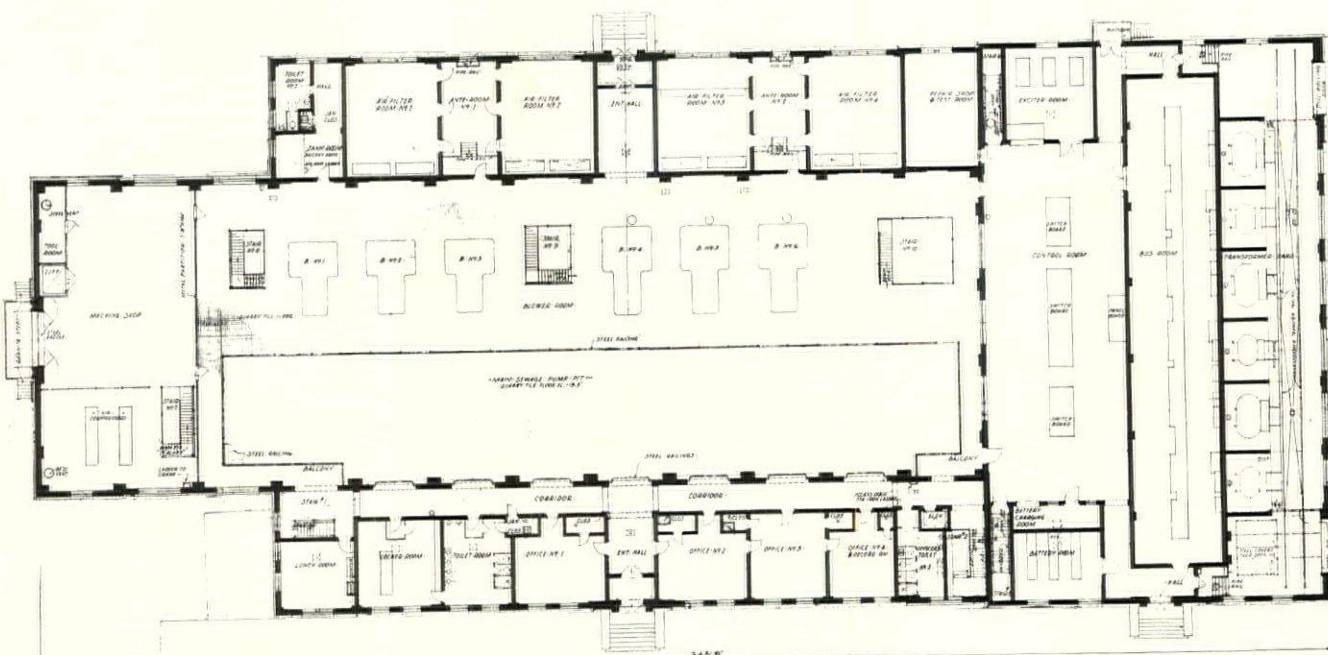
"Sewage reaching the island from Manhattan and the Bronx will flow from the tunnel uptake shaft to the pump and blower house, where it will be raised some 46 ft. and discharged through conduits into the preliminary settling tanks. The settled sewage will then flow to the aeration tanks through conduits equipped with Venturi meters. Just before it reaches the aeration tanks the return activated sludge will be added. From these tanks the activated sewage will flow across the operating galleries to the final tanks. Here the clear liquid will be drawn off the top and discharged through conduits into the East River, while the sludge at the bottom will flow to the return sludge pumping stations. From there, a large portion, equivalent to some 25 per cent of the raw sewage, will be returned to the inlet conduits of the aeration tanks, and the rest will go to the sludge storage tanks at the dock, for loading into the sludge boats after some decantation."

GH PLANT





GROUND FLOOR PLAN OF SLUDGE STORAGE BUILDING

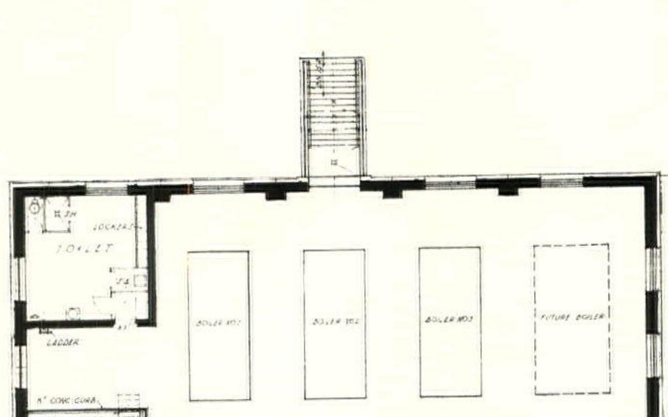


GROUND FLOOR PLAN OF PUMP AND BLOWER HOUSE

WARDS ISLAND SEWAGE TREATMENT PLANT, NEW YORK

FULLER & McCLINTOCK ENGINEERS

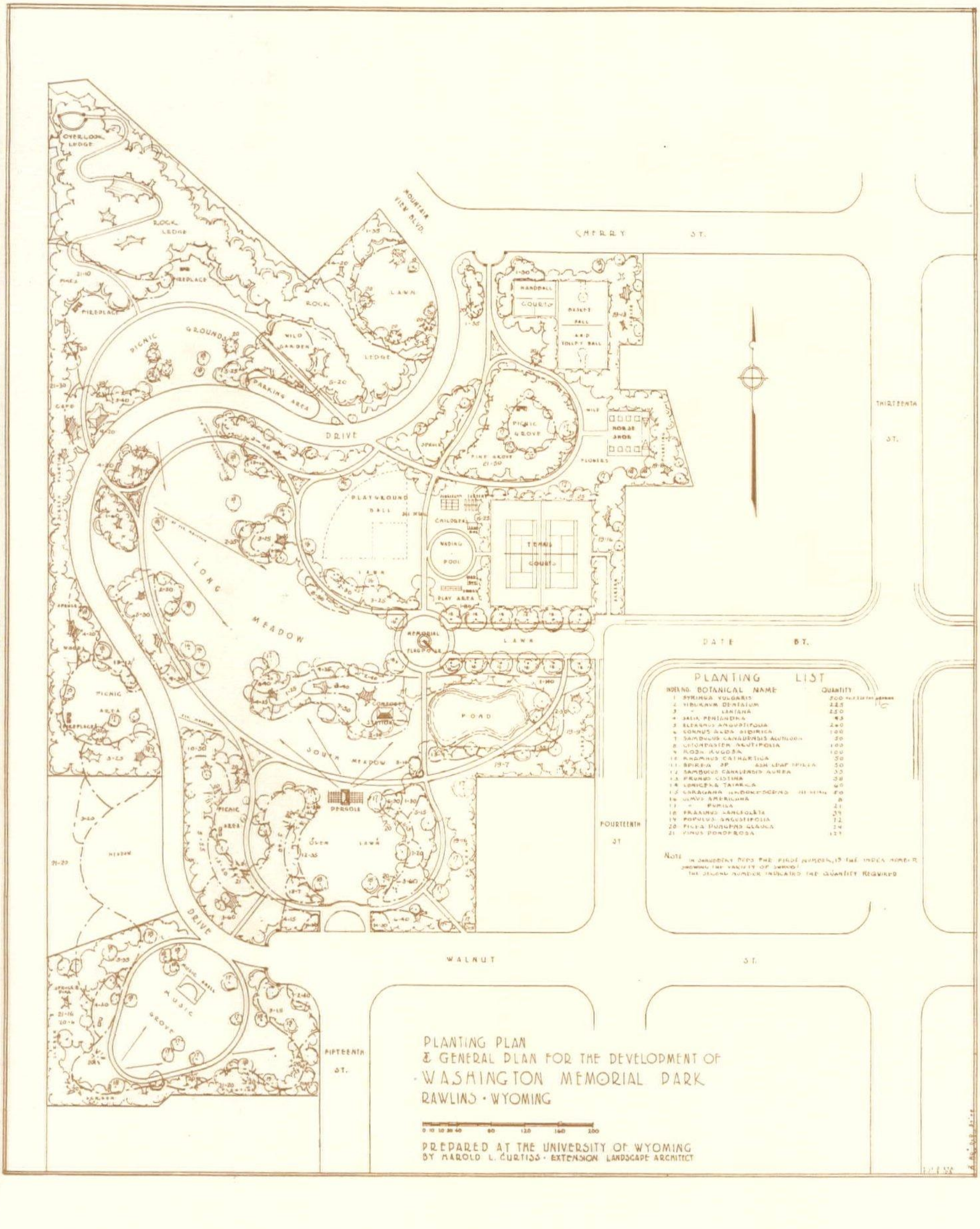
SLOAN AND ROBERTSON ARCHITECTS

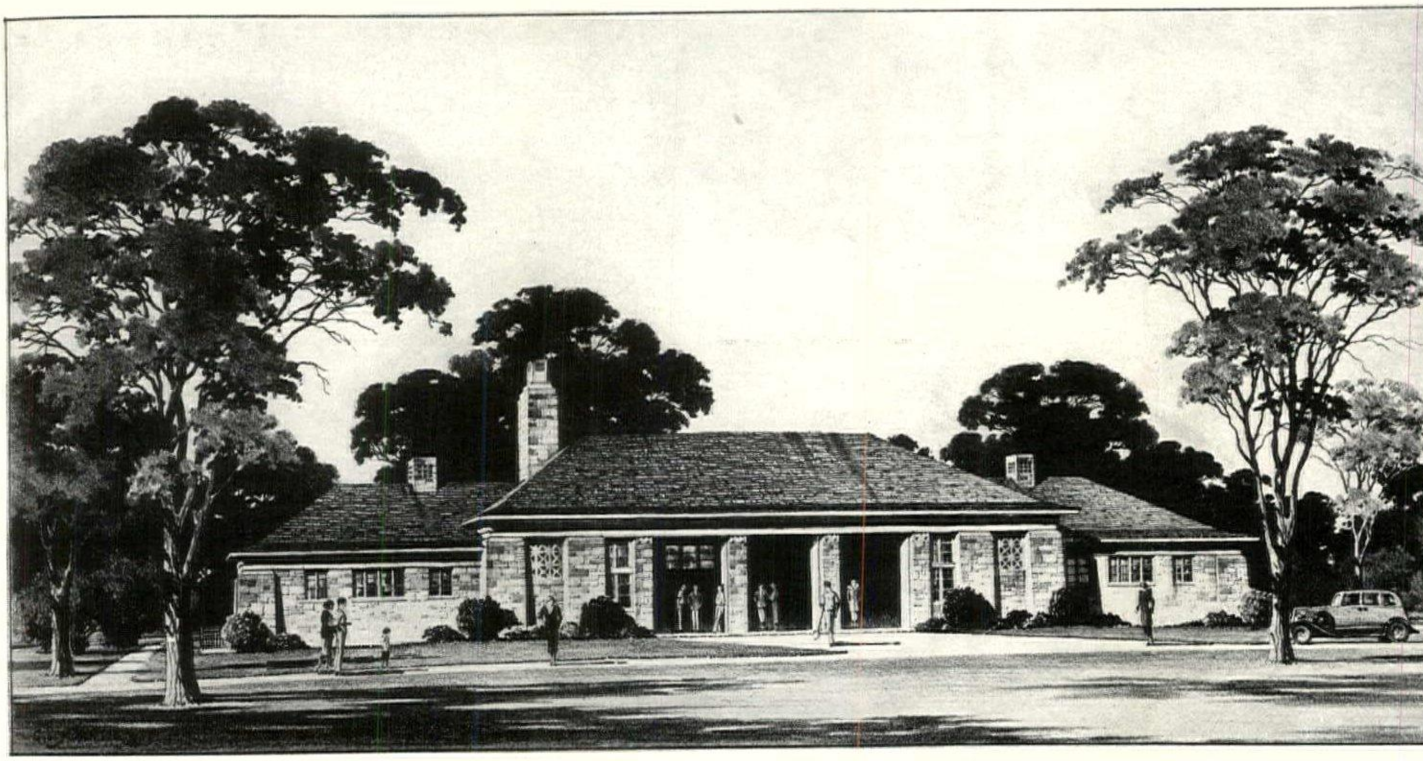


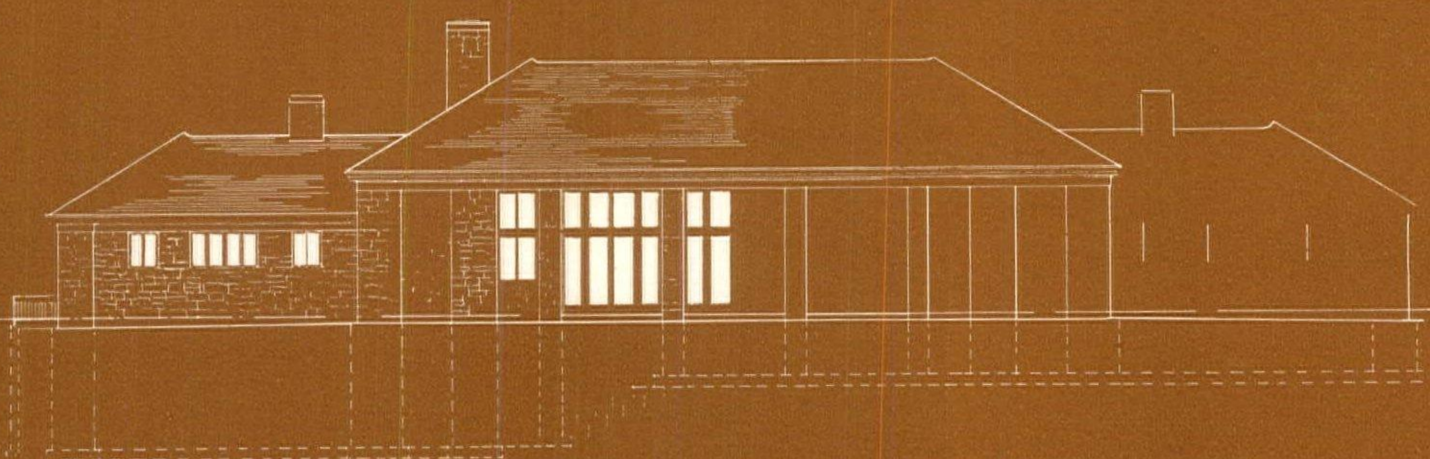
HEATING PLANT

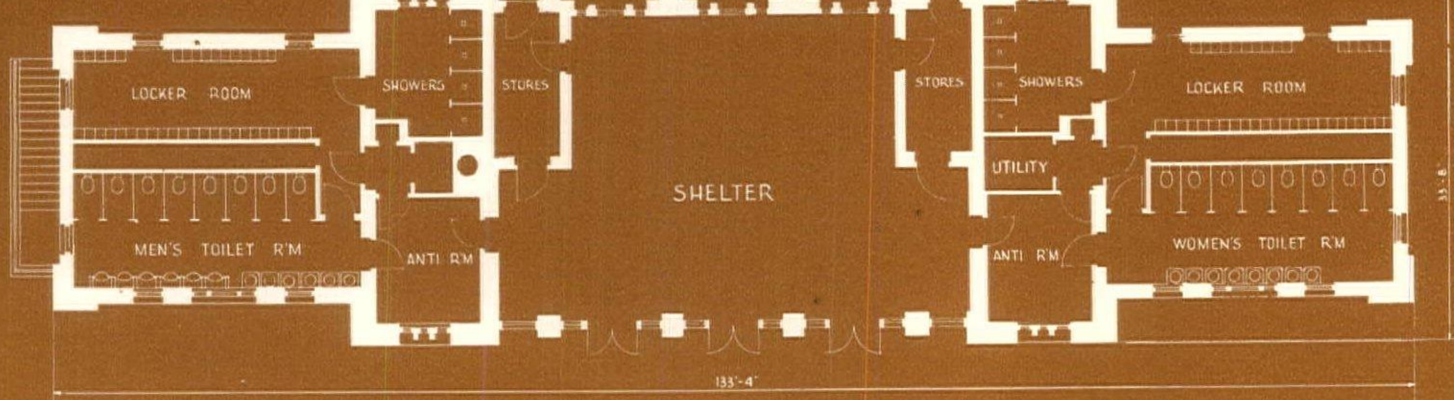
PARKS

A large percentage of funds expended in Wyoming by the Federal Emergency Relief Administration have been used in the development of George Washington Memorial Parks now nearing completion. Varying in size from 3 to 27 acres, these parks contain adequate provision for a wide range of active and passive types of recreation. Harold L. Curtiss, landscape architect, University of Wyoming, was selected to supervise these projects which were carried forward in cooperation with local park advisory committees on sites acquired by purchase, by gift and by transfer of tax delinquent tracts from other governmental agencies. The accompanying landscape plan shows the general design of one of these recreation areas.





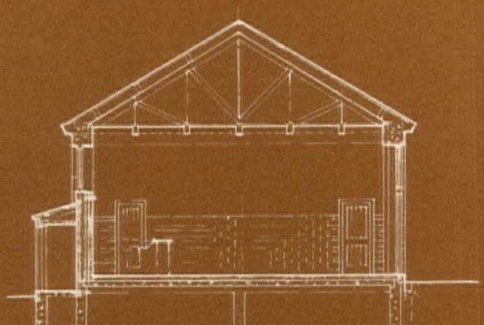


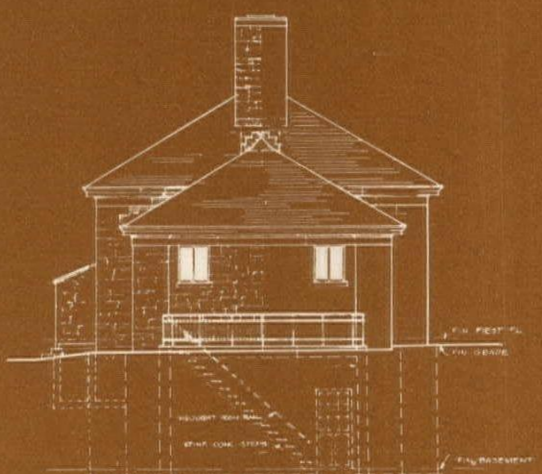

LOCKER ROOM
SHOWERS
STORES
STORES
SHOWERS
LOCKER ROOM
SHELTER
UTILITY
MEN'S TOILET R'M
ANTI R'M
ANTI R'M
WOMEN'S TOILET R'M
33'-8"
133'-4"

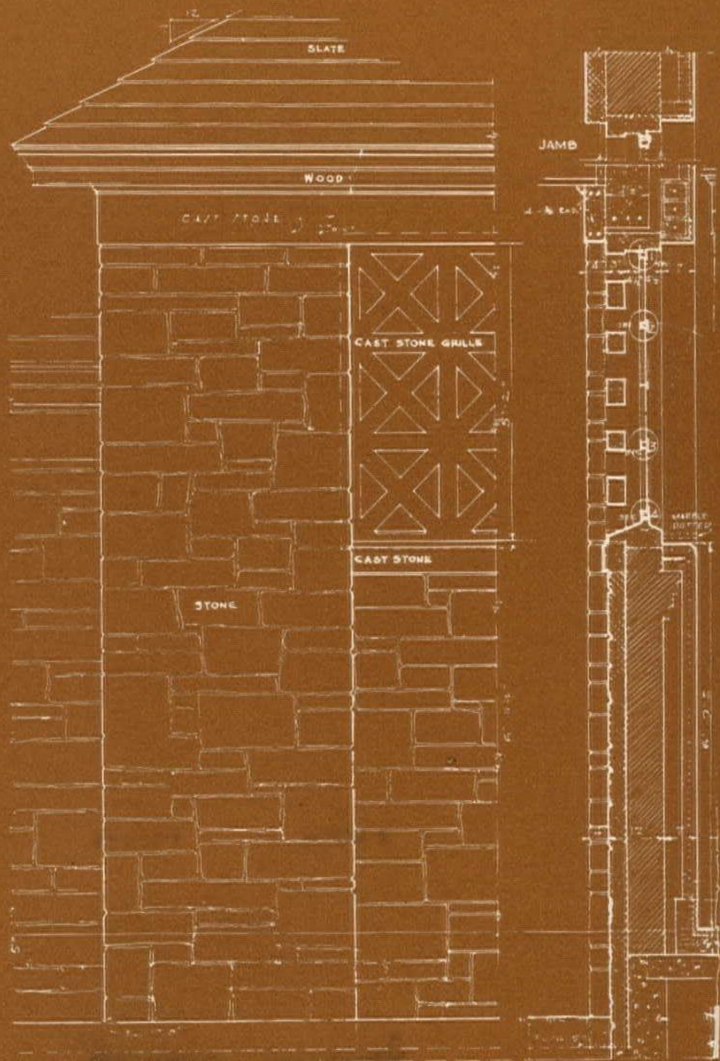
FIELD HOUSE ON GRAND CENTRAL PARKWAY, LONG ISLAND

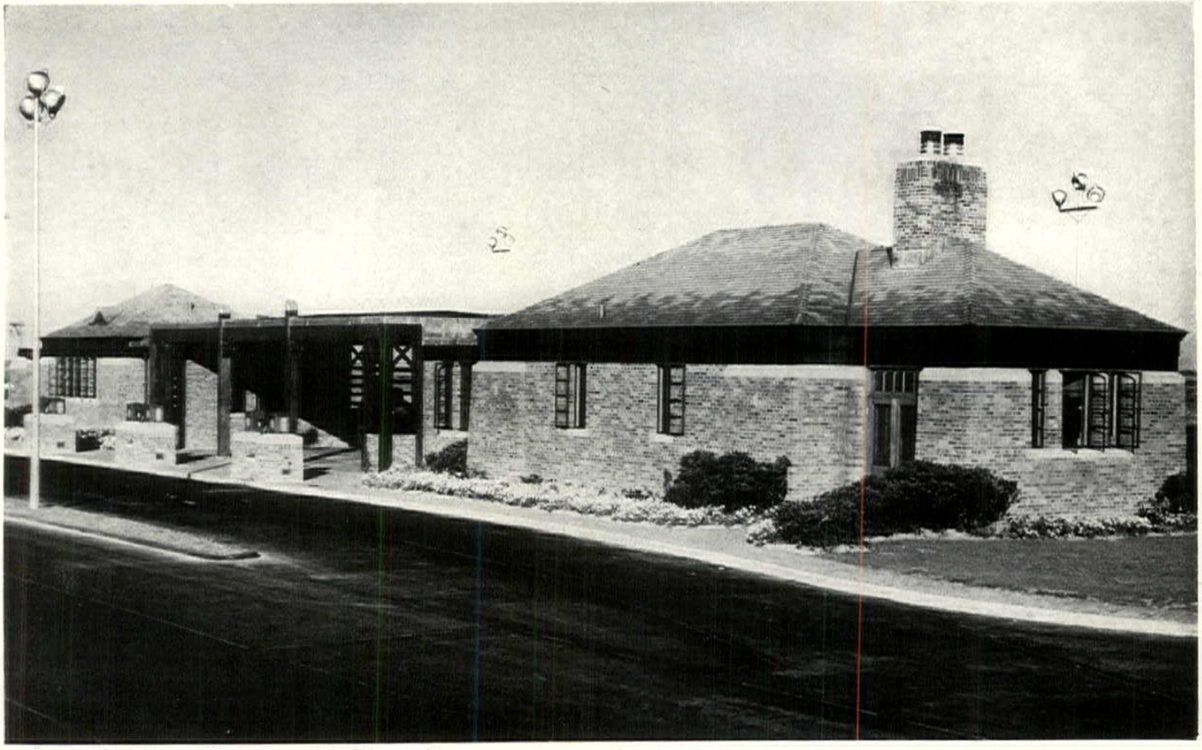
ALLEY POND PARK
BOROUGH OF QUEENS

STATE OF NEW YORK DEPARTMENT OF PUBLIC WORKS
WILLIAM E. HAUGAARD, COMMISSIONER OF ARCHITECTURE

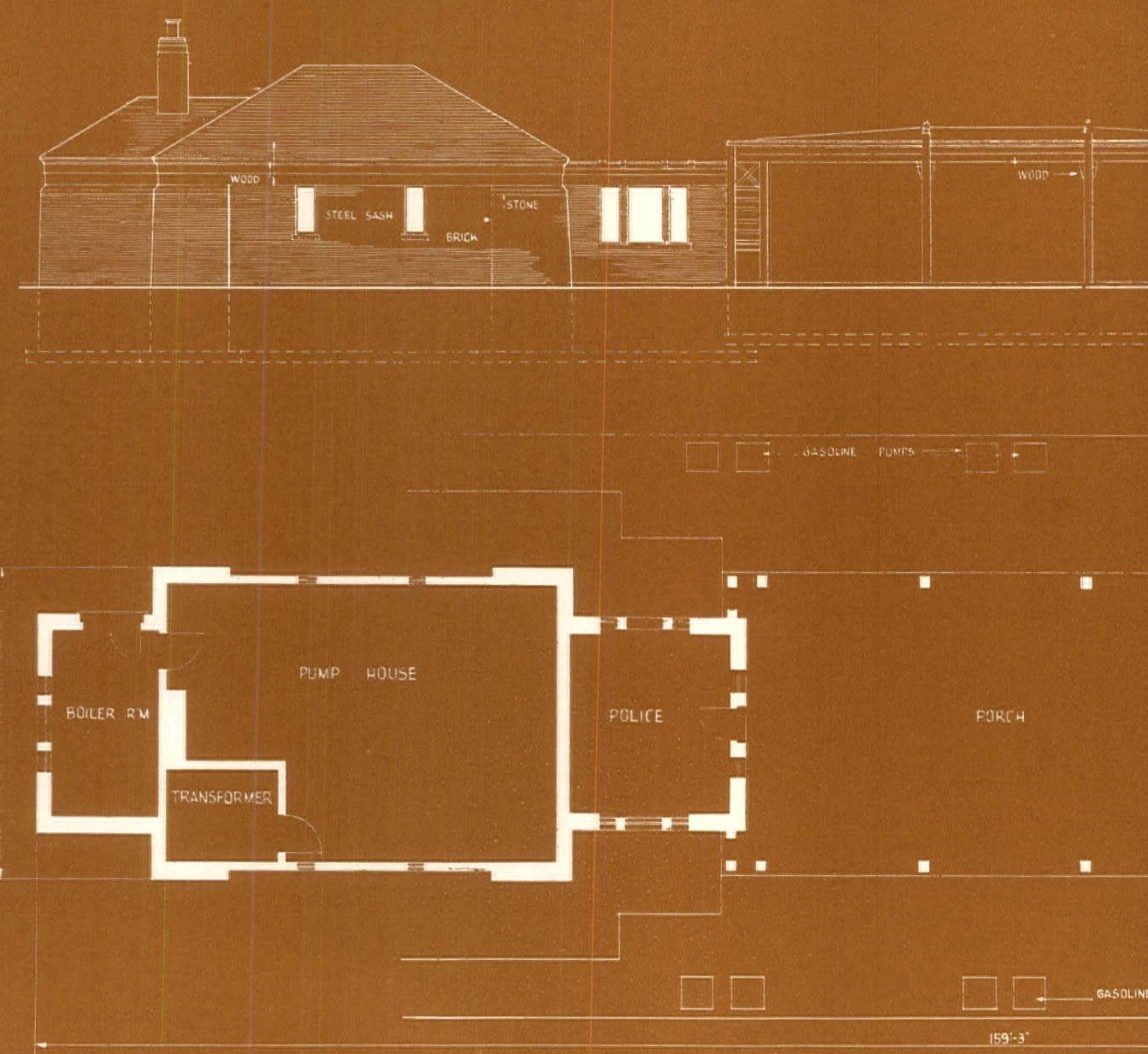






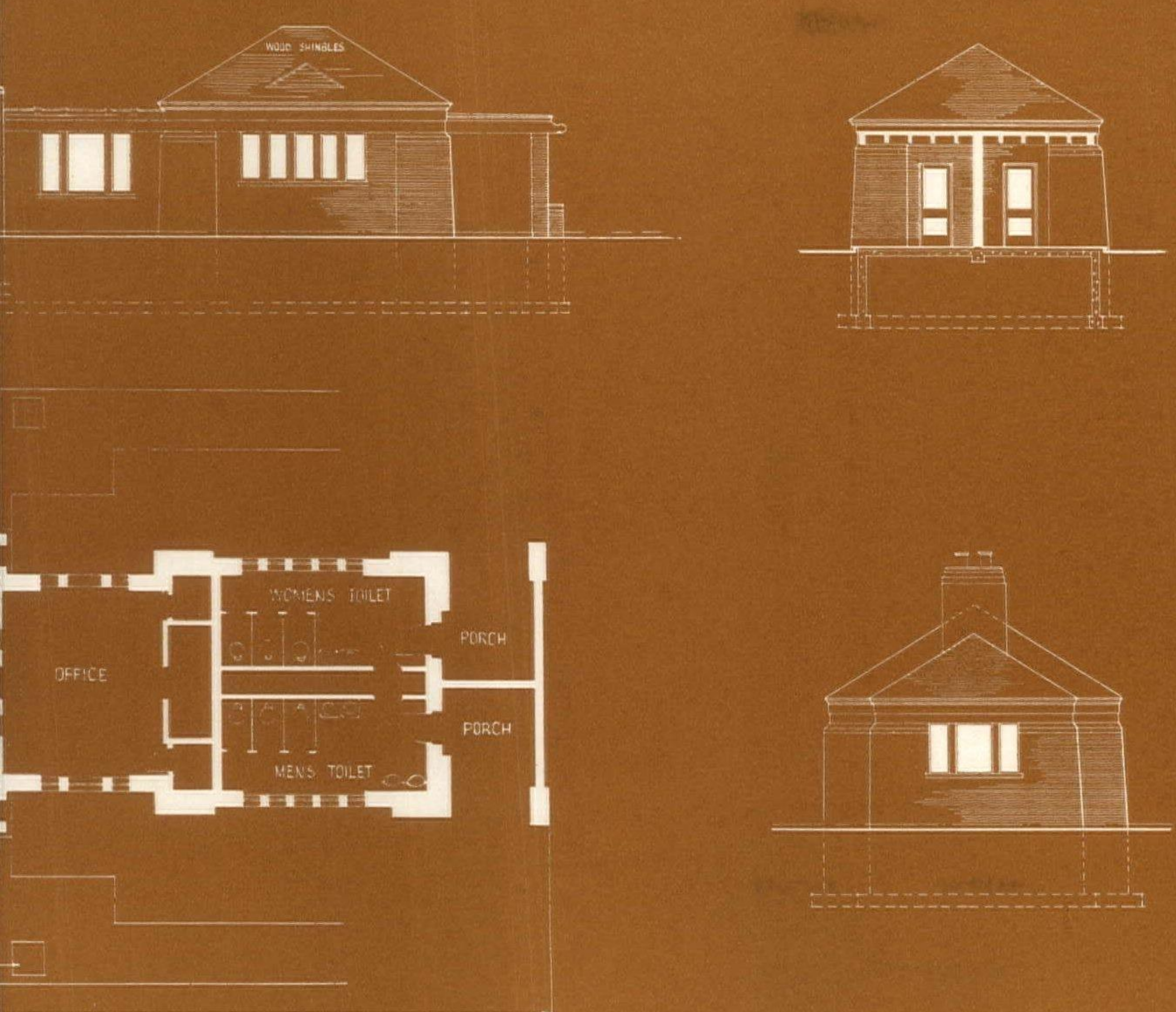


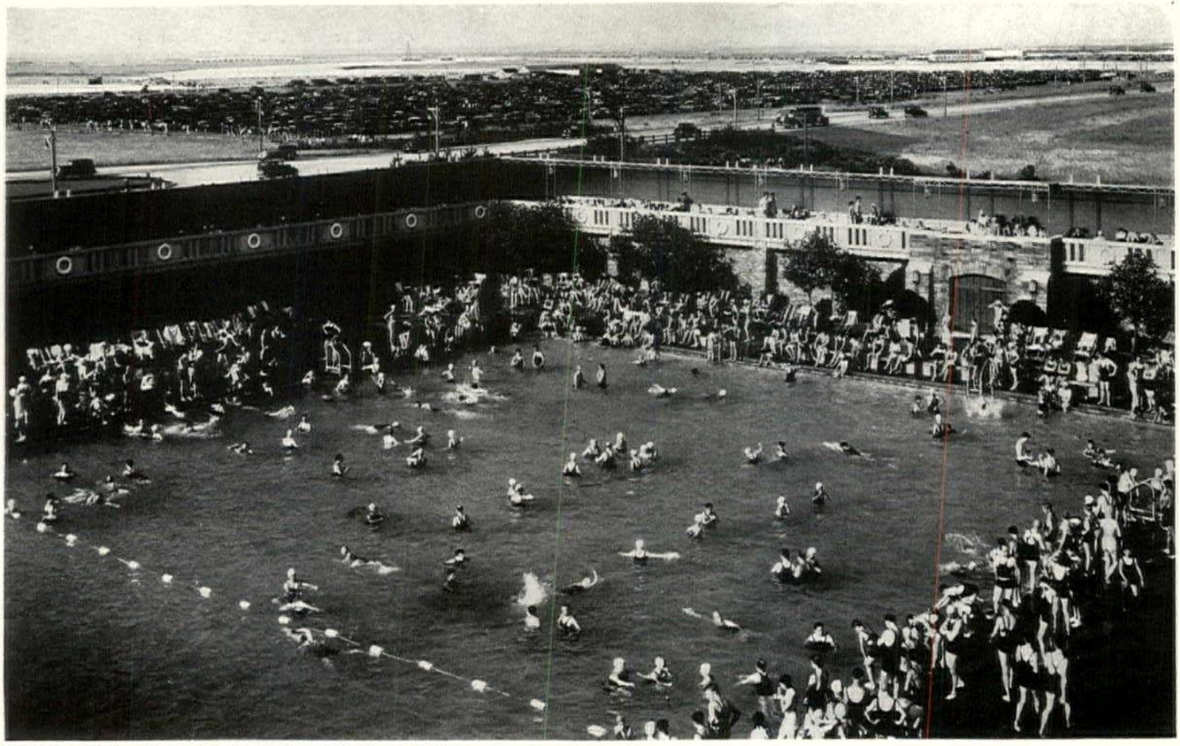
Photograph by Long Island State Park Commission



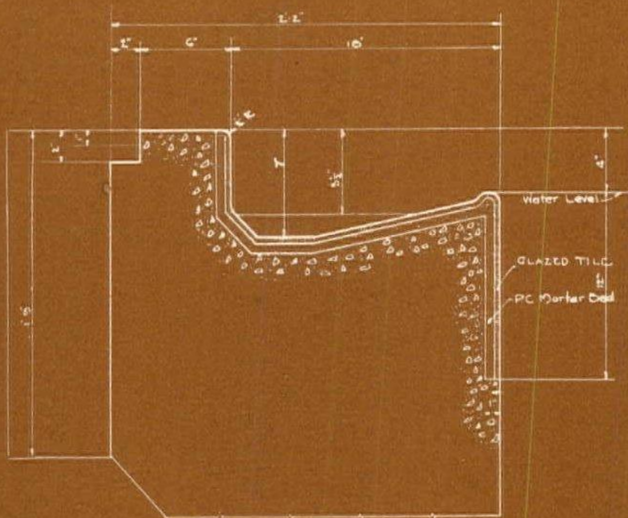
GAS STATION AT JONES BEACH STATE PARK

LONG ISLAND STATE PARK COMMISSION — NEW YORK

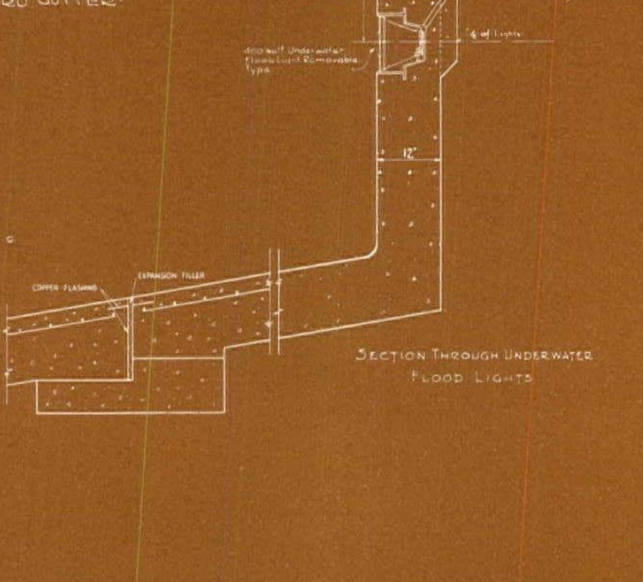




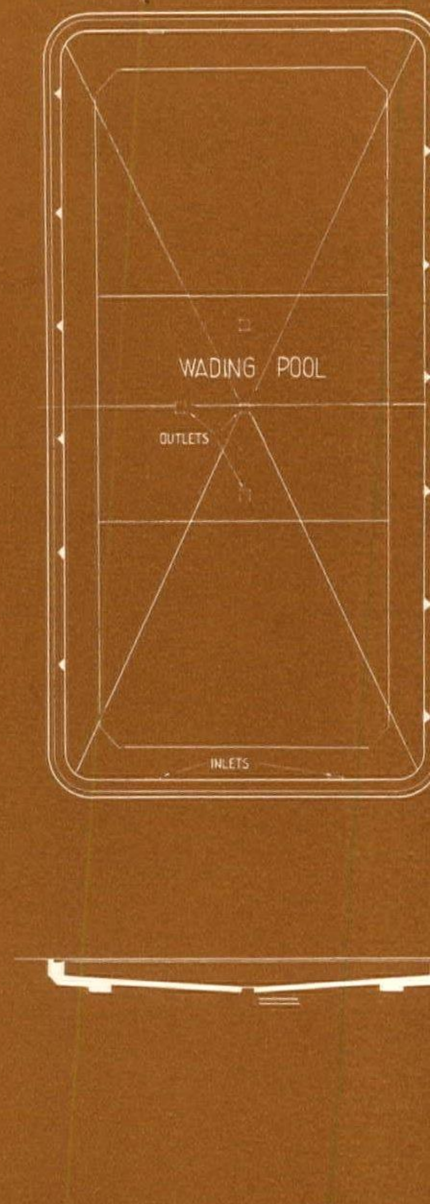
Photograph by Long Island State Park Commission



SECTION THRU GUTTER

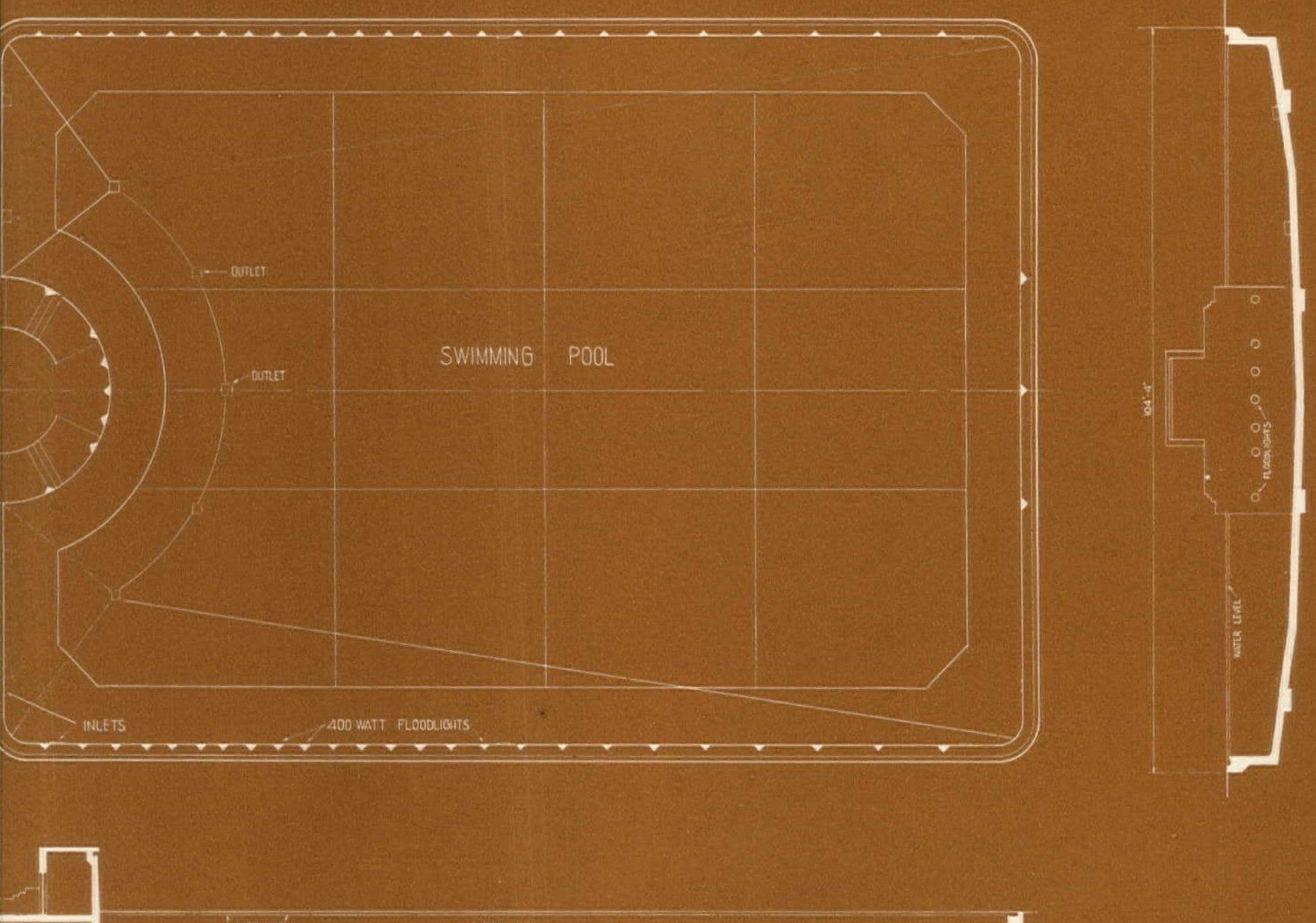


SECTION THROUGH UNDERWATER FLOOD LIGHTS



WEST BATHHOUSE POOL AT JONES BEACH

LONG ISLAND STATE PARK COMMISSION — NEW YORK



ILLUSTRATED NEWS

The proposed amendment to Title I of the National Housing Act increasing the maximum government insured loan from $2,000 to $50,000 for purposes of modernization and repair has been passed by both House and Senate and is now in conference. Its early enactment is anticipated.

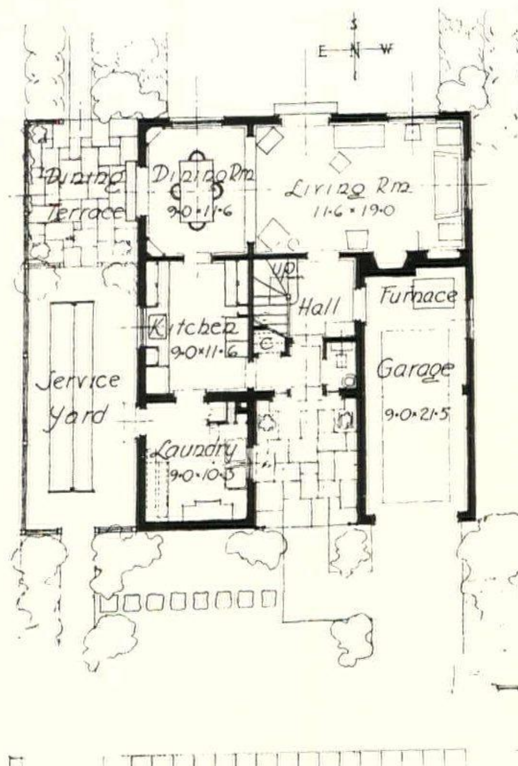
This revision of Title I of the Act has far-reaching possibilities for store merchants, owners of hotels, apartment houses, theaters, industrial plants, clubhouses, hospitals, gas stations and other buildings normally part of "Main Street."

To reach this market the Federal Housing Administration will utilize, in addition to its regular field activity, a visomatic presentation, "Modernize Main Street," and will also utilize the facilities of motion pictures.

B. A. McDonald,
Director of Promotion
Federal Housing Administration.

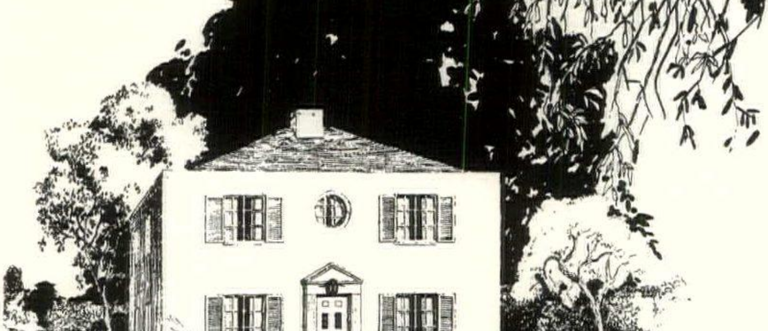
Photograph courtesy of Gar Wood Industries

A HOUSEBOAT ON LAND: In order to make room for more automobiles, the forward cabins of the Great Lakes Engineering Works' steamer "Britannia" were removed. C. E. Baisley, the shipping company's manager, has made a house from the two-story deck quarters, now located on the banks of the Detroit River at Ecorse.

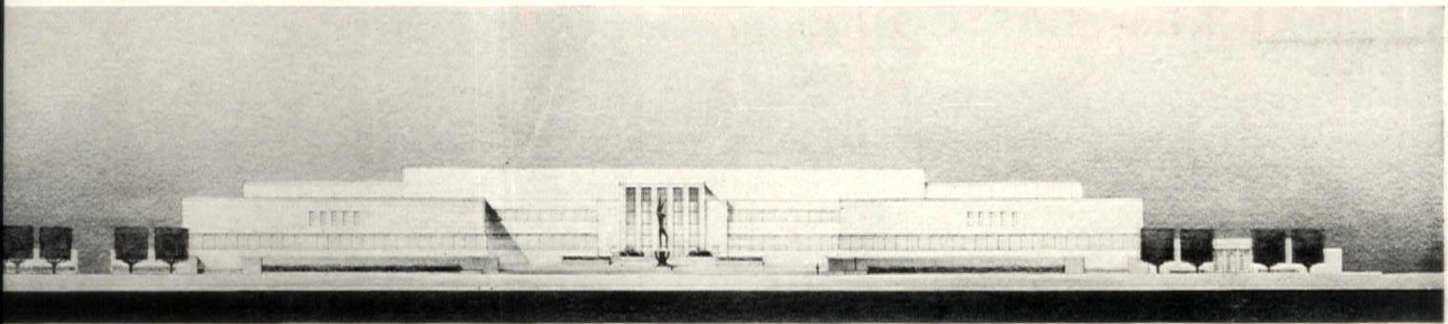


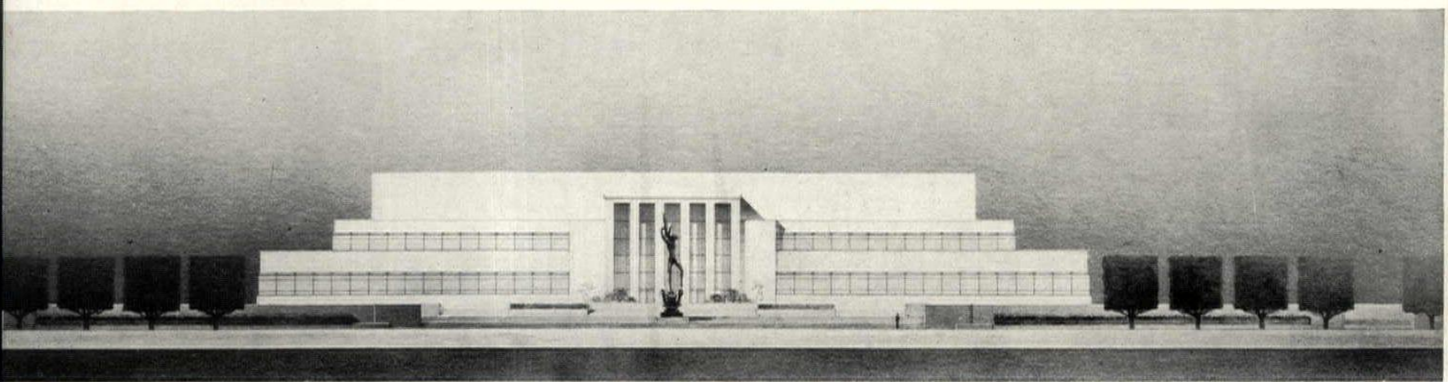
(ABOVE) HOUSE DESIGNED BY JOSEPH J. DEUCHER, ARCHITECT

(BELOW) HOUSE DESIGNED BY OTT AND DOLEYS, ARCHITECTS



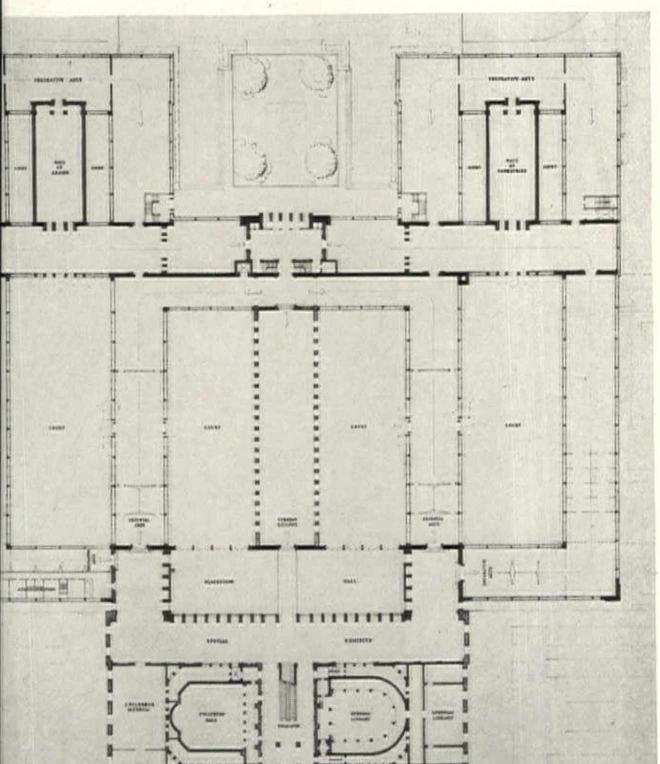
WINNING DESIGNS IN SMALL HOUSE COMPETITION SPONSORED BY BUILDERS EXCHANGE OF CLEVELAND
HOUSES CONSTRUCTED AS EXHIBITS IN GREATER CLEVELAND SMALL HOME SHOW, MAY 4 - 18

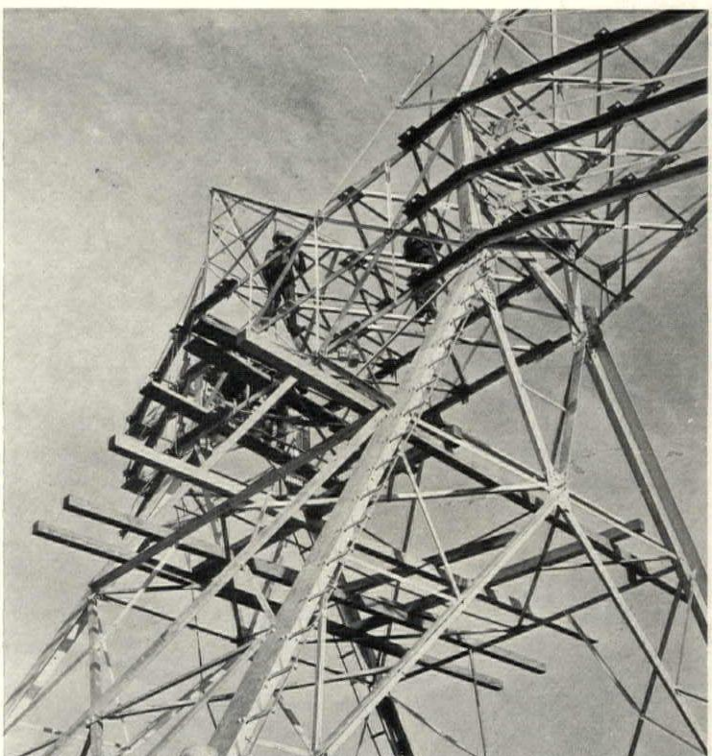




...s courtesy of the Art Institute of Chicago

WINNING DESIGN FOR PROPOSED ADDITION TO THE ART INSTITUTE OF CHICAGO — HOLABIRD AND ROOT, ARCHITECTS. The lower illustration shows that part of the complete plan which will be constructed first. The addition will cost $10 million, and the construction will extend over a period of eight to ten years.





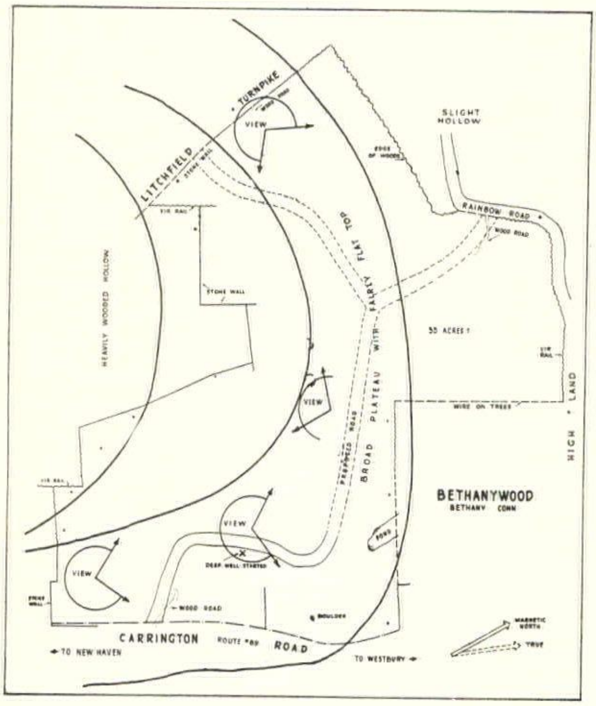
ONE OF THE STEEL RIVER CROSSING TOWERS for the transmission line which supplies power for the dredges and tunneling operations for the Fort Peck dam, which is being built by the Engineer Corps in eastern Montana with an allotment of $50,000,000 from the Public Works Administration.

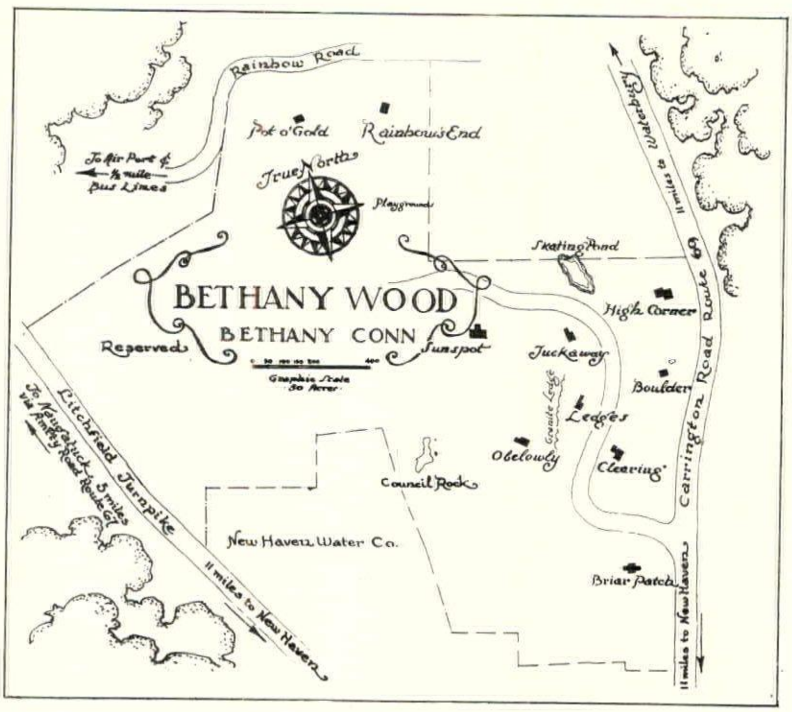
A SMALL ALL-YEAR COUNTRY COLONY

A wooded tract of 50 acres on the outskirts of New Haven, Connecticut, is being developed by J. Cox Howell as a small all-year colony for ten or twelve congenial families with a common background of cultural interests. The site is at an elevation of over 600 ft. and has a southern exposure with extensive views over the surrounding country. The express motor highway from New York to Boston, proposed by the Regional Planning Board, is intended to pass through Bethany Gap. Improvements have been started on a modest scale. A road has been surveyed on the east end of the site and a well is now being drilled for water. Three houses designed by L. Bancel LaFarge, architect, are in process of construction and will provide comforts and conveniences on a scale commensurate with yearly incomes of $4,000 to $6,000.

The community will be organized by a non-profit corporation owning and maintaining the common road, playgrounds and land reserved for protection against encroachment. Individual property lines will be run, so far as practicable, as individual buyers desire. Each individual unit of ownership will be entitled to representation in the corporation by election.

The extent to which community interests can be unified depends on the wishes of the members, but the following possibilities are contemplated by Mr. Howell: (1) Janitor service for the care of paths and grounds, and removal of house wastes. (2) Cooperation with local school authorities in training girls from families in the neighborhood for domestic service, and the establishment of uniform practices among the housewives in the colony in employing these girls to secure maximum satisfaction on both sides. (3) A nursery school or at least an informal nursery group for care and supervision of small children. (4) For children of school age it is suggested that money which would be spent for expensive private schools be applied to the already excellent local consolidated school, enabling it to improve the quality of its teaching staff and its bus service. (5) A flexible schedule of playtime supervision for afternoons and Saturdays and the Christmas and Easter school holidays. (6) Group marketing for furnace oil, milk, laundry and other staple supplies and services. (7) Community exchange of books and periodicals. (8) A community house with or without a guest suite. (9) A pool for wading in the summer and skating in the winter. (10) A safe hill for winter coasting. (11) An inclosed dog park where pets can be left safely in the care of the community janitor. (12) An outdoor fireplace for picnics and story telling.





THE ESSENTIALS OF PRISON DESIGN

By CHARLES D. WHITE of Lockwood Greene Engineers, Inc.

The principles involved in the design of a modern penal institution do not differ materially in many ways from the principles controlling the design of any building or group of buildings in which highly specialized functions are to be housed. A successful newspaper plant cannot be designed without an intimate and exhaustive knowledge of newspaper methods and production, nor can a prison be successfully designed without an equal and intimate knowledge of prison requirements and prison routine.

It is not sufficient for the architect to read books or articles on prison design, study a few plans in current literature, or pass several hours in a hurried trip through some institution. Prisons must be studied at first hand, carefully and continuously in detail with the warden, the captain of the guard, the steward, the storekeeper, and above all with the maintenance man, who has to dig and delve to find broken or misplaced piping and must maintain constant and uninterrupted service through all sorts of mishaps.

Without this intimate knowledge of actual routine in similar institutions, without a thorough study of the successful types of housing for the various classifications of inmates, the length of time to be served, the program of rehabilitation, the educational methods planned and the trades to be taught, a comprehensive and successful plan cannot be conceived.

It is not the intention of this article to be a compendium covering the subject, nor does it even attempt to give definite details of construction, proper size of cells, or the benefits of cafeteria service versus table service in the mess hall. Its real purpose is to emphasize forcibly to the architect and those in authority who are charged with the construction of the institution the necessity of a thorough study of the problem before the institution becomes a mass of solid and not easily changed construction.

This, then, is the first and most important essential of prison design. It would seem that such a statement is a platitude and obvious to all readers, but intimate contact and observation prove only too truly that all too often the subject is not given the attention it requires.

DETENTION

A prison is first of all a place of detention and its main purpose is to keep its inmates within its walls. If it fails in this purpose, all its other features will be of little value.

Steel bars and the latest locking and control devices are, of course, a most important part of the equipment of any institution, but many locations to be carefully checked for protection are outside the space in which the inmate may be locked for safe keeping, and are frequently overlooked in the plans.

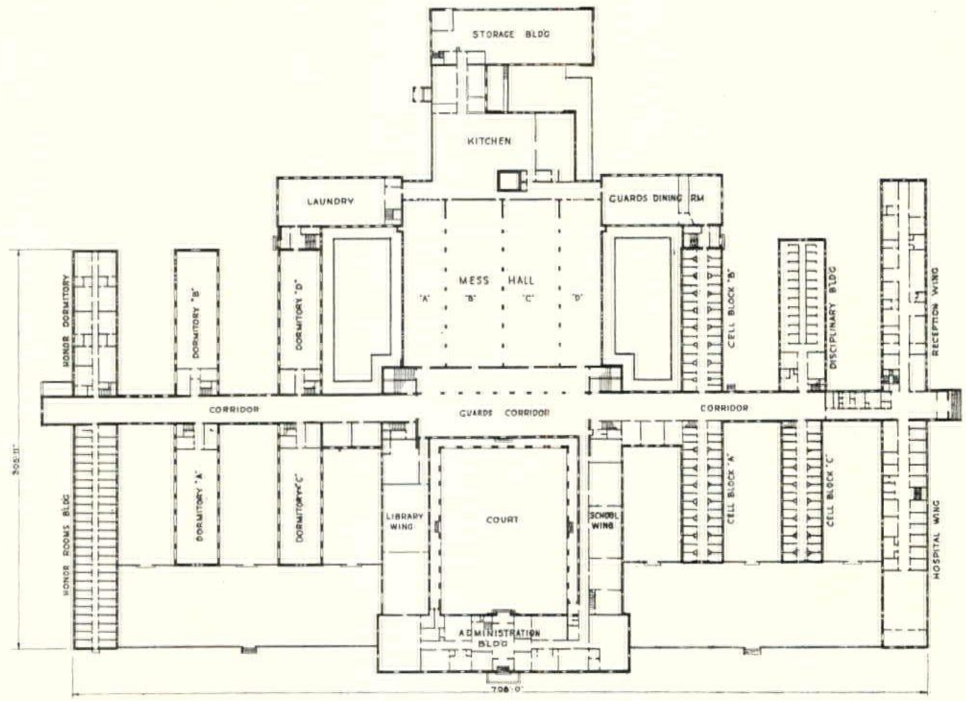
Toilet rooms, locker rooms, storerooms and similar spaces, not under constant observation, require as much if not more protection than spaces commonly under observation. These spaces are under observation at the time of their use by prisoners, but for long periods are not under observation and for that reason offer an excellent opportunity for uninterrupted work by the prisoner, and he does get access to just such spaces, as reference to the newspapers will prove. Every opening is a hazard, no matter where it may be.

Any place into which an inmate can force his way and hide from the custodian is a source of trouble and expense. An inmate who cannot be accounted for at count periods is to all intents and purposes an escaped prisoner and it may require as much effort to find that inmate as if he were actually outside the walls.

Storerooms and warehouses require protection from without, for more prisoners break into storage spaces than ever break out of prisons. These spaces should also have wire mesh screens to prevent articles being thrown out by inmate workers to be picked up later.

It is important to consider carefully every detail from the standpoint of the inmate, the man who "wants out,"

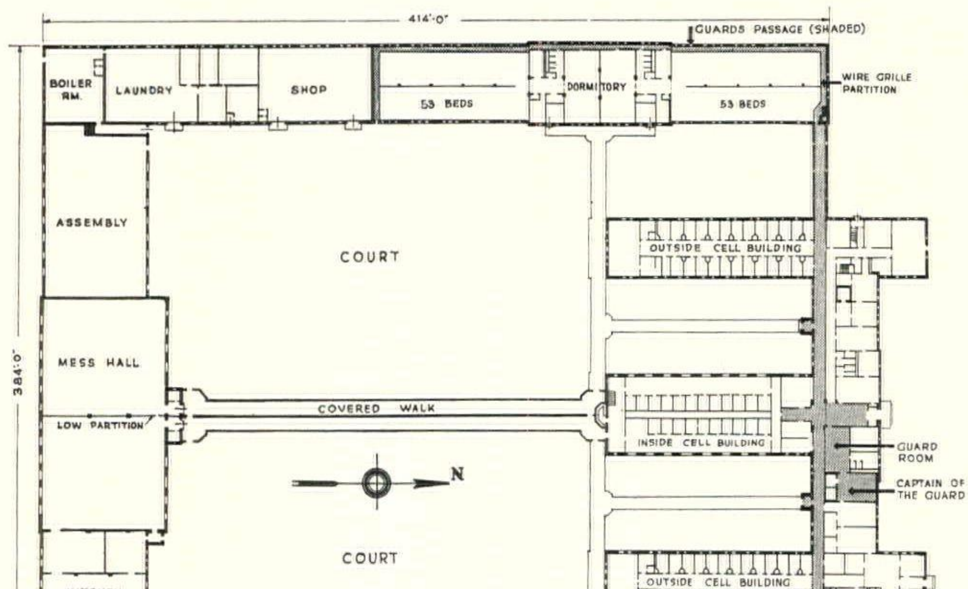
AN EXAMPLE OF CAREFUL PLANNING FOR CLASSIFICATION OF PRISONS



FEDERAL PENITENTIARY AT LEWISBURG, PA.

ALFRED HOPKINS, ARCHITECT

IN THIS FEDERAL JAIL THE PRINCIPLE OF PROTECTION FOR THE GUARDS HAS BEEN CAREFULLY CONSIDERED



SMITH, HYNCHMAN AND GRYLLS, ARCHITECTS

who spends his entire waking moments in scheming ways and means to overcome and defeat the methods of detention.

PROTECTION

Closely related and of almost equal importance to detention is the problem of the personal safety of individuals responsible for the custody of the inmates. Too many instances are on record of unfortunate injuries or even death itself to permit neglect in planning the institution so that the custodial force can perform its duties with utmost protection from attack and injury. Even in institutions housing only the young or first offenders all precautions should be taken against the possibility of danger. Wire mesh partitions or steel grilles are cheap as compared with human lives.

OBSERVATION

The ideal plan would be one in which all inmates would be under the constant observation of a single guard. This is, of course, theoretical and cannot be carried out in practice, but the closer in conformity to this theory the institution can be planned, the more effective the custody and the less the cost.

The size of the custodial force, and consequently the cost of operating the institution, is directly controlled by the ease or difficulty of observation and supervision. This essential should be constantly kept in mind in the planning of corridors, stairways, the relation of dormitories to corridors and in the avoidance of all spaces accessible to inmates and not easily supervised which may be sources of trouble.

The location and design of all inlet and outlet grilles, radiator inclosures and similar situations are important as they are likely places in which to secrete dope or other contraband. All doors to refrigerator boxes, closets and similar unoccupied spaces should have observation panels and the light switch on the outside.

UNAUTHORIZED TRAVEL

Proper control is seriously impaired if careful attention is not given in the planning to prevent travel by inmates in unauthorized sections. If it is necessary for an inmate to pass through a section in which he has no legitimate business in order to reach a section to which his permission extends, then he has a good excuse when found in forbidden areas and the proper control of the institution is seriously affected. It is especially important that the location of toilets, washrooms and locker rooms be planned to prevent the necessity of inmates leaving their own departments.

MALICIOUS MISCHIEF

Careful consideration must be given in prison design to the element of malicious mischief as an excessively large amount of maintenance expense in institutions may be caused from this item alone.

It has been found, as an example, that in power plants operated by inmates a surprisingly large cost of repairs occurs where mechanical stokers of a type which does not permit firing by hand during a breakdown are used. If the stokers are so designed that the boiler can be fired by hand during a breakdown only a nominal amount of repairs is found necessary.

A detention type of sash may be sufficiently strong to prevent the inmate making an unauthorized exit, but out of sheer maliciousness he may wreck the ventilator section if not of proper strength. The damage may be of no value to the inmate except for the relief to his pent-up feelings, but it is an added item on the repair costs.

Electric service junction boxes often placed in places accessible to inmates offer enticing possibilities not only of mischief but for secreting contraband. The lock on the box only offers an intriguing pleasure to the resourceful inmate.

CLASSIFICATION

Under this subject there are really two divisions. The first is that of separating the inmates into groups determined by the need of proper detention for each group, usually referred to as minimum, medium and maximum security.

Maximum security is, in the average institution, not needed for the entire population; in fact in most institutions this class constitutes not over 30 per cent of the prison population.

It is an unnecessary expense to house all types of prisoners in maximum detention conditions at a construction cost of $3,000 per inmate, when not over 30 per cent require this type, and 30 per cent can be housed under medium security methods for $2,000 per man and at least 40 per cent can be housed in minimum security conditions at a cost of $600 to $800 per man and in many cases for less.

Where an institution is planned in its entirety for a single predetermined type of inmate and class of detention, as is the case in States with such a large criminal population that separate institutions will be built for the different types of detention, this classification would not have to be considered in any one institution. But when an institution must for good reasons house the varied types, this problem of classification should be carefully studied and provisions made for the several types of housing and detention.

The second consideration is that of grouping the inmates so that group and individual harmony can be maintained with the least enforcement of discipline. By grouping of inmates is meant not only the housing of inmates in rooms with four to fifty men but also the separation of inmates into single rooms or cells. These units of housing should include the inside cell block, the strongest type of detention; cell blocks with outside rooms with small and heavily barred windows; dormitories both large and small; honor rooms and honor dormitories for inmates meriting that privilege.

In the discussion of single rooms versus dormitories for the minimum type of detention, there is and can be no final and definite answer. The modern institution will contain both. Some inmates like the privacy of the single room, or are trouble breeders if housed with a group. Some men enjoy the companionship of the dormitory and select it from choice. The dormitory has the advantage of low cost and easy supervision.

This choice of quarters is not allowed the inmates as a mistaken form of kindness but is a practical method of obtaining discipline at a less cost than by custodial control and is more satisfactory to all concerned. With this variety of housing the inmate can by the degree of his conduct progress from the cell block, in which he is confined for the observation period, through the various grades to the honor rooms or dormitories.

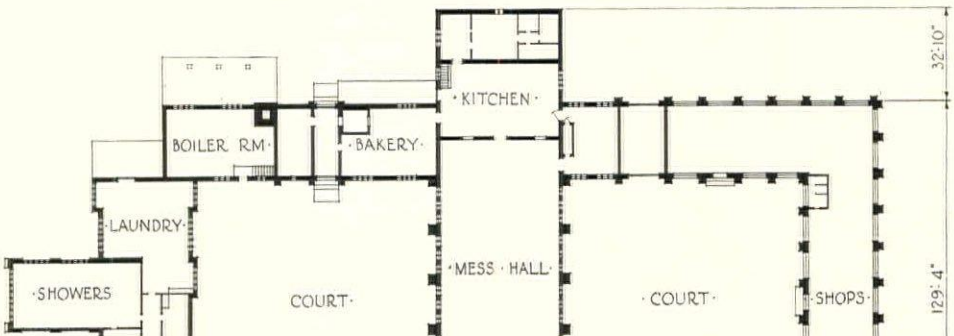
THE BERKS COUNTY PRISON AT READING, PENNSYLVANIA

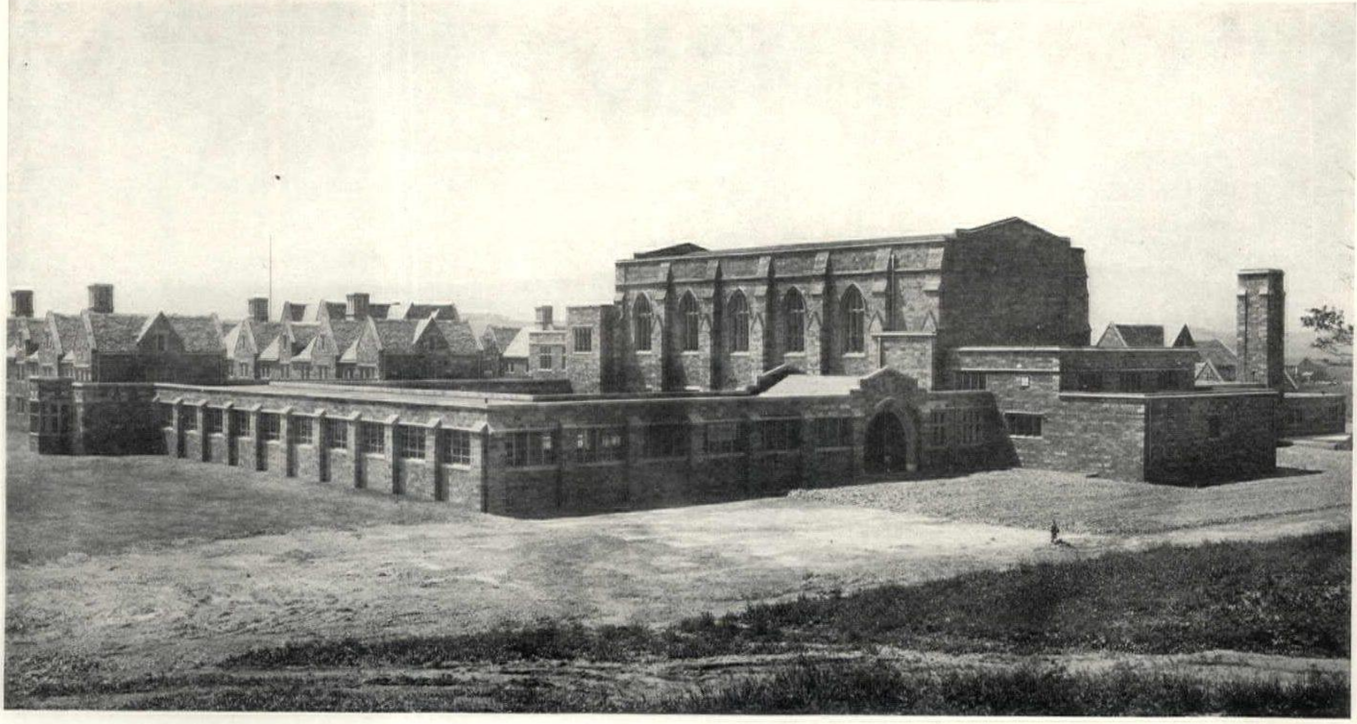
The main feature of the prison is the group of four cell blocks, each approximately 31 by 130 feet in size, with the administration building, about 53 by 42 feet, between the two center blocks. Across the entire building at the north end of the cell blocks is a recreation corridor 27 feet wide divided into four sections by decorative grilles.

Each cell block contains 72 cells, 36 on each of the two floors. The inside dimension of most cells is 6'2" wide by 9' long. All plumbing is inclosed in a duct on the corridor side of the cell which also provides ventilation through vents to a false chimney on the roof. Heating of cells is done by a steam riser placed at the side of the window.

In the administration building are the main offices, visitors' room, hospital rooms, and dormitories for the guards. Over the reception section, consisting of doctor's office, Bertillon room and clothes storage, and adjacent to the shower baths and laundry, is a large dormitory to accommodate vagrants who come in to sleep.

The buildings, fireproof throughout with the exception of the roof which is erected over a reinforced concrete slab, have bearing walls of concrete masonry units made with limestone aggregate. Masonry trim is of cast stone.





DESIGNED BY ALFRED HOPKINS AND ASSOCIATES, ARCHITECTS

Conversely, the inmate who will not conduct himself in accordance with the discipline of the institution or proves that he is not fitted to be in contact with his fellow inmates has the threat of demotion even to the disciplinary cells always before him.

More important than all other considerations is the possibility that proper classification allows for the separation of the different types of offenders so that at least there is not so much possibility of the prison becoming a college of crime in the education of the younger by the older criminals.

FLEXIBILITY

It is a well established fact that no new institution has been used in its several parts after occupancy as may have been planned. It seldom happens that the person who is selected to manage the institution had much, if anything, to do with its planning and construction. The type and classification of inmates may be changed and the methods of routine and custodial procedure may be revised. This is not unusual and is to be expected and anticipated.

One large institution recently completed was designed with this point clearly in mind. No two experts or authorities would agree on the ratio of single rooms and dormitories and it was seen, after much study, that no fixed ratio would be satisfactory extending over a period of years. With this consideration as a controlling motive, a single room unit was adopted and the layout of all housing sections was established by this measure. All windows, radiators, doors and partitions were so arranged that each wing could be readily changed at any time from single rooms to dormitories, or vice versa, by the simple expedient of adding or removing partitions without any material structural or mechanical changes. The wisdom of this planning was proven, for within six months after opening the institution, the need for more single rooms developed and it was a simple matter to make the change. In the same institution provision was made for additions to any of the wings so that extensions could be built in the future without material change in the existing structure.

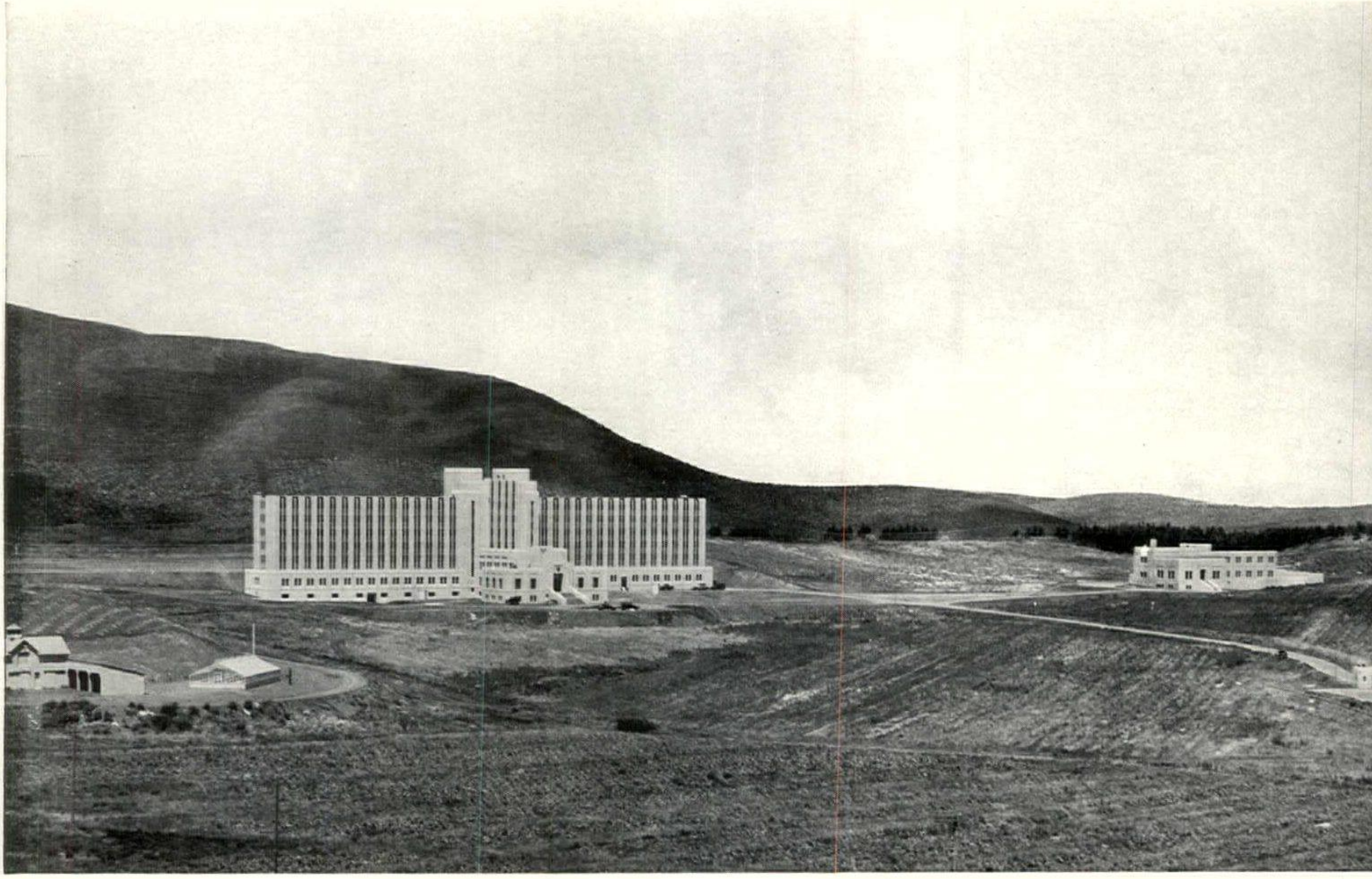
It is also impossible to foresee and plan the relative size of each division but if the plan is such that an overcrowded section can be continued into a less populous area, then it is a simple matter to vary the allocation of areas as needs demand.

SUMMARY

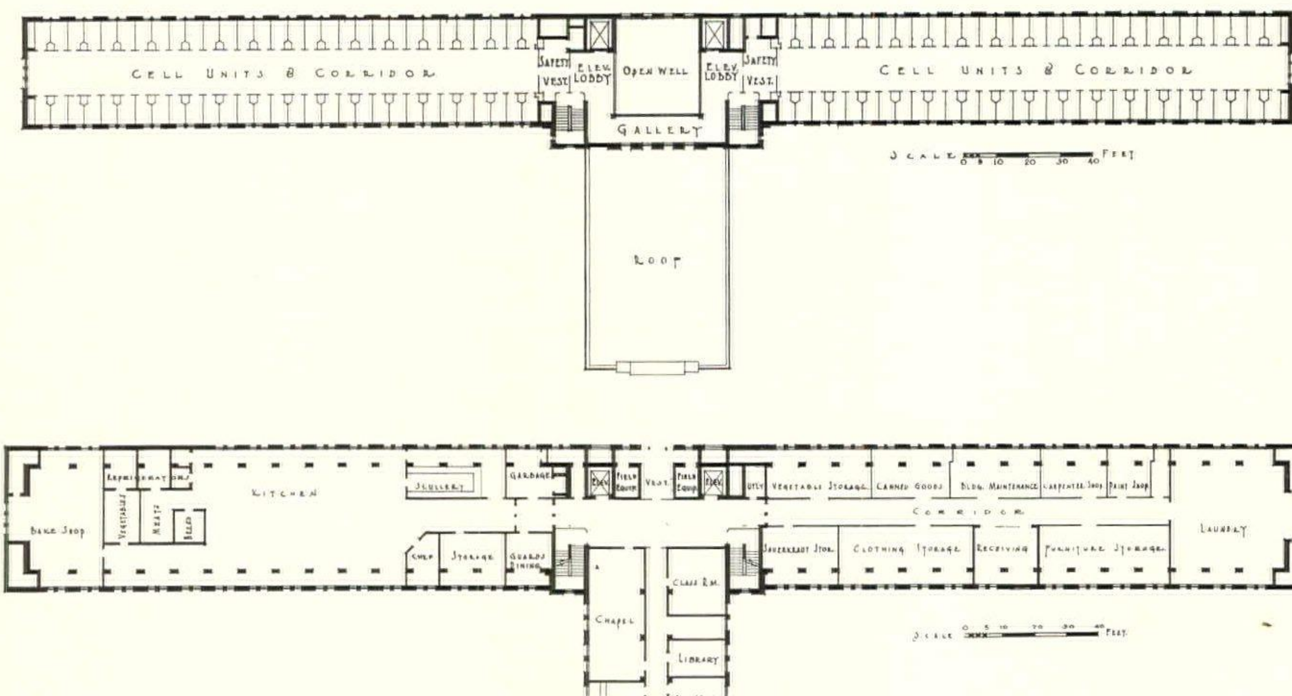
These are the essential elements in planning a penal institution which should be given special attention, but they are by no means a complete list. Obviously in an article of this length even these can only be treated in the briefest manner.

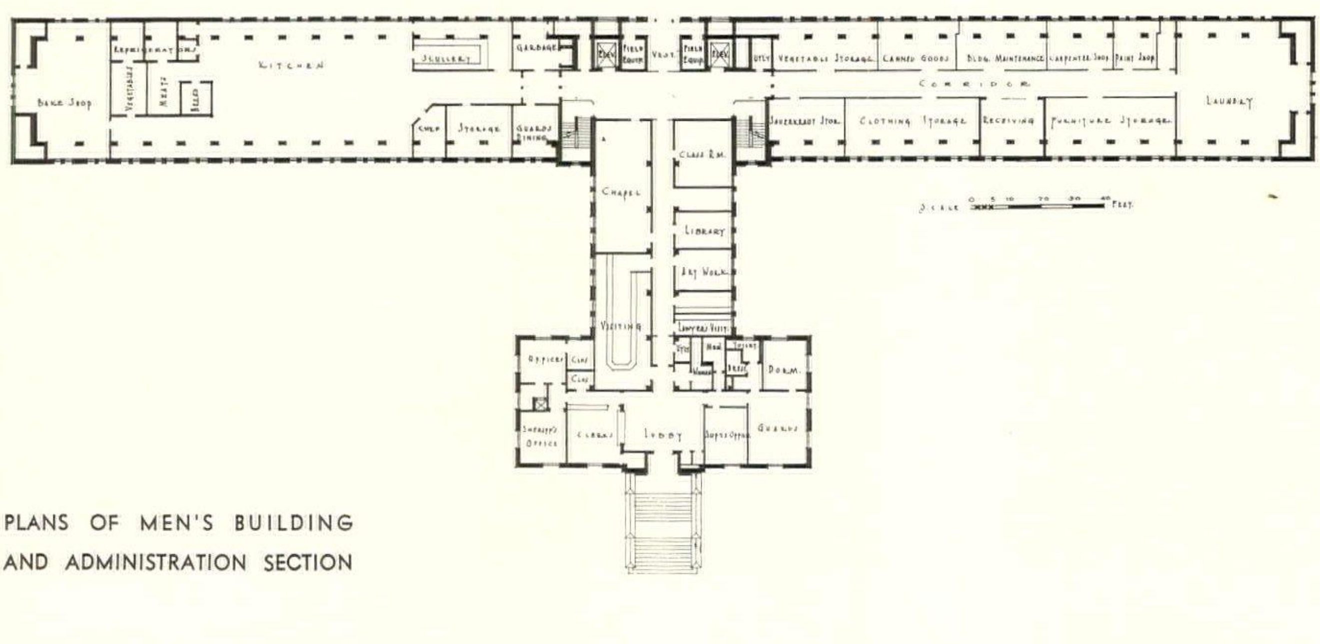
The dominant idea which the writer has endeavored to stress is the importance and absolute necessity of intensive study on the part of the architect before he even makes his first rough sketches. Very few architects have had an opportunity to design a penal institution and the number who have designed their second one is small indeed. So even the experience of profiting by mistakes has been denied to many.

Equally important is the fact that overcrowded conditions in many of the Federal, State and county institutions and the availability of Government funds make likely an unprecedented amount of construction in this type of building during the next two years.



FARM GROUP MEN'S BUILDING AND ADMINISTRATION WOMEN'S BU





PLANS OF MEN'S BUILDING
AND ADMINISTRATION SECTION

SAN FRANCISCO COUNTY JAIL FOR MEN AND WOMEN

ALBERT F. ROLLER AND DODGE A. REIDY, ARCHITECTS ASSOCIATED

This new institution is an outside cell block type, each of the 528 cells having its individual window only for the admission of direct sunlight. The windows may be opened for cleaning but are ordinarily kept closed because each cell is mechanically ventilated and the temperature thermostatically regulated. Instead of employing the old system of vertical bar grilles over each opening there has been incorporated into the window itself, as an integral part, horizontal bars of tool-resisting steel welded into frames of similar material, thus providing maximum protection without unsightly effects.

Another feature is the single occupancy of cells, instead of the usual custom of placing two or more inmates in every cell. Each cell is provided with its own sanitary appliances.

The men's and women's buildings are both constructed of fire-resisting materials throughout. The structural floors and walls are of reinforced concrete, all partitions and stairs are of fireproof materials and the windows and doors throughout are of metal. Due to the nature of occupancy, prohibiting the introduction of numerous exits and fire-escapes, every precaution was taken in the structural design of the buildings to insure the safety of those housed therein.

The main (or men's) building, T-shaped in plan, is approached by a wide stairway to the administrative portion which is two stories in height. The connecting service portion between administration and cell blocks is three stories in height. The cell block section or main mass is seven stories high, the center portion terminating in additional stories housing mechanical equipment. This step-back facade was prompted by the contour of the low, rolling hills against which the building is imposed, in the middle of 250 acres of ground.

The lower floor of the main building is devoted to inmate-receiving rooms, shower and dressing rooms, barber shops, clothes and shoe repair shops, boiler and battery rooms, garage and storerooms. The first floor contains administrative offices, visiting rooms, chapel and classrooms, food and clothing storage rooms, laundry and kitchen facilities. On the next floor are two dormitories, each with a capacity of 60 beds, and a complete infirmary with 3 five-bed wards, doctors' and dentists' reception and treatment rooms and a sun deck behind high walls for convalescent inmates.

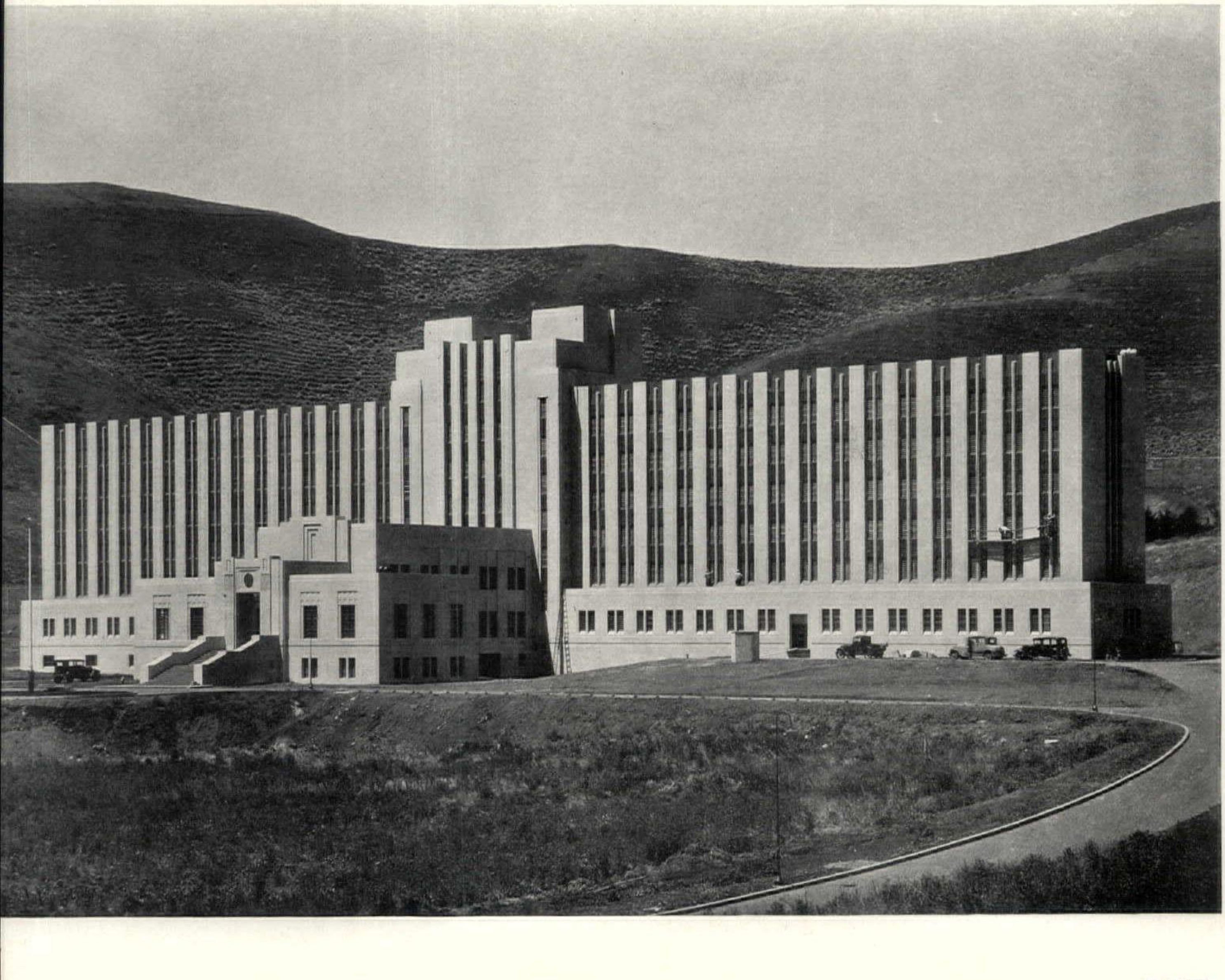
The next four succeeding floors are devoted to cell blocks—each floor containing four banks of 30 cells, a total of 480 individual cells on four floors. The tower or central portion of the building, above the cell blocks, houses the mechanical equipment of the elevators and the fan equipment serving the entire building with washed and thermostatically controlled air.

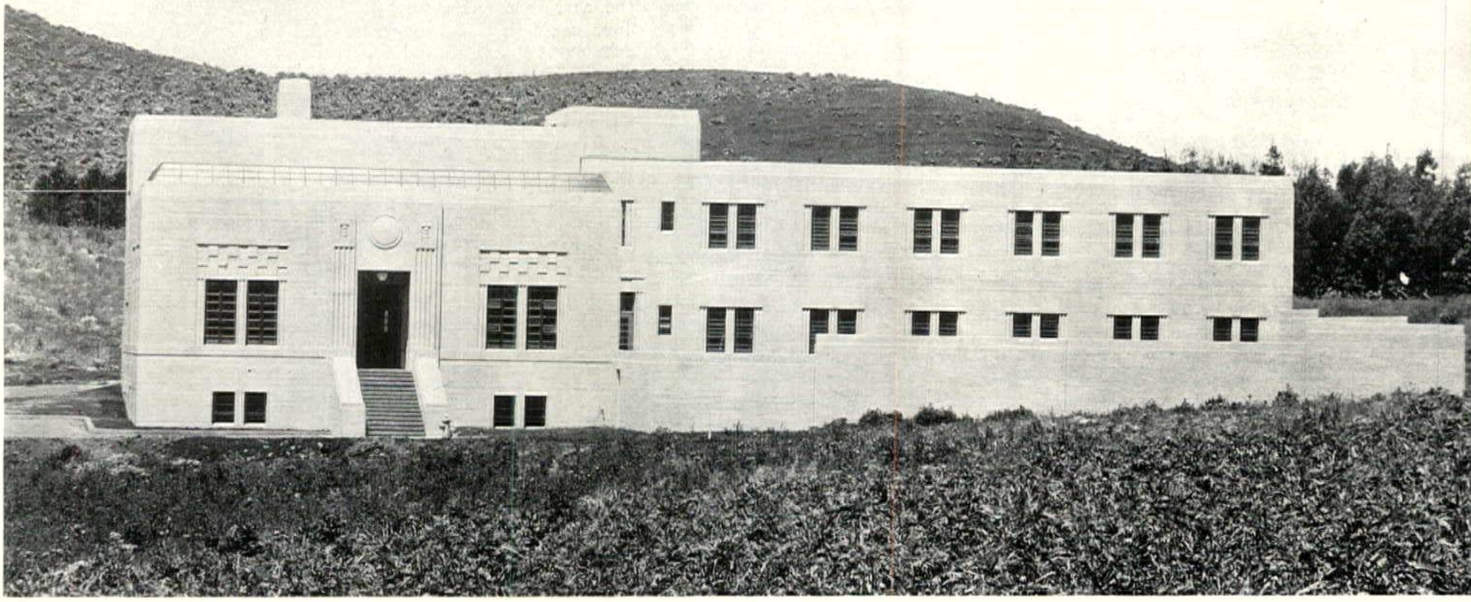
Both buildings are equipped with a complete radio broadcast and address system through which from a central control office orders or instructions can be issued to any of the personnel or inmates. This is in addition to a silent code signal system and a house telephone system for use of the guards.

Water for domestic consumption and sanitary requirements is brought to the site a distance of approximately 3¼ miles and stored in sufficient quantities to provide a week's supply in the event of a shut-down of the pumps.

As a part of the farm group, consisting of stables, corrals and farm equipment, sheds and a greenhouse for the propagation of young plants and vegetables, is a sewage disposal plant with all units in duplex including dual chlorination. The buildings of the farm group, like the two major buildings, are of reinforced concrete.

FRONT ELEVATION OF MEN'S BUILDING

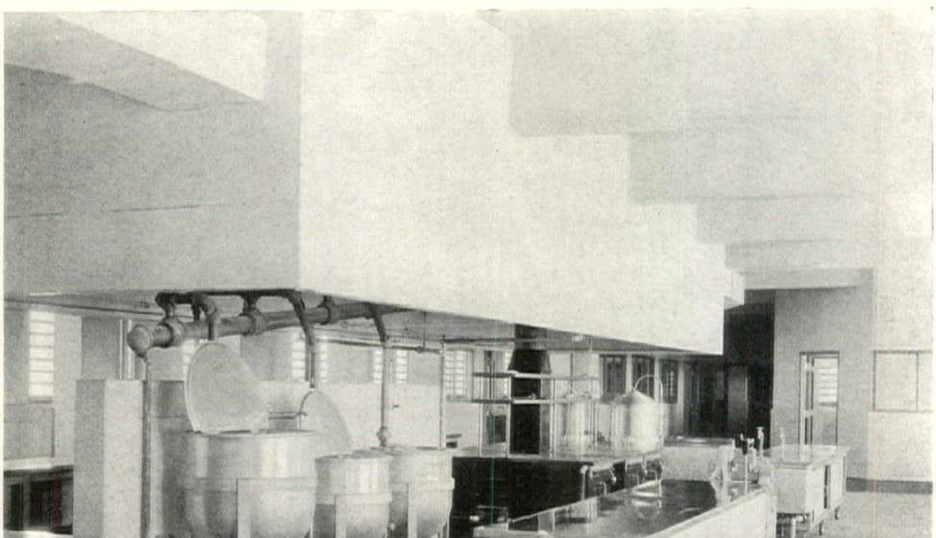




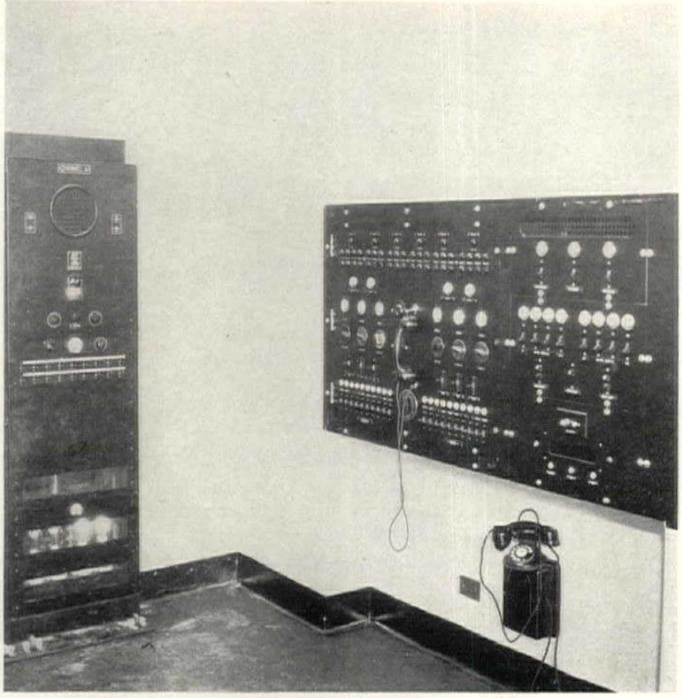
FRONT ELEVATION OF WOMEN'S BUILDING

SAN FRANCISCO COUNTY JAIL FOR MEN AND WOMEN

DETAIL VIEW OF KITCHEN



The women's building, situated 600 feet from the main building, is a two-story L-shaped structure and contains in addition to 48 separate rooms for sleeping purposes all the necessary service facilities, including recreation room, dining room, sewing room and a large serving pantry. The food is supplied from the main kitchen to this building in electrically heated carts, thereby reducing to a minimum the capital investment in kitchen and refrigeration equipment and eliminating the double overhead of maintaining two food preparation departments. This building is also served with steam from the main boilers but contains its own ventilating equipment. Recreation yards, or inclosures, are provided for both buildings and in addition, the women's building has a spacious sun deck with walls of concrete and glass.



CONTROL BOARD IN CHIEF JAILER'S OFFICE

DETAIL OF TYPICAL CELL

ALBERT F. ROLLER AND DODGE A. REIDY, ASSOCIATED ARCHITECTS

VIEW OF TYPICAL CELL BLOCK IN MEN'S BUILDING

CHECKING SCHEDULE

A complete check list of prison design would require more space than a magazine article could allow. A partial list of many items that have been overlooked or improperly designed in actual practice is given herewith, however, to emphasize the several points discussed in this article. Many of these items may appear obvious but nevertheless did not so appear to the designers of various institutions for they are all observations recorded by Mr. White.

SITE

Ample supply of good water.

Railroad facilities.

Farm land: At least one acre per inmate; minimum 800 acres.

Avoid locations where fog is prevalent.

INCLOSURE

Minimum: Cyclone wire fence as a dead-line.

Inclosure wall: Avoid projecting piers, arches, brackets, and the like.

Vehicle trap.

Pedestrian trap: Designed to require two guards, one of whom is protected from any possible attack, to control and operate.

Automatic recording device for concealed weapons or tools.

Gas stations controlled by protected guard.

Guard towers: Full visibility (no small windows), toilet, heat, telephone, flood light with flexible control; entrance only from outside of inclosure.

ADMINISTRATION

Check list of civilian personnel to insure ample administration office space. Warden usually requires his offices away from the common center. Assistant, usually the custodial office, requires offices near control center.

Chief clerk: Easily accessible to public.

Record vault.

General clerical: Large space divided by glazed movable office-type partitions, preferably metal, allowing complete observation and flexibility. Avoid solid partitions.

Large storage for supplies.

Vault for books and records.

Vault or safe for valuables and cash.

Paymaster convenient to clerical corridor with safe or vault.

PUBLIC AREA

Waiting space with toilets.

Avoid windows opening onto prisoners' courts or yards; if necessary, guard with fine mesh fixed screens.

Attorneys' rooms for conference (where institution has persons awaiting trial).

VISITING ROOM

Access by prisoners through controlled corridors.

Access by visitors as direct as possible.

Physical separation of prisoner and visitor by (1) glazed screens with speaking device, (2) wire grilles, (3) table with center partition extending to floor. Depending on type of inmates housed.

In some cases examination of visitors should be provided for by small examining rooms.

CUSTODIAL HOUSING

A number of guards should have living quarters in the institution for emergency:

Single rooms with lavatory.

Shower and toilet rooms.

Lounge.

GUARD CENTER

Locker room and duty room: Toilet for guards.

Office for Captain of Guards.

Key vault.

Telephone equipment room.

RECEPTION OF PRISONERS

Provide trap or inclosure so that prisoners arriving in bus cannot make a break.

Avoid elaborate suite of rooms for reception, bathing and dressing of new inmates.

Provide large room in which are showers, toilet, benches and small storage for prison clothes for maximum incoming squad.

Room for photography and finger printing.

Doctors' room.

Record Clerk's office.

Civilian clothes: Storage for clothes, valuables and personal effects.

Hold cells for squads arriving too late for day's routine and for observation.

MESS HALL

Quarry tile floor and base.

Ample floor drains.

Hose bibb connections.

Guard's control station.

Wire grille partition for patrol guard.

Acoustical treatment on ceiling.

Cross light and ventilation.

Not less than two divisions: Partitions solid to height of seven feet, wire grille above if required.

Built-in tear gas stations operated from guard's control station.

Loud speaker connection.

Provide sufficient space for waiting lines if outside communication is used.

Tables, if wood, of heavy construction with linoleum tops.

Use heavy benches and not separate stools or chairs.

Metal tables and benches secured to floor.

Serving tables: Use simple type without warming closets. One serving unit for each 100-125 men. Hot tables of stainless steel on pipe frame with two round containers 18″ diameter, two oblong 16″ x 18″, all 11″ deep, with covers and cover handles. Flush removable plates in two sections to allow use as plain table when all hot containers are not in use. Bake pans can be set on table and served from direct.

GUARDS' AND OFFICERS' MESS

Cafeteria service preferable to table service.

Use small standard hot table, dishwashing machine, separate guards' kitchen.

KITCHEN

Quarry tile floor and base.

Impervious wall surface.

Ample floor drains.

Depression in floor under kettles, walkway at back of kettles at floor level.

Steel removable mat in depression in front of ranges.

Ample light and cross ventilation.

Monitor type roof advisable for light and ventilation.

All partitions glazed for observation.

Ranges, bake ovens, and so forth, set on tile base.

Equipment at walls instead of in center.

Hot and cold water supply over range bank.

Steam kettles to have gate valve on bottom of kettles instead of draw-off cocks.

Hot and cold water supply to all kettles.

Cook's table anchored to floor.

Pot and pan rack over Cook's table supported on standards from table and not hung from above.

Use minimum number of drawers in equipment.

Sinks not less than 30″ x 30″ x 16″ made of stainless steel with all corners rounded. Drain valves instead of sink plugs.

Doors into mess hall and other rooms of ample width for trucks, etc.

Ventilating fan for range hood.

Ventilating ducts will condense much moisture; pitch ducts and make provision for drainage.

Screens in range hood vent easily removed and cleaned.

DISHWASHING

Use separate, inclosed vented room for dishwashing. Dishwashing not a part of kitchen.

Quarry tile floor and base, impervious wall surface.

Ample floor drains.

Double compartment sink.

Dishwashing machine, stainless steel, not less than two tanks; advisable to have two for breakdown.

Large doors for dish trucks.

Separate locked room for clean dishes. Not many shelves required.

STEWARD'S ROOM

Raised floor, glazed partition, located for observation of kitchen.

Ample size as several clerks, runners, and others, will occupy this room.

VEGETABLE PREPARATION

Floor and walls as for kitchen. Ample size as much work is done by hand. Ample drains.

Vegetable sinks, not less than 30″ x 30″ x 16″, stainless steel, gate valve waste.

Ample floor drain under vegetable peeler.

Spinach washer.

Vegetable peeler.

BAKERY

Ample light and natural ventilation.

Floor, walls and drains as for kitchen. Minimum of machinery. Flour elevators, molders, and the like, difficult to keep clean.

Flour sifter makes better bread.

Dough mixer need not be large, since 1 pound of bread per man a day is unit and four runs of bread can be made per day.

Proof box or room with heat, steam jet and floor drain.

Ample table top surface for hand molding.

Bun divider advisable.

Avoid built-in or inclosed bread storage. Use metal racks, wire shelves, with duck covers. Racks have storage capacity of one rack per 500 men.

Doughnut depositor.

Tilting steam kettle.

Mixing machine.

Hand bread slicer.

Ventilate flour storage.

Small refrigerator for yeast, milk, and so on.

REFRIGERATION

Minimum for Steward's daily supplies.

Meat, dairy and vegetable boxes opening into meat preparation room which acts as a vestibule to boxes.

Ice box for fish.

Garbage room.

Main refrigeration for Storekeeper in warehouse. Minimum: Fresh meat (not less than carload capacity with overhead track and hangers), smoked meats, dairy, vegetable storage.

Cold room for roots.

Blanket storage.

All doors to boxes to have observation panels, light switches on outside.

Refrigeration section should not be a thoroughfare for other utilities.

SCHOOL

Linoleum floor covering for rooms and corridor.

Classrooms and corridor partitions glazed office type.

Acoustical treatment on ceiling.

Classrooms not like standard civilian schools. Most classes are small.

Arm table chairs. No fixed seats or desks except for special work.

LIBRARY

Linoleum or similar flooring.

Acoustical treatment.

Work room.

Book storage.

Supplies storage.

Librarian's office.

HOSPITAL

In general good hospital practice should be followed with strict attention to detention and observation.

Ample space should be provided in office portions as trustee orderlies and clerks are used in larger numbers than in a civilian hospital.

Officer of the day convenient at control center.

Barber shop for hospital inmates.

Terrazzo or painted cement floors with 6′0″ linoleum insert and acoustical treatment on all corridors.

PATHOLOGICAL LABORATORY

Gas, compressed air, vacuum line.

Locks on all chemical hood doors.

Lavatory.

X-RAY

Check operating room for size and room for wheeled stretcher.

Toilet and lavatory for Technician.

Toilet and lavatory for patients.

Water cooling for X-ray developing.

Ventilation for dark room.

Lavatory in dark room.

DENTAL CLINIC

Not less than two chairs.

Work room with sink and plaster trap; electric outlet for small motors.

Dental X-ray.

UROLOGICAL

Ample supply of straddle sinks.

Scrub up sink for doctor.

HYDROTHERAPY

Tile floors and base and walls if possible.

Ample floor drains.

Sitz bath raised on platform, away from wall and not controlled from control table.

Set control cabinet on tiled base to prevent water running under marble sides.

Slight pitch from control table to shower inclosure to drain water from nozzle streams.

Set bidet jet in this drain.

All metal cabinets on tile or terrazzo base.

SICK CALL

Daily average 1 per 10 to 20 inmates.

Waiting space; examination room.

DRUG ROOM

Vault or safe for narcotics, alcohol, and so on.

AUDITORIUM

Acoustical treatment.

Window dark shades.

Conduits for control and operation of sound devices from operator's booth to stage.

Gas stations controlled from guard station.

Protected guard station.

BAND ROOM

Highly desirable in large institutions. Band, orchestra and musical instruction important features in discipline.

Opportunity to practice where noise is not objectionable.

WAREHOUSE

Receiving space with floor scales, beam in office.

Office for Storekeeper.

Toilet facilities.

No access except for authorized persons.

Loading platform, with ramp to ground.

Separate room for coffee, spices and dry groceries with coffee and spice grinder.

Cold room for blanket storage.

Vault for files, saws, cutting pliers, and so on.

Wire grilles ½″ mesh on all windows in addition to detention grilles.

POWER PLANT

Flush platform scales for coal.

Testing equipment for boilers, CO^2 recorder, draft gauge, and the like.

Boiler room, coal bunkers and ash handling devices away from kitchen and bakery to prevent infiltration of dirt and dust.

Mechanical stokers should be of type allowing firing of boiler by hand in case of breakdown.

Electric standby service where generating plant is used.

Two sources of power if public utility current is used.

All switchboards, transformers, and the like, under locked protection.

All electric panels in locked rooms, not in corridors or accessible to inmates.

Red, green and white lights at top of stack or tower controlled from guard center for use in escapes or to notify of capture.

Provide emergency lighting for operating rooms, mess hall and all inmate corridors and cell houses.

CONSTRUCTION NOTES

All stairway doors with observation panels.

All office doors glazed except those that are strictly private.

No glazing below lock rail height.

All doors to dormitories and outside rooms should have observation openings, glazed or grilled.

All clerical and school doors and partitions glazed.

Check shop and other doors for size to allow passage of machinery, material and finished products.

Doors or panel at least 8 feet wide for laundry machinery.

Hollow metal door jambs in preference to wood and in all cases cut off at top of base.

Check anchorage and weight of all frames with swinging iron solid or grille doors.

When cell toilets discharge back to back into common line, provide fitting designed to prevent flushing across.

All shower baths should have ample drains, not less than 9″ face plate; the 3″ type is almost useless.

Check for curbs at front to prevent water flowing onto outside floor. Such faults are all too frequent.

Pedestal type of urinal most satisfactory in every way.

Wall closets secured to both floor and wall are subject to breakage by shrinkage movement.

Poured reinforced concrete in smooth lined forms is very successful in cell and dormitory partition construction. The use of plaster should be avoided in all except civilian quarters.

Grille front cells should have floors 2″ above corridor floors to allow washing of corridor floors without flooding cell floors. It also prevents rusting of steel grilles in cell front.

Check for all nooks and angles not under easy supervision. Avoid stairways which afford lurking places for inmates with murderous or malicious intentions.

Check for all unprotected openings not guarded by grilles. Every opening is a weak spot in detention.

Provide grilles and access for guards so that all duties of the guards—operating cell door control boxes, and so on—can be performed as far as possible without possibility of inmates attacking guards.

Provide by gun ports or galleries means by which all cell blocks can be controlled by rifle fire. Such openings may prevent a serious affair merely by their threat.

T H E

ARCHITECTURAL RECORD

WHAT IS THE MEDICAL CENTER?

By T. J. YOUNG of the office of John Russell Pope, Architect

The Philadelphia Hospital, erected in 1752, had a simple arrangement of beds for the segregation and treatment of the sick, but little else to suggest modern hospital. Anaesthesia, the X-ray, asepsis and the many laboratory procedures necessary to the diagnosis and treatment of diseases have given us a building far removed from that simple beginning.

The functions of a modern hospital may be divided into four categories: (1) treatment of the sick or the *medical* function; (2) training of medical students and nurses, or the *teaching* function; (3) investigation, or the *research* function; (4) constructive health building, or the *social* function. In the last quarter century there has been such a rapid expansion of all these functions that it has become increasingly difficult for any single hospital in a community to accept the fourfold obligations.

Out of this situation has developed the medical center, which is simply a logical economic coordination of hospital and health facilities. Physically, it is a hospital or group of hospitals and their dependencies, frequently linked with the medical faculty of a university, and arranged, if properly planned, for orderly expansion of any or all of the hospital functions.

The medical center may serve the crowded population of our largest cities, as do the two principal examples in New York City, or it may serve smaller cities, such does the one at Syracuse. In the future numerous examples of the medical center idea will no doubt be planned to serve regionally the more thickly populated rural districts.

It has been frequently found advisable to decentralize some of the hospital functions. At Syracuse, for example, the ultimate development will include a psychiatric hospital, a city hospital, a university hospital, a medical school, a nurses' home, laboratories and dispensaries.

The architect has numerous problems in this diversification, but he may escape many pitfalls by a careful preliminary examination of the topography, neighborhood, prevailing winds and other matters bearing on the placing and orientation of the proposed and future buildings. He will also need to study the relationship of the buildings in order to secure maximum efficiency. The relation of the buildings to traffic arteries is likewise important because of the possibility of noise. An agreeable prospect from the patients' buildings is desirable for obvious reasons. In districts in or near industrial developments consideration must be given to the prevailing winds which may carry impurities, dust or smoke and which can be a source of much trouble. If the trustees or directors of the medical center are far-sighted they will protect the properties from too close encroachment by industrial buildings. Most important, they will secure plenty of ground for expansion.

One of the chief problems for the designer is securing an aspect of homogeneity in such varying structural types as a tuberculosis hospital and a nurses' home.

The patient frequently gets his first impression from the hospital entrance, and such impressions may influence subsequent experiences inside the hospital. Impressive dignity is not necessary and may even be harmful. Should the medical group be erected in a residential zone, it may be advantageous to carry out the exterior architecture in a domestic spirit. The duty of the designer is to eliminate, wherever possible, harshness of color, sound or form, and to replace gloom with an atmosphere of cheerful efficiency.

MEDICAL CENTERS—SMALL AND LARGE

By GEORGE S. HOLDERNESS of the office of John Russell Pope, Architect

The complete medical center may be considered as an institution containing the following divisions: General Hospital, Maternity, Pediatrics, Orthopedic, Crippled and Ruptured, Isolation, Tuberculosis, Cancer, Convalescent, Neuro-psychopathic, Urology, Dental, Eye-Ear-Nose-and-Throat, X-ray, Clinic, Welfare (Social Service), Laboratories, Medical School, School of Nursing.

Every division in this grouping represents an activity to which a separate and complete institution could be and often is devoted. Although some of these divisions are found in the standard general hospital there is no inherent rivalry expressed in the articulation of the properly balanced medical center. Though distinct in their respective phases of the work, they are bound by a common purpose—the good health of the public.

It should be borne in mind that a medical center is not necessarily an administrational amalgamation. In the case of a grouping of several institutions, of which each has its own plant, it is often found that they are held and administered separately but with a working agreement for reciprocal use of facilities. Among other reasons for this is the fact that the medical center sometimes consists of an assortment of state, county, municipal and private institutions.

In any community, whether it be a metropolis or a small city of 25,000, the medical center generally is developed around one or more existing institutions. In many cases the location of these nuclei determines the site of the proposed group. In other instances the entire medical center is housed in a plant which is entierly new from stem to stern.

FOR THE COMMUNITY OF 25,000

The community of 25,000 intending to develop a medical center has the problem of deciding just which of the hospital divisions should be provided. It is safe to say that there is a need, to a greater or lesser degree, of all of these divisions. In formulating a building program the extent of this necessity is the crucial point; the paramount question is whether this or that type of case will appear for hospitalization in sufficient numbers to justify the community in providing a distinct service for it.

GENERAL HOSPITAL

The nucleus of any medical center is the general hospital. In a community of 25,000 it assumes increased importance because of the likelihood that it will include many of the divisions which in a larger community would be considered as separate entities. At the other extreme of the range of probable inclusion is the medical school, a no less desirable feature but barred by circumstances in nearly all instances. The average community of 25,000 does not possess a medical school, and even the Chamber of Commerce, where properly advised, rarely entertains any illusions about creating one.

The maternity, pediatric, convalescent, urology, orthopedic, crippled and ruptured, cancer, and eye-ear-nose-and-throat divisions are essential, but in this size community the demand is generally insufficient to justify their establishment as so many separate hospitals. Their rightful place seems to be in the general hospital, where flexible planning and organization can be made not only to satisfy the patients' every need but to result in administrational economies as well. The same is true of the neuro-psychopathic division, although in a city of the size considered the volume of such work is generally small and the patients are in most cases merely held under observation pending discharge or commitment to special institutions for treatment.

Because of their close relationship with the various parts of the general hospital, the X-ray and laboratory divisions likewise should appropriately be located here. It appears likely that practically all dental work required of a medical center in a small city can be handled in the out-patients' division, or clinic.

ISOLATION HOSPITAL

For communicable diseases the usual practice favors strict segregation in a detached and fairly removed building, although in some cases circumstances compel the use of merely a separate and distinct wing for this purpose. In certain communities the presence of a contagious hospital in any of the well populated neighborhoods is looked upon with disfavor. It can be said definitely, however, that if communicable diseases are to be treated in the medical center the isolation hospital is a necessary division. For the treatment of tuberculosis there is little likelihood that in the average community of 25,000 a separate hospital could be justified. Because of the lingering nature of their affliction and the specialized character of treatment required, tubercular patients customarily are cared for in state or other institutions planned and equipped particularly for this work. Such institutions are made practical by the wide area from which they draw patients; in the small community the tubercular patient can be cared for in a special section of either the general or the isolation hospital until his future hospitalization is agreed upon.

CLINIC

For economy in construction the small community generally will find it practical and desirable to house its clinic as an integral part of the general hospital building. The clinic, however, is to be thought of as a separate unit, an organization that could function even though there were no general hospital. It is properly regarded as one of the most important elements of a medical center and a prime contributor to the sustained health of a community. Here we find a broad division into medicine and surgery and customarily the following classification of treatment for out-patients—dentistry, eye-ear-nose-and-throat, obstetrics, pediatrics, neurology, dermatology, genito-urinary, gynecology, orthopedics, gastrology and dispensary. In the small community, where a distinct tuberculosis hospital is impractical, the provision of out-patient treatment for ambulatory victims of this malady is recommended by many authorities.

In modern times it has become realized that a considerable part of all illness is the result of social causes, and the conscientious hospital now feels that its social service or welfare department is one of its indispensable adjuncts. The home, work, recreational and emotional life not only of both bed- and out-patients but of the community at large are the fields in which social service is active, and this department is properly located within easy access to the clinic and the public spaces of the general hospital.

NURSES' QUARTERS

The provision of living quarters for nurses is generally regarded as part of any general hospital project. Preferably such accommodations take the form of a separate building where relaxation and domestic life are furthered by remoteness from hospital atmosphere. The nurses' home should include not only sleeping quarters, in a proper balance of single and double rooms, and adequate bath and toilet facilities, but also rooms for recreation and social intercourse. There is at present among the best hospital minds a divergence of opinion as to the usefulness of the training school for nurses; in cases where the school is favored it is customarily found in the nurses' home and includes class and assembly rooms, laboratories, demonstration rooms, library and offices.

OTHER REQUIREMENTS

While a separate building for servants' quarters is not at all rare in connection with hospitals, it is hardly probable that an urgent need would be felt for such accommodations in a medical center for a community of 25,000. Except where this population is unusually spread out the hospital generally has no acute problem in securing servants. This observation, of course, is based upon a community whose population is of average cross-section. In a community which consists largely of restricted residential developments it is not unlikely that a hospital would be forced to draw its servants from neighboring towns, in which case the medical center would find it distinctly advantageous to provide quarters.

In a small group, such as the medical center under consideration, it is generally found economical in construction and operation to locate the power plant in the principal hospital building or in a wing. This is true also of the laundry and garage.

CONCLUSIONS

Reviewing the requirements as already set forth, it appears that a reasonably compact and yet efficient medical center for a community of 25,000 would consist of (a) general hospital, including also the special divisions of maternity, pediatrics, convalescence, urology, orthopedics, eye-ear-nose-and-throat, neuro-psychopathics, X-ray, laboratories, and social service, (b) isolation hospital for communicable diseases, including tuberculosis, if not cared for in the general hospital, (c) clinic (incorporated in the general hospital building), and (d) nurses' home, including training school where desired.

This program would involve a group of three buildings in a scheme which cannot be charged with being excessively ambitious for a community of 25,000. In view of the wide variation of conditions and customs among communities of this size no attempt has been made to predetermine the amount of space and facilities to be assigned to the several divisions of this typical medical center; in arriving at such information every individual community is a separate problem to which the answer can be obtained only after careful analysis of its needs and the wishes of those sponsoring the movement.

It must be remembered also that this survey of probable requirements is based on the premise that the hypothetical community under consideration has no special hospitals for any of the divisions included. In exceptional localities, for example, a maternity or convalescent or tuberculosis hospital might already be in existence and contemplated as an important element in the proposed medical center, in which case the program as here outlined would be modified accordingly; but such special institutions rarely exist in communities of this size.

FOR THE COMMUNITY OF SEVERAL HUNDRED THOUSAND

For more populous localities, and yet not those which fall in or border upon the "metropolitan" class, let us consider the community of several hundred thousand, which might be a single city of that size or even a county or other district consolidated in the project of a medical center. How would the medical center in such a community differ in make-up from that in the smaller one?

The principal difference results from the greater need of hospitalization in the special divisions, which means not only a probable necessity of providing separate hospitals for certain divisions but also an increased likelihood that such special hospitals already exist in the community and are potential parts of a medical center. If a completely new plant is contemplated it is fitting, then, to provide separate wings for these special divisions instead of merely assigning them to space in the general hospital. Thus each special division enjoys the benefits of segregation without losing the obvious advantages of physical connection with the general hospital and other phases of the medical center.

SPECIAL DIVISIONS

It is impossible to catalogue the exact special divisions for which in a community of this size separate wings of the medical center should be set aside. In certain communities, for example, it is conceivable that there are well established special hospitals which are located unfavorably for becoming a unit in the proposed medical center and which for valid reasons object to moving bodily into new quarters. A possible effect of this situation is a notable curtailment of the medical center's activities in these particular fields; in such a case the building committee often contents itself with planning a future wing or wings for their accommodation.

MEDICAL SCHOOL

Where the community is the seat of a medical school, which is more likely than in the case of the smaller community, this institution is usually looked upon by the sponsors of a proposed medical center as a very desirable element in the scheme of an enlarged public service; in fact, the benefits to the medical school are so pronounced that its own guiding spirits are generally found among the prime movers behind such a development. The planning of a medical school is a study in itself. Suffice it here to say that while the school's separate identity and prestige are not to be clouded, its location nearby or with the main hospital buildings is to be recommended.

SERVICE BUILDINGS

The provision of servants' quarters depends on local conditions. Where available living accommodations are too far removed from the site of the medical center it is often found desirable and even urgent to care for the servants on the property. In such cases the customary practice is to segregate the men in one detached building and the women in another, although for the sake of economical construction a single building divided into two parts is sometimes adopted. The matter of the separate power house also is largely controlled by factors which cannot be anticipated when discussing communities in general but must be made the subject of careful analysis for each individual case. Whether technical and financial considerations dictate that the plant shall be isolated or incorporated in one of the hospital buildings, it is of great importance that the chimney be sufficiently high or remote to cause no annoyance to patients and personnel.

CONCLUSIONS

In other fundamental respects the medical center for a community of several hundred thousands is likely to bear a strong resemblance to its little brother of the less populous community. Although more imposing in size and with its functions more highly developed it is essentially the same mechanism. The general hospital and the clinic are here also the chief instruments of public service, with the noteworthy difference that certain special divisions are of a magnitude sufficient to warrant their segregation in distinct wings or even in separate buildings, while the nurses' home and the isolation hospital assume an increased importance in keeping with the remainder of the group.

Summing up, the framework of a medical center in a community of this size would become an assembly of (a) general hospital, including also those special divisions for which local conditions do not justify separate establishments, (b) special hospitals, as warranted by local circumstances, installed in separate wings of the main hospital or in detached buildings, (c) clinic and dispensary, (d) isolation hospital, (e) medical school, where possible, (f) nurses' home, including training school if in line with the policy of the administration, (g) servants' quarters, where nature of community demands, and (h) power house.

THE COMPACT MEDICAL BUILDING

No discussion of medical centers would be complete without reference to the compact "medical building," a form of concentrated service which in recent years has found much favor in town and city alike. Starting as the "doctors' building," an office structure occupied exclusively or almost so by members of the profession, it has in many cities become expanded to a point of considerable clinical significance.

In the medical building we find the offices of doctors of all branches of medicine and dentistry, complete with laboratories and rooms for consultation, treatment, rest, and minor operations. Here also are roentgenologists, chemists and others practicing in fields allied to the medical and dental. In some instances the medical building goes so far as to include a full-fledged hospital with accommodation for bed patients, major operating rooms and other standard features.

ADVANTAGES

As compared with the miscellaneous locations where doctors' offices are generally found the medical building has distinct advantages. It offers planning and mechanical arrangements designed particularly for this class of occupancy. It provides an intimate and profitable relationship among those who are working in kindred fields, and for the public it facilitates the business of "going to the doctor." For the purposes which it serves, the advantages of a location in the heart of a city are manifest.

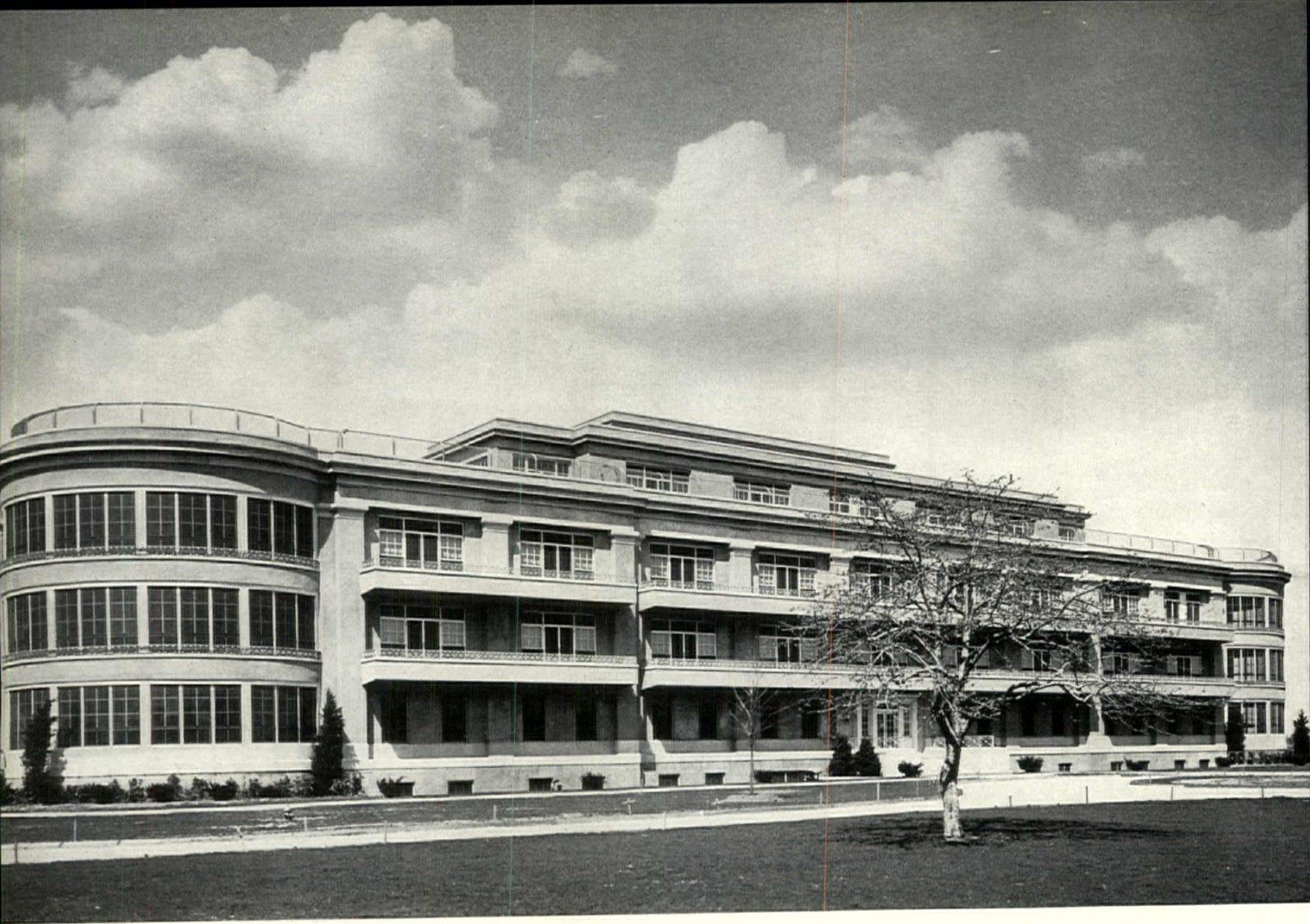
LIMITATIONS

Although it embraces a range of services the medical building is primarily a "center of doctors" and is not to be thought of as a competitor of the medical center where such an institution exists. While it is true that in some localities the medical building does yeoman service as a substitute for a medical center it is essentially a coordination and refinement of the private practice of doctors in a community. Except in the rare cases where actual hospitalization is provided it cannot be regarded as an encroachment on the true territory of the complete medical center.

HOSPITALS AND MEDICAL CENTERS

MEADOWBROOK HOSPITAL AT HEMPSTEAD, LONG ISLAND, NEW YORK
OFFICE OF JOHN RUSSELL POPE AND WILLIAM F. McCULLOCH, ASSOCIATED ARCHITECTS

Photograph by Drix Duryea, Inc.



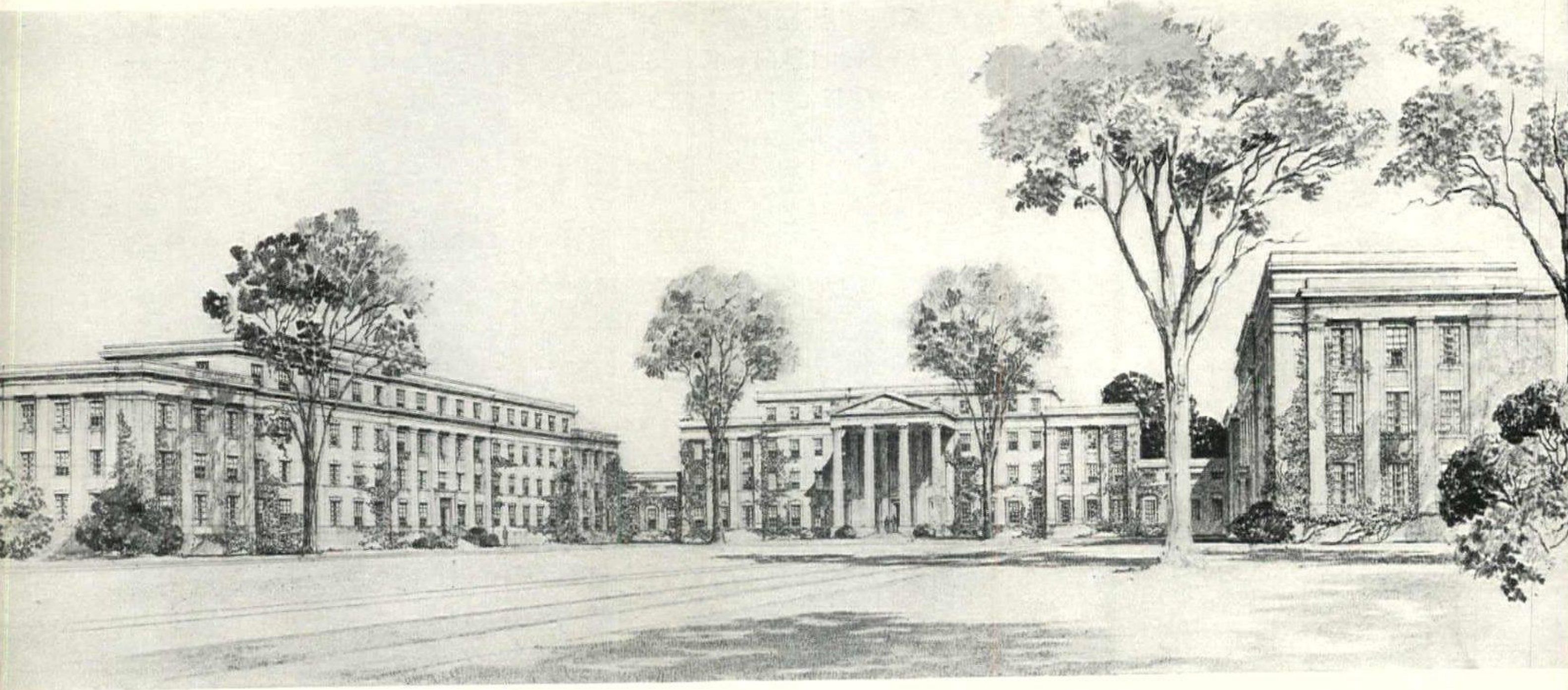
GENERAL VIEW OF PATIENTS' BUILDING

INTERIOR VIEW OF TYPICAL SOLARIUM

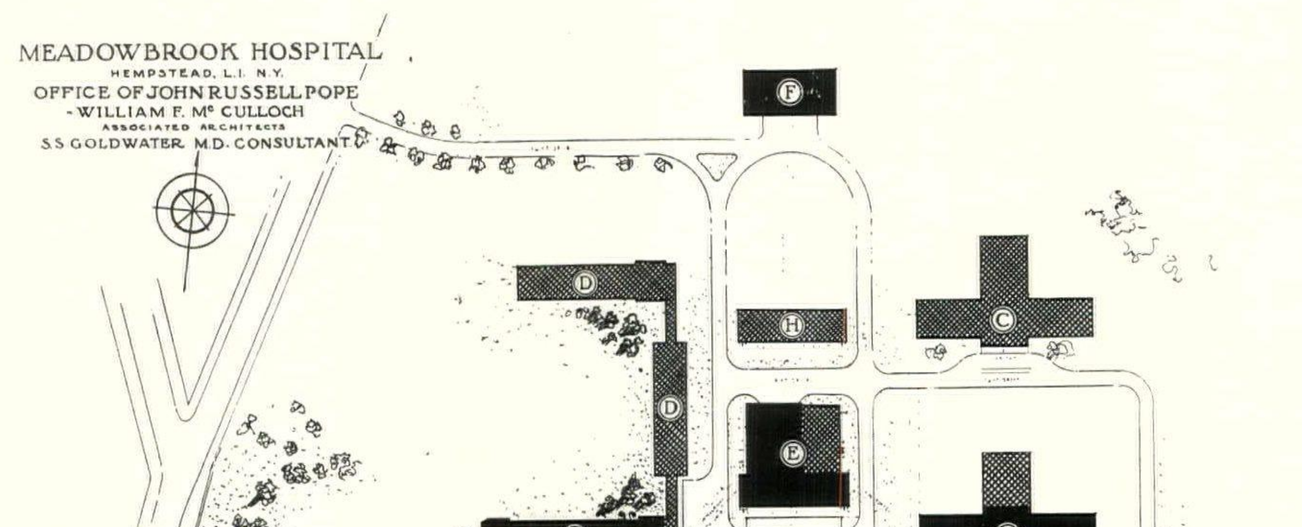
Photographs by Drix Duryea, Inc.

MEADOWBROOK HOSPITAL AT HEMPSTEAD, LONG ISLAND, NEW YORK
OFFICE OF JOHN RUSSELL POPE AND WILLIAM F. McCULLOCH, ASSOCIATED ARCHITECTS
S. S. GOLDWATER, M.D., CONSULTANT

CANTILEVERED BALCONIES FOR PATIENTS

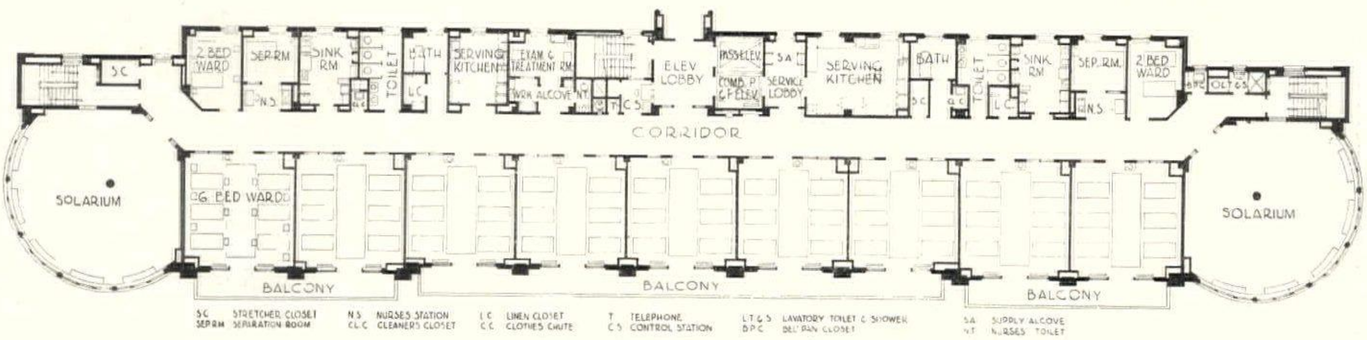


PERSPECTIVE VIEW OF FUTURE ENTRANCE COURT



MEADOWBROOK HOSPITAL AT HEMPSTEAD, LONG ISLAND, NEW YORK
OFFICE OF JOHN RUSSELL POPE AND WILLIAM F. McCULLOCH, ASSOCIATED ARCHITECTS

TYPICAL WARD FLOOR IN PATIENTS' BUILDING

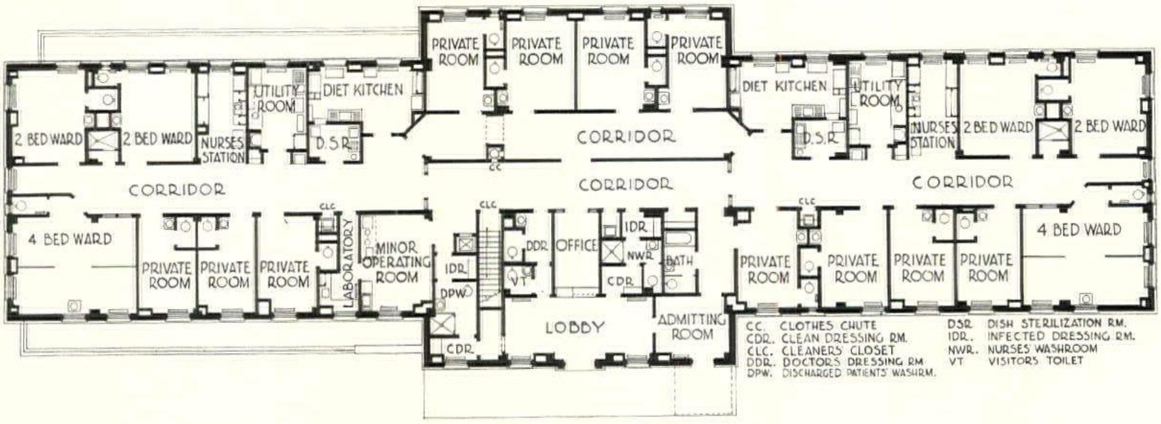


SECOND FLOOR PLAN

Main Patients' Building (including kitchen and operating departments): 173 beds. Cost: $759,874 or 66 cents a cubic foot . . . Nurses' Home: 107 beds. Cost: $203,209 or 68 cents a cubic foot . . . Other Patients' Buildings: 27 beds. Cost: $121,571 or 70 cents a cubic foot . . . Cost of entire plant: $1,403,207 or 67 cents a cubic foot.

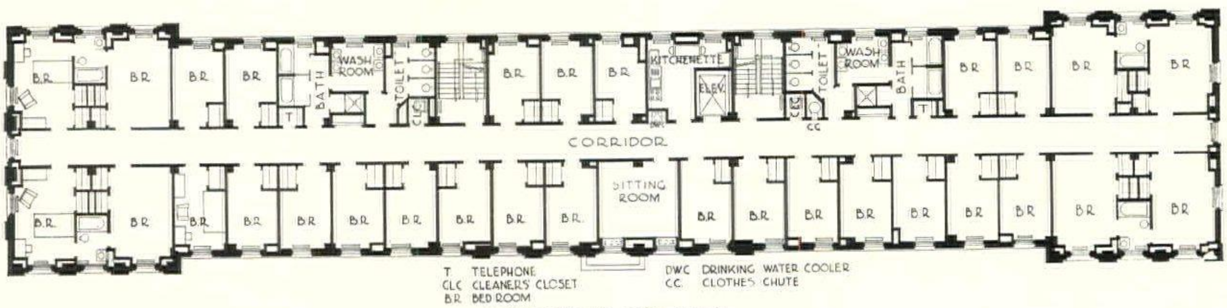
BIRD'S-EYE PERSPECTIVE OF COMPLETE HOSPITAL GROUP

Drawings photographed by Peter A. Juley & Son



FIRST FLOOR PLAN

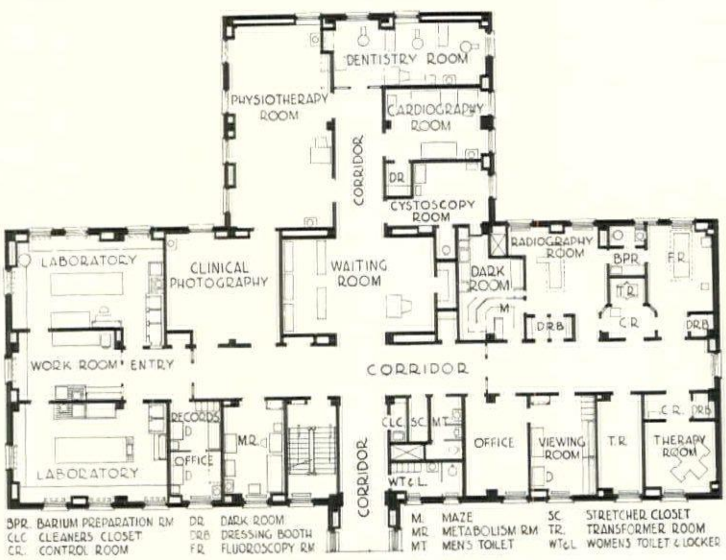
PATIENTS' FLOOR IN CONTAGIOUS BUILDING



SECOND FLOOR PLAN

A TYPICAL BEDROOM FLOOR IN NURSES' HOME

SCALE OF PLANS:
1/32" EQUALS 1'0"



FIRST FLOOR PLAN

X-RAY AND LABORATORY FLOOR
IN KITCHEN AND OPERATING BUILDING

MEADOWBROOK HOSPITAL AT HEMPSTEAD, LONG ISLAND, NEW YORK
OFFICE OF JOHN RUSSELL POPE AND WILLIAM F. McCULLOCH, ASSOCIATED ARCHITECTS

SYRACUSE MEMORIAL HOSPITAL AT SYRACUSE, NEW YORK

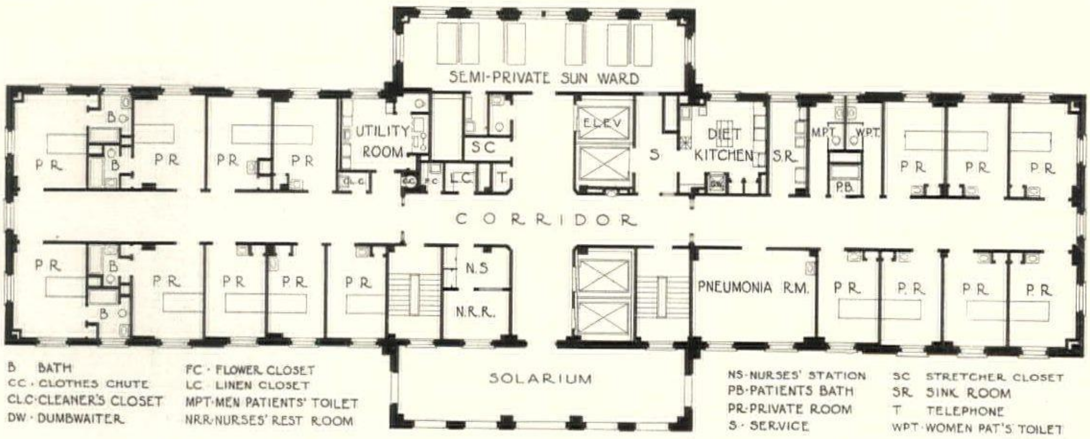
OFFICE OF JOHN RUSSELL POPE AND DWIGHT JAMES BAUM, ASSOCIATED ARCHITECTS

Photograph by Samuel H. Gottscho

Photograph by Samuel H. Gottscho

DETAIL OF TOWER LOGGIA

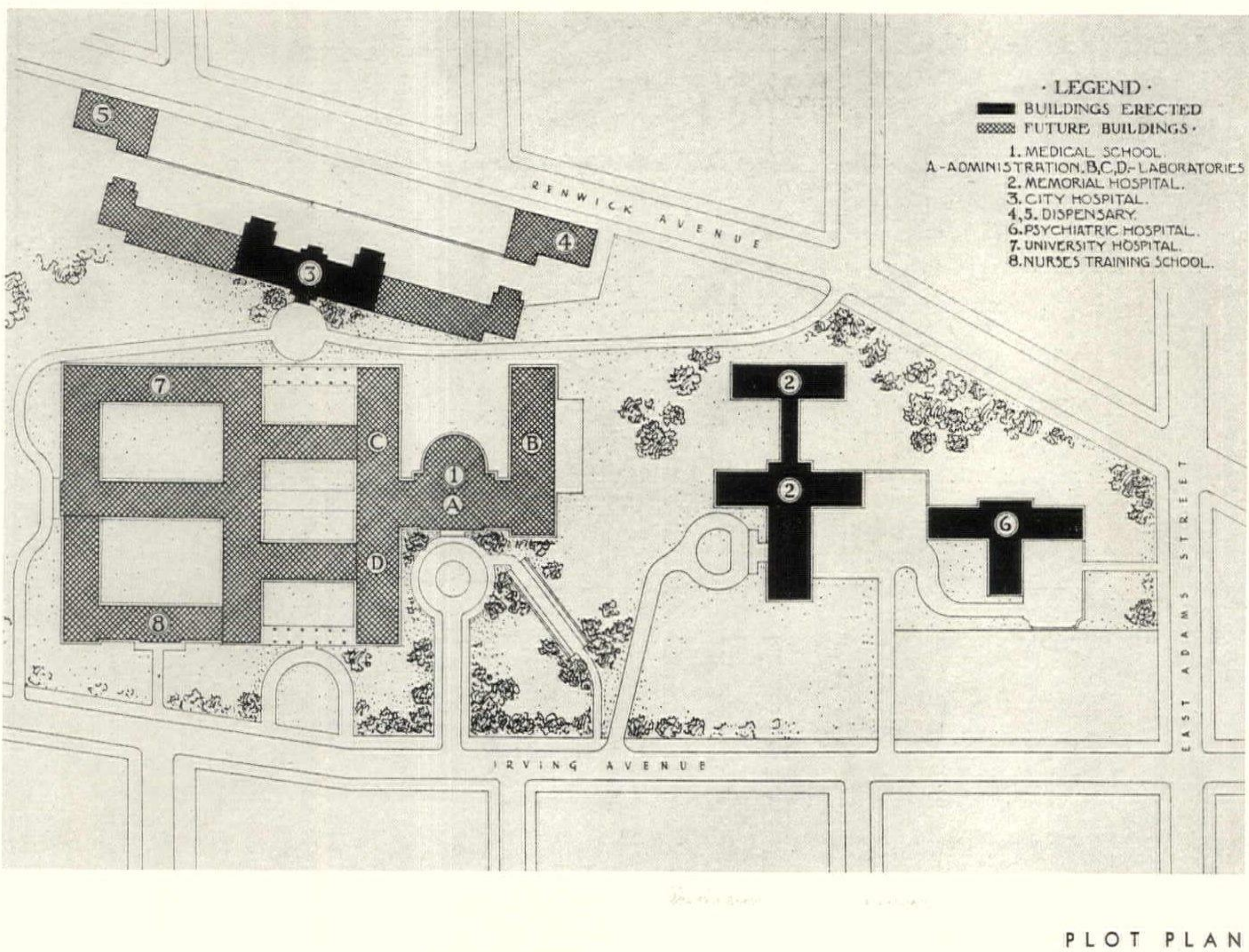
SYRACUSE MEMORIAL HOSPITAL AT SYRACUSE, NEW YORK
OFFICE OF JOHN RUSSELL POPE AND DWIGHT JAMES BAUM, ASSOCIATED ARCHITECTS



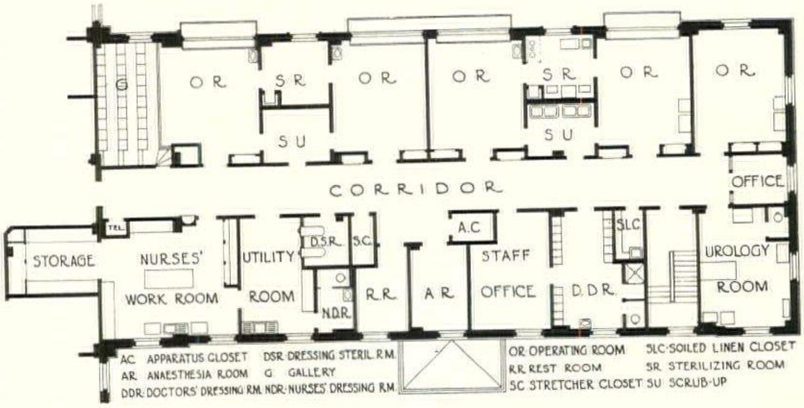
SIXTH FLOOR PLAN

PRIVATE ROOMS FLOOR IN PATIENTS' BUILDING

Main Patients' Building (including administration space): 283 beds. Cost: $1,458,220 or 82 cents a cubic foot. . . . Nurses' Home: 145 beds. Cost: $415,274 or 74 cents a cubic foot. Cost of entire plant: $1,873,494 or 80 cents a cubic foot.



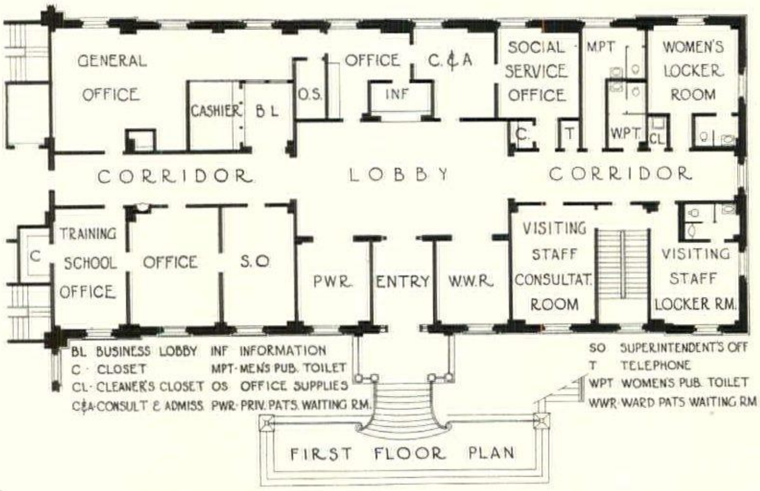
PLOT PLAN



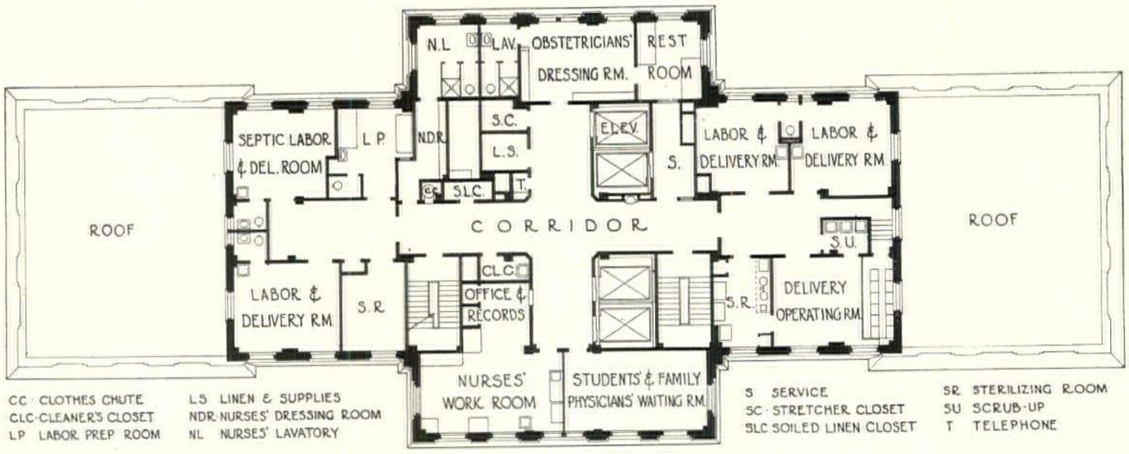
SECOND FLOOR PLAN

OPERATING DEPARTMENT IN ADMINISTRATION BUILDING

SCALE OF PLANS:
1/32" EQUALS 1'0"



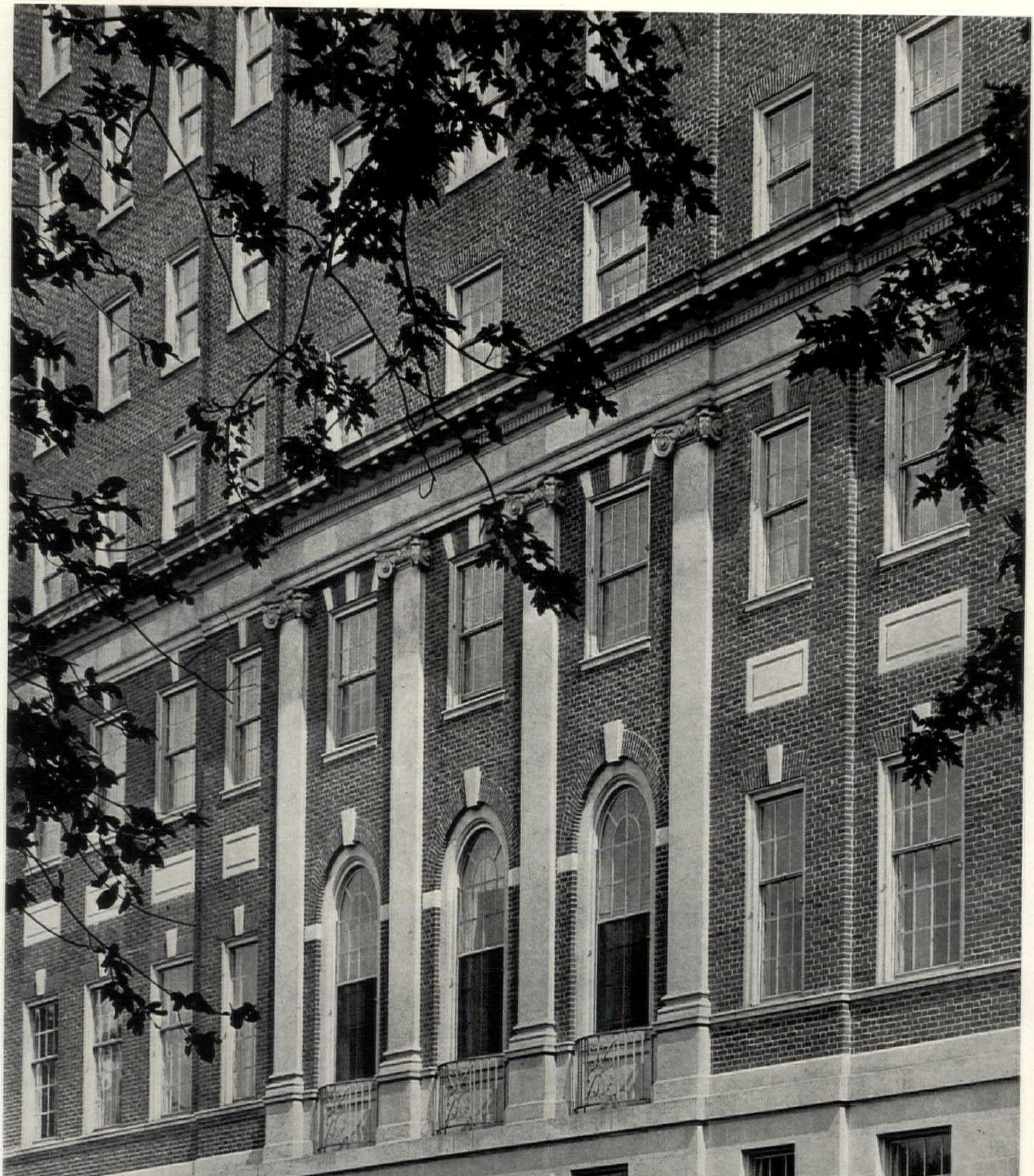
MAIN ENTRANCE FLOOR IN ADMINISTRATION BUILDING



CC CLOTHES CHUTE
CLC CLEANER'S CLOSET
LP LABOR PREP ROOM
LS LINEN & SUPPLIES
NDR NURSES' DRESSING ROOM
NL NURSES' LAVATORY
S SERVICE
SC STRETCHER CLOSET
SLC SOILED LINEN CLOSET
SR STERILIZING ROOM
SU SCRUB-UP
T TELEPHONE

TENTH FLOOR PLAN

OBSTETRICAL DEPARTMENT IN PATIENTS' BUILDING



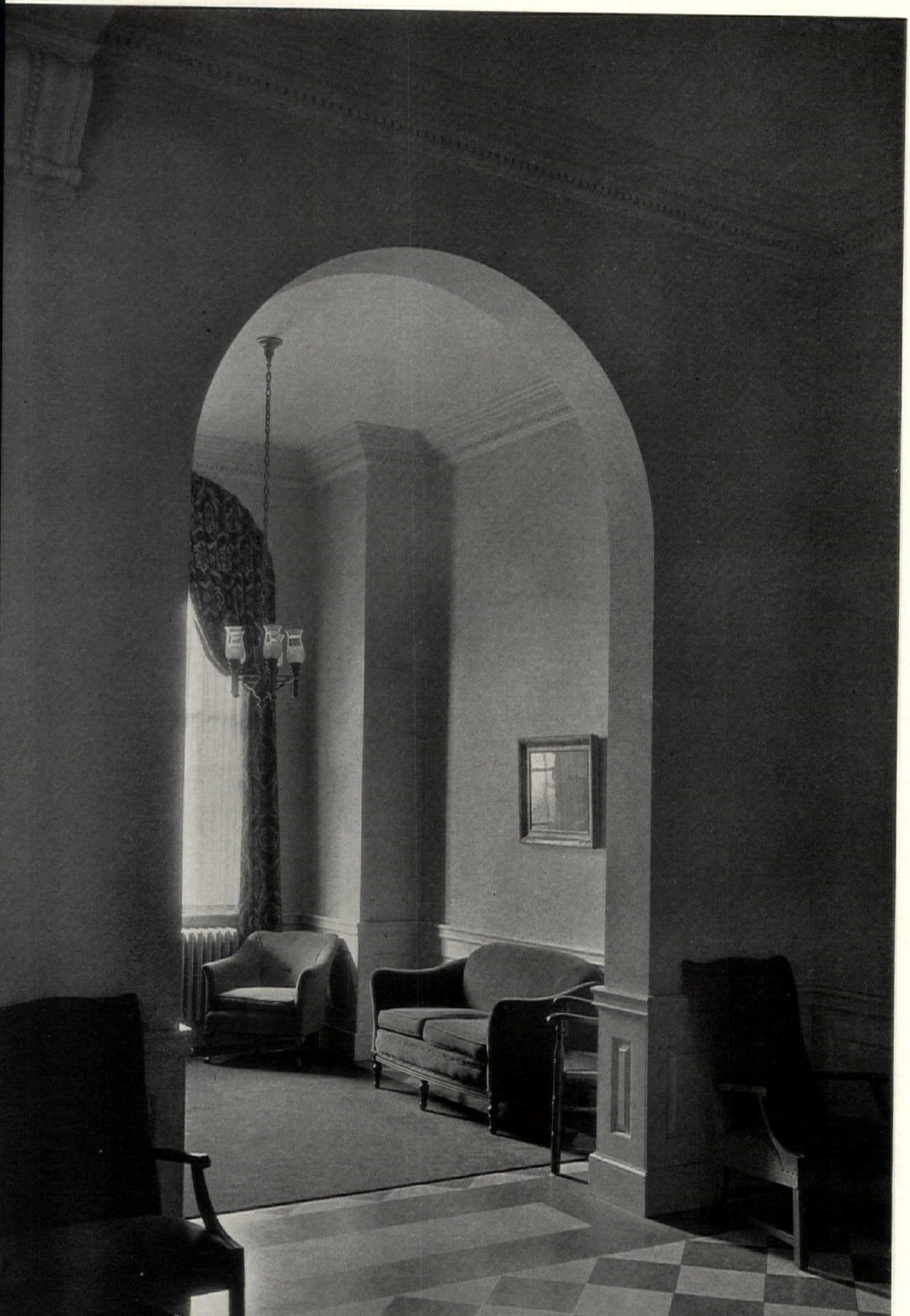
Photograph by Samuel H. Gottscho

DETAIL OF FACADE OF NURSES' WING

DETAIL OF MAIN ENTRANCE LOBBY

Photographs by Samuel H. Gottscho

OFFICE OF JOHN RUSSELL POPE AND
DWIGHT JAMES BAUM, ASSOCIATED ARCHITECTS



DETAIL OF WEST
RECEPTION ROOM

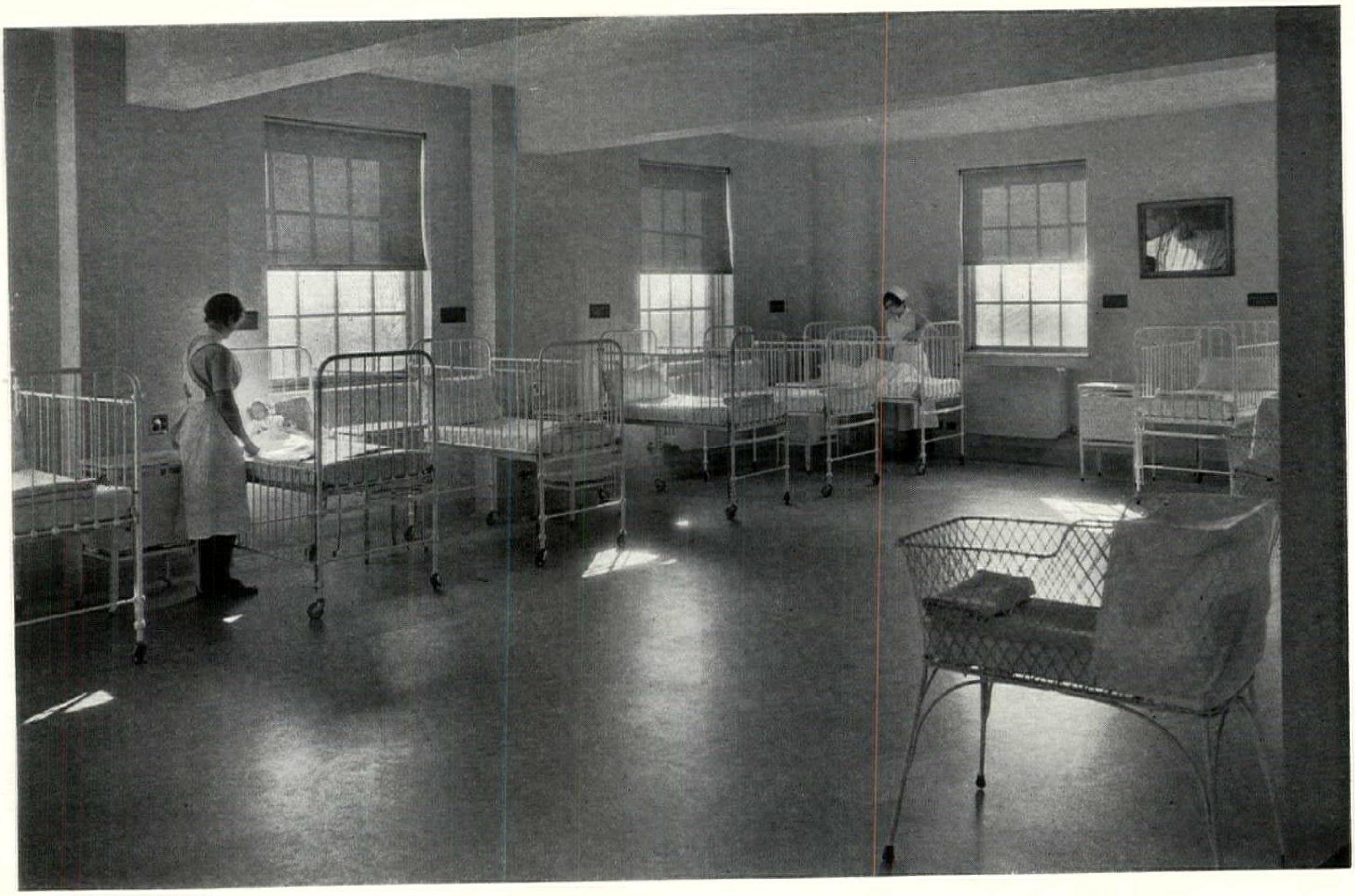
SYRACUSE MEMORIAL HOSPITAL AT SYRACUSE, NEW YORK
OFFICE OF JOHN RUSSELL POPE AND DWIGHT JAMES BAUM, ASSOCIATED ARCHITECTS

OPERATING ROOM

Photographs by Samuel H. Gottscho

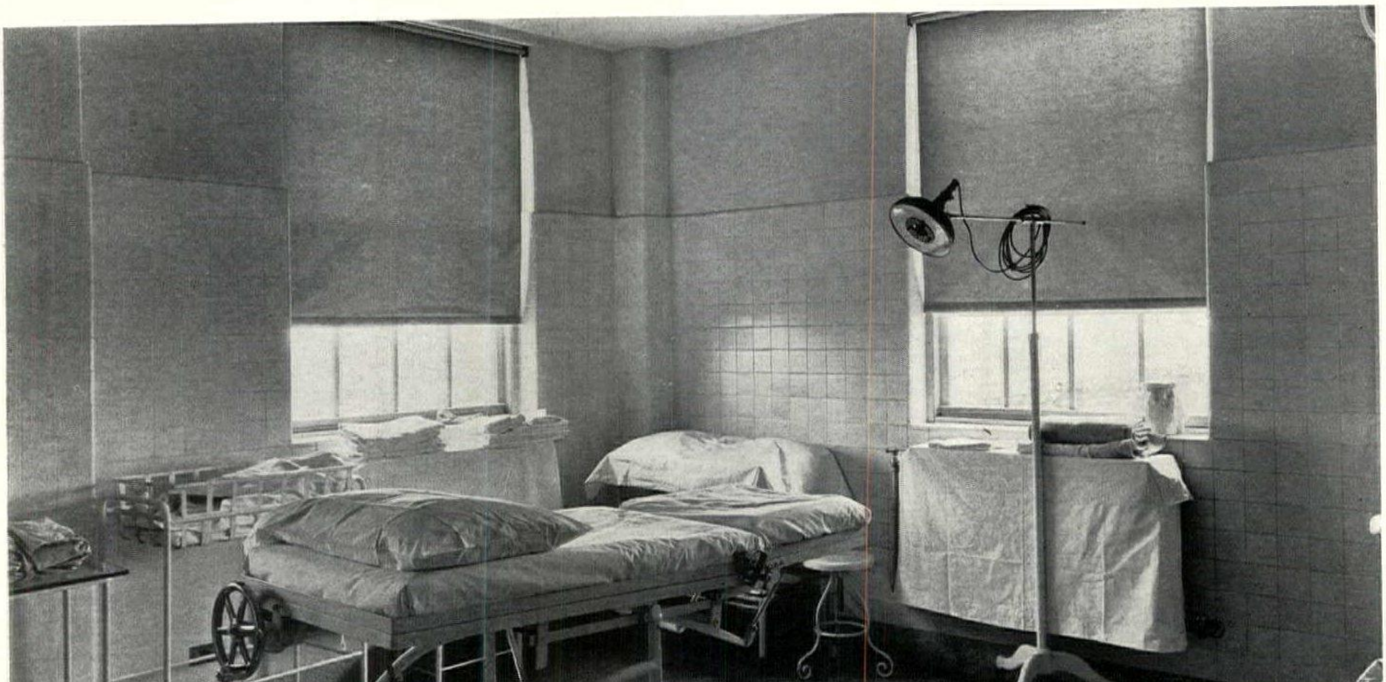
SPECIAL DIET KITCHEN

UTILITY ROOM



INFANTS' WARD

DELIVERY ROOM



Photographs by Samuel H. Gottscho

BABIES' SOLARIUM

SYRACUSE MEMORIAL HOSPITAL AT SYRACUSE, NEW YORK
OFFICE OF JOHN RUSSELL POPE AND DWIGHT JAMES BAUM, ASSOCIATED ARCHITECTS

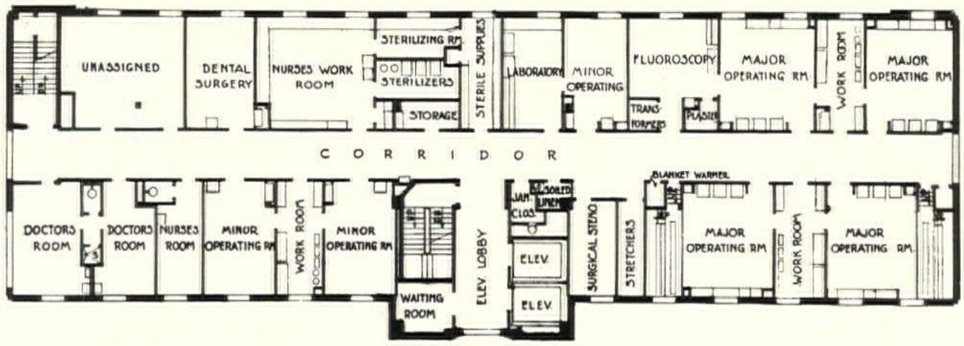
ROBERT PACKER HOSPITAL AT SAYRE, PENNSYLVANIA

ELLERBE & CO., ARCHITECTS

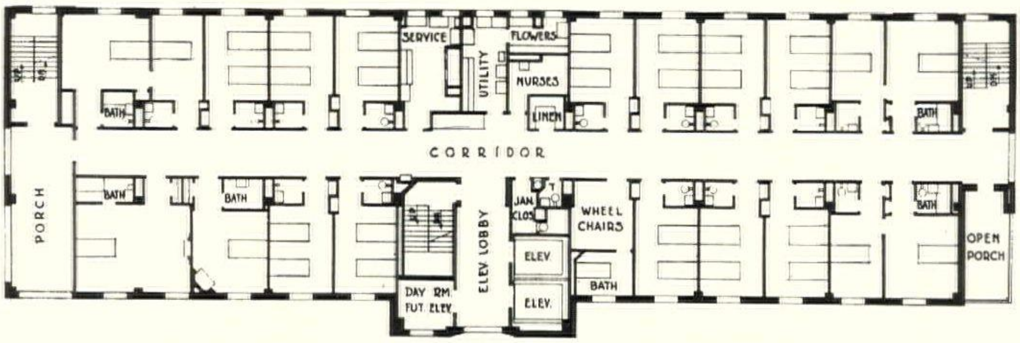
This unit, replacing one destroyed by fire, contains 200 beds of a 300-bed institution. The first, second and third floors are wards; the fourth, fifth and sixth floors private and semi-private rooms. The administrative and out-patient sections are in the Clinic Building.

Features: Concrete frame, brick walls; mastic tile floors in wards; linotile floors in private rooms; rubber floors in corridors, service rooms and operating rooms; glazed brick wainscots in corridors, tile wainscots in baths and terrazzo wainscots in toilets, terra cotta wainscots in operating rooms; acoustical ceilings in corridors and service rooms; air conditioning includes cooling in operating rooms and corner rooms for private patients; two-channel radio at each bed; direct control on radiators; central food service and central dishwashing with tray conveyor and dumb-waiter; bedpan flushing facilities for all toilets.

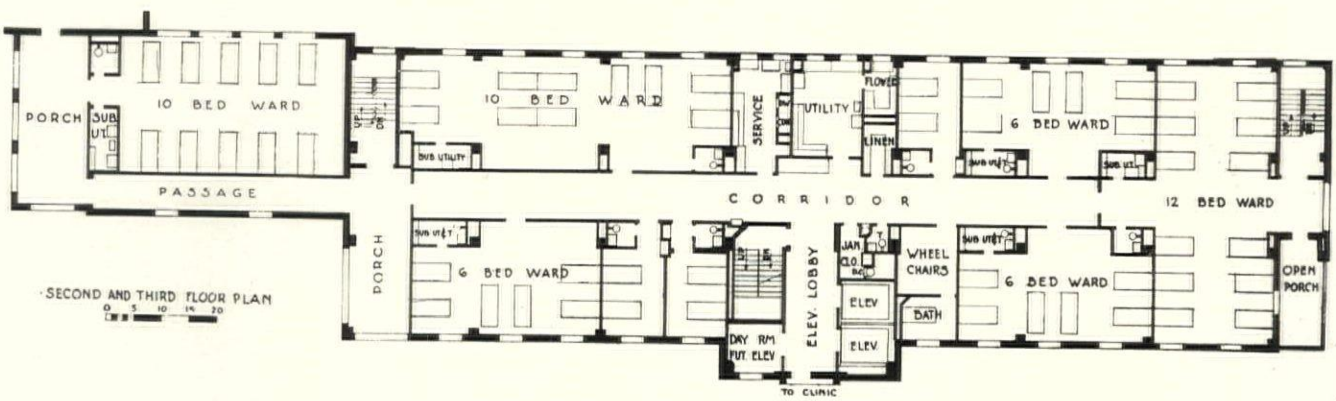
Cost, including elevators, kitchen equipment, refrigerators, sterilizers, light fixtures, air conditioning and architects' fees, but not including boiler plant (in separate building): $500,000, or 58¢ a cubic foot.



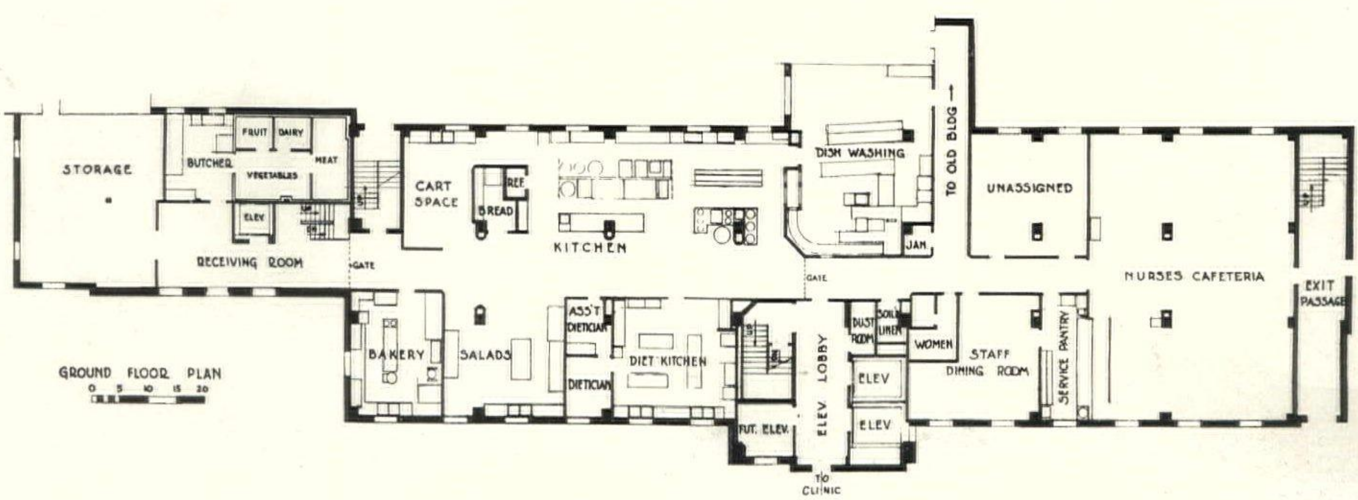
SEVENTH FLOOR PLAN
0 5 10 15 20



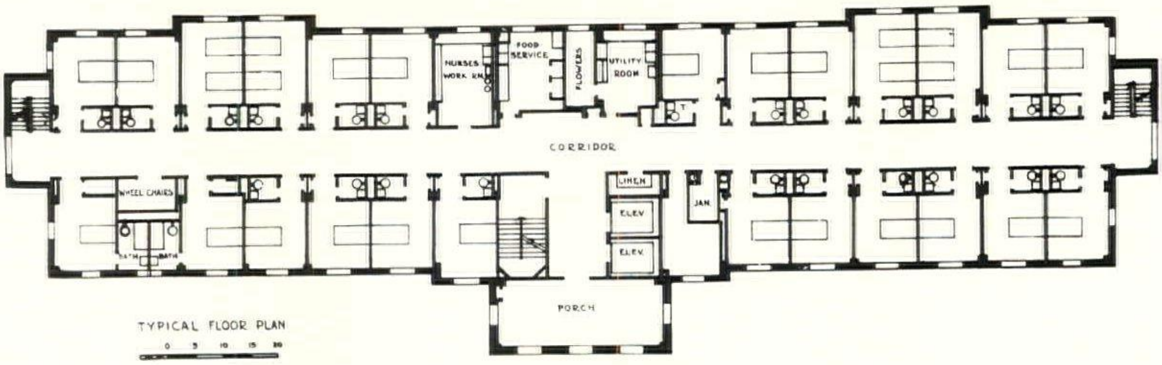
SIXTH FLOOR PLAN
0 5 10 15 20



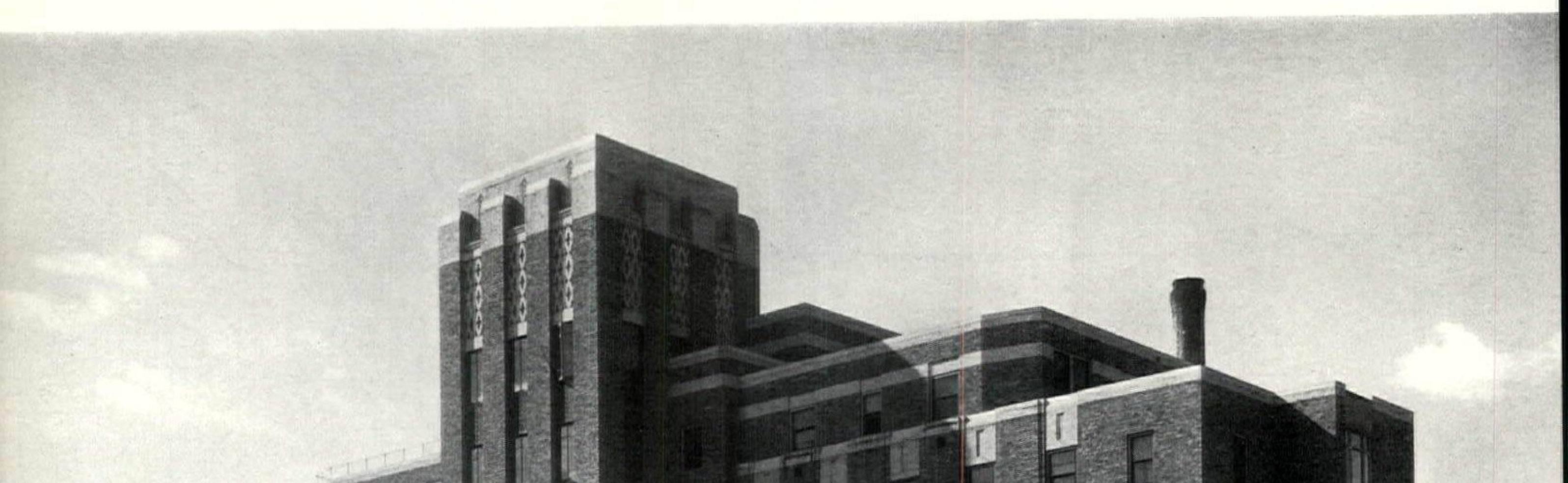
SECOND AND THIRD FLOOR PLAN
0 5 10 15 20



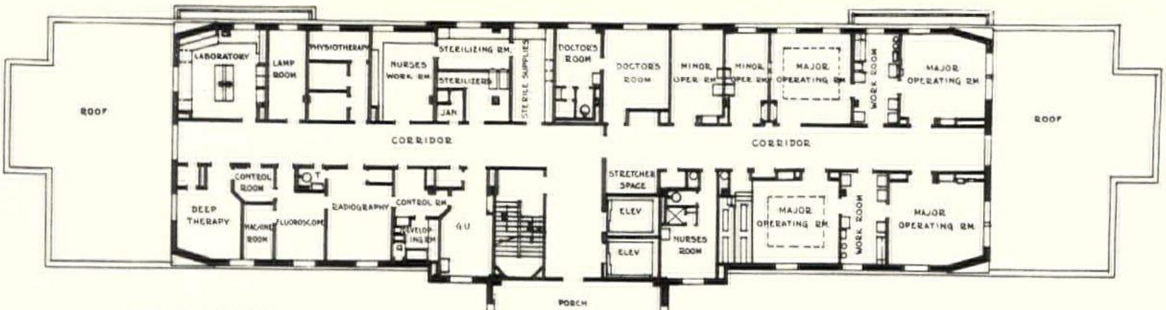
GROUND FLOOR PLAN
0 5 10 15 20



BETHESDA HOSPITAL
ST. PAUL, MINNESOTA
ELLERBE & CO., ARCHITECTS

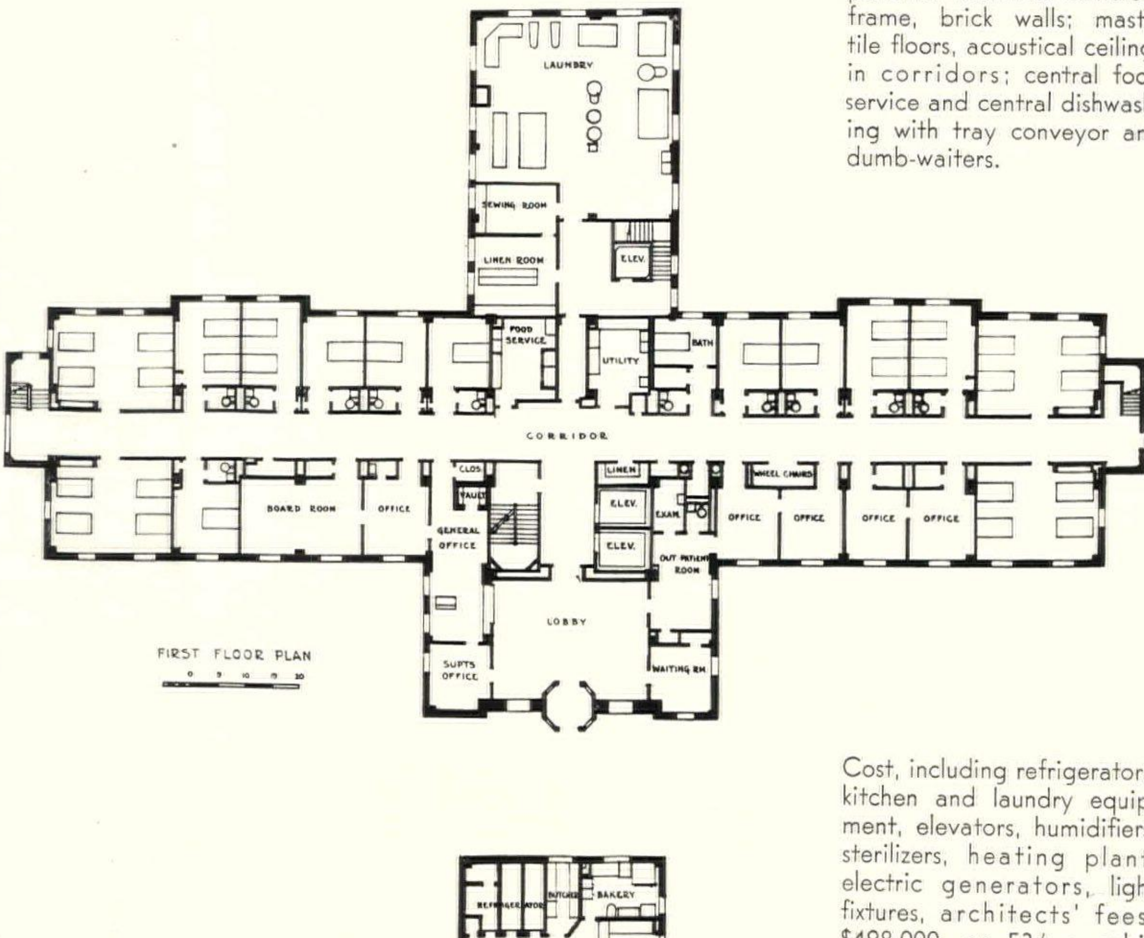


Photograph by Kenneth M. Wright Studio



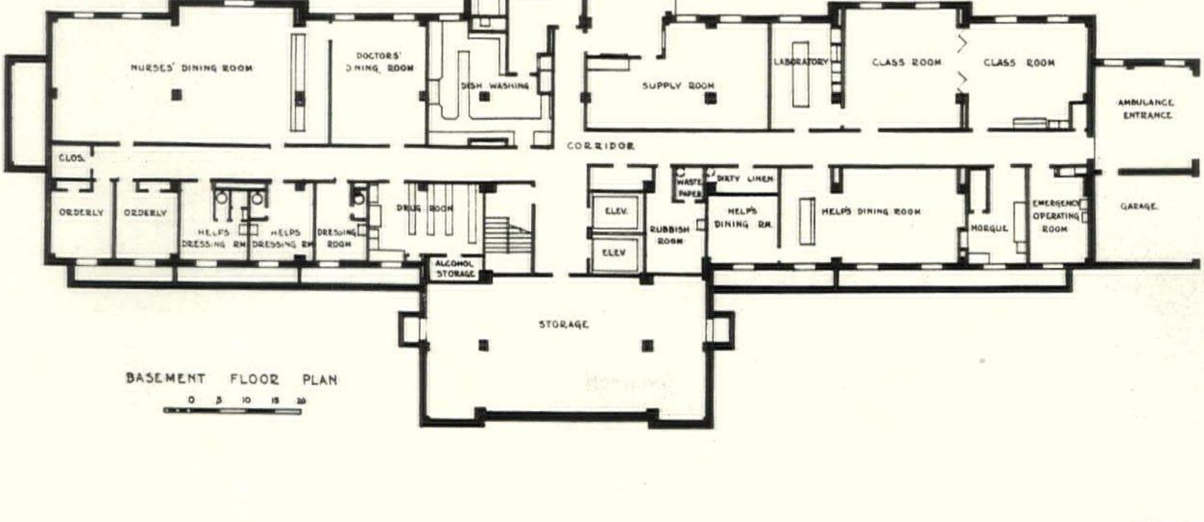
SIXTH FLOOR PLAN
0 5 10 15 20

General hospital: 135 beds; two 12-bed wards for free patients. Features: Concrete frame, brick walls; mastic tile floors, acoustical ceilings in corridors; central food service and central dishwashing with tray conveyor and dumb-waiters.

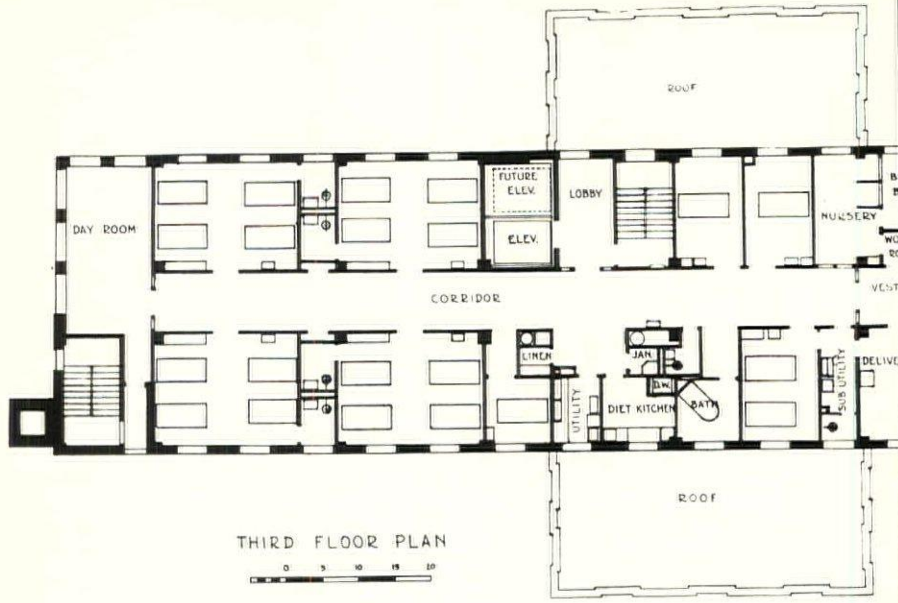


FIRST FLOOR PLAN
0 5 10 15 20

Cost, including refrigerators, kitchen and laundry equipment, elevators, humidifiers, sterilizers, heating plant, electric generators, light fixtures, architects' fees: $498,000, or 53¢ a cubic foot.

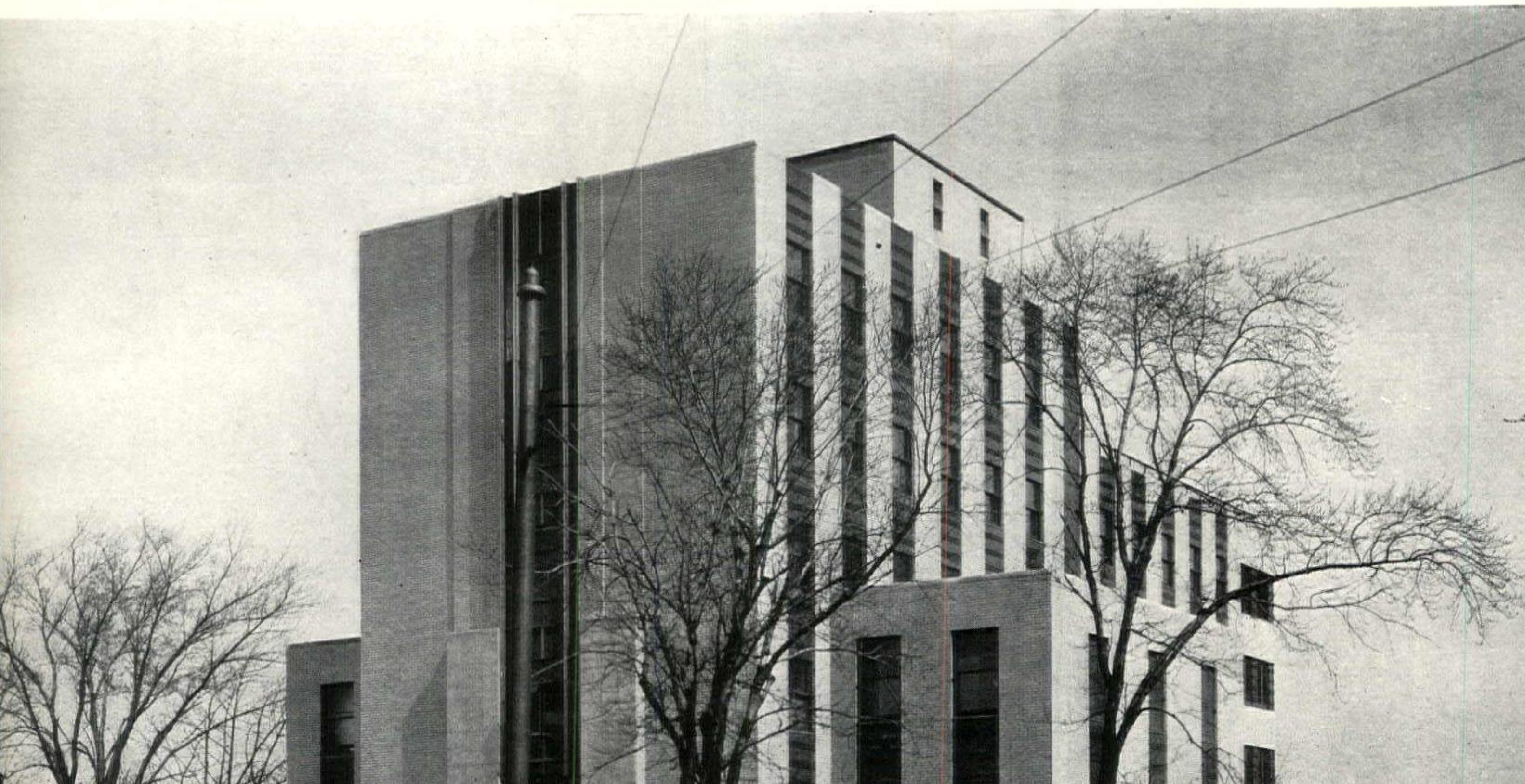


BASEMENT FLOOR PLAN
0 5 10 15 20



MILLER MEMORIAL HOSPITAL IN DULUTH, MINNESOTA

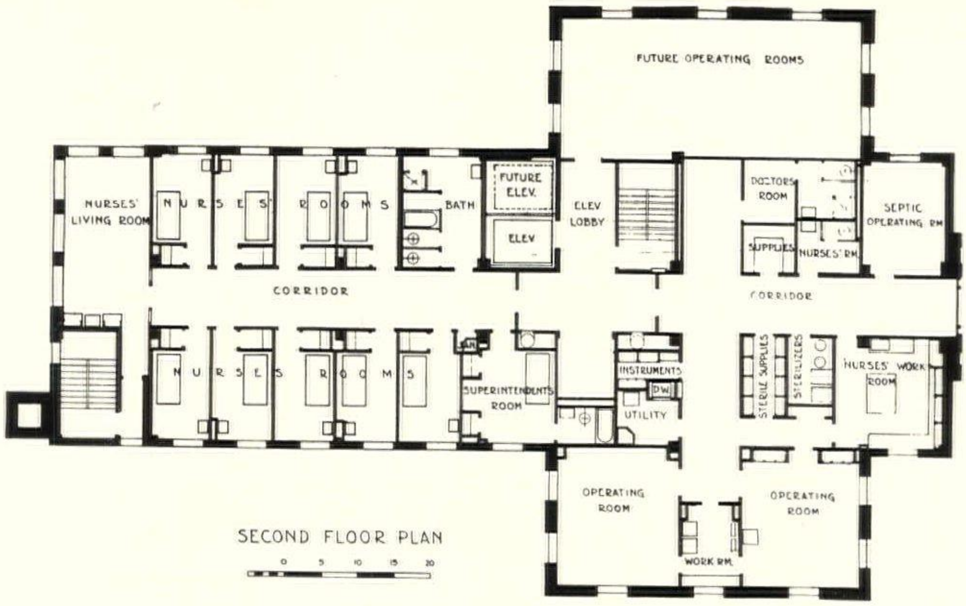
ELLERBE & CO., ARCHITECTS — ERICKSON & CO., ASSOCIATED ARCHITECTS



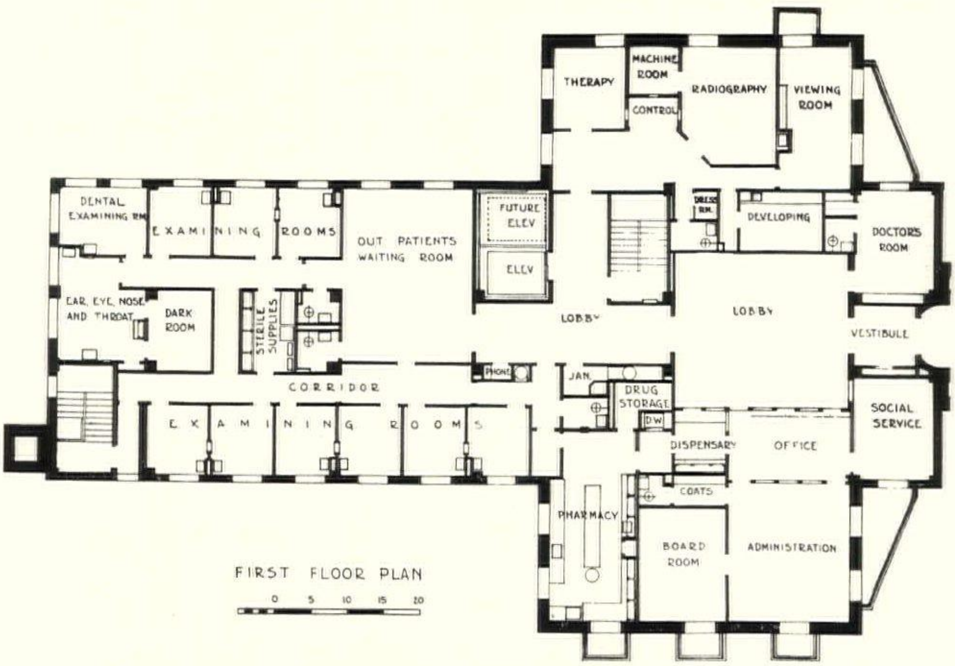
Photograph by McKenzie

The location of this 46-bed hospital is midway between the two principal hospitals in Duluth. The rear porches overlook Lake Superior. The building is designed for a four-story vertical expansion. One of its principal features is a very large Out-Patient Department.

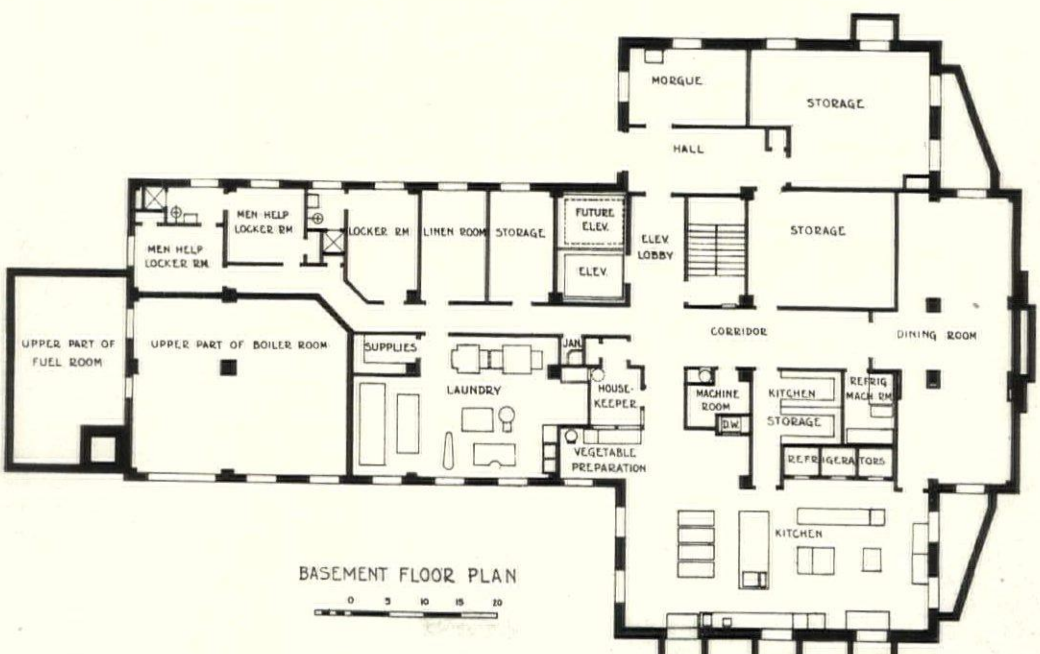
Cost, including elevator, refrigeration, kitchen and laundry equipment, sterilizers, light fixtures, heating plant and architects' fees: $180,000, or 43¢ a cubic foot.



SECOND FLOOR PLAN



FIRST FLOOR PLAN



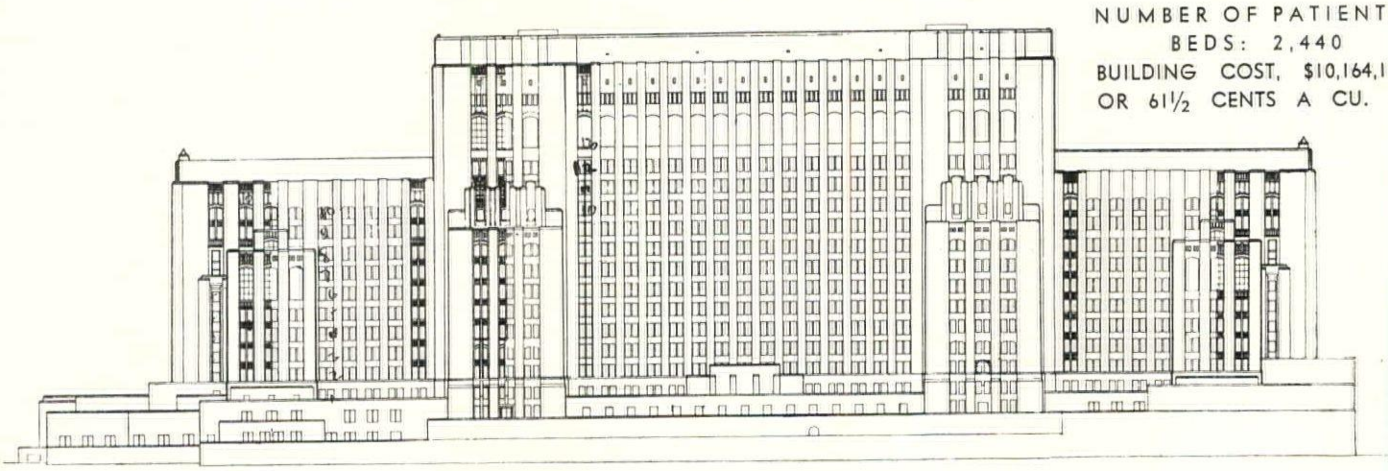
BASEMENT FLOOR PLAN

LOS ANGELES COUNTY GENERAL HOSPITAL: ACUTE UNIT

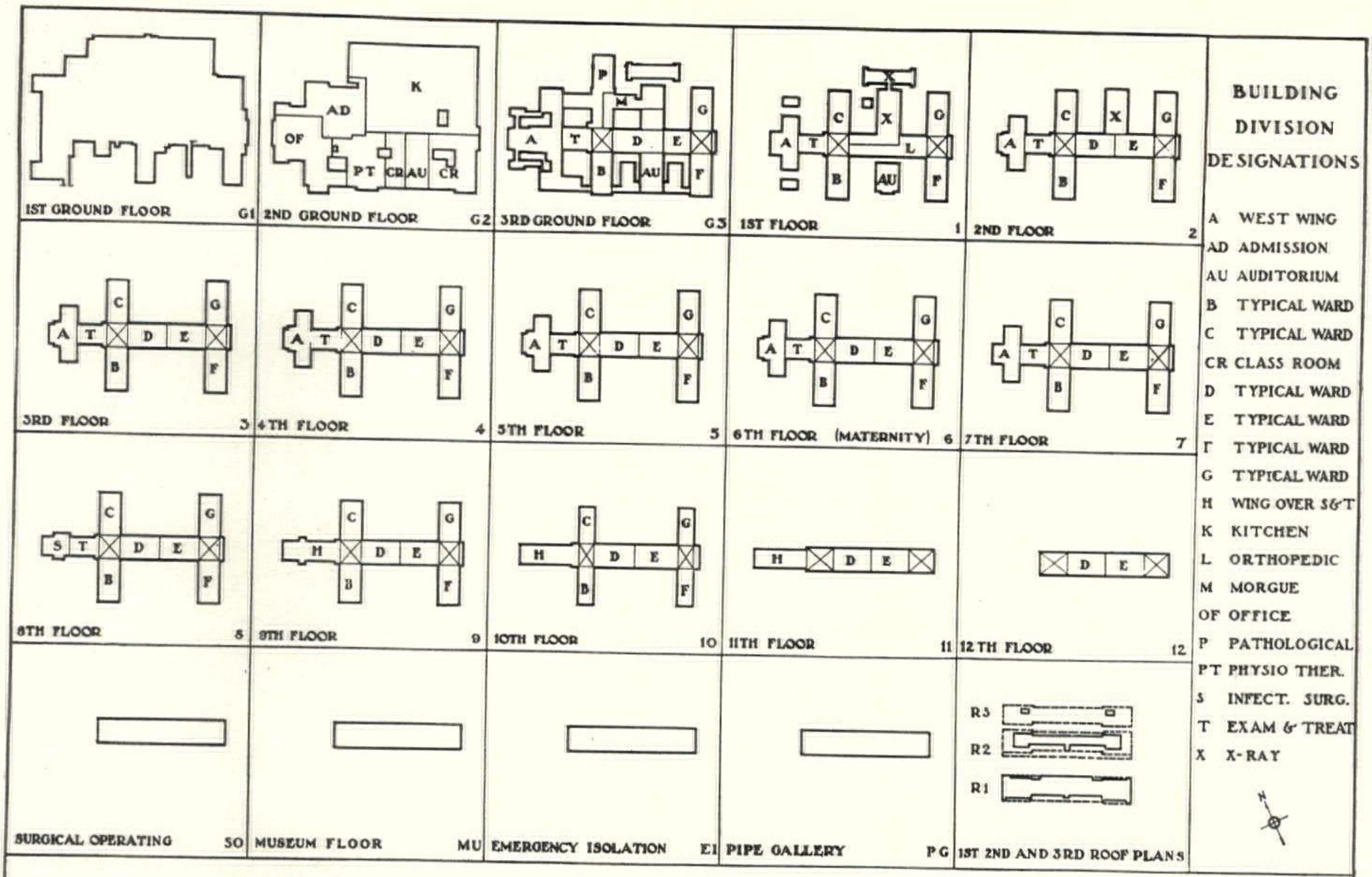
DESIGNED BY THE ALLIED ARCHITECTS ASSOCIATION OF LOS ANGELES

(EDWIN BERGSTROM, MYRON HUNT, PIERPONT DAVIS, SUMNER P. HUNT, WILLIAM RICHARDS)

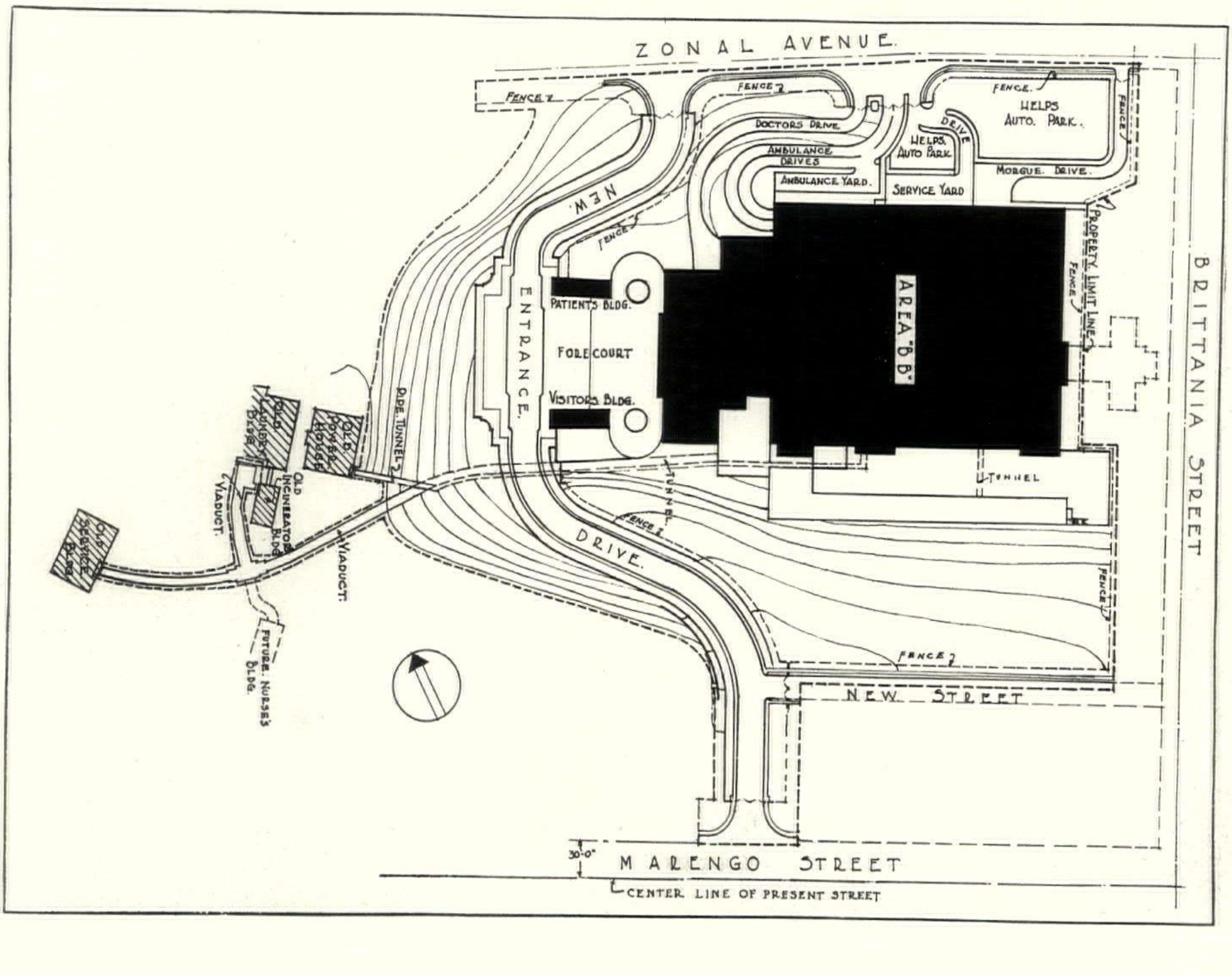
NUMBER OF PATIENTS' BEDS: 2,440
BUILDING COST, $10,164,180, OR 61½ CENTS A CU. FT.



Photograph by Dick Whittington

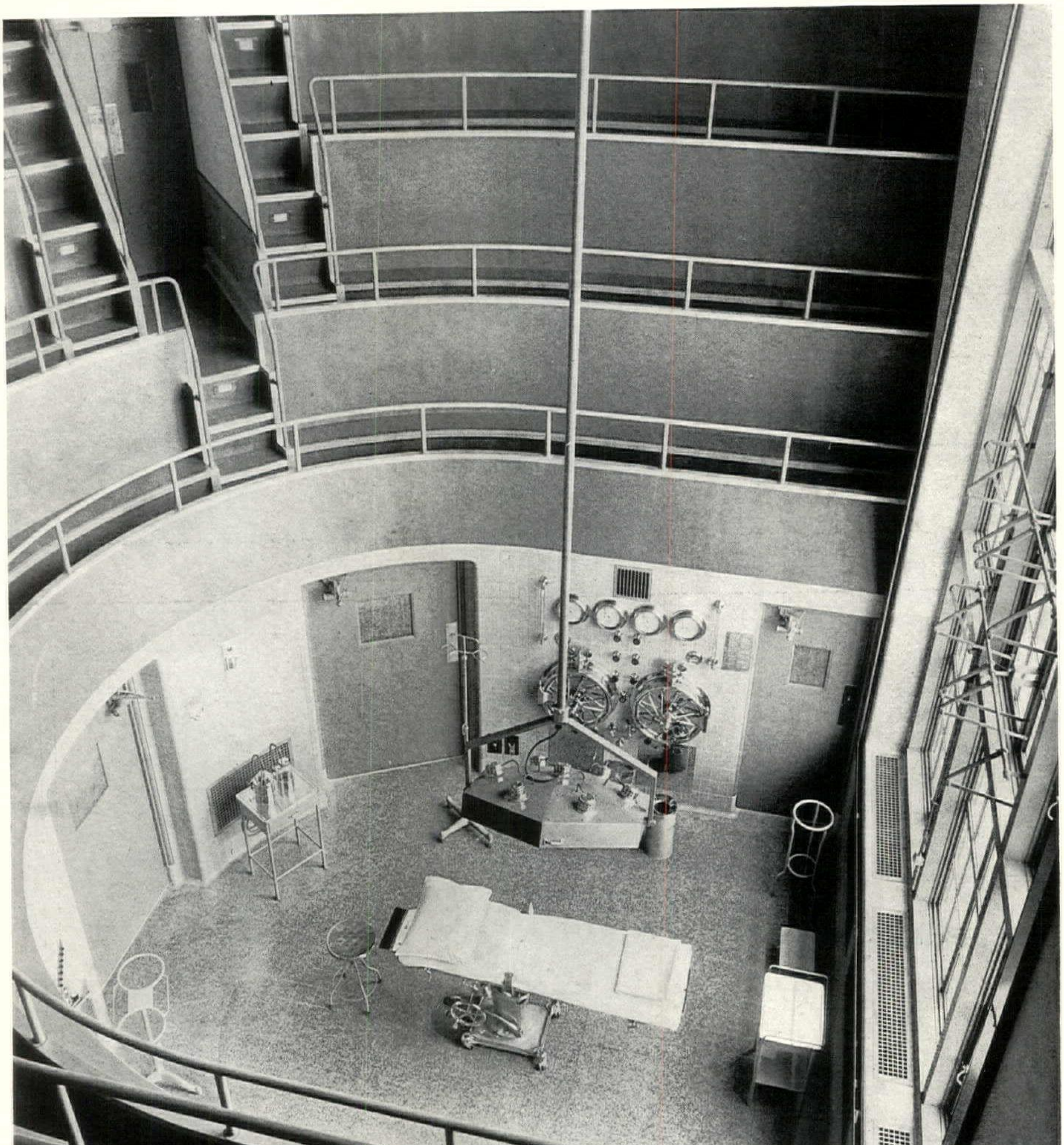

BUILDING DIVISION DESIGNATIONS
A WEST WING
AD ADMISSION
AU AUDITORIUM
B TYPICAL WARD
C TYPICAL WARD
CR CLASS ROOM
D TYPICAL WARD
E TYPICAL WARD
F TYPICAL WARD
G TYPICAL WARD
H WING OVER S&T
K KITCHEN
L ORTHOPEDIC
M MORGUE
OF OFFICE
P PATHOLOGICAL
PT PHYSIO THER.
S INFECT. SURG.
T EXAM & TREAT
X X-RAY
1ST GROUND FLOOR G1
2ND GROUND FLOOR G2
3RD GROUND FLOOR G3
1ST FLOOR 1
2ND FLOOR 2
3RD FLOOR 3
4TH FLOOR 4
5TH FLOOR 5
6TH FLOOR (MATERNITY) 6
7TH FLOOR 7
8TH FLOOR 8
9TH FLOOR 9
10TH FLOOR 10
11TH FLOOR 11
12 TH FLOOR 12
SURGICAL OPERATING SO
MUSEUM FLOOR MU
EMERGENCY ISOLATION EI
PIPE GALLERY PG
1ST 2ND AND 3RD ROOF PLANS
R3
R2
R1

KEY PLANS

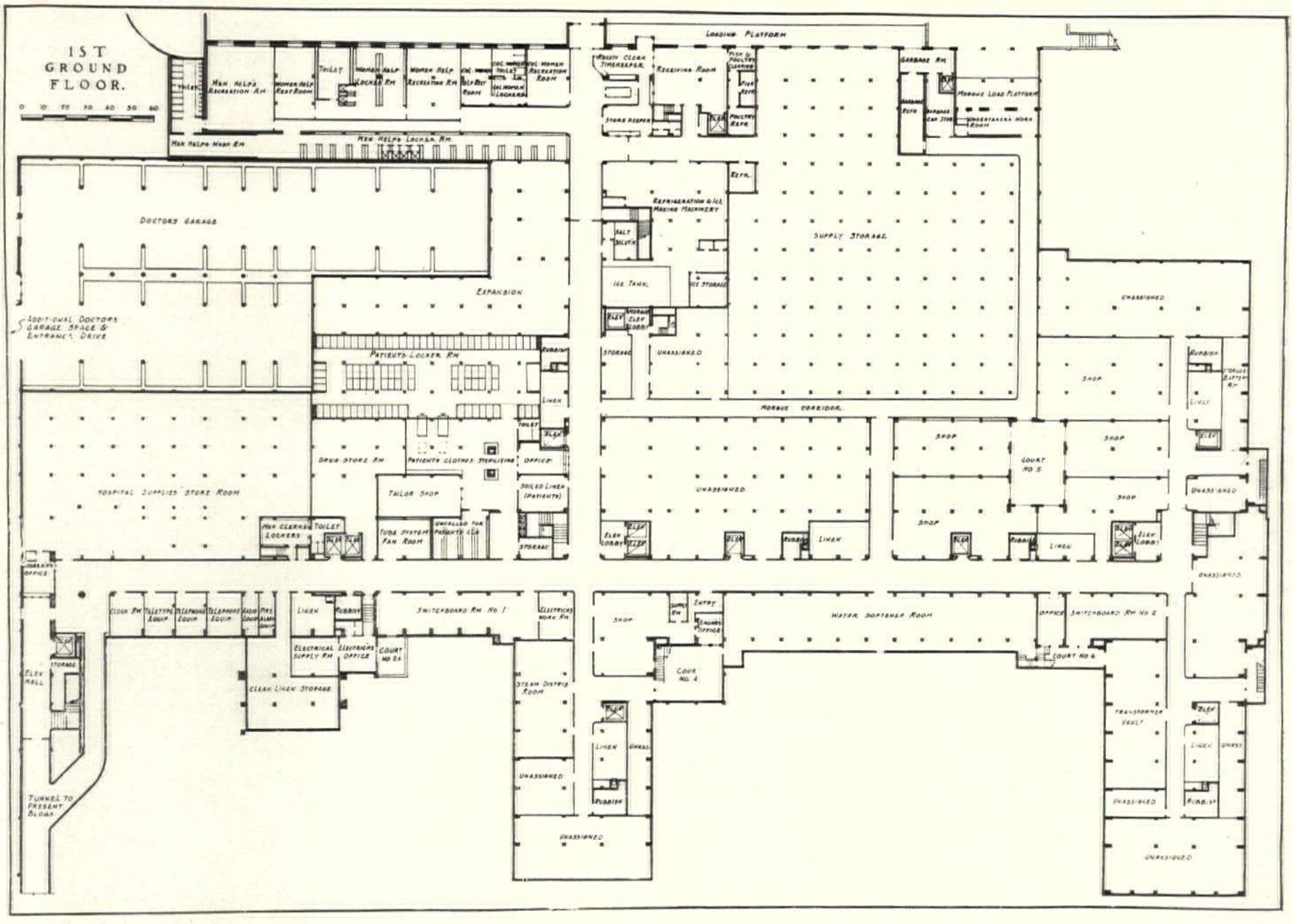

ZONAL AVENUE
BRITTANIA STREET
MARENGO STREET
CENTER LINE OF PRESENT STREET
NEW STREET
30'-0"
NEW
DRIVE
ENTRANCE
PATIENTS BLDG.
FORE COURT
VISITORS BLDG.
AREA "B.B."
DOCTORS DRIVE
AMBULANCE DRIVES
AMBULANCE YARD
SERVICE YARD
HELPS AUTO PARK
HELPS AUTO. PARK.
MORGUE DRIVE
DRIVE
FENCE
PROPERTY LIMIT LINE
TUNNEL
PIPE TUNNEL
VIADUCT
OLD INCINERATOR BLDG.
FUTURE NURSES BLDG.

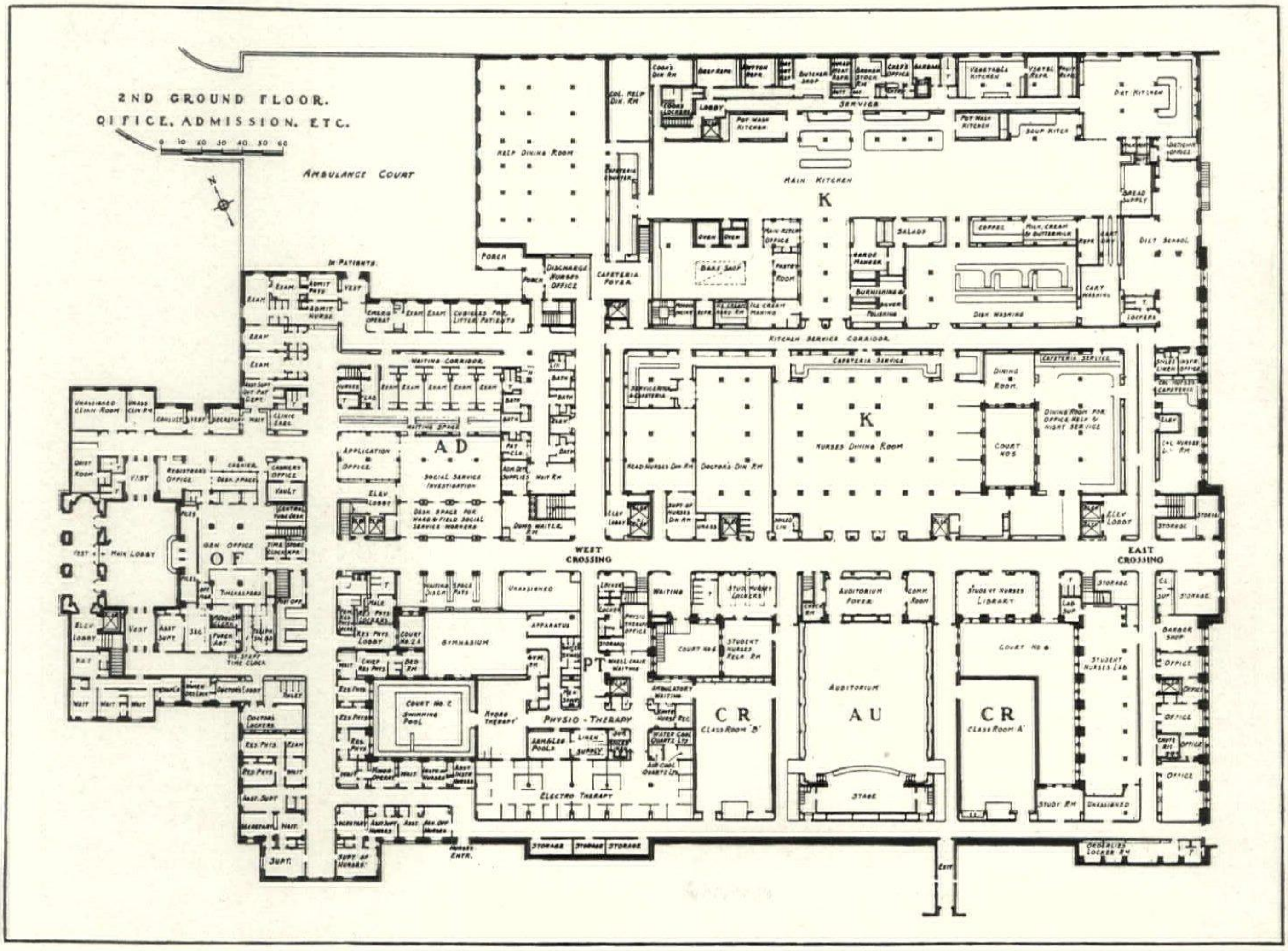
LOS ANGELES COUNTY GENERAL HOSPITAL: ACUTE UNIT
DESIGNED BY THE ALLIED ARCHITECTS ASSOCIATION OF LOS ANGELES

VIEW OF CLINICAL SURGERY ROOM FROM OBSERVATION GALLERY



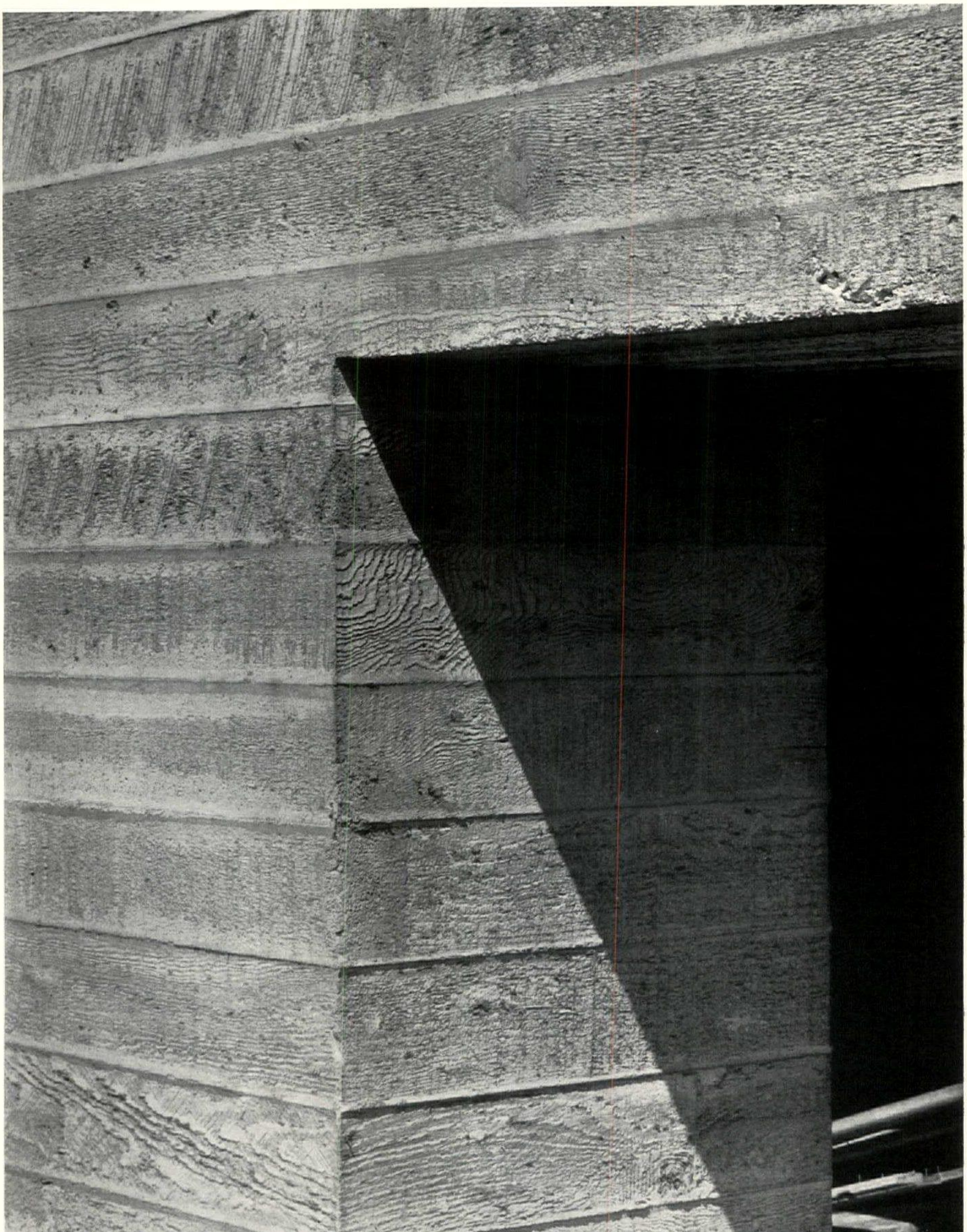
Photograph by W. P. Woodcock


1ST GROUND FLOOR.
DOCTORS GARAGE
HOSPITAL SUPPLIES STORE ROOM
SUPPLY STORAGE
LOADING PLATFORM
PATIENTS LOCKER RM
EXPANSION
MORGUE CORRIDOR
WATER SOFTENER ROOM
SWITCHBOARD RM NO 1
CLEAN LINEN STORAGE
UNASSIGNED
SHOP
TUNNEL TO PRESENT BLDGS

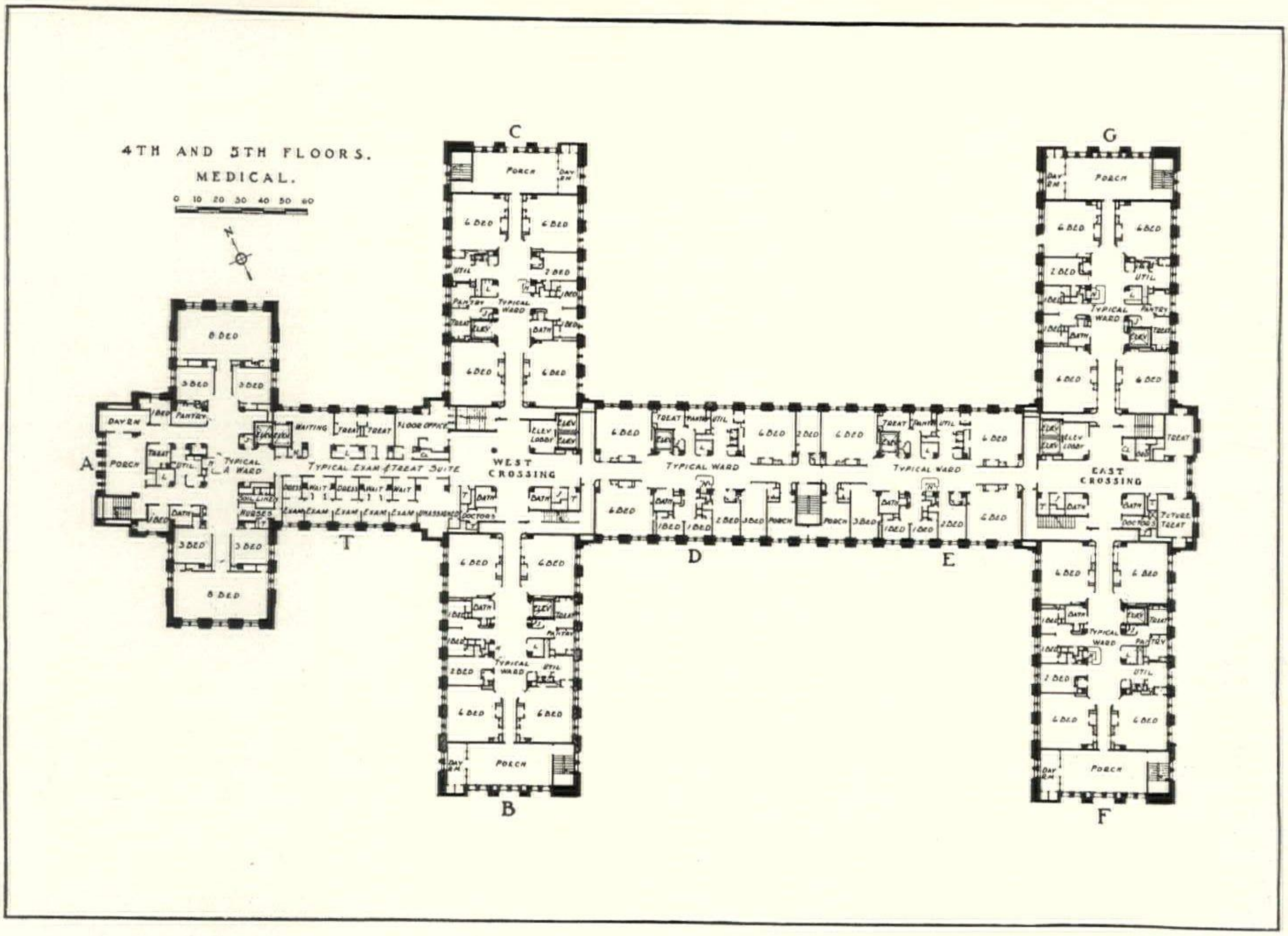

2ND GROUND FLOOR.
OFFICE, ADMISSION, ETC.
AMBULANCE COURT
MAIN KITCHEN
K
NURSES DINING ROOM
HELP DINING ROOM
KITCHEN SERVICE CORRIDOR
WEST CROSSING
EAST CROSSING
MAIN LOBBY
OF
AD
PT
PHYSIO-THERAPY
ELECTRO THERAPY
GYMNASIUM
CR
CLASS ROOM 'B'
AU
AUDITORIUM
STAGE
CLASS ROOM 'A'

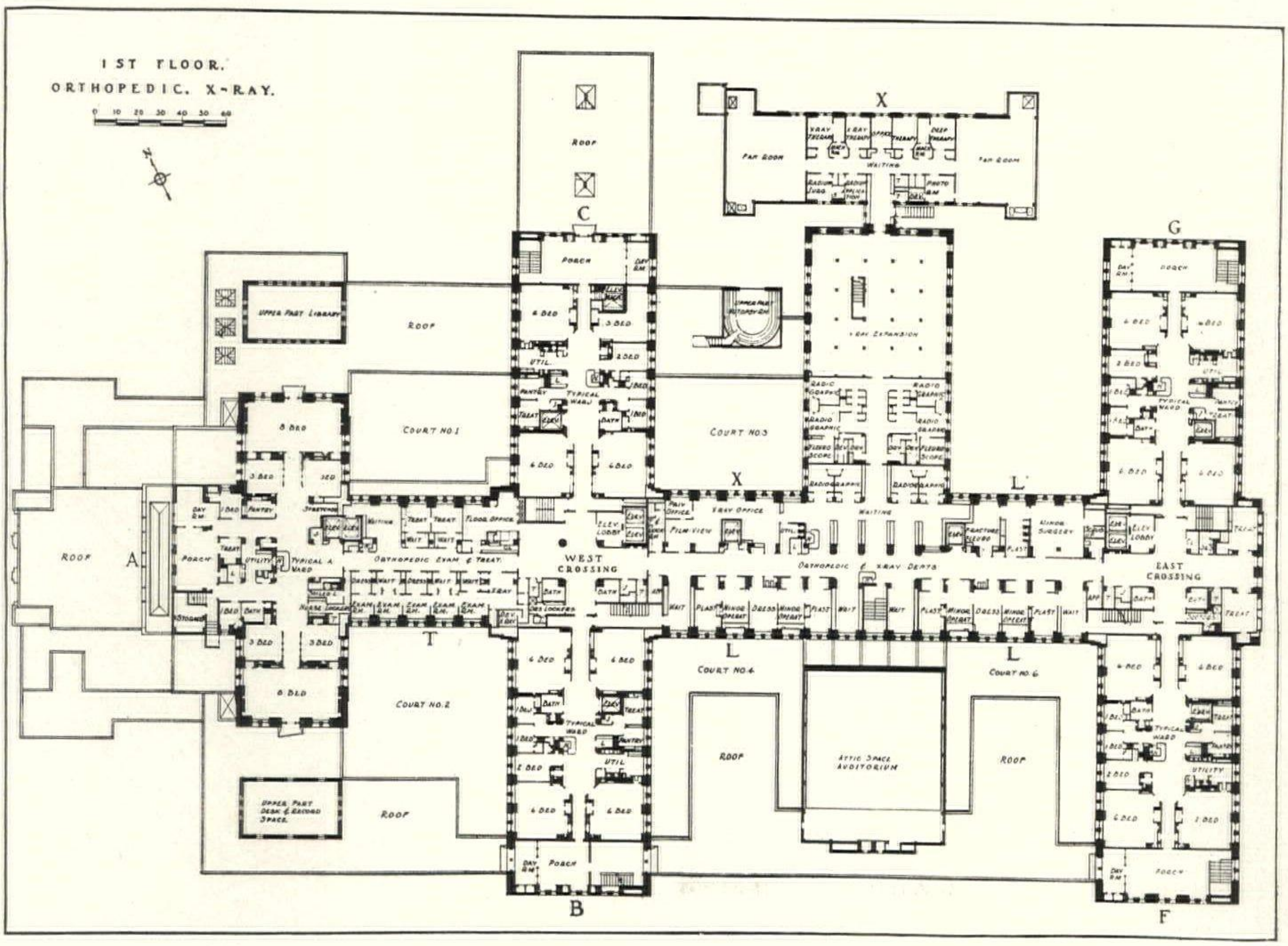
LOS ANGELES COUNTY GENERAL HOSPITAL: ACUTE UNIT
DESIGNED BY THE ALLIED ARCHITECTS ASSOCIATION OF LOS ANGELES

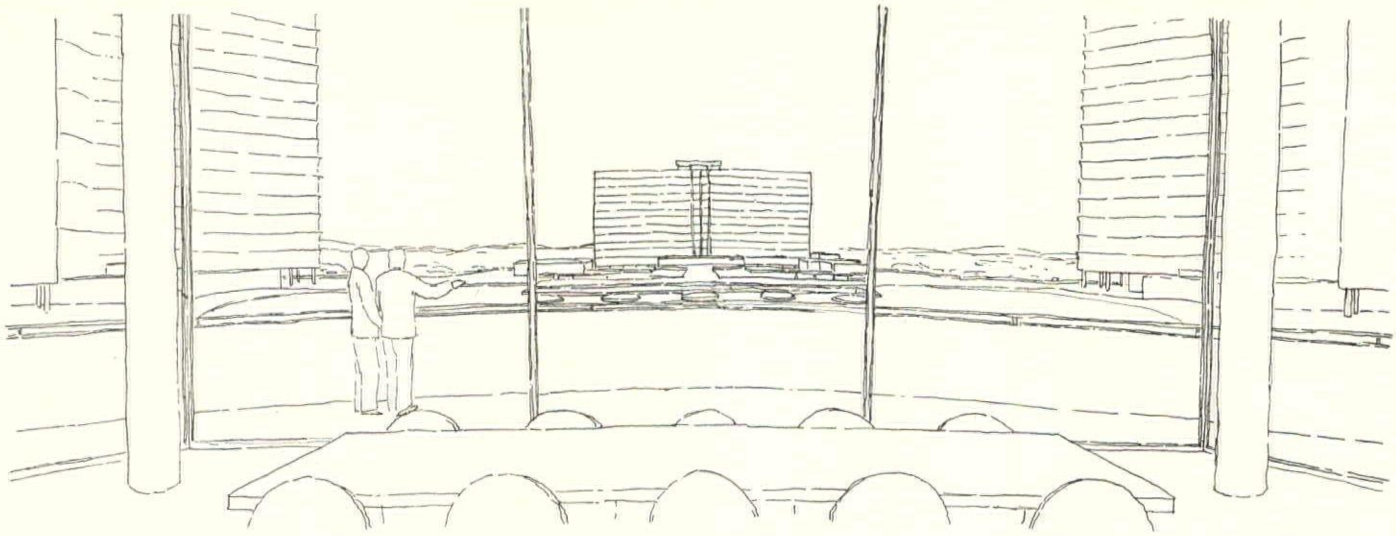
CLOSE-UP VIEW SHOWING TEXTURE OF EXTERIOR SURFACE



Photograph by Dick Whittington


4TH AND 5TH FLOORS.
MEDICAL.
0 10 20 30 40 50 60
A
B
C
D
E
F
G
T
WEST CROSSING
EAST CROSSING
TYPICAL EXAM & TREAT SUITE
TYPICAL WARD
PORCH
8 BED
6 BED
3 BED
2 BED
1 BED

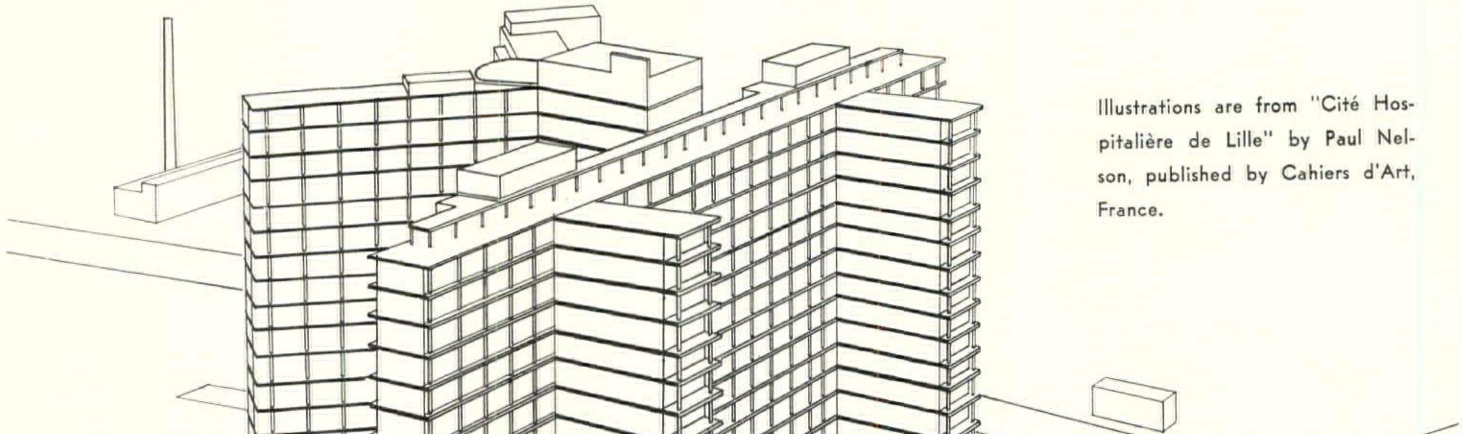

1ST FLOOR.
ORTHOPEDIC. X-RAY.
0 10 20 30 40 50 60
A
B
C
F
G
L
T
X
ROOF
COURT NO. 1
COURT NO. 2
COURT NO. 3
COURT NO. 4
COURT NO. 6
WEST CROSSING
EAST CROSSING
ORTHOPEDIC EXAM & TREAT.
ORTHOPEDIC & X-RAY DEPTS
ATTIC SPACE AUDITORIUM
UPPER PART LIBRARY
UPPER PART DESK & RECORD SPACE
X-RAY EXPANSION
FAN ROOM
WAITING
PORCH



The administration of the hospitals of Lille (which controls all the public hospitals and charitable organizations of this city) intends to centralize the existing institutions in combination with a school of medicine to form the Health City of Lille. The medical center includes a pavilion for private patients, a school for nurses and midwives, a home for the pensioned, and general services.

HEALTH CITY OF LILLE, FRANCE . . . PAUL NELSON, ARCHITECT

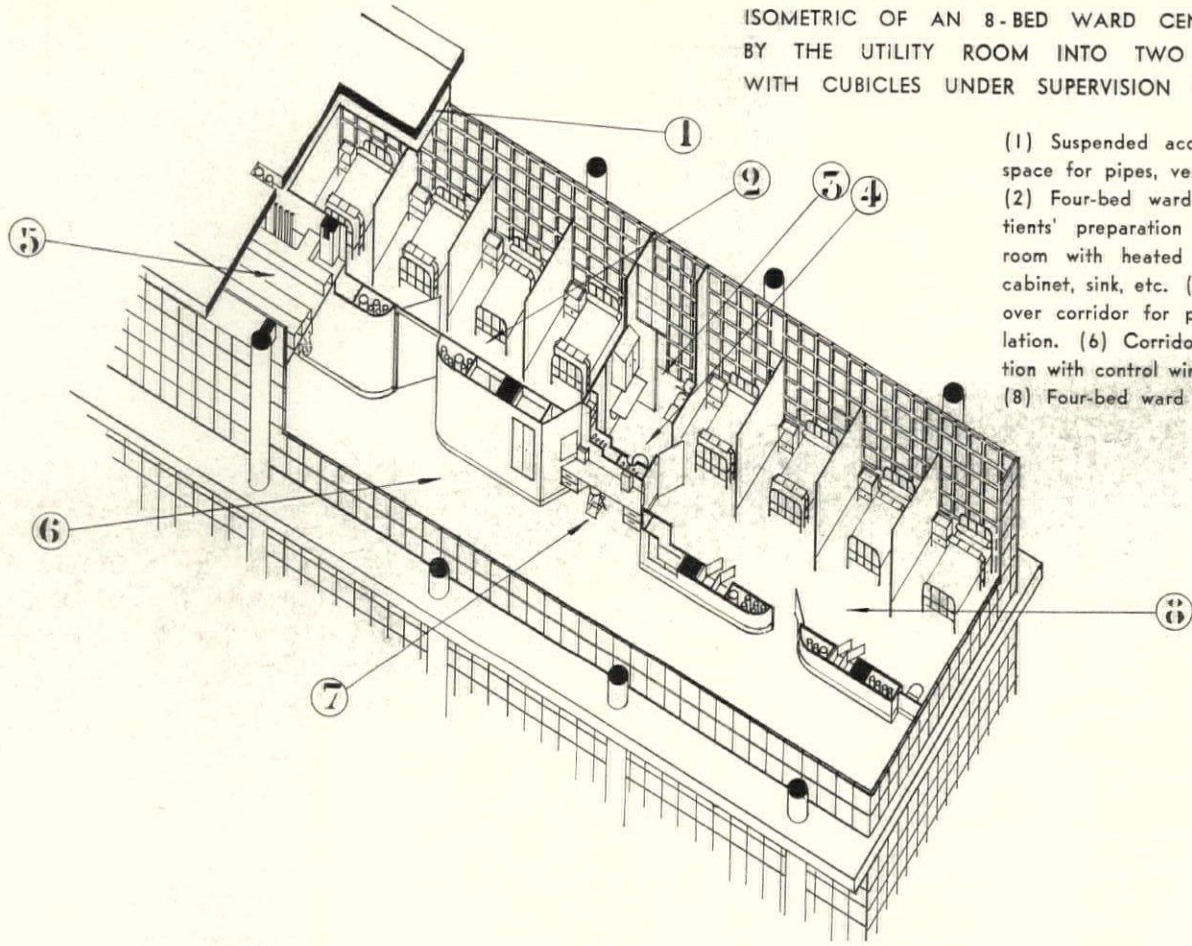
Illustrations are from "Cité Hospitalière de Lille" by Paul Nelson, published by Cahiers d'Art, France.



THE MEDICAL CENTER AND PRIVATE PATIENTS' PAVILION

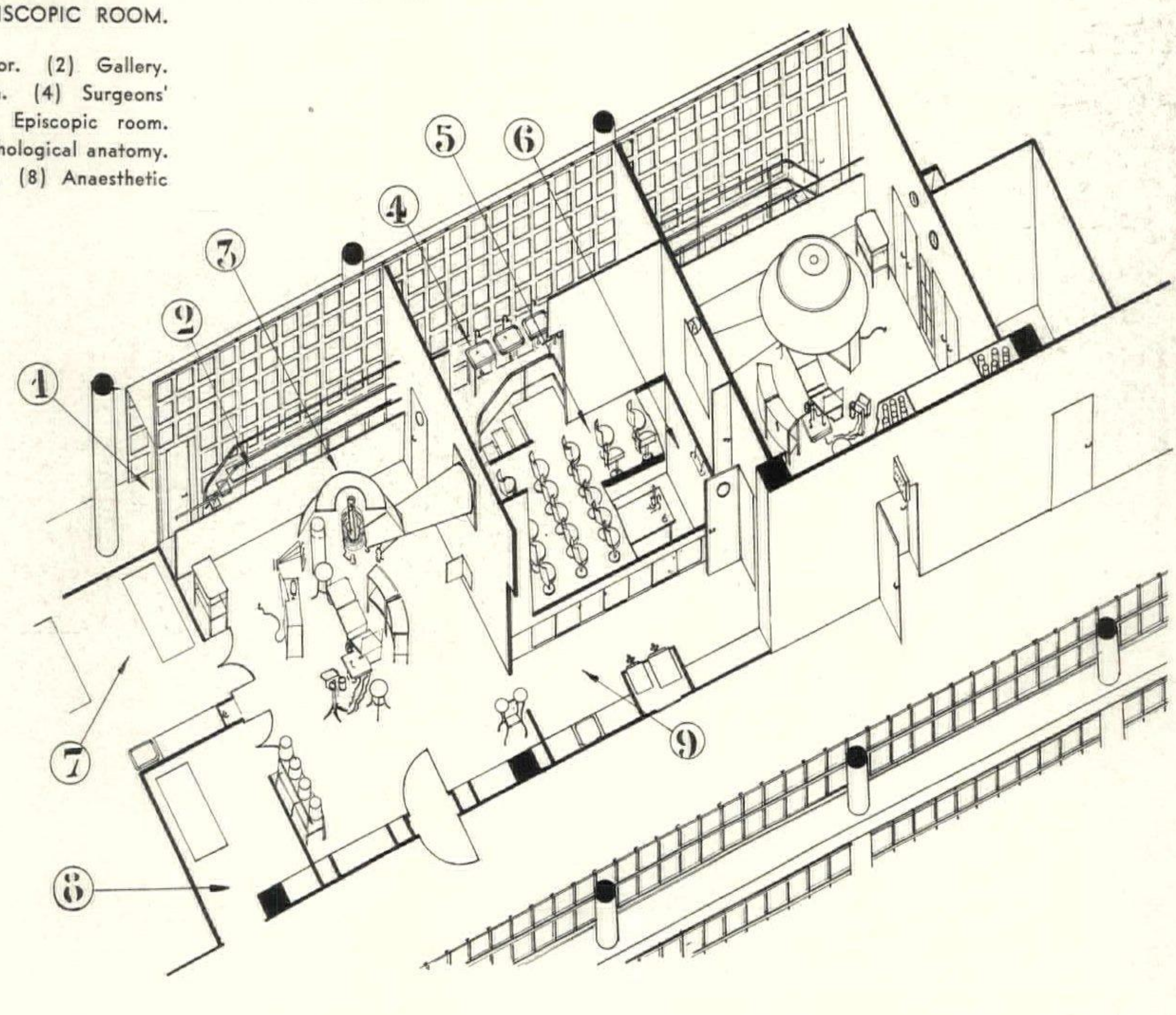
ISOMETRIC OF AN 8-BED WARD CENTRALLY DIVIDED BY THE UTILITY ROOM INTO TWO 4-BED WARDS WITH CUBICLES UNDER SUPERVISION OF ONE NURSE

(1) Suspended acoustical ceiling with space for pipes, ventilation, tubes, etc. (2) Four-bed ward cubicles. (3) Patients' preparation room. (4) Utility room with heated linen and bedpan cabinet, sink, etc. (5) Horizontal space over corridor for plumbing and ventilation. (6) Corridor. (7) Nurses' station with control window for each ward. (8) Four-bed ward cubicles.



AN OPERATING SUITE CONSISTING OF TWO OPERATING ROOMS. STUDENTS ARE NOT PRESENT IN THESE ROOMS BUT WATCH THE OPERATIONS AS PROJECTED ON A SCREEN IN THE EPISCOPIC ROOM.

(1) Students' corridor. (2) Gallery. (3) Operating room. (4) Surgeons' scrub-up room. (5) Episcopic room. (6) Laboratory of pathological anatomy. (7) Awakening room. (8) Anaesthetic room.



CONTRACTS FOR HOSPITAL AND INSTITUTIONAL BUILDING: 1925-1935

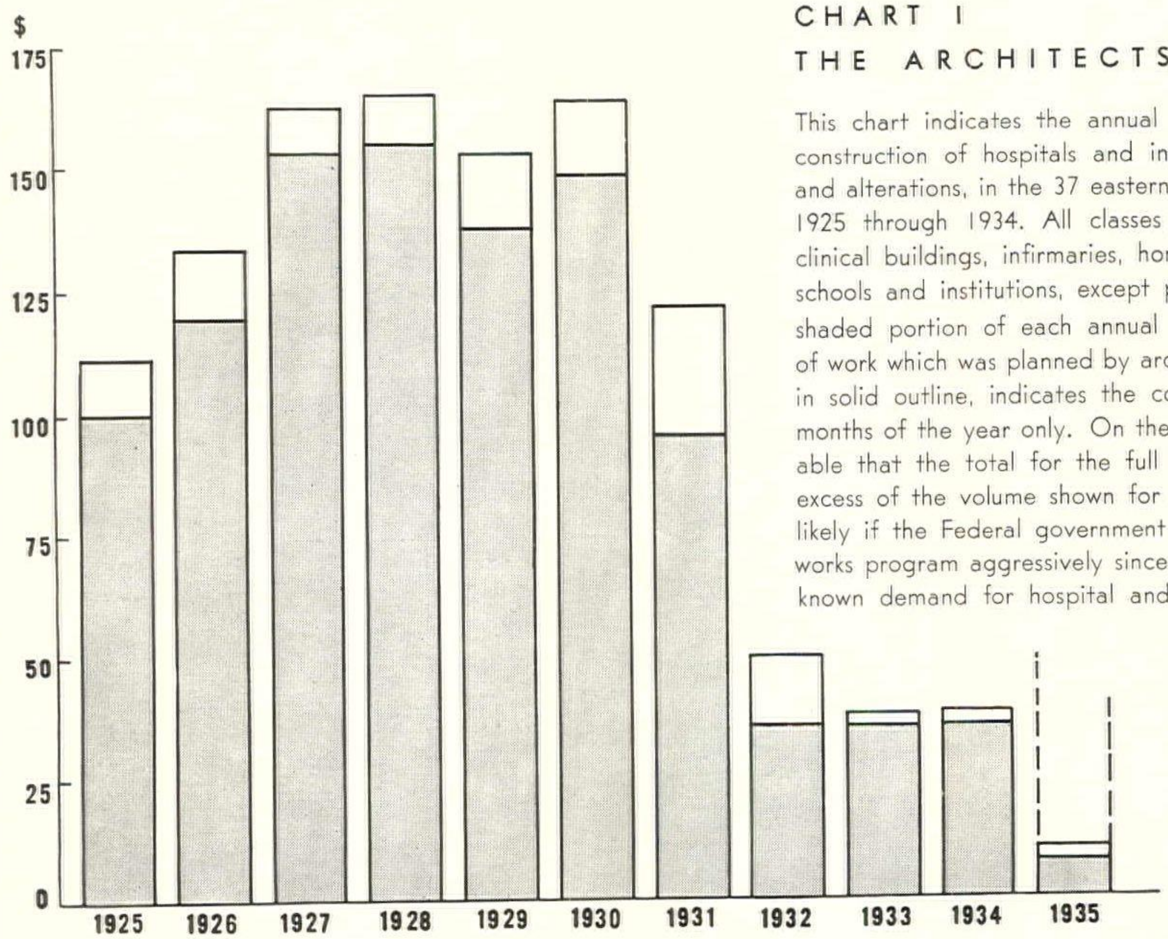


CHART 1
THE ARCHITECTS' INFLUENCE

This chart indicates the annual contract volumes for the construction of hospitals and institutions, both new work and alterations, in the 37 eastern States for the years from 1925 through 1934. All classes of hospitals, sanitariums, clinical buildings, infirmaries, homes, almshouses, industrial schools and institutions, except prisons, are included. The shaded portion of each annual bar indicates the volume of work which was planned by architects. The bar for 1935, in solid outline, indicates the condition for the first four months of the year only. On these results it appears probable that the total for the full year will be somewhat in excess of the volume shown for 1934; this is all the more likely if the Federal government is to push its new public works program aggressively since there is a relatively large known demand for hospital and institutional projects.

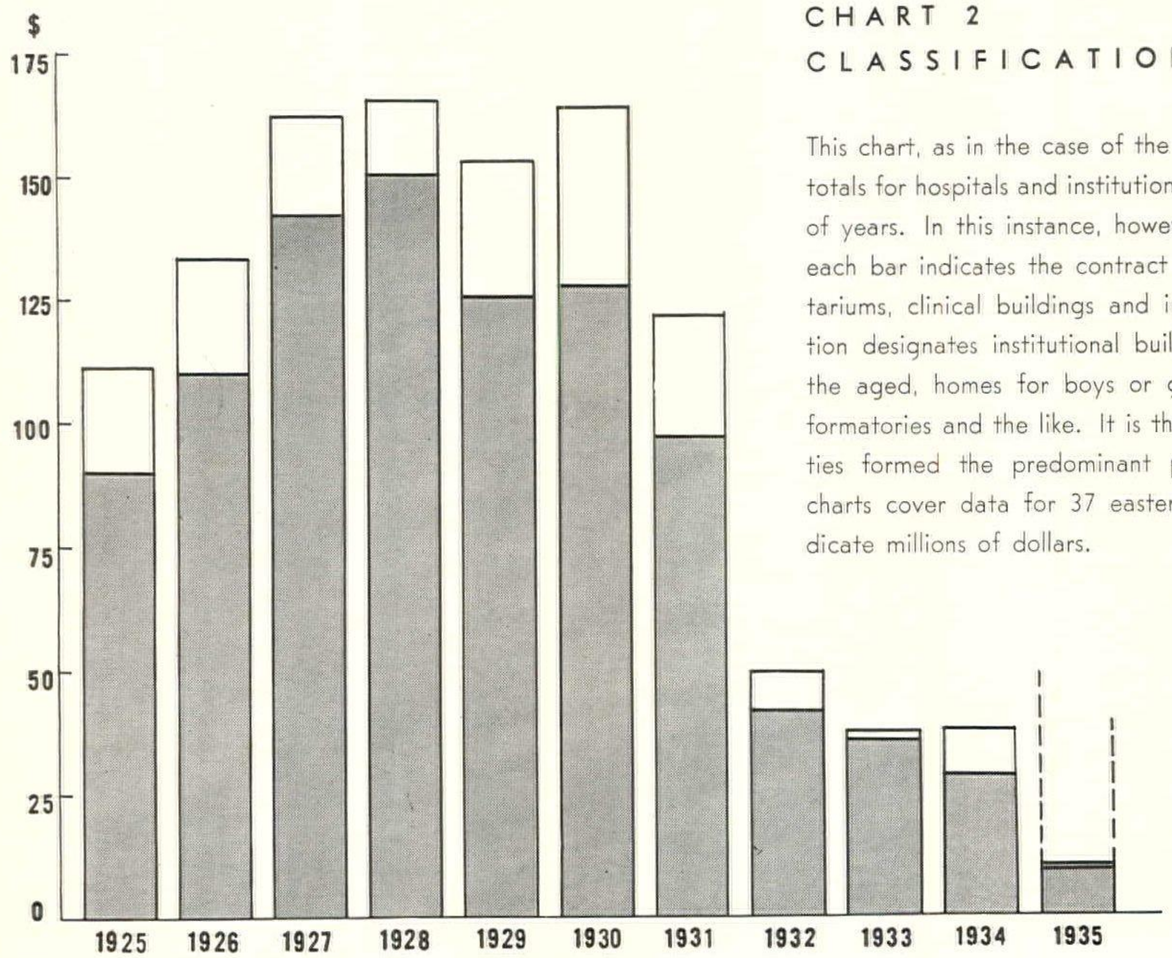


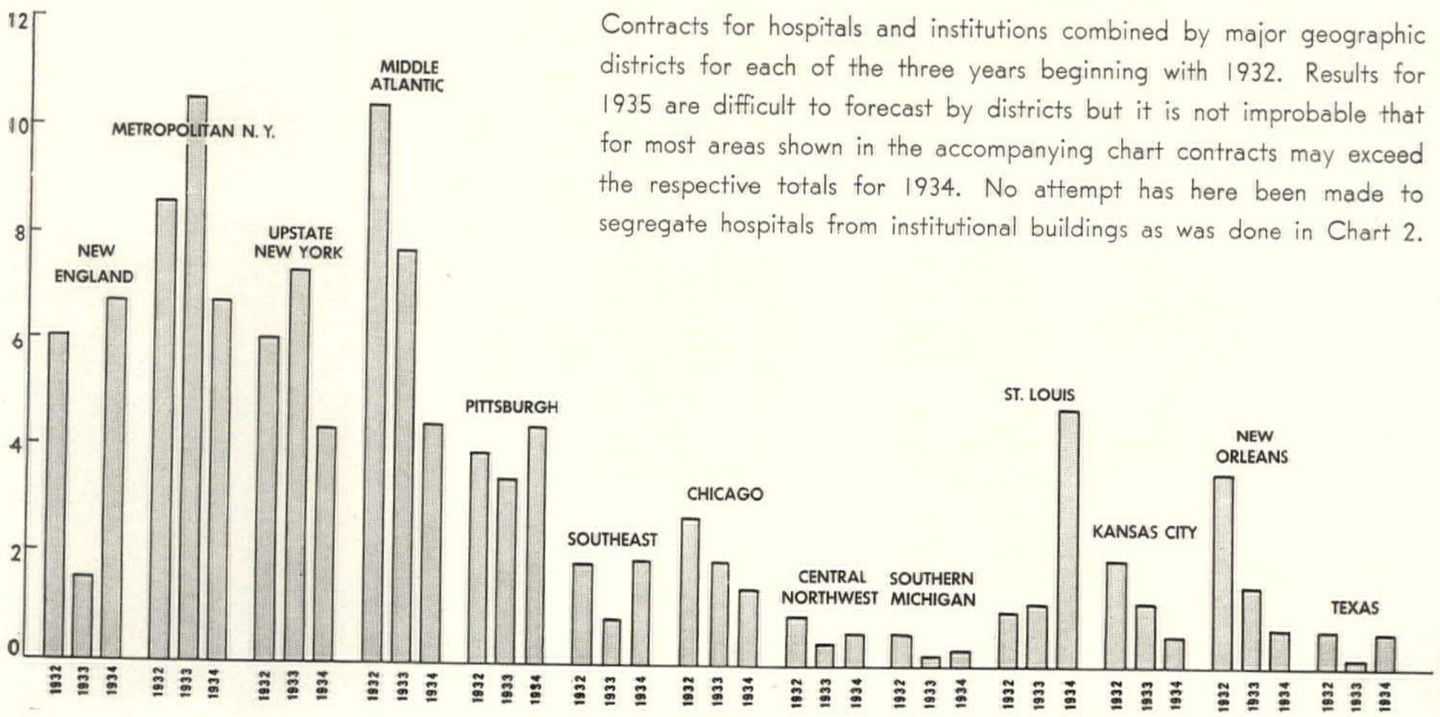
CHART 2
CLASSIFICATION BY TYPES

This chart, as in the case of the first, pictures the contract totals for hospitals and institutions over the indicated period of years. In this instance, however, the shaded portion of each bar indicates the contract volume for hospitals, sanitariums, clinical buildings and infirmaries. The white portion designates institutional buildings—asylums, homes for the aged, homes for boys or girls, industrial schools, reformatories and the like. It is thus seen that hospital facilities formed the predominant portion of each bar. All charts cover data for 37 eastern States only. Figures indicate millions of dollars.

CHART 3

DISTRIBUTION BY GEOGRAPHICAL AREAS

Contracts for hospitals and institutions combined by major geographic districts for each of the three years beginning with 1932. Results for 1935 are difficult to forecast by districts but it is not improbable that for most areas shown in the accompanying chart contracts may exceed the respective totals for 1934. No attempt has here been made to segregate hospitals from institutional buildings as was done in Chart 2.



TRENDS IN HOSPITAL CONSTRUCTION

By L. SETH SCHNITMAN, Chief Statistician, F. W. Dodge Corporation

Since the war virtually two billion dollars have been expended in the United States on the erection of new hospitals and institutional buildings and the extension of their existing plants. Over the 16-year period which began with 1919 an average of not far from $125,000,000 per year—based upon known results for the area east of the Rocky Mountains— has gone into this specialized form of shelter-housing for the sick, the aged, the infirm, the recalcitrant.

For all practical purposes 1928 was the peak year, while 1933 was the year of lowest volume. In 1928 contracts for construction of hospitals and institutional buildings in the country as a whole probably approximated $200,000,000; in 1933 awards had receded to a level somewhat below $50,000,000. In good times and bad this class of building represents roughly 3 per cent of the total construction volume, but its importance to the architect transcends this seemingly small percentage. Customarily most such buildings are designed by architects; in fact, over the 5-year period ended 1934 approximately 85 per cent of all hospital and institutional buildings were so designed.

During each of the three years, 1932 through 1934, the quantitative volume of architect-planned institutional building, though low, was virtually on an even keel. Related to the total volume of such building, however, an important change occurred between 1932 and 1933; the archiect's influence had improved from the depression-induced percentage of only 71 for 1932 to 92 for 1933 where it remained for the year 1934 as well.

Loans and grants to states, cities, and local public and quasi-public bodies for hospital and institutional buildings under the old PWA program approximated $37 million. This sum together with the funds to be locally raised it has been estimated, will produce almost $60 million in construction. One hundred and eighty-two projects, new and alteration, are involved in this program, some of which are already completed. In addition 80 Federal hospital projects were provided for with a total allotment of almost $13 million.

Private funds for hospital and institutional building are still scarce. When allotments under the old PWA program were stopped because funds were exhausted more than $75 million in applications for loans and grants for hospital enterprises were pending estimated to cost in excess of $125,000,000; this was exclusive of a sizable amount of desirable Federal buildings of similar types.

What may be expected from the new public works program as to hospital and institutional construction is difficult to determine, but there are doubtless many meritorious projects which will be made possible out of the new fund.

Photograph by Drix Duryea, Inc.

ABOVE: MEADOWBROOK HOSPITAL AT HEMPSTEAD, LONG ISLAND. OFFICE OF JOHN RUSSELL POPE AND WILLIAM F. McCULLOCH, ARCHITECTS; S. S. GOLDWATER, M.D., CONSULTANT.

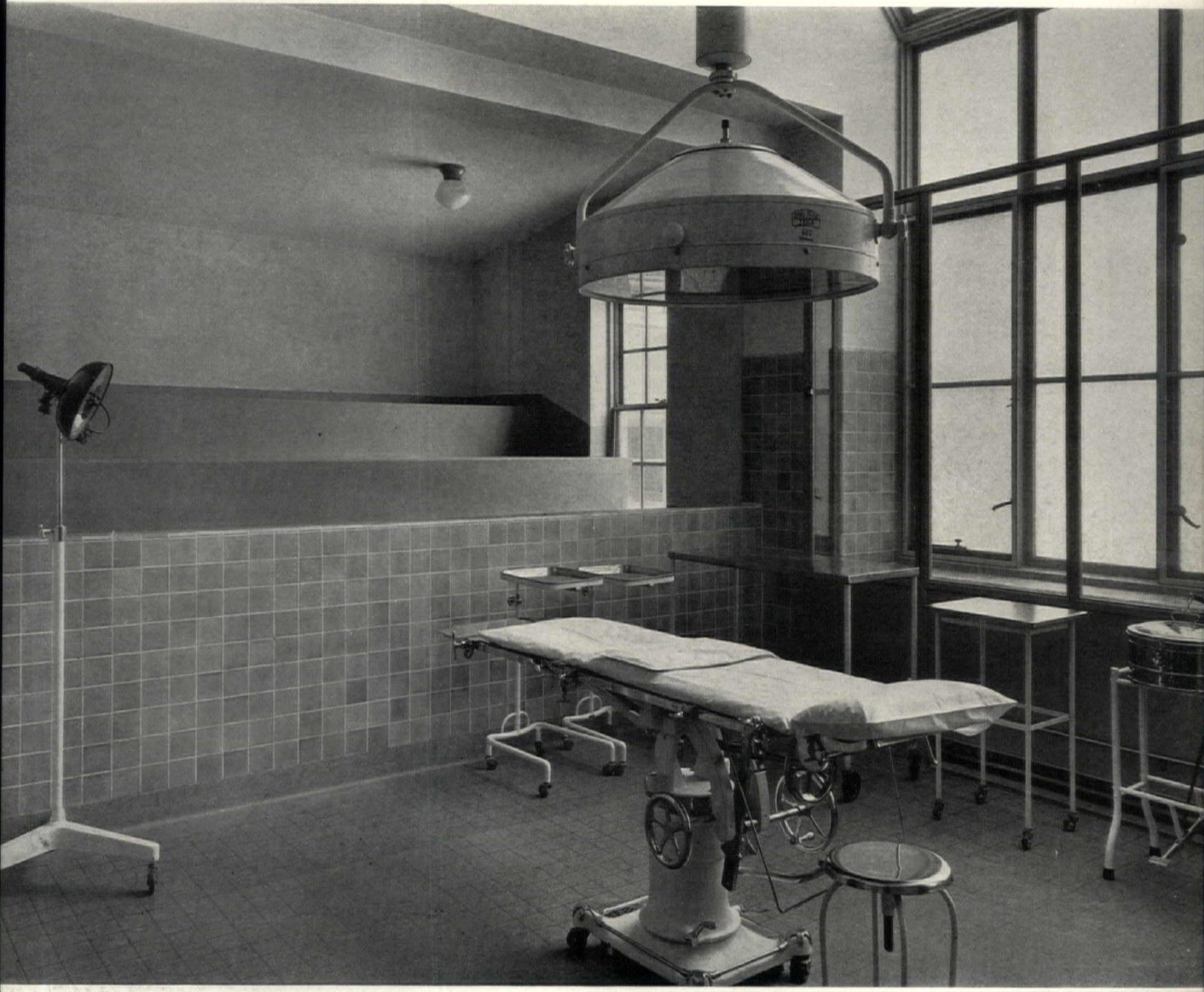
ON OPPOSITE PAGE: SYRACUSE MEMORIAL HOSPITAL AT SYRACUSE, NEW YORK. OFFICE OF JOHN RUSSELL POPE AND DWIGHT JAMES BAUM, ARCHITECTS.

GENERAL OPERATING ROOMS

PLANNING OF HOSPITALS AND HOSPITAL UNITS

The following tabulation of some of the more important considerations in hospital planning is given as a possible aid to architects and others interested in such work. In reading this tabulation it should be borne in mind that while the elements of a hospital plan are supposed to function in a definite interrelationship the plan cannot be developed merely by the application of a formula. An expert analysis of local conditions and requirements is a necessary foundation upon which to formulate any hospital building program, and on this analysis depends to a large extent the determination of just what and how much is to be included in a given program. This is particularly true in respect to the use of arbitrary ratios for deriving from the population figures a key to the total number of beds required or to the correct numbers in the various classifications. A careful appraisement of the situation by a reliable hospital consultant is much more likely to result in a well balanced building program than by arbitrary use of formulas.

PREPARED BY GEORGE S. HOLDERNESS OF THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT



Photograph by Samuel H. Gottscho

Gottscho

OPERATING DEPARTMENT CORRIDOR, SHOWING BUILT-IN INSTRUMENT CABINETS, IN SYRACUSE MEMORIAL HOSPITAL

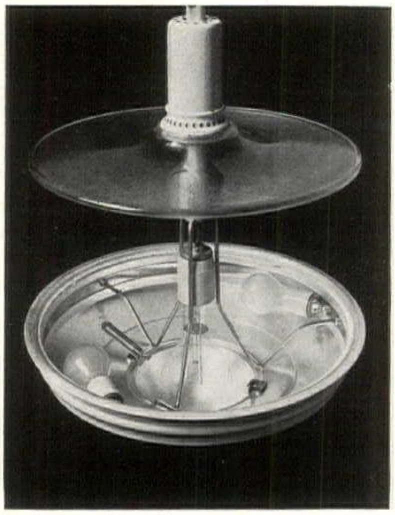
HOSPITAL UNITS

TYPE OF HOSPITAL. General: special divisions; teaching facilities; clinic. **Special:** maternity; pediatric (children's); orthopedic; crippled and ruptured; isolation; tuberculosis; cancer; convalescent; neuro-psychopathic; urological; dental; eye, ear, nose, and throat. **Medical Center:** general hospital; special hospitals; clinic; medical school.

SIZE. Dependent on character of community, specific ambitions of building committee, and available funds. Affected by number of existing hospitals, history of community as to sickness of various kinds, urban or rural nature of location, degree of local tendency toward hospitalization of the ill, and probable growth of the community. Analysis of these conditions recommended rather than use of formulas.

SITE. Size and shape: adaptable space for proposed building or group, permitting grounds where possible; space for future horizontal extension. **Accessibility:** easily reached via public transportation lines and highways; delivery of supplies. **Environment:** remote from playgrounds, ball parks and factories, and not adjacent to car lines or railroad tracks; pleasant outlook upon extensive lawns, natural park, or countryside; absence of swamps and other sources of insects; clean air, devoid of smoke, dust and other irritants. **Orientation:** sunny exposure for patients' rooms without loss of agreeable outlook. **Topography:** easy natural drainage; location at top of sloping ground rather than in depression. **Service facilities:** presence of water, gas, electric, drainage, and sewage disposal lines. **Permanency:** probable continuance of present aspect of surroundings. **Relation to other hospitals:** advantages vs. disadvantages of proximity; inclusion as a part of medical center.

LIGHTING FIXTURE USED IN LOS ANGELES COUNTY HOSPITAL



Woodcock

BUILDINGS. Number: dependent upon size of institution; one composite building, or several buildings inter-connected at all floors, for administration, general patients, nursing facilities, operating section, X-ray, laboratories, kitchen, dining rooms, and clinic; separate buildings or wings for special divisions, such as maternity, etc., where volume demands; isolation building; nurses' home; servants' quarters; garage; power house; laundry, if not contained in main buildings; medical school, where included in program; the small institution to be housed completely in one building; the large institution requires separate buildings or wings for administration, clinic, and other features. **Type:** vertical vs. horizontal; for general hospital purposes multi-story buildings offer structural economies in the vertical repetition of similar elements and are more wieldy in administration; horizontal type and separate pavilions suited for convalescents, tuberculars, and others requiring easy access to grounds; I-shaped plan best for maximum lighting and ease of control; lateral extensions for kitchen, laundry, etc. **Location:** provision of surrounding grounds; approaches to various entrances for persons and supplies; location of ambulance, morgue and service entrances remote

Gottscho

A PRIVATE PATIENT'S ROOM IN SYRACUSE MEMORIAL HOSPITAL

from patients' outlook; power house, if detached, at north end of group; location of patients' buildings at south end of group to insure against interruption of proper exposure for patients' rooms; roads on property; space for truck-gardening, and recreational areas for nurses and staff; allocation of space for future buildings or wings; parking spaces. **Interconnection:** if not in one composite structure, the units of the patients' group (except isolation hospital) connected by inclosed corridors at all floors; other buildings preferably connected with patients' group and with one another by tunnels, for passage of personnel and accommodation of service piping.

•

PATIENTS' BEDROOMS

CLASSIFICATION OF SERVICE. Receiving, medicine, surgery, maternity, isolation, convalescent, psychopathic.

SEGREGATION OF PATIENTS. By sex and age—men, women, children, infants.

CAPACITIES. Private, semi-private, wards, preferably not mixed in the same nursing unit; wards up to 35 or 40 beds sometimes used, but 16-bed ward is maximum recommended by most authorities.

SIZES. Private rooms: 9'0" x 12'0" to 11'0" x 15'6". **Semi-private rooms:** 11'0" x 15'0" to 12'0" x 15'6". **Wards:** minimum floor area, including circulation, 80 sq. ft. per adult's bed and 50 sq. ft. per child's bed. Minimum volume, 800 cu. ft. per bed in adults' wards and 500 cu. ft. per bed in children's wards.

CEILING HEIGHTS. 10'0" recommended minimum.

EXPOSURE. Maximum sunlight and protection against cold desirable; buildings running north and south afford morning sun in some patients' rooms and afternoon sun in others; where possible building should run east and west, with south side exclusively for patients and with utilities concentrated on north side.

SEPARATION WITHIN WARDS. Portable screens or curtains on overhead track; fixed screens about 7'0" high and with panels of translucent glass recommended for contagious wards.

LIGHTING, NATURAL AND ARTIFICIAL. Windows: minimum areas, in wards 1 sq. ft. to every 5 sq. ft. of floor area, in private and semi-private rooms 1 sq. ft. to every 8 sq. ft. of floor area. **General illumination (electric):** ceiling fixtures with minimum total of $1\frac{1}{2}$ to 2 watts per sq. ft. in wards and 1 watt per sq. ft. in private and semi-private rooms. Semi-indirect type recommended, with auxiliary lamping for low-intensity illumination.

LIGHTING FIXTURE USED IN LOS ANGELES COUNTY HOSPITAL

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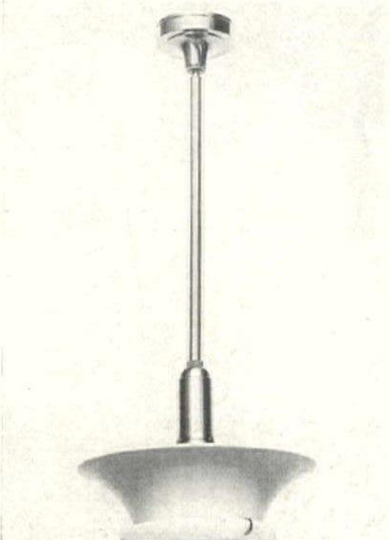
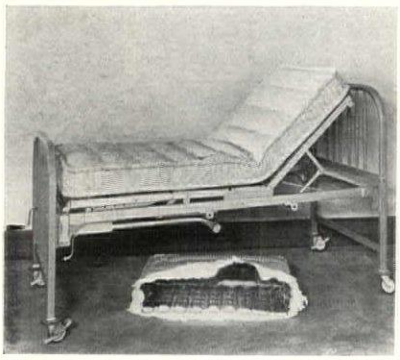
A TYPICAL DIET KITCHEN IN SYRACUSE MEMORIAL HOSPITAL



Miller Co.

SEMI-DIRECT LIGHTING FIXTURE

TYPICAL WARD BED USED IN LOS ANGELES COUNTY HOSPITAL



Woodcock

FURNITURE AND EQUIPMENT. Private and semi-private rooms: beds, standard sizes 3'0" x 6'6" for adult and 2'6" x 5'0" for child; bedside utility table about 16" x 20" and reading and feeding table, for every bed; easy and straight chairs as determined by hospital; lavatory (with arm-action control) or private bathroom or toilet and lavatory compartment; louvered night light in wall near floor, switched at door; dome type indicator light over door on corridor side; for every bed—one double jack radio receptacle, one duplex convenience outlet, one nurses' call (one, with double extension cord, will suffice for two patients), all these to be about 4'0" above floor; possible installation in every room, dependent upon character and refinement of service contemplated—one telephone jack, one electro-cardiograph outlet, one surgical vacuum outlet, all near head of bed. **Wards:** same as for private and semi-private rooms except no easy chairs or telephone jacks; possible limitation of bedside tables to one for every pair of beds, and night lights to be distributed about one to every 5 or 6 beds.

BATHROOMS AND TOILETS. General use: toilets and baths in separate rooms; lavatory in every toilet room; one toilet stall for every 10 patients; one bath for every 20 or 30 patients, except more required for convalescent and other ambulatory patients; stall doors open out. **Private accommodations:** the private bathroom, with tub, lavatory, and toilet; the private toilet room with lavatory and toilet; doors opening toward bedrooms; toilets with or without special fittings for bedpan washing. **Special notes:** tubs in general baths preferably arranged with working space at one end and both sides; children's fixtures of smaller size, and tubs raised on pedestals; separate toilets and baths for maternity section, with showers used instead of tubs.

GENERAL PLANNING ARRANGEMENTS. Doors swing into rooms from corridors; in private and semi-private rooms door should be diagonally across room from window, with head of bed at window side; beds preferably parallel with window wall, with window at patient's left; space in private and semi-private rooms for nurse's cot; in small wards beds preferably parallel with window wall; in large wards nature of plan sometimes necessitates placing of beds with backs to exterior wall, with windows between beds.

SOLARIA AND OPEN SPACES. Solaria: placed at each end or in center of patients' building, depending on plan; preferably on all patients' floors; sunny exposure; exterior walls with the maximum possible area of glass; windows arranged for opening; special glass permitting entry of therapeutic rays of sun; wide doors for passage of beds; preferably heated; consider possible use as overflow wards. **Covered porches:** similar to solaria except with no window sash and unheated; possible minimum of solid construction in exterior walls. **Balconies:** for private or joint use; size sufficient for beds and attendants; preferably opening from rooms but not

Woodcock

NURSES' STATION IN A TYPICAL WARD IN LOS ANGELES COUNTY HOSPITAL

projecting far enough to impair light in spaces below; cantilevered if consistent with architecture. **Open roofs:** particularly desirable in conjunction with and at same level as children's section. **Parapets:** at least 3'6" high; where used by children surround space completely with wire mesh inclosure extending at least 7'0" above roof and curving inward at top.

PATIENTS' CLOTHING. Closets or lockers in private and semi-private rooms; lockers in wards; general storage room for clothing of ward patients or of all patients.

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TREATMENT AND NURSING FACILITIES

CONTROL STATION. Generally one on every patients' floor, facing elevators and separated from elevator lobby by glazed partition having counter and wicket or opening; contains desk, chair and portable cabinets; sometimes combined with nurses' station when location is suitable.

NURSES' STATIONS. Generally one for every large ward or other nursing unit; in form of (a) alcoves in corridor or (b) separate rooms with glazed partitions and counter or railing; equipment includes desk, chair, medicine cupboard, dressing tray cabinet, chart rack and files, telephone, and call signals; medicine cupboard in form of dresser, with lower and upper sections, counter of stainless steel, monel, or marble on top of lower section, 10" diameter vitreous china bowl set into counter, and hot and cold water connections and drain; one portion of medicine cupboard under special key for narcotics; nurses' rest room; telephone adjacent or nearby.

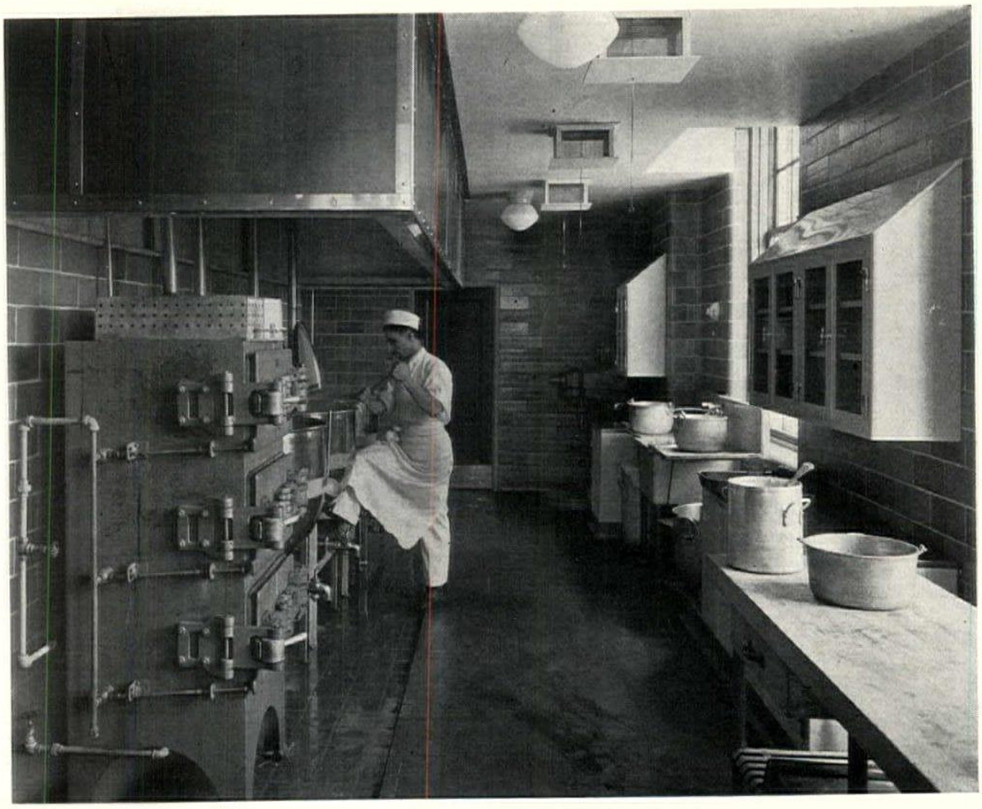
EXAMINATION AND TREATMENT ROOMS. At least one on every patients' floor, except not essential where patients are in private rooms exclusively; central location; north light desirable but not essential; equipment includes examining table, utensil sterilizer, instrument sterilizer, portable instrument cabinet, and all-service sink; ceiling fixture arranged dually to give semi-indirect lighting of room or beam of light on table at option of operator.

UTILITY AND SINK ROOMS: One to each nursing unit; equipment includes work table, supply cabinets on wall with space underneath for linen hampers, gas hot plate (one or two burners), utility sink and drain board with space underneath for refuse can, warming cabinet for solutions and utensils, bedpan emptier, built in or free-standing at wall, combined bedpan washer and sterilizer, clinic slop sink, portable bedpan rack, and slate or marble shelves; floor drain; nurses' toilet and lavatory.

WORK ROOM. Combined with utility room or as an adjunct of treatment and examination room; in latter case generally contains warming and supply cabinets, drying cabinet for blankets and garments, work table, and portable refrigerator.

CHILDREN'S ROOF AND PARAPET ON MEADOWBROOK HOSPITAL

Drix Duryea



Gottscho

MAIN KITCHEN, SHOWING STEAMER AND SOUP KETTLES, IN SYRACUSE MEMORIAL HOSPITAL

CLOSETS. Stretcher: one to every nursing unit; size about 3'2" x 7'0". **Linen:** one to every nursing unit; walk-in type favored; size varies with number and classification of patients; ventilation in door; metal or wood shelving and counter. **Flower:** one per floor; slate or soapstone table with built-in sink; size variable; flower closets generally not provided for wards. **Telephone:** one per floor; coin box or otherwise.

●

MISCELLANEOUS. Drinking fountains: one on every floor, centrally located in corridor; built-in wall type favored, with diagonal stream and glass-filling faucet; lever handles; cooled water. **Clothes chutes:** one per patients' building generally sufficient; stainless or glazed metal; diameter 24" standard, 20" medium, and 18" small; material of doors and intake and outlet throats same as chute; doors equipped with rubber sealers and refrigerator-type handles; vent and perforated flushing ring at top, and drain at bottom. **Clocks:** one double-faced type in every corridor, projecting from wall or ceiling and being readable up and down corridor; controlled from master clock elsewhere in hospital; 12" diameter face for long corridors and 10" for short. **Signal systems:** doctors' paging indicators, hung from wall or ceiling and visible up and down corridor. **Nurses' call annunciators:** in nurses' stations.

KITCHENS, DINING, AND FOOD SERVICE

TYPE OF FOOD SERVICE. Centralized or otherwise? Determination of type by consultant and administration of hospital; space for enlargement of centralized kitchen in case of expansion of hospital.

MAIN KITCHEN. Location: near entry of supplies and convenient to elevators; generally in basement; good natural light and ventilation desirable. **Main kitchen:** ranges, soup kettles, steamer, and cereal cooker, all under vent-hood having bottom edge about 7'0" above floor and fitted with lights for illumination of equipment; slight depression, with drain, in floor under kettles; cook's table, with built-in bain-marie and sink, and with overhead pan rack suspended from ceiling; cold service counter with shelf over and with ice cream cabinet and salad refrigerator adjacent; cook's refrigerator and walk-in refrigerators for (a) fruit and vegetables, (b) meat and poultry, and (c) dairy products, the walk-ins convenient to main kitchen and food preparation room; dressers for dishes, utensils and small supplies; coffee urns on cup-warming cabinet; bread rack and table; space for food carts and electric outlets for their heating; 10" clock controlled from master clock. **Dishwashing room:** dishwashing machine and tables for clean and soiled dishes; sink and drain board; this room not necessary if dishwashing is done in serving kitchens. **Scullery:** adjacent to main kitchen and separated by dwarf wall about 6'6" high; tables, pot racks, pot sinks, and can-washing sink (on floor); floor space, with drain, for washing carts. **Central diet kitchen:** adjacent to main kitchen; refrigerator; dressers; gas range with hood; cook's and work tables, and pan rack from ceiling; sinks and drain boards; mixers;

FOOD CART USED IN LOS ANGELES COUNTY HOSPITAL

Woodcock

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MAIN KITCHEN, SHOWING RANGES, STEAM TABLE AND BUILT-IN REFRIGERATORS, IN SYRACUSE MEMORIAL HOSPITAL

portable tray racks. **Food preparation room:** adjacent to main kitchen; work tables, sinks and drain boards, butcher's block and work bench, ice cream freezer, mixer and parer. **Bakery:** refrigerator, sink and drain board, oven, pastry stove, kettle, mixer and table. **Supply rooms:** daily supplies, and general stores; convenient to kitchen, food preparation room and service entrance to building. **Dietitian's office:** located near and preferably with a view of main kitchen and central diet kitchen.

Woodcock

BEDSIDE STAND USED IN LOS ANGELES COUNTY HOSPITAL

SERVING KITCHENS. One on every patients' floor, and supplemented by sub-serving kitchens where distance to patients' rooms is great; principal serving kitchen on each floor separated from elevators and corridor by a service lobby, with no door directly from kitchen to corridor; refrigerators, sink and drain board, dishwashing machine and tables (if not centralized in main kitchen), work table, and electric toaster and egg timer; combination steam table, warming cabinet, and gas stove with hood; space for food carts; pasteurizer on children's floor.

DINING SERVICE. Dining rooms: customary separation into staff, clerks, nurses, and help; usually located near and on same floor as main kitchen and served by the cafeteria system; areas dependent on numbers in the respective groups; visitors' dining room, if required, with type of service optional. **Cafeterias:** separate cafeteria for servants; one additional cafeteria can serve the other personnel groups; counter, with tray rail and built-in steam table; cutlery box; refrigerator; ice water fountain; sink and drain board; gas stove, and coffee urns on cup-warming cabinet, with hood; dresser; ice cream cabinet, and electric toaster and egg timer; adjoining dishwashing room, connected directly with both cafeteria and dining room, and containing dishwashing machine and dish tables.

MISCELLANEOUS ITEMS. Minimum ceiling height of 10'0" recommended; all working surfaces, such as tables and counters, of stainless metal, except where specific uses (e.g., as butcher's) require wood; 2'10" satisfactory height for tables and counters; refrigerators and cabinets preferably built in, or with room base and wall carried out to face; hoods should be mechanically ventilated to outside of building; special study of routing of food carts in kitchen; concealed ducts and piping at ceiling; grease traps on plumbing fixtures.

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OPERATING DEPARTMENT

LOCATION. Preferable to assign entire floor or one end of floor to this section; through-passage not desirable; access by elevator or corridor to all patients' floors; extent dependent on nature and size of hospital.

OPERATING ROOMS. Size: 18'0" x 18'0" average, with minimum ceiling height of 10'0"; additional space if observation galleries required. **Windows:** about 10'0"

NURSERY IN THE LOS ANGELES COUNTY HOSPITAL

Woodcock

A CONTINUOUS FLOW BATH

KNEE-ACTION WASH-UP SINK

wide x 7'0" high and customarily divided into one large fixed sash and two smaller operating sash; glass screen about 8'0" high and width of window, incloses radiator and screens room from drafts; window in at least one operating room equipped with light-proof shades for eye, ear, nose and throat work; obscure glass. **Equipment:** operating table of type selected; built-in instrument cabinets, closed and open types with glass shelves; built-in film viewing cabinet; aspirator; instrument and dressing table; irrigator and drum stands; anaesthetist's fixtures; clock, with second ticker, etc.; plaster sink for fractures in at least one operating room. **Lighting:** wide variety of approved types for operating light, ranging from the suspended fixture on adjustable mount to the series of focusing floodlights housed in ceiling; general illumination of room by ordinary methods; emergency current from storage batteries (automatically cutting in) recommended. **Heating, etc.:** thermostatic control giving 85 degrees temperature when outside is at 10 degrees below zero; local humidifiers recommended where no general air conditioning exists; brass, of 6" x 6" squares, installed in floor over entire area and grounded as safeguard against explosions of anaesthetics from static electricity.

DOCTORS' SCRUB-UP ROOMS. Preferably connected with operating rooms, generally between two, and connecting also with operating department corridor; generally two scrub-up sinks for every operating room, with knee or foot control and mirror and glass shelf above; size of each sink usually 30" x 22" x 10" deep; built-in soap system; when no scrub-up room is provided one sink is generally placed in every operating room.

STERILIZING ROOMS. Connecting with operating rooms, generally between two; clinic sink, warming cabinet, instrument sink and battery of sterilizers for water, utensils and instruments.

NURSES' WORK AND SUPPLY ROOMS. Located near operating rooms, generally across corridor; supply cabinets with shelves, drawers, counters and bins; utility sinks and drain boards; tables; warming cabinet and glove-drying rack; dressing sterilizers of cylindrical, built-in type, with access space at rear; water still; drum cabinet, and portable drum racks; these rooms generally en suite.

ANAESTHESIA ROOMS. One for every pair of operating rooms, and located near but not connected with them; size approximately 11'0" x 11'0"; brass grid in floor as for operating rooms; lavatory and supply cabinet; flat wood strip 8" inches high on all walls, with center 33" above floor, for protection of plaster against damage from stretchers; anaesthetist's fixture.

MISCELLANEOUS SPACES. Doctors' locker and dressing room, with shower, toilet, and lavatory adjoining; similar but smaller accommodations for nurses; stretcher

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OBSTETRICAL OPERATING ROOM WITH STUDENTS' OBSERVATION GALLERY IN SYRACUSE MEMORIAL HOSPITAL

closet; public waiting rooms and toilets; recovery rooms; observation galleries, with or without glass separating screens, and entered from corridors.

CORRIDOR. Built-in instrument cabinets (with glass shelving) where desired, supplementary to or in lieu of cabinets in operating rooms; control alcove.

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OBSTETRICAL DEPARTMENT

LOCATION. Entirely independent of operating department if maternity work is extensive; housed with operating department if maternity work is on small scale, but having independent facilities; in latter case this department often consists of a labor room, delivery room, and sterilizing room, all reached through a portion of the operating room corridor partitioned off from the remainder.

ELEMENTS. Labor and delivery rooms: about 14'0" x 17'0" in size, with minimum ceiling height of 10'0"; one designated for septic cases; scrub-up sink; private toilet. **Labor and preparation rooms:** about 13'0" x 15'0"; bed, slab bath, and lavatory in room; private toilet. **Delivery operating room:** similar to general operating room; sterilizing room adjoining; observation gallery if used in student work. **Obstetricians' dressing room:** lockers; shower, toilet, and lavatory adjoining; rest room. **Nurses' dressing room:** similar to obstetricians'. **Nurses' work room:** similar to work rooms in general operating section. **Sterilizing room:** centrally located and with equipment similar to such spaces in connection with the general operating rooms. **Other spaces:** waiting room, linen and supply closets, office and records, stretcher closet, telephone closet; nursery customarily placed in maternity section. Soundproofing customary on floors, walls, ceiling, and doors of labor rooms.

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PSYCHOPATHIC DEPARTMENT

SCOPE AND LOCATION. Except where a special hospital is devoted to such work, this department customarily consists of a series of small bedrooms, segregated in groups, for men and women, and provided with baths, toilets, utility rooms, and nurses' station. Should be so located that rooms do not face other rooms of hospitals.

BEDROOMS. All single rooms, about 8'0" x 10'6" in size; windows of detention type with shatterproof glass, and providing panes and openings limited to 5" in one direction, inclosed radiators; lighting fixtures flush with ceiling and with shatterproof glass; door hardware flush on room side.

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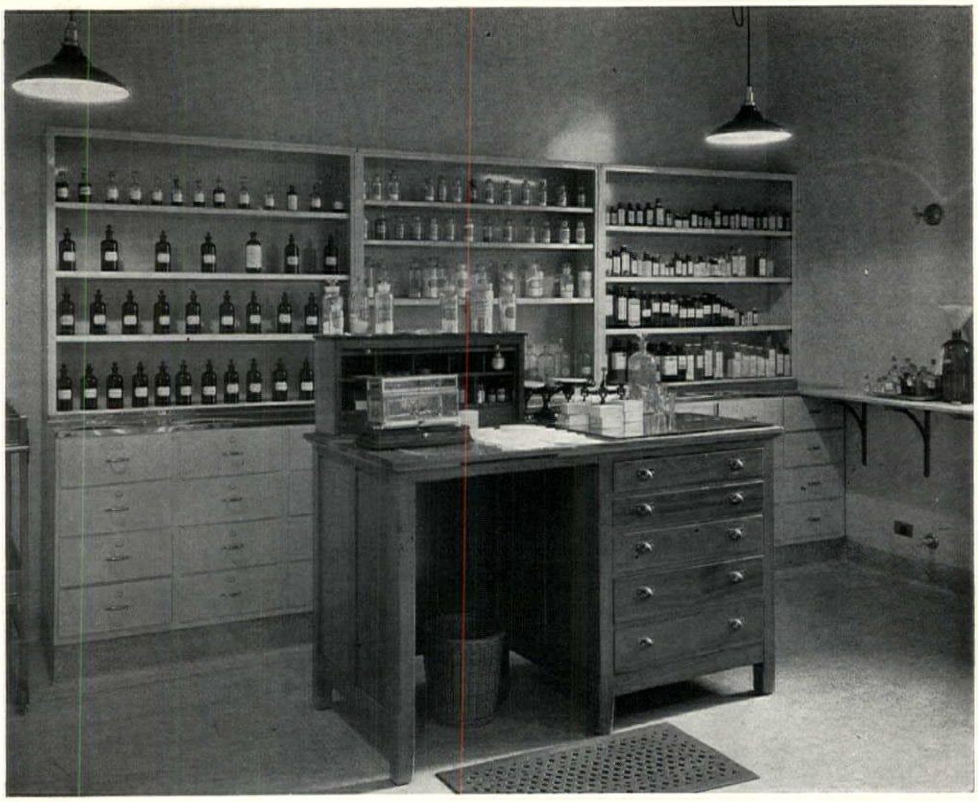
X-RAY DEPARTMENT

LOCATION. Convenient to patients' rooms and general activities of the hospital; should not be in damp locations, such as basement.



PHARMACY IN SYRACUSE MEMORIAL HOSPITAL

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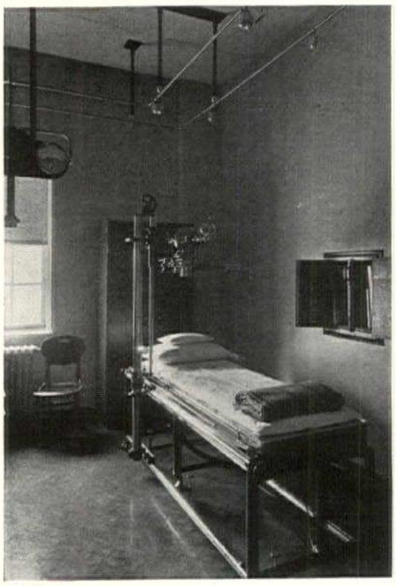

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RADIOGRAPHY ROOM, SHOWING FILM TRANSFER BOX IN WALL, IN SYRACUSE MEMORIAL HOSPITAL

ELEMENTS. Number of rooms for each phase of the work depends on size of department. Superficial therapy; deep therapy; radiography; fluoroscopy, with light-proof shades on windows; foreign body and fractures, containing special sink with plaster trap; control booths with view of rooms through vision panels in walls; viewing room, reached directly from corridor and containing stereoscopes and electrically illuminated film-viewing cabinets with sloping fronts; dark room for film developing, entered through light-proof maze and containing developing tanks, sink, film-drying cabinet, safe lights, and light-proof pass boxes (cassettes) installed in partitions for transfer of films from X-ray rooms; barium preparation rooms, with sink and drain board; dressing booths, connected with X-ray rooms and corridor; office and records; waiting room and toilets.

INSULATION. Floors, doors and partitions (but not exterior walls) of rooms with X-ray machines should be lined with lead; ceiling insulation overhead not necessary with most types of machine; partition insulation sometimes installed in large sheets hung between two wall thicknesses, but simpler method is by use of patented lead-lined blocks having overlapping joints; barium plaster sometimes used; vision panels of special "lead glass" between control booths and X-ray rooms.

MECHANICAL. Special characteristics of current required for different machines; location of general transformer; cooled water preferable for developing tanks.

FILM STORAGE. Special vault, located in conjunction with department or elsewhere; requiring in either case at least 8" brick or concrete walls; at least 6" concrete slab over and under if rooms above or below; self-closing fire door with fusible link device; automatic sprinkler system; vent to outside air; size and other details to conform to requirements of National Board of Fire Underwriters.

LABORATORIES AND RESEARCH

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LOCATION. Convenient to center of activities; not necessarily in patients' building, but easily accessible from it; good natural light desirable, north where possible.

SUBDIVISIONS. Bacteriology and immunology, pathology, chemistry and haematology, metabolism, and urinalysis; media preparation and work rooms; office and records; animal dissecting room; animal quarters, generally located on roof or outside of buildings, with cages, sink and floor drain.

EQUIPMENT. Refrigerators; tables with acid-proof tops, duriron bowls and drains, and outlets for compressed air, vacuum and electricity (A. C. and D. C.); chemistry tables with soapstone or similar tops, soapstone sink at end, bottle racks, drawers, cupboards, and outlets for gas, water, compressed air, vacuum and electricity; stone

Drix Duryea, Inc.

DENTISTRY DEPARTMENT, SHOWING EXTRACTION ROOM BEYOND, IN MEADOWBROOK HOSPITAL

sinks and drain boards; pegboards on walls; fume hoods of transite or other similar materials, completely open and with sliding glass doors; cabinets for supplies and equipment; autoclaves; centrifuge; water still; oven; incubators; mechanical ventilator from fume hoods to outside air.

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OUT-PATIENTS' DEPARTMENT

LOCATION. At ground level, with direct entrance from street and connection with hospital.

CLINICAL DIVISIONS: (a) medicine, (b) surgery. Dentistry, eye-ear-nose-and-throat, obstetrics, pediatrics, neurology, dermatology, genito-urinary, genecology, orthopedics, and gastrology.

SPACES. Division into spaces customarily effected by partitions of wood or hollow metal having large areas of obscure glass and carried to ceiling or 7'6" height depending on use of space. Waiting room with ample benches and with information and control office behind railing; general treatment rooms, with tables and chairs, all-service sink, and portable instrument cabinet; private examination and treatment rooms, some with genito-urinary sinks; history rooms; dental room, with dental chairs and units as required, portable instrument cabinets, lavatory with depressions for instruments, electric instrument sterilizer, dental X-ray machine, supply cabinets, desk and chair; refraction rooms for eye work (giving 21'0" range) equipped with sink, sterilizers and instrument cabinet, and with arrangements for complete darkening; E. N. & T. room, with individual cubicles, and equipped with chairs, pedestal cuspidors, all-service sink, instrument sterilizer and cabinet; minor operating room, with treatment table, all-service sink, instrument cabinet, and battery of sterilizers for water, utensils, and instruments; dark room; office and records; toilets.

PHARMACY AND DISPENSARY. Located in conjunction with out-patients' department, yet easily accessible from remainder of hospital. **Waiting room:** out-patients' waiting room can be used when convenient, or separate waiting space provided. Pharmacy: counter, with window or wicket to waiting space; work tables and benches; storage closet; refrigerator; sink and drain board; shelving. **Pharmacy workroom:** adjacent or directly below or above pharmacy; connected by dumb-waiter if at different levels; gas stove; sinks and drain boards; work tables and benches.

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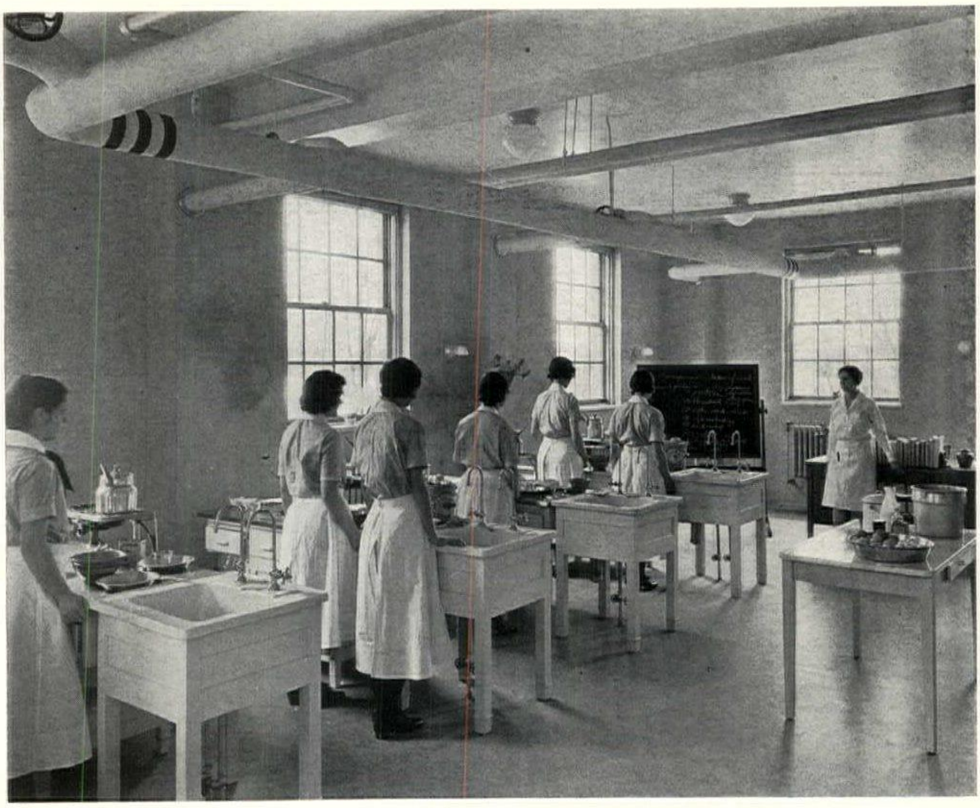
ADMINISTRATION

PUBLIC SPACES. General lobby and waiting room: focal point for corridors, stairs, and elevators to various parts of hospital; ample seats and pleasant atmosphere;



DOMESTIC SCIENCE CLASSROOM IN SYRACUSE MEMORIAL HOSPITAL

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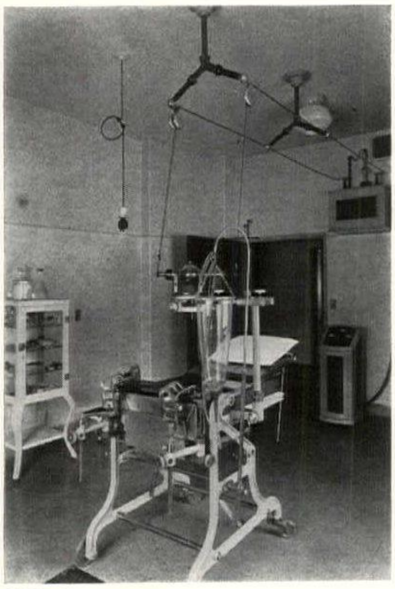

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UROLOGY ROOM IN SYRACUSE MEMORIAL HOSPITAL

counter at information office; telephone booth; drinking fountain; public toilets nearby. **Business lobby:** usually between general waiting room and business office; check counter; bank screen with cashiers' wickets. **Reception and conference rooms:** finished and furnished equal to general waiting room, and generally adjoining that space.

OFFICES. Information, separated from general waiting room by counter, and containing telephone switchboard, doctors' paging machine, and information facilities; general business, for bookkeepers, stenographers, clerks, etc.; professional, for hospital superintendent, heads of main departments, and superintendent of nurses.

RECORD ROOMS. **Active:** generally in conjunction with offices. **Inactive:** can be elsewhere, but should be easily reached from offices.

SOCIAL SERVICE. Consultation rooms, offices, reading room, toilet and lavatory facilities.

ADMITTING DEPARTMENT. Ambulance entrance: remote from main entrance, and not visible from patients' rooms; marquees over entrance platform. **Entrance lobby:** large enough for circulation, wheel chair and stretcher. **Emergency room:** adjacent to ambulance entrance lobby, and equipped as a minor operating room: supply and splint cabinets, all-service sink, portable instrument cabinet, and treatment table; ceiling fixtures giving semi-indirect light for room or direct beam downward to table at option of user. **Examining room:** treatment table, portable instrument cabinet, and all-service sink; lighting fixture as in emergency room. **Sterilizing room:** in connection with emergency and examining rooms; warming cabinet, utility sink and work table; sterilizers for water, instruments and utensils. **Nurses' station:** as described under Treatment and Nursing Facilities. **Receiving wards:** preferably 2- and 3-bed wards, with toilets and admitting bath. **Utility room:** bedpan washer and sterilizer, utility and clinic sinks, table and hot plate. **Serving kitchen:** as described in section on Kitchens.

FOR STAFF DOCTORS. **Locker room:** lockers; adjoining toilet and lavatory. **Conference and meeting room:** provision for stereopticon lectures and motion pictures; raised platforms; portable seats; mechanical ventilation. **In-and-out board:** generally located near offices and on natural route of doctors when entering or leaving hospital.

OTHER DEPARTMENTS

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PHYSIO-THERAPY. Hydrotherapy, requiring control table, shower, miscellaneous therapeutic baths and massage facilities; heliotherapy, natural or artificial, involving exposure to sun and use of sun lamps; office and waiting room; individual treatment cubicles.

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A LECTURE ROOM IN SYRACUSE MEMORIAL HOSPITAL

CYSTOSCOPY. Cystoscopic table, all-service sink, electric instrument sterilizer, X-ray machine, supply and instrument cabinets; toilet; separate dark room, with work bench and developing tank, or location adjoining general X-ray dark room, with pass-box for transfer of films; lead lining in partition between cystoscopy room and dark rooms as protection for films in latter.

CARDIOGRAPHY. Portable electric cardiograph, couch, desk and chair, lavatory, portable cabinet; dark room as described for Cystoscopy Room, wiring connections to cardiograph outlets at patients' bedside.

AUTOPSY ROOM AND MORGUE. Usual location at rear of hospital and out of view of patients. **Autopsy room:** size for room with one table about 18'0" x 18'0", with minimum ceiling height of 10'0"; autopsy table, work tables, sink and drain boards, and lockers; adjoining toilet and lavatory; large window area, with obscure glass; floor drain; accommodation for work by public authorities. **Morgue:** near autopsy room; embalming tables, number dependent on character and size of hospital; slop sink at end of each table; mortuary refrigerator with individual compartments, sliding trays, and card holders on doors; refrigerator generally 7'6" from front to rear, 2'6" high per tier, and 2'8" wide per compartment, over-all sizes.

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MISCELLANEOUS ELEMENTS

NURSES' HOME. Usually a distant building; domestic life and relaxation furthered by separation from hospital atmosphere; grounds around, with space for tennis courts and other outdoor exercise; **Bedrooms:** mostly single rooms, some double; standard size of single rooms 8'6" x 13'6", of double rooms 11'0" x 15'6"; minimum ceiling height 8'0"; closet for every nurse, about 3'0" x 3'0" and opening into bedroom; usual furniture — bed, desk, straight chair and easy chair. **Bath and toilet rooms:** private bathrooms for a few ranking nurses, and general bathrooms and toilets for others; either a lavatory in every bedroom or grouping in a general washroom; for general rooms usually 1 toilet for every 4 or 5 nurses, 1 bath tub (with shower over) for every 7 or 8 nurses, 1 separate shower stall for every 10 nurses, and, where general washrooms are adopted, 1 lavatory to every 3 nurses. **Social rooms:** general living room, usually on first floor, designed and furnished in domestic spirit and containing fireplace, built-in bookcases and the like; reception rooms, in same spirit as general living room, intended for small groups, such as family visits, and located near social center. **Recreational rooms:** spaces for dancing and noisy games usually in basement; sitting room on every bedroom floor for bridge and other quiet forms of relaxation. **Nurses' school:** opinion differs as usefulness; if adopted the training school is usually segregated in a distinct portion or wing of the nurses' home; laboratories (including domestic science), demonstration

NURSES' CAFETERIA IN SYRACUSE MEMORIAL HOSPITAL

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rooms, class and lecture rooms, library and office. **Miscellaneous features:** Office, located at main entrance and containing information counter, nurses' in-and-out board (accessible from office and corridor or lobby side) and mail clerk; superintendent's suite, consisting of living room, bedroom, and bath; kitchenette on every bedroom floor, containing gas range, refrigerator, sink and drain board, and dresser, all conveniently combined in one piece of equipment if desired; men's coatroom and toilet, located near entrance; nurses' linen room, house linen room, sewing room, nurses' hand laundry, trunk and general storage rooms, all in basement; one or two telephone closets and clothes chute in corridor on every floor; elevator where building has two or more floors above entrance floor.

SERVANTS' BUILDING. Usually consists of bedrooms, one sitting room per floor, and general toilets and baths; bedrooms about 8'0" x 13'0", minimum ceiling height 8'0", and with or without closets; where building is divided into two parts, for men and women servants, sitting rooms and bath and toilet facilities occur in each part.

LAUNDRY. Located in basement of hospital or in separate building; good light and natural ventilation desirable; size dependent on volume and character of work; minimum ceiling height 11'0"; layout of machinery with a view to proper route of work through laundry; receiving space, washers, tumbler, extractors, steam pressers, ironing boards, flat-work ironer, tables, drying cabinets; in separate room with counters facing main laundry room—linen supply and sewing rooms, with shelving as required; skylights where possible; connection by underground passage with other buildings of group; toilets.

GARAGE. Preferably in separate, one-story building; space for ambulances and hospital cars; inside dimension from front to rear, about 23' average; laterally, car spacing 11'0" o. c. gives surrounding work space; doors 8'0" wide x 8'6" high, overhead or hinged at jamb—sliding type not practical where several occur in row; overhead washing device; work room; chauffeurs' rest room and toilet; garage for cars of staff and nurses sometimes provided.

GENERAL DATA

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WINDOWS. Material: wood or steel, latter preferable for reasons of durability. **Sizes:** where of particular importance sizes are given in discussion of various rooms; elsewhere determined by architect's judgment as to light and appearance. **Sill heights:** approximate minimum 2'10" from floor to stool (interior); sills near floor should have guard rail on outside. **Action:** for all practical purposes double-hung windows are satisfactory, sometimes used with transom; elevated stool, permitting lower sash

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IRONING MACHINES IN LAUNDRY OF SYRACUSE MEMORIAL HOSPITAL

to open sufficiently to give ventilation at meeting rail only; casements, projected, and pivoted sash useful in certain cases, depending on use and on character of elevation. **Glass:** 26 oz. usual practice; generally clear, except obscure in operating rooms, autopsy rooms, and in baths and toilets if desired; wire glass where stairs.

DOORS. Material: exterior doors usually wood or bronze at main entrances, dependent on character of architecture and budget, and kalamein at service entrances; interior doors generally of wood, except hollow metal customary in basements and wherever expected to receive hard use or required for fire protection; copper-covered doors usual practice on roof bulkheads and wherever no shelter from weather is afforded. **Design:** doors at exterior openings and in spaces having architectural character are usually paneled or glazed as required by the style of the building; elsewhere wood doors are of flush type and metal doors in one panel. **Sizes:** thickness usually 1¾" for interior doors and 2" for exterior; except where architectural design dictates otherwise doors usually from 6'8" to 7'0" high; width—3'10" or 4'0" between patients' rooms and corridors and wherever passage of beds is expected, 3'0" to stairs, 2'6" to closets except where pairs required, 2'8" or 2'10" to nurses' bedrooms, elsewhere determined by customary considerations. **Vision panels:** small panel required in every double acting door; doors to psychopathic bedrooms require observation panels about 6" x 8", of shatterproof glass and hinged to swing toward corridor; doors to contagious bedrooms require panels about 8" x 12", fixed in position and provided with solid shutter (preferably of metal) or corridor side of glass—shutter-hinged or vertical sliding; where desired certain doors have entire upper portion glazed for borrowed light in corridors. **Lead lining:** in doors which occur in lead-lined partitions (X-ray department). **Soundproofing:** in doors which occur in soundproofed partitions (obstetrical department, for example); thickness about 3"; special jambs with rubber gaskets, etc. **Finish:** practice varies; upkeep favors stained finish on wood doors and baked-on finish on hollow metal doors. **Jambs and trim:** hollow metal, combination buck, jamb and trim favored; trim flat, about 2⅛" wide, and about ⅛" in front of plaster, with molded wood trim applied where architectural treatment demands.

PARTITION SASH. To gain light in corridors and interior spaces; jamb and trim as for doors; material of sash generally wood for lighter weight; desirable generally for sash to hinge at bottom and swing toward rooms, with adjustable holders at sides; glass usually obscure.

CORRIDOR. Widths: in hospital building 8'0", except 7'0" sometimes used on children's floors; in nurses' home and servants' quarters 6'0". For **Materials,** see discussion of that subject.

PARTITIONS FOR WARD CUBICLES

SURGEONS' SCRUB-UP ROOM IN OPERATING DEPARTMENT OF SYRACUSE MEMORIAL HOSPITAL. (NOTE KNEE-CONTROL SINKS)

Gottscho

STAIRS. Steel construction; treads of terrazzo, rubber, or linoleum; cement treads satisfactory in servants' quarters and for minor stairs; composition treads (terrazzo and cement) require mixture with abrasive aggregate; linoleum or rubber treads usually have metal nosings with abrasive insets; hand and wall rails of molded or plain wood, stained; balusters and newel posts of steel in simple pattern; minimum width of main stairs 3'8" clear; riser and tread approximately $7\frac{1}{2}$" and 10" respectively; location of stairs in accordance with usual practice for adequate egress from building.

ELEVATORS. Centrally located, usually convenient to main waiting room; minimum of two needed unless hospital very small; standard inside size of car 5'0" wide x 8'0" deep; simple design preferable, sometimes with electroplated finish for durability and upkeep; self-leveling device and all safety appurtenances recommended; lever, push button, or combination control; one-car combination passenger and service, with doors at each end; rubber flooring; shaft doors either two-speed or center-opening, but in either case producing a clear opening of at least 3'10"; doors hollow metal; elevator in nurses' home may be of smaller size as required.

CLEANERS' CLOSETS. Located off corridors, usually one to every floor, or two where corridor is long; slop sink with roll rim, and protected metal covering on front roll; slate or marble shelf 12" wide and about 5'0" above floor; door 2'6" wide and opening to corridor; space on floor for buckets and cleaners' paraphernalia.

SOUNDPROOFING. Usually limited to labor and delivery rooms of obstetrical department, where floors, walls and ceilings are soundproofed, and to kitchens, dining rooms and dishwashing spaces, where soundproofing frequently is installed only at ceilings. Other spaces, where required by special conditions.

STORAGE ROOMS. Large space usually required; location as available.

MECHANICAL EQUIPMENT. See separate discussion of that subject (pages 430-436 of this issue).

FLOOR FINISHES

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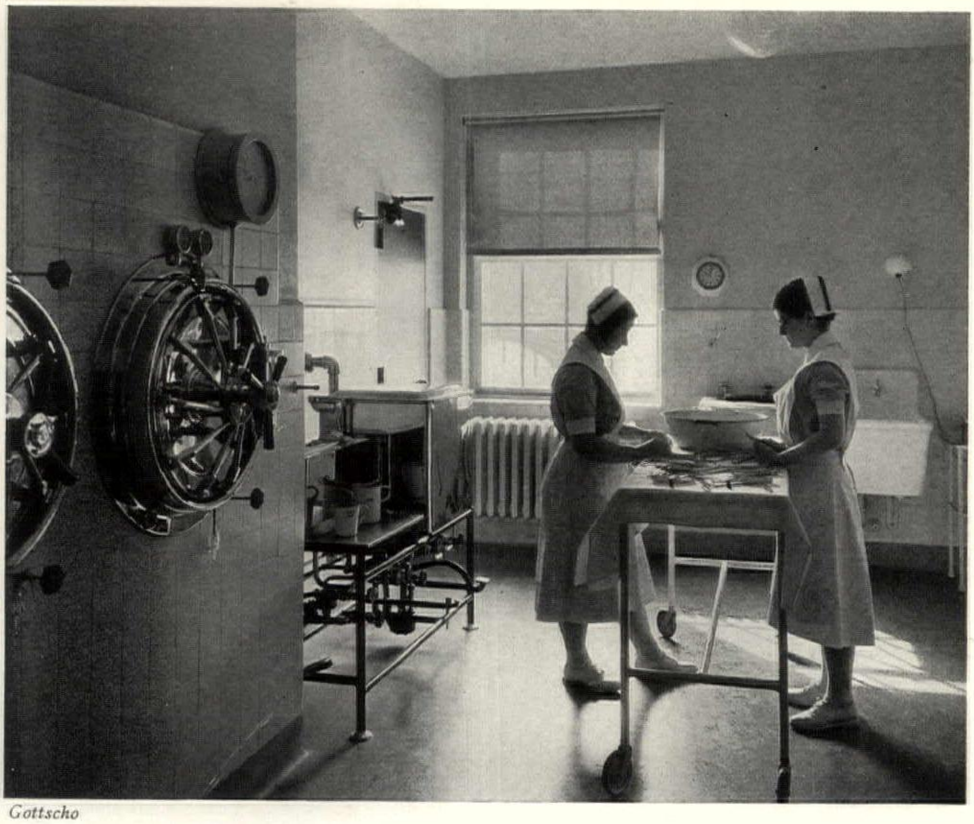
CERAMIC MOSAIC TILE. Bath, lavatory and toilet rooms; terrazzo sometimes used for these spaces.

QUARRY (PROMENADE) TILE. Kitchens and allied spaces, cafeterias, laundry, solaria, roofs and porches used by patients or staff; base of same material.



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STERILIZING ROOM IN SYRACUSE MEMORIAL HOSPITAL

LINOLEUM. Corridors, nurses' and servants' bedrooms, X-ray department, offices, clinic, etc. Wood base in nurses' and servants' bedrooms; in other spaces 12″ border of terrazzo and 6″ or 8″ base of same material, with cove between base and border and brass strip between linoleum and border. Linoleum strip in aisle between beds of wards.

RUBBER TILE. If preferred, for the spaces listed under linoleum, except rarely used in nurses' or servants' bedrooms; pattern of alternating squares of different colors where desired in public spaces; rubber border and base where ultra-sanitary quality of terrazzo not urgent.

CEMENT. Storage rooms and similar spaces; painted or with integral color; also in nurses' and servants' bedrooms and in many other spaces when budgetary limitations demand; border and base of same material.

WOOD. In social rooms of nurses' home, for sake of domestic atmosphere; maple for dancing.

TERRAZZO. Patients' bedrooms (including wards); laboratories; operating and anaesthesia rooms, with brass grid as described; serving kitchens, sink, utility, treatment, sterilizer, and similar rooms; border and 8″ base of same material; terrazzo divided into approximately 4′0″ squares by brass strips.

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WALL FINISHES

SALT-GLAZED TILE. Kitchens and allied spaces; cafeterias; laundry; morgue; finish integral with structural material of wall; available in various sizes for laying in ashlar pattern; bottom course coved at floor; bull nose at exterior angles and cove at interior.

GLAZED TILE WAINSCOTS. Bath, toilet and wash rooms—height usually 4′0″ except carried to 6′6″ in shower stalls and where showers occur over tubs; operating and delivery rooms, 6′10″ or 7′0″; corridors of operation and obstetrical departments, 5′0″ to 7′0″ as desired; sink and utility rooms, and serving kitchen, 5′0″.

PLASTER. Generally throughout, from top of base or wainscot to ceiling; cement plaster in cleaners' closets; cove at intersection of wall and ceiling improves appearance somewhat but adds to cost and is overrated as a sanitary precaution.

PAINTING. All plaster surfaces customarily painted; lead and oil; lithopone; washable fabrics sometimes used, but add to cost.

A MODERN MEDICAL CENTER:

ITS MECHANICAL AND ELECTRICAL EQUIPMENT

By CLYDE R. PLACE, Consulting Engineer

In a modern medical center the electrical and mechanical facilities should be so designed as to utilize the practical results of present research and invention and also to provide for extension of facilities as a result of future research.

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With the introduction of air conditioning and its use in both large and small installations, much valuable experience has been obtained. Design has been greatly improved, and definitely controlled atmospheric conditions can now be obtained according to any pre-set values. In fact, the application of air conditioning has become so widespread in commercial practice that it is surprising that more use of it is not made in hospitals where controlled atmospheric conditions are of major importance.

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Research in lighting—the use of light for therapeutic purposes, the use of high frequency current, improvement in X-ray equipment, sterilizers and the like—has also resulted in the development of apparatus which is now an essential part of the equipment of hospitals. In fact, the use of electricity for special apparatus, as well as for power in connection with air conditioning and similar mechanical equipment, has increased to such an extent that standards of design for electrical feeders, generating equipment and the like have had to be changed to accommodate the increased loads. A hospital designed today must necessarily provide in its electrical generating equipment and feeders an ample reserve capacity to carry a future load which will no doubt be imposed because of the need for new electrical accessories.

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Adequate and proper water supply, sewage disposal and refrigeration are major items in hospital design. The science of materials and the work of metallurgists, corrosion engineers, research chemists and pathologists have contributed information which is valuable to the sanitary engineer: he can now select materials which will last for the life of the structure, he can treat the water to assure its purity, and he can dispose of sewage without danger to the hospital or without polluting neighboring property.

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Air conditioning has practically forced the invention and use of refrigeration machines using a non-toxic refrigerant. Hazards which have been imposed on many hospitals owing to the use of ammonia are no longer necessary.

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Another hazard—fire—can also be obviated by a combination of practical structural and mechanical design. Fire detecting apparatus, absolute electrical control of watchmen, automatic sprinklers and alarms, automatical chemical extinguishers and similar recent inventions can be applied with judgment to eliminate this hazard entirely.

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The modern skyscraper has forced the development of the elevator. Micro-leveling photo-electric devices and, above all, greater speed have simplified the problem of vertical transportation.

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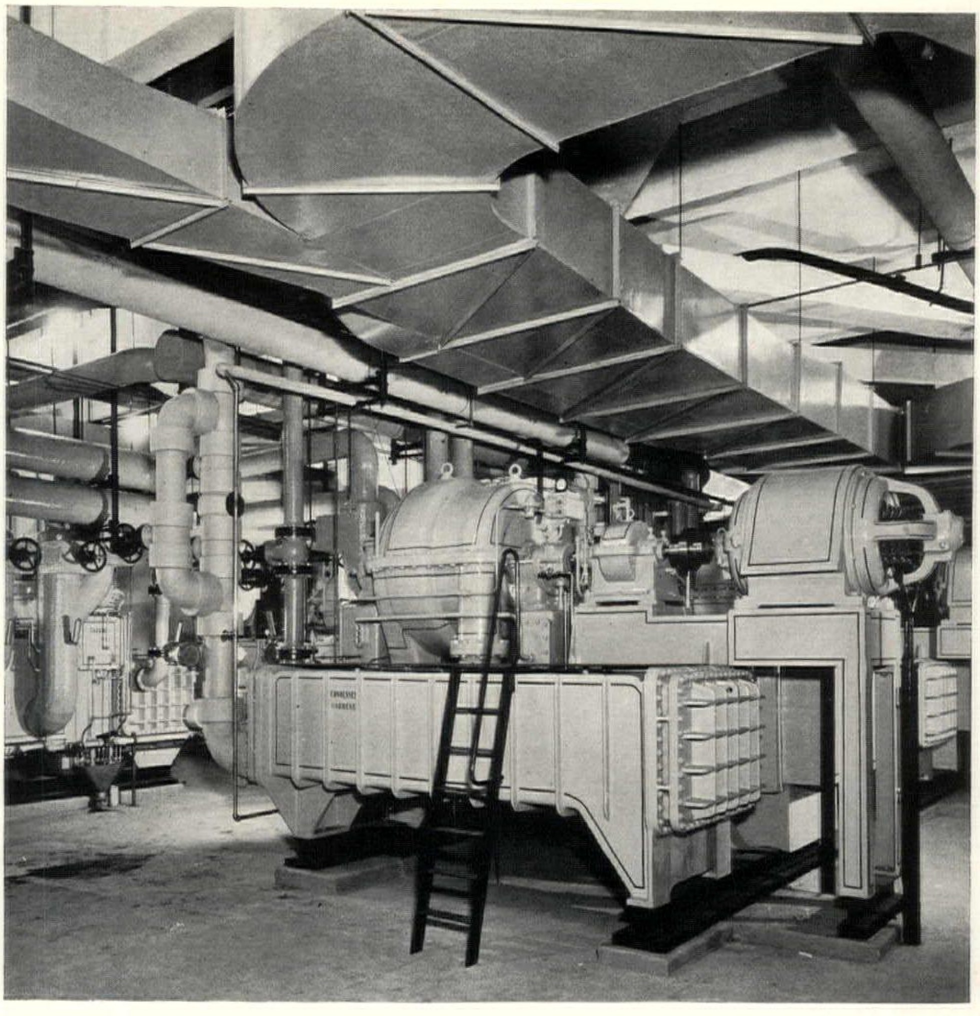
That more attention is being given to sound levels is apparent in all mechanical design. The demands for quiet have been met by engineers and practically all unnecessary and uncontrolled vibrations can be removed from the mechanical equipment and the building structure.



Centrifugal-type refrigeration machines using a non-toxic refrigerant in conjunction with air conditioning.

AIR CONDITIONING

Air conditioning in hospitals has many important applications. For example, using proper washing, dehumidifying and control apparatus, it is possible to provide clean, pollen-free air and to maintain the same temperature and humidity conditions as prevail at Saranac, which has become famous as a health resort for tuberculosis patients. Recently developed ionizing equipment makes possible a supply of air of ionic content similar to that of country air with its vitalizing effect.

If the medical staff of a hospital should establish the humidity and temperature requirements for each section of the medical center, the designing engineer can obtain and maintain the designed conditions within close limits. It is possible to design a good tuberculosis sanitarium in the heart of New York City.

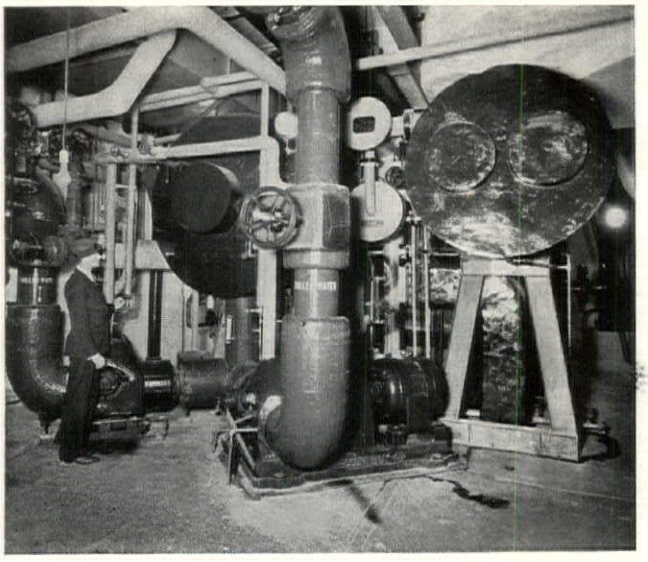
At the present time surgeons while performing their difficult duties are subjected to an additional physical strain because of atmospheric conditions in the operating and delivery rooms. High-power lamps which radiate heat, wet towels, sterilizers and the like contribute to the temperature and humidity in rooms where there is poor ventilation, and create atmospheric and static electric conditions which are not suitable for doctors performing difficult surgery work and are hazardous to the patient. Even simple air conditioning would not be satisfactory, although it would be an improvement.

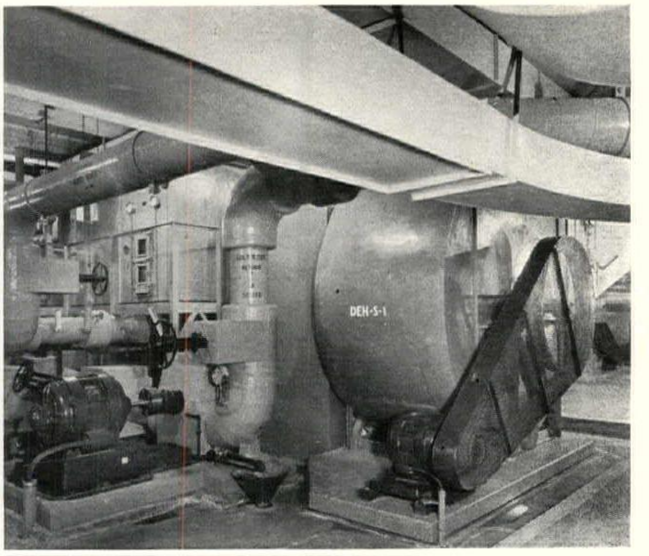
Rooms of this type require special air conditioning installations. Flexibility of control to make automatic adjustments to rapidly changing conditions, absolute purity of air, the absence of perceptible air motion, absolute control of temperature and humidity, and removal of noxious gases and odors are all necessary adjuncts which can and should be incorporated in the design.

Proper air conditioning requires a refrigeration plant. The ammonia or carbon dioxide plants have been supplemented by two new general types of equipment. One type uses a non-toxic refrigerant such as freon in either low-pressure centrifugal compressors or low-pressure reciprocating machines. A second general type uses steam in conjunction with jets or exhausters.

Every refrigeration plant requires an ample supply of condensing water. If the hospital is located near a stream or river the problem is reduced to one of pumping. If, however, the hospital is located away from a stream, it is necessary for the engineer to figure definitely whether the economic solution is the purchase of a supply of water from a public water system or the installation of cooling towers or spray ponds.

Here again progress has been made. The old cooling towers and spray ponds are being replaced by evaporating chambers, fully inclosed, quiet in operation and having a higher efficiency.





Brown Brothers

(Left) Steam jet refrigeration machines for use in conjunction with air conditioning.
(Right) Dehumidifier used for washing air and maintaining temperature and humidity conditions.

HEATING AND VENTILATING

The general requirements for heating in hospitals are temperature regulation and cleanliness.

Radiators which have a proclivity for collecting dust and which are difficult to clean are not practical for use in hospital heating. The old fashioned cast-iron radiator, with minor modifications to improve its appearance and to obtain simplicity in cleaning, will be difficult to replace.

Control of heat emission for the radiator offers the engineer an opportunity to use excellent control equipment of either the pneumatic or electrical type. The nurse or doctor can establish the desirable room temperature, both day or night, for any particular room and this temperature can be maintained within a fraction of a degree. Temperature variations can be obtained by the simple manipulation of a thermostat in the room.

Special heating requirements for hospitals generally vary with the type of institution. Radiant panel heating can be successfully used where it is necessary to keep patients warm yet maintain the temperature of the room the same as outdoors. This method of heating would be particularly applicable to tuberculosis sanitariums.

Where violently insane patients are isolated, special provisions must be made for absolutely safe heating equipment. Concealed panel heating circulating hot water through coils in the walls is an excellent solution.

The heating of operating and delivery rooms must be considered as a special problem. Wide variations in temperature which must be obtained within a few minutes time and maintained within close limits require special heating lines, apparatus and control.

Adequate ventilation of laundries, toilets, service and machinery rooms is essential to the health of the hospital employees as well as the patients served by them.

Rapid removal of cooking odors, exhausting smoke and grease vapor from ranges and the introduction of clean fresh air is necessary for a sanitary hospital kitchen.

In conjunction with heating and ventilating, the design must be handled very carefully where air conditioning is involved so that interference in control and operation is not obtained. This correct correlation of the phases of mechanical design requires careful study by technical and practical engineers.

ELECTRICAL EQUIPMENT

The modern medical center has a definite use for practically every type of electrical equipment. In this equipment electricity is used in most of its forms, namely, high and low frequency, high and low voltage, direct and alternating current. Radios, X-rays, therapeutics, lights, heaters, annunciators—all set up special requirements and standards.

Aside from the general power distribution there must be provided a dependable and efficient annunciator call system for nurses, a first class watchman's and fire alarm system, and power for cooking and sterilizing, X-ray and utility rooms.

The operating and delivery rooms must be provided with automatic stand-by electrical power equipment so that failures in the general system will not interfere with the work of the surgeons.

Special light fixtures in corridors and bedrooms require careful design both of the fixture itself and its location so that sleeping patients will not be disturbed at night. The design and installation of lights for the operating room requires the greatest care and skill, and can only be done properly by a qualified electrical engineer working in conjunction with the surgeon and the equipment specialist.

An electrical clock system placing all clocks in the building under an accurate master control is important. Clocks in special rooms should be provided with second hands for the convenience of doctors and nurses.

The importance of obtaining quick communication with individual doctors as they make their rounds through the hospital can not be denied. This can be done by an electric annunciator call system directly controlled from the telephone operator's desk.

In conjunction with the doctors' call system the hospital should be provided with an electrical register system which the doctor operates to indicate when he arrives at the hospital and when he departs.

Cleaning in the hospital can be simplified by electric outlets in halls for scrubbing, waxing and vacuum cleaning machines.

FIRE PROTECTION

Fire protection can be divided into three essential phases, namely, prevention, detection and extinguishing. (Although structural requirements and the "human elements" enter into all phases, discussion is limited to that which concerns the mechanical or electrical engineer.)

Proper design of electrical work, conduit, fused protection, use of automatic extinguishers and a carefully routed and controlled watchman's system contribute to the prevention of fires.

Detection of incipient fires before they have reached major proportions is important. There are several positive systems using either the "rate of rise" or thermostatic principles which can be adapted to use in hospitals. Fires can be automatically detected, definitely located and quickly extinguished or isolated.

For extinguishing, the potency of a stream of water under pressure is important. In hospitals over five stories in height, the internal fire protection system must be carefully designed and installed. The complete standpipe system with its storage tanks, pumps, nozzles, hose, valves and siamese, should be constructed of the finest materials, and arranged for frequent testing.

Special hazards such as X-ray film storage vaults, trucking spaces, storage spaces, paint and carpenter shops and similar utility spaces should be protected by automatic sprinkler systems of the type best suited to the particular hazard.

In addition to the standpipe and automatic system it is advisable to locate portable extinguishers in easily accessible places for the use of nurses, doctors or watchmen. Essential to the quick extinguishing of a fire is the time element which is diminished in proportion as the extinguishing medium is made quickly accessible.

SANITATION

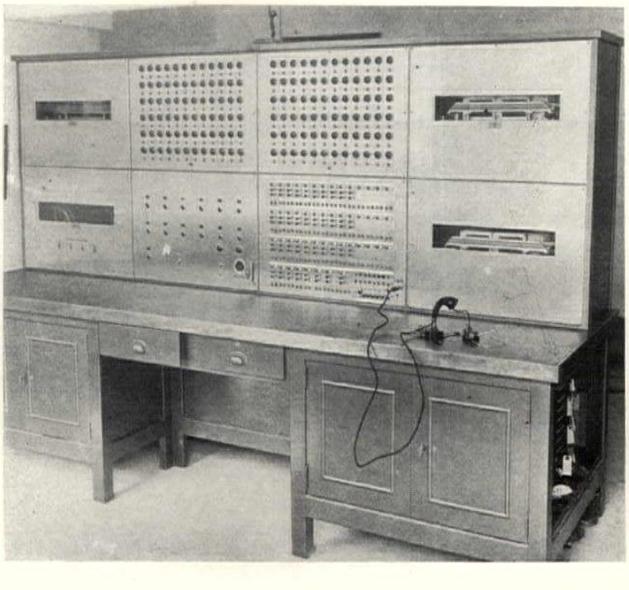
The sanitary systems in a hospital consist essentially of the water systems (hot, cold and drinking), drainage systems for sewerage and storm water, and compressed air and vacuum lines for cleaning and laboratory purposes.

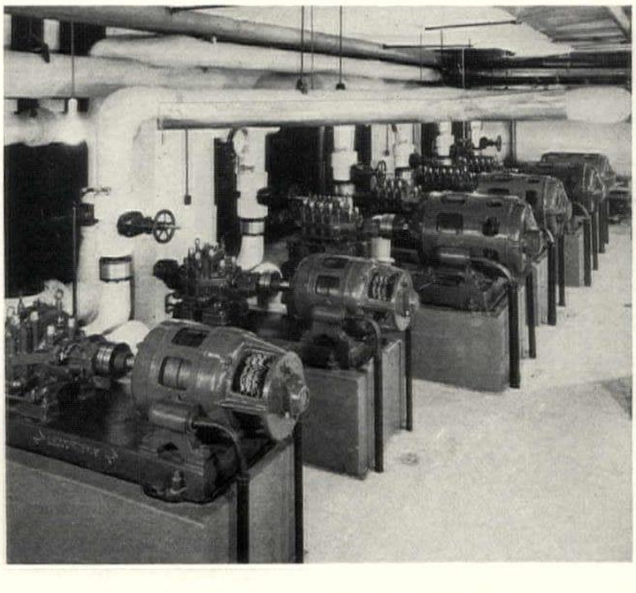
The engineer's obligation is to provide an unfailing and adequate supply of pure water. Recourse may be made to use of large storage capacities, wells, water treatment or filtration to assure proper supply and quality. However, even after the quality and quantity of water supply is definitely assured, great care must be taken in the design of a proper distribution system.

Fluctuating pressures may cause scalding of patients; improper connections to fixtures may cause back syphonage and pollution of water; and incorrect selection of materials may cause discoloration of the water and metallic contamination. Even with the use of nonferrous metals it is possible to obtain metallic contamination in such quantities as to cause the water to become toxic.

Even in ordinary buildings the use of properly designed plumbing fixtures is important. When considering hospitals the importance of fixture design becomes greater by virtue of the fact that hospitals, due

(Left) Central control desk for watchman, fire alarm, elevator and maintenance department telephone systems. (Right) Electric-driven house pumps for maintaining an adequate water supply for fire and domestic purposes. Note large storage tank in background.





to the nature of occupancy, must be considered extraordinary as regards sanitation. The use of the hands for the manipulation of faucets, wastes and flushometer valves is one of the most positive means for germ transmission that could be devised. This hazard can be eliminated by substituting for hand-operated equipment various devices which obtain the same results but which are operated by the foot, knee or elbow.

The removal of waste materials and water from the fixtures involves several important considerations. Any direct connection between the water supply and the drainage system may cause contamination. Although this may at first sight appear obvious, it is also obvious that in numerous hospitals this condition prevails at the water closets. When the closet bowl is full to the top as in the case of a stoppage, then everything is set for syphonage of water from the bowl into the plumbing system. The use of anti-syphon devices is becoming popular but does not represent the complete solution to the problem which is dependent on both fixture design as well as the design of the water system.

Sanitation in the kitchen requires equipment for cleaning purposes. Ample supply of both hot and cold water, drains and sill cocks for flushing floors, garbage refrigerators and can washers are mechanical devices which contribute to the maintenance of proper sanitary conditions.

The use of water for hydrotherapeutic treatments involves many special fixtures and connections. The continuous flow both for sedative and curative purposes is one of the types more generally known. Other devices such as control tables for jet applications, special showers and light cabinets are also used in the hydrotherapy department of a hospital.

ELEVATORS

Hospital elevators should incorporate the features which have marked the progress of design of elevators for use in modern office buildings. In addition there are special requirements such as large cars for handling stretcher cases, special automatic push button elevators for Nurses' Homes or places where the service is not constant enough to warrant an operator.

The use of automatic leveling elevators, especially for stretcher cases, is good practice since smooth rolling of the carriage is guaranteed. Smooth and uniform acceleration and deceleration contribute to the comfort of travel and may even in severe cases eliminate complications.

Noise in elevator operation can now be eliminated by proper design. Selection of machinery, sound isolation, treatment of machine rooms, floating of motor generator sets on flexible foundations, special door design, special design of cabs, and "streamlining" of shafts and cars contribute to the solution of this problem.

POWER PLANTS FOR HOSPITALS

Constant unfailing supplies of steam and electricity are required in structures of all types. In none of the general building types, however, do these requirements reach the absolute importance that they do in the case of hospitals. In the latter case, a failure of steam or electricity introduces a definite hazard, which must be removed from the realm of probability.

In addition to this question of constant supplies, other considerations are involved, such as costs of obtaining the services from various sources, freedom from labor troubles, availability of fuel supply under all conditions, reliability of sufficient steam pressure, and the like.

In the majority of cases the construction of a steam and electrical generating plant will be the outcome of the preliminary studies. The next step will be to determine the type of plant as regards both the production of steam and the generation of electricity. Too much emphasis cannot be placed on the fact that every proposed structure must be considered as an individual problem and that detailed studies must be made of every phase of the proposed plant. Precedent cannot be safely followed as the combinations of steam and electrical loads vary in every case, causing variations in the "heat balance" of the plant and requiring differing combinations of equipment for the most economical operation.

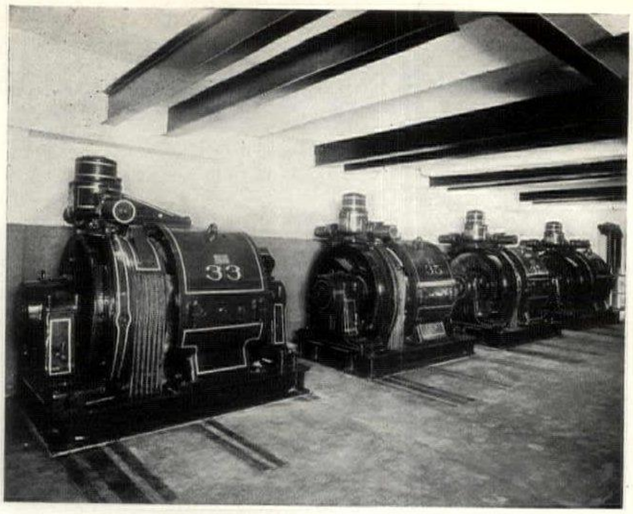
(No attempt is made here to discuss the many highly technical considerations constantly in the mind of the engineer. The sole purpose of this discussion is to acquaint the reader with the varied problems encountered in making the preliminary studies for selection of sources of power and selection of equipment.)

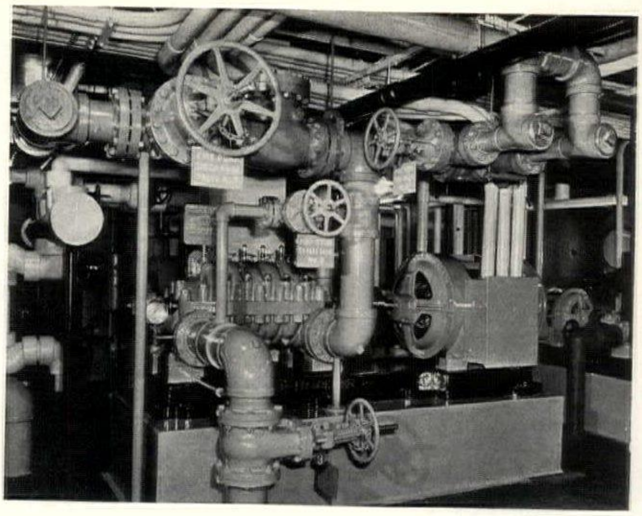
Before any such selections can be made, close estimates must be made of the maximum use of steam and electricity and the average use over a period of one year. Allowances must be made for future additions or extensions and future additional equipment. The maximum demands thus figured must be used in selecting the size of the steam and electrical services or of the generating equipment.

Hospitals in many cities have as one alternative the purchase of all steam requirements. Whether or not such purchase is to be seriously considered depends in large part on the company offering the sale. In the majority of such cases the company would be a public utility, under the control of a Public Service Commission. When the facilities of such a company are adequate and past performance indicates uninterrupted service, the question of continuity of service is easily answered. Where the company offering steam for sale is a neighboring building or manufacturing plant, the purchase of steam must be carefully studied from every point.

The pressure of steam entering the building is another important factor, especially where steam sterilizers are used. It is of even greater importance if steam engines are to be used in conjunction with generators for the production of electricity. The only positive assurance of a constant pressure of steam supply is an engineering survey of the plant and distributing system and the experiences of other building owners using the same source of steam located in the same neighborhood. If the examination indicates a first class plant and the experience of those owners is satisfactory, the effect on the steam pressure of additions to the steam distribution system must be gauged. The prospective consumer is, however, more or less dependent on the steam company in this respect.

The cost of purchasing steam as compared to genera-





(Left) Elevator machines for handling passenger cars traveling at the rate of 1,400 feet a minute. (Right) Electric-driven fire pump for maintaining an adequate water supply for fire standpipes.

tion can be determined only by accurately estimating the annual requirements and computing the probable cost under each plan. The installation of an electric generating plant and the use of exhaust steam for heating and other low-pressure requirements is also generally considered in computing the desired costs.

The selection of the source of electricity brings into question again the continuity of supply. A constant supply is virtually an assured fact owing to the large number of customers generally served by such power companies and the resulting multiplicity of equipment installed in the generating plants.

A minimum variation of voltage is of importance only from a maintenance standpoint.

The cost of purchasing electricity as compared to generation must be estimated as in the case of steam. More variations are involved, however, as the costs of generation with various types of prime movers must be computed in order to determine the most economical method.

If it is found advisable to purchase both steam and electricity, the sole remaining problem is to select the most advantageous schedules of rates and to determine the adequacy of existing street mains. This latter consideration applies more to the purchase of steam, in which case it is always the best policy to be sure that the steam will be supplied from more than one station and that the mains are "looped" in such a way as to assure constant service even with failure of one main. It will generally not be possible to have changes made if the existing equipment is not adequate, except in the case of particularly large buildings or a group of buildings.

If a decision has been reached to generate the steam, a selection of the general types of equipment must be made. First, and most important of all, is the selection of the fuel to be used. Generally speaking, the location of the building geographically will determine the cost and availability of the various types of fuels. For example, a hospital located near the mining districts would most logically use coal. On the other hand, a hospital located in a large city such as New York may use either coal or oil, depending on the cost per million B.t.u.'s delivered and prepared if necessary at the plant. In either case, the assurance of delivery of a sufficient quantity of fuel under all weather conditions is of utmost importance.

In some instances the fuel selection may be dictated to some extent by the facilities provided for storage. In urban communities, for example, where land costs are high, it would conceivably be cheaper to install oil storage tanks beneath driveways or courtyards than to provide the necessary coal storage space in the basement of the building or on an adjoining lot. In suburban or rural districts, however, outside storage of coal may be feasible, as also would be the use of oil tanks either buried or above ground; the storage problems would then be of minor importance.

If coal is to be used, whether it should be anthracite, bituminous or a mixture of the two will depend entirely on the relative costs per unit of steam output at the boiler nozzle and on the availability of supply. Generally speaking, it will be more economical to use automatically controlled stokers, the type (underfeed, overfed, chain grate, etc.) depending on the adaptability of the various types to burning the coal used. Pulverized coal will not be considered except in the case of very large plants, as the installation cost of equipment and the cost of coal preparation would be prohibitive in small or medium-sized plants.

When oil is the fuel selected, it will be found best to use the heaviest suitable grade obtainable, assuming of course, an operating staff competent to handle the heavier oils. Recent developments in oil-burning equipment have made possible the burning of No. 6 oil under low-pressure boilers, and the higher heat value per pound of oil, together with the lower costs, make the use of heavy oil desirable.

Regardless of the type of fuel selected, great care must be taken to provide adequate storage space, sufficient to permit continuous operation of the plant under maximum load during short periods of severe weather when deliveries of fuel may be temporarily curtailed.

Aside from the characteristics of the current to be generated, the major problem in the design of an electric generating plant is the selection of the prime movers. If steam is generated the most suitable equipment would be turbines or engines, for by this method the exhaust steam is used for heating the building at a very low cost.

The most accurate method of determining the equipment to be used consists of making a series of "heat balances." These indicate the quantities of steam used for all purposes under varying load conditions, thus showing how much exhaust steam may be utilized and how much wasted if condensers are not used. Inasmuch as the different types of steam-driven prime movers require different quantities of steam for the production of the same quantity of electricity, it may be seen that the loads existent in different buildings may not permit the economical use of the same types of equipment.

Where large quantities of steam are required at pressures lower than that supplied by the boilers, as for sterilizers, laundries, kitchens and the like, "bleeder" type turbines may be used to advantage. Turbines of this type discharge steam at more than one pressure, useful work being extracted from the steam in the reduction of pressure.

"Mixed pressure" type turbines may be advantageously used in cases where the demand for exhaust steam is very low during certain times of the year. These turbines use a combination of low and high-pressure steam, the quantity of high-pressure steam being automatically regulated in accordance with the available supply of low-pressure steam. When a mixed-pressure turbine is to be used, a high-pressure turbine should be installed to carry a portion of the load, the exhaust from this unit being used in part by the mixed-pressure unit and in part for heating.

The selection of reciprocating engines would be made on the basis of a heat balance as already described. For smaller plants, however, turbines would not generally be used and the selection of the engines would normally be made. If a large quantity of exhaust stean is required, four-valve engines would be used. If the exhaust steam requirements are smaller, uniflow engines might be used. In the latter instance, it would be necessary to balance the additional cost of uniflow engines against the greater economy obtained by their use before a definite decision can be reached.

Whether turbines or engines are used, the use of condensing units must be considered very carefully. When the exhaust steam requirements are very light during summer months and the cost of water is low, a condensing unit may be used, and a considerable increase in economy obtained. It may be found that the savings in operating costs due to the use of condensers will not compensate for the higher first cost of the plant. Again, a cost study must be made to determine the course of procedure.

Diesel engines driving generators will generally not be used if a high-pressure steam generating plant is installed or if steam can be economically purchased at a high, constant pressure. When low-pressure boilers are already installed and the cost of altering them for high-pressure use would be prohibitive, Diesel engines may be used. The use of Diesels in conjunction with steam turbines or engines may also be of advantage for handling night loads, exceptional peak loads or emergency use.

The installation of stand-by equipment is essential to a continued supply of steam and electricity. Additional boiler capacity is the general rule as regards the steam service. Ordinarily, at least one spare boiler is provided so that under all conditions steam may be furnished for generation of electricity and other uses.

The question of stand-by electrical generating units is of far greater importance than is that of spare boilers. A hospital may manage to continue operations for a short time without steam, but not without electricity. For this reason, emergency systems are installed for lighting of exits, operating rooms and other vital parts of the building.

Spare generators and other auxiliaries are installed in case of breakdown of one of the main units, but these are connected to the main system. The source of power for the emergency system may be an entirely separate Diesel or gasoline engine-driven generator, storage batteries or a "breakdown" service purchased from a power company.

When a separate generating unit is installed in connection with the emergency system, such a unit should be so arranged as automatically to start operation with failure of the main system. A very rigid schedule of inspection must be maintained to be sure that the unit is always in proper operating condition and regular periodic running tests must be made of the complete emergency system.

If storage batteries are used they must automatically be kept fully charged at all times. If the electrical system is of the alternating current type a motor-generator set or rectifiers must be used both for charging the batteries and for transforming the current for use. Obviously, a direct current system would not require a motor-generator set or rectifiers. In either case, an automatic switch must be used to put the emergency system into operation.

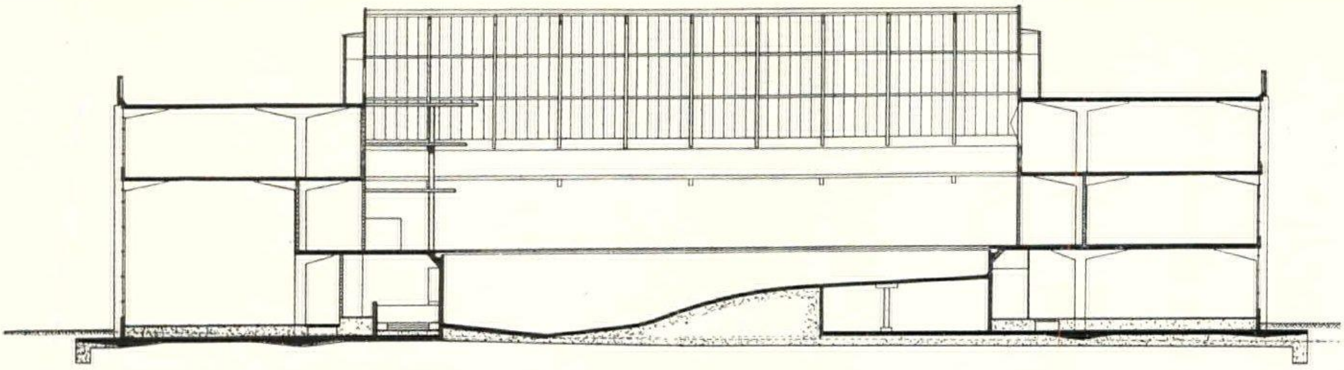
Probably the best source of current for emergency use is a power company. Under most contracts for breakdown service the consumer is entitled to use an amount of electricity equivalent to the contract cost. If the purchased service is sufficiently large, the additional current may be used during early morning hours when the electrical load is small or during such periods as the main generating units are shut down for repairs or maintenance. As in the other cases cited, an automatic switch must be used to put the emergency system into service immediately upon failure of the main system.

As mentioned before, it is not possible to give a standard procedure to be followed in the selection of the source of steam and electricity or the selection of equipment if a generating plant is decided upon for any particular building. As a general rule, however, it will be found that a steam and electrical generating plant will be most adaptable to hospital buildings. A review of existing hospitals, both new and old will indicate the trend in this respect.

Photograph © The Architects' Journal
FRONT ELEVATION SHOWING COVERED PLAYGROUND FOR CHILDREN

THE PIONEER HEALTH CENTRE
ST. MARY'S ROAD, PECKHAM, LONDON
DESIGNED BY SIR OWEN WILLIAMS

HEALTH CENTERS:



SECTION A-A

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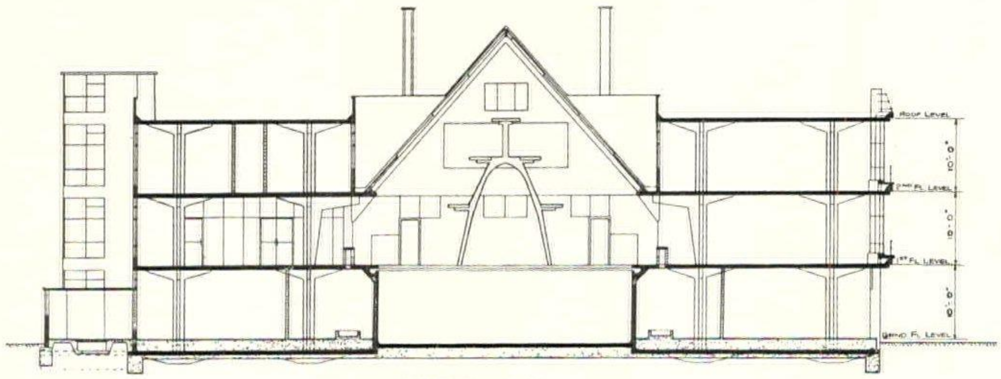
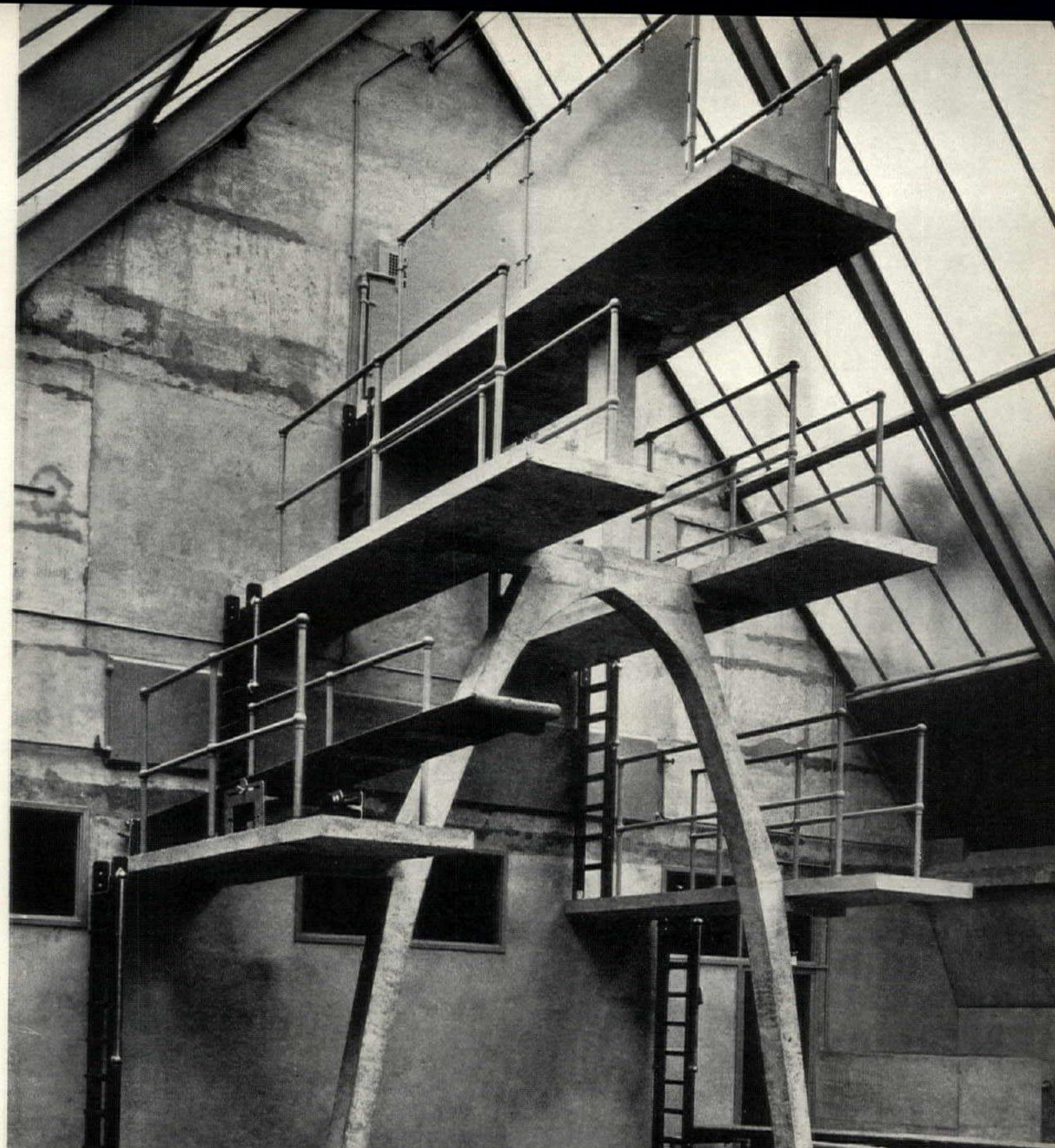


SECTION B-B

GLASS PANELS PERMIT SWIMMING POOL TO BE SEEN FROM LOUNGE AND CAFETERIA

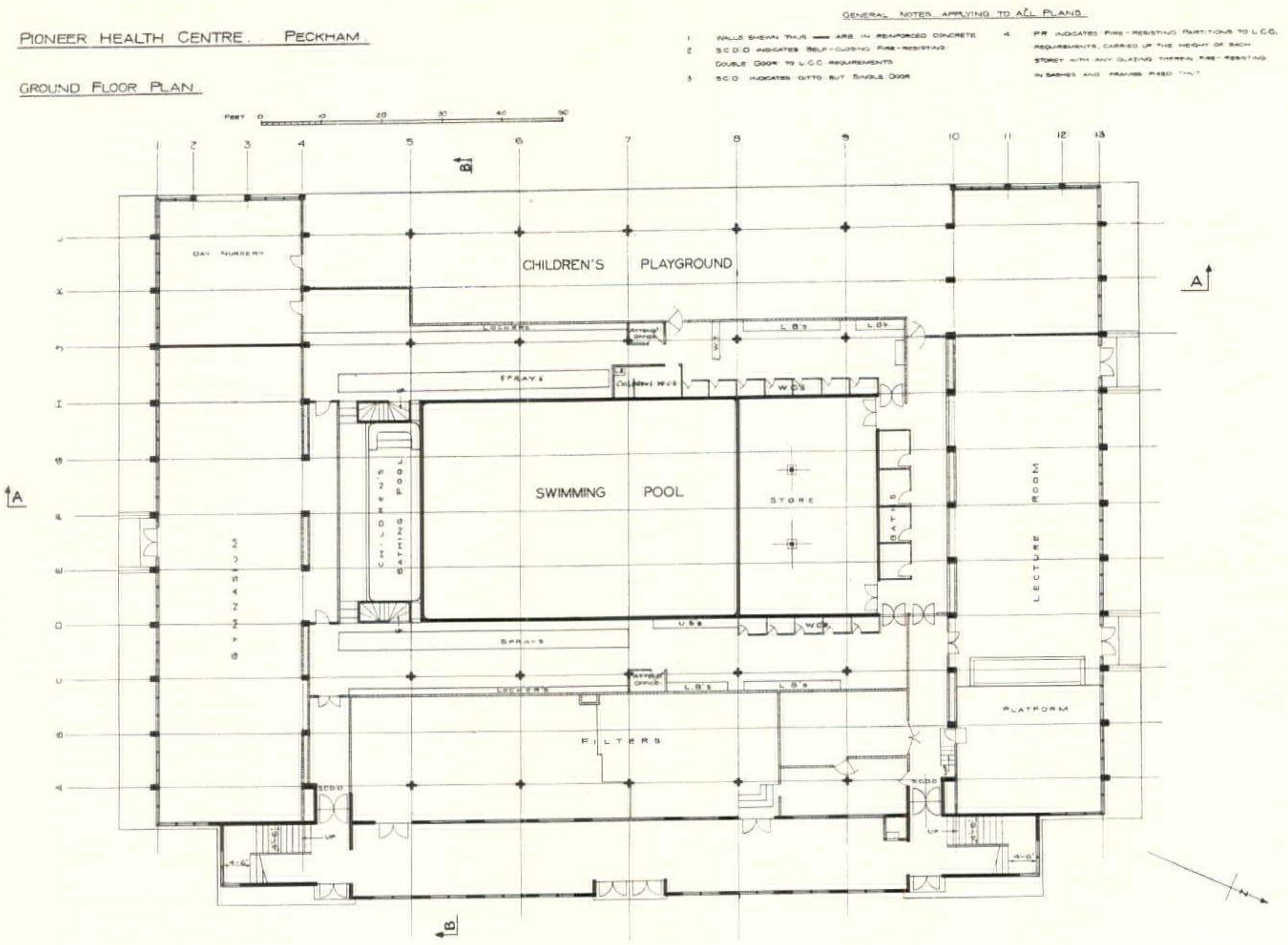


Photographs © The Architects' Journal

REINFORCED CONCRETE DIVING STAGE AT END OF SWIMMING POOL

PIONEER HEALTH CENTRE AT PECKHAM, LONDON

DESIGNED BY SIR OWEN WILLIAMS, ARCHITECT AND ENGINEER



PIONEER HEALTH CENTRE AT PECKHAM, LONDON

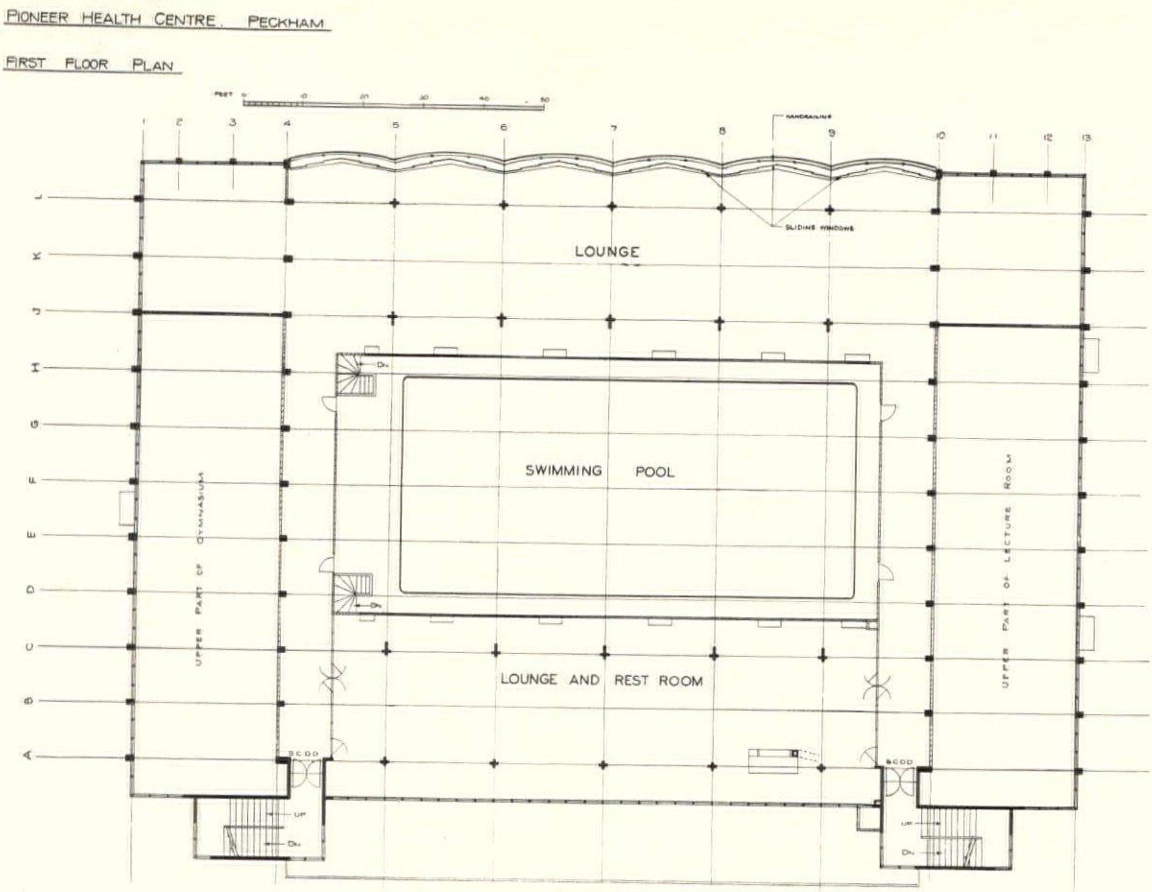
DESIGNED BY SIR OWEN WILLIAMS, ARCHITECT AND ENGINEER

The Pioneer Health Centre has been built to house activities for maintaining health as described in a book, "The Case for Action," by Dr. Innes H. Pearse and Dr. G. W. Scott Williamson. Briefly, the book postulates that a community should take care of health before it is broken down rather than deal with it in hospitals afterwards.

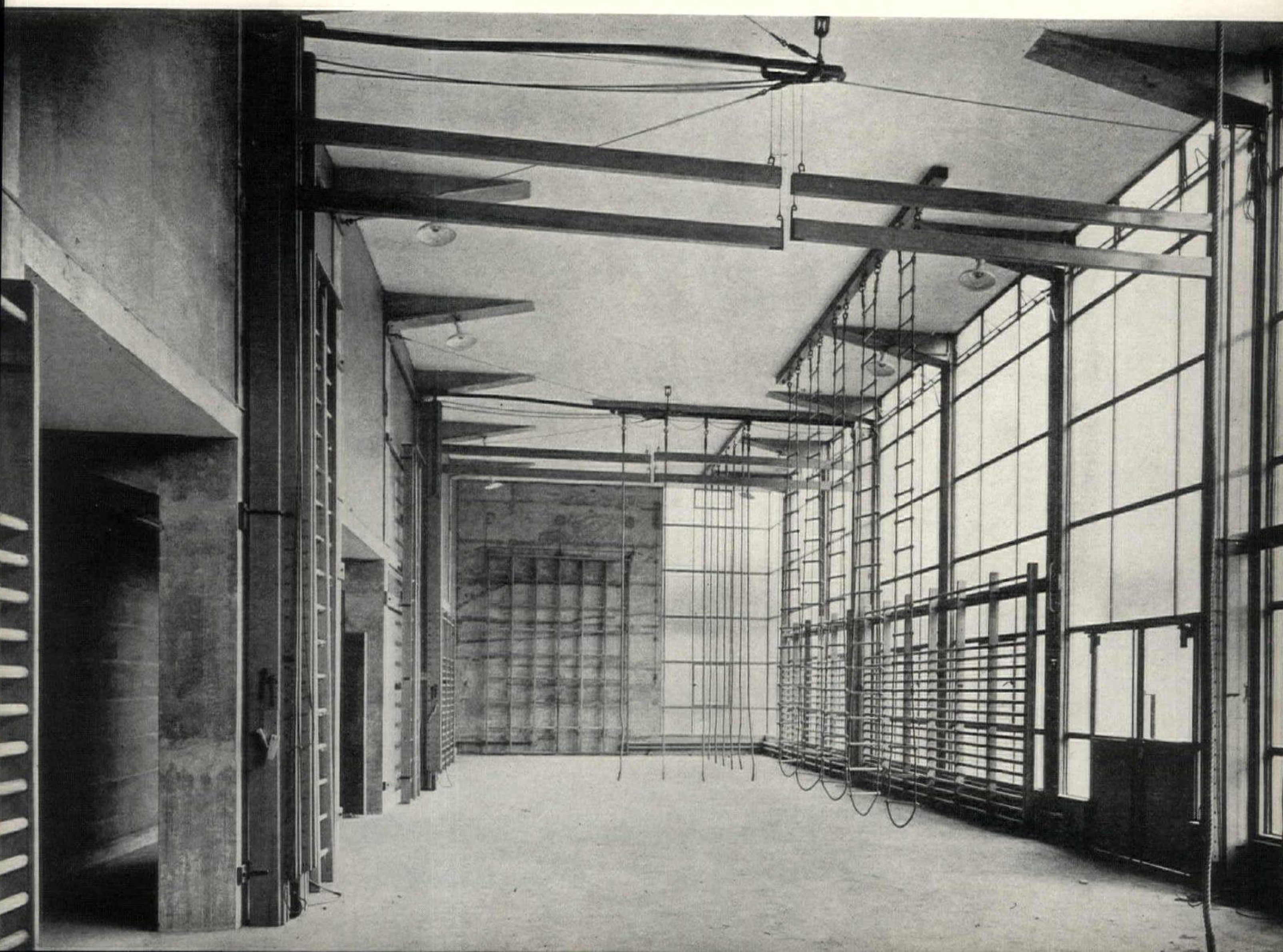
The building is 157 by 114 feet with a swimming pool occupying a central rectangular space 90 by 42 feet. Entering from the garden surrounding the building is the gymnasium. Leading from the gymnasium are the spray baths on the way to the swimming pool, and beyond is a theater or lecture hall. Off the garden there is also a covered children's playground 130 by 21 feet and a children's nursery 24 feet square. Off the playground is a children's swimming pool 29 by 8½ feet in which the depth of water can be varied up to 3 feet.

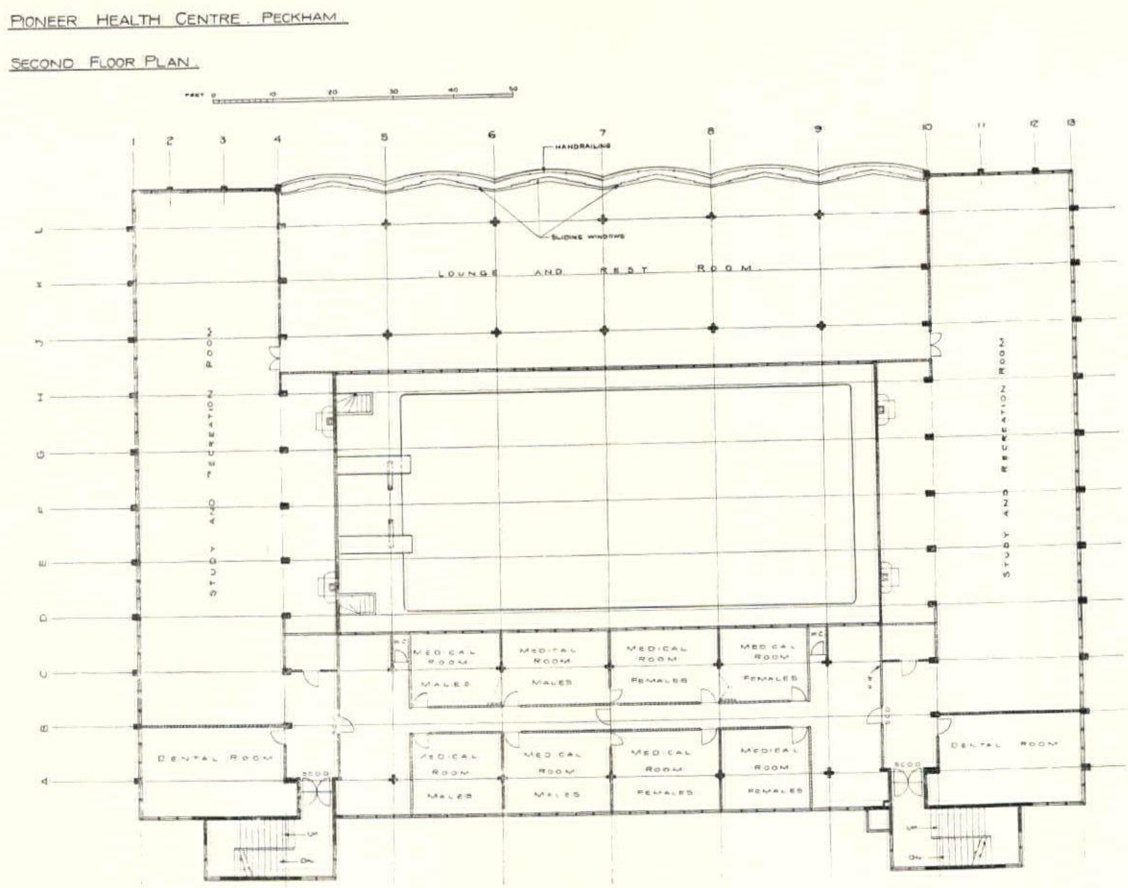
On the ground floor is the main entrance hall with accommodation for perambulators. Two staircases give access to the first and second floors and roof. The swimming pool is at the first floor, the depth of the bath (maximum 10'9") being accommodated between ground and first floors. The swimming pool has a diving stage with a high dive of 21 feet. On each side of the swimming pool, and separated by glass screens, are (1) a lounge (108 by 30 feet) in the front of the building, and (2) a cafeteria restaurant (90 by 18 feet) with kitchens at the back of the garden. From the lounge the theater and gymnasium can be viewed. Sliding windows give a completely open outlook in fine weather.

On the top floor are (1) a mental rest room, (2) a physical rest room, (3) a library, and (4) complete medical quarters for periodical examination of members by resident doctors. The flat roof is to be used for a garden.



GYMNASIUM AT GROUND FLOOR LEVEL — GLAZED DOOR ON RIGHT GIVES ACCESS TO GARDEN





LIBRARY AND REST ROOM ON SECOND FLOOR

Photographs © The Architects' Journal

RECREATION AND REST ROOM ON SECOND FLOOR

The building is of reinforced concrete and flat slab construction. In the front and back parts the spans are 18 feet with 6-foot cantilevers, the freedom from columns on elevations giving unobstructed balconies. In the theater and gymnasium the spans are 24 feet. In all cases the floor slab is 6 inches thick. The underside of the concrete flooring is covered with cork slabs 1 inch thick giving good insulating and acoustic properties. The swimming pool is of reinforced concrete with a reinforced concrete diving stage. The roof of the swimming pool is almost entirely glass. The floor surfacing is generally cork and the walls have been "papered" with cork sheet $1/8$" thick.

The heating of the building is by electricity which can be purchased economically at the off-peak period at night and used to heat water. The hot water is circulated from the storage tanks through pipes and radiators throughout the building. The same arrangement also serves the hot water supply and heating of the swimming pool.

The swimming pool, theater, gymnasium and cafeteria are supplied mechanically with conditioned air at the correct temperature. The swimming pool water is filtered and purified every $3\frac{1}{2}$ hours on the chloramine process.

The illumination is electric with emergency gas points.

Where paint is used its color is generally functional, i.e., particular colors defining particular purposes. Doors not to be used are vermilion, doors to be used are orange, and so forth.
The windows (which form two-thirds of the exterior walls) have metal frames.

Photograph © The Architects' Journal

REAR ELEVATION SHOWING STAIRCASE TOWERS AT CORNERS OF BUILDING

PIONEER HEALTH CENTRE AT PECKHAM, LONDON

DESIGNED BY SIR OWEN WILLIAMS, ARCHITECT AND ENGINEER

UNIFIED HEALTH AND WELFARE CENTERS OF LOS ANGELES COUNTY, CALIFORNIA

The system of administration developed by J. L. Pomeroy, M.D., health officer of Los Angeles County, California, since his appointment in 1915 represents both a modern conception of the unified health and welfare center with subsidiary district centers, and a successful solution of the problem of adapting this conception to American local political organization. It accepts the county as the smallest unit of public health administration in order to promote control of water supply, milk and foods, the disposal of garbage and other factors bearing on the spread of communicable diseases; and presents two main features of organization, namely (1) decentralization of operations and (2) coordination of the health and welfare work of cities, school districts and the county.

At the time of his appointment Dr. Pomeroy was the sole employee in the Los Angeles County health department. The work of the health officer had until then consisted mainly of quarantine enforcement and abatement of public nuisances. The story of Dr. Pomeroy's initiative in the development of this rudimentary service into a comprehensive health and welfare program can not be told here for want of space. The chief obstacle to the development was removed in 1919, when the Legislature passed a law which permits municipalities to contract for public health services with Los Angeles County.

By 1924 nineteen cities were buying their public health service from the county and 121 school districts were sharing costs with the county through the joint employment of nurses, dentists and physicians. In that year plans were submitted for a number of buildings covering the county geographically by districts which would provide under one roof in each district for the activities of the health department and of the welfare department and provide also for clinics for medical care of the indigent sick as well as preventive work.

The first health center was completed in the City of San Fernando, in 1926. Since 1926, health center buildings have been erected at Compton, Pomona, Santa Monica, Belvedere, Alhambra, Inglewood, Monrovia and Torrance. A few small child welfare stations have also been built by the county, notably at Maravilla Park, Duarte, Los Nietos and Lancaster. In a number of other sections, particularly Glendale, Whittier, Huntington Park, West Hollywood, Culver City and other points in the county, local centers have either been donated by municipal governments or private organizations or have been rented.

1. The health center provides proper housing, equipment and a meeting place for all public health, social and medical workers in a district.

2. It promotes efficiency by permitting team work between all workers in the unit. Coordination is thus brought about preventing duplication of effort and clearing all activities.

3. It renders service to the public more neighborly and permits the focusing of various types of services according to the needs of the situation.

4. It improves the public health control of the district by prompt diagnostic service both laboratory and clinical, thus enabling more efficient action on communicable disease and insanitary conditions.

5. It enables the complete organization of a standardized milk inspection service resulting in great improvement of milk supply to the public.

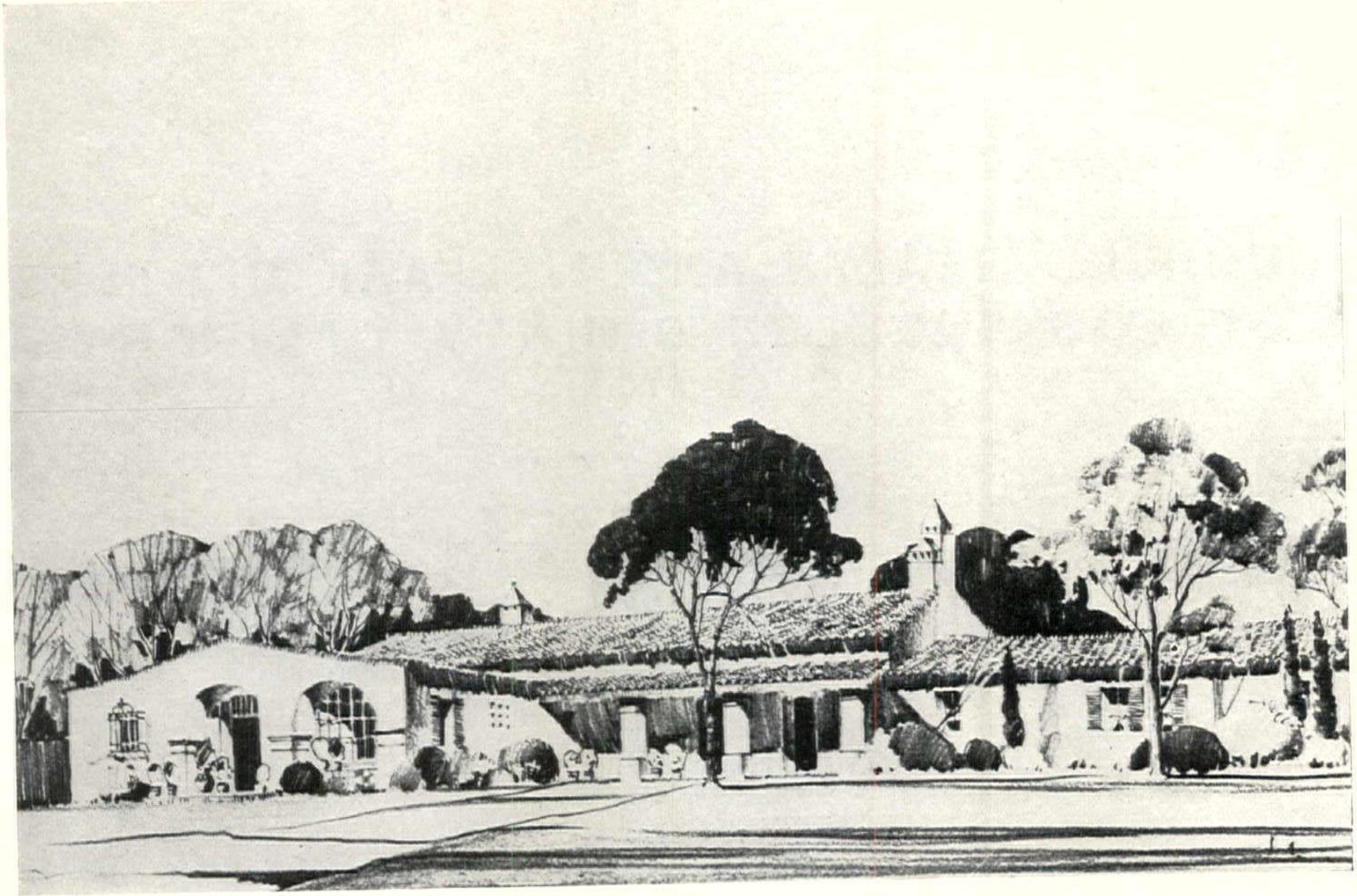
6. The health center serves as an educational institution improving the health ideals and aims of the population and thus promoting hygiene and reducing sickness.

7. During disasters, such as the Montrose flood, the earthquake of 1933 and the San Francisquito dam disaster, the health center serves as a local first aid station and organization point for relief of all kinds.

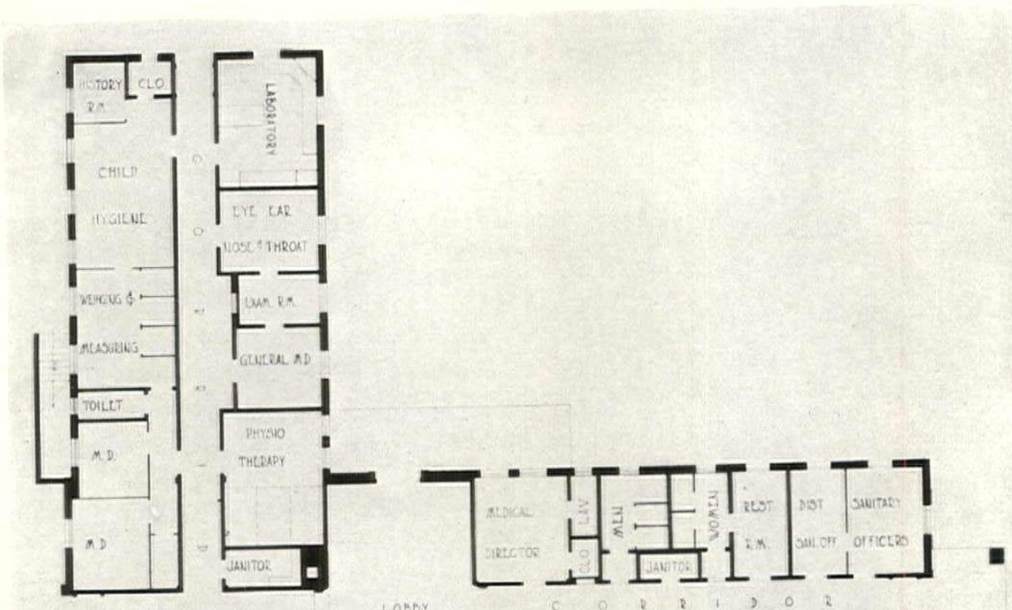
8. To the county institutions the health center facilitates more prompt admission and discharge of patients, permitting more patients to be cared for with the same number of beds. Clinic care costs much less than institutional care in most cases.

9. The health center fulfills the modern conception of medical and social work in that it mobilizes all of the necessary technical assistants, laboratory, X-ray, physiotherapy, etc., together with the medical and social resources of the community.

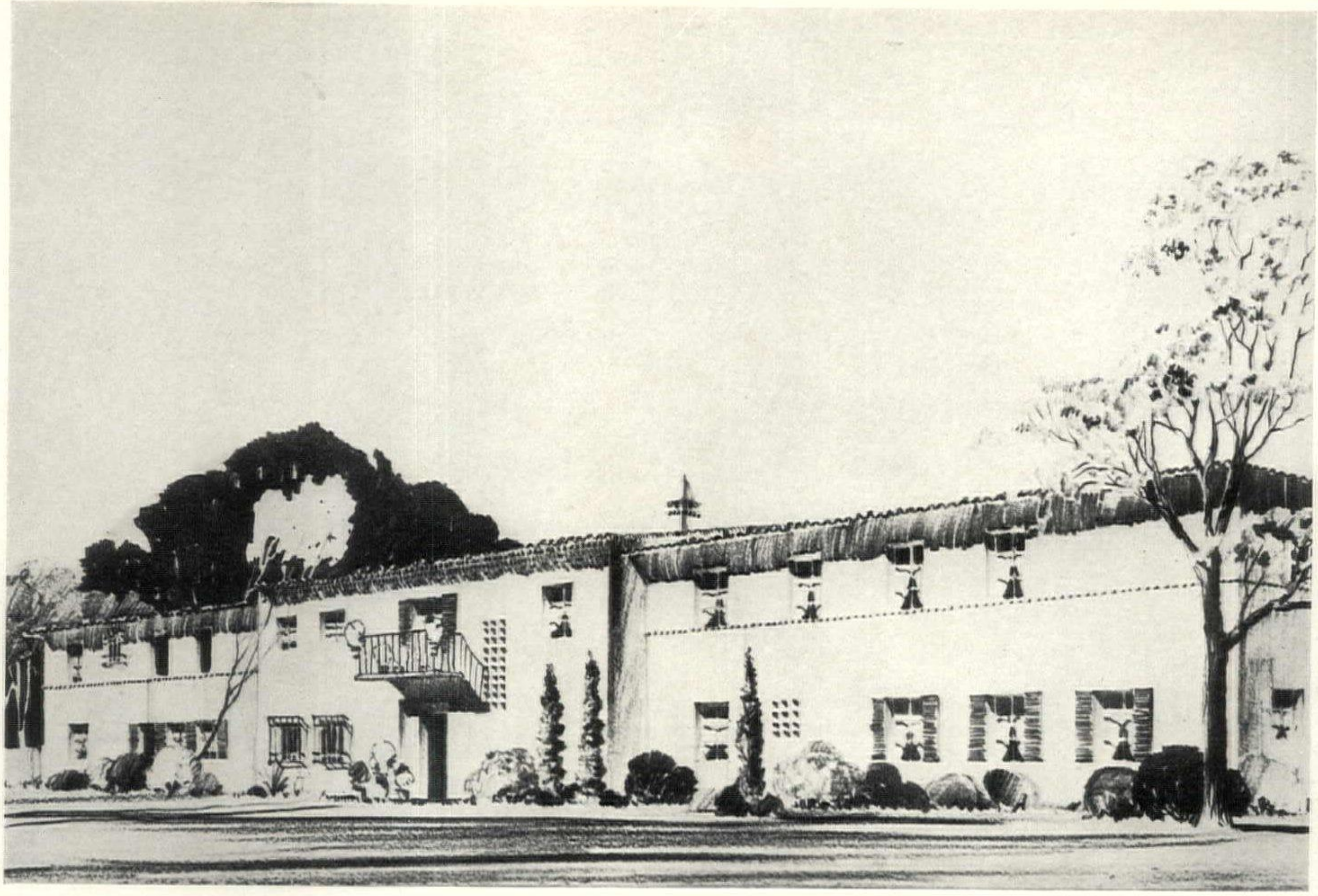
The department is organized into a central office with headquarters in the Hall of Justice, Los Angeles, and district offices of which there are now twelve major health centers and two sub-districts. Each district is in charge of a local district health officer who is the executive officer of his area. Technically the organization is of a mixed type comprising elements of both the functional and military type of organization, the lines of authority running from the health officer to the dis-



TORRANCE HEALTH CENTER CALIFORNIA



FIRST FLOOR
TORRANCE HEALTH CENTER



BELVEDERE HEALTH CENTER, CALIFORNIA

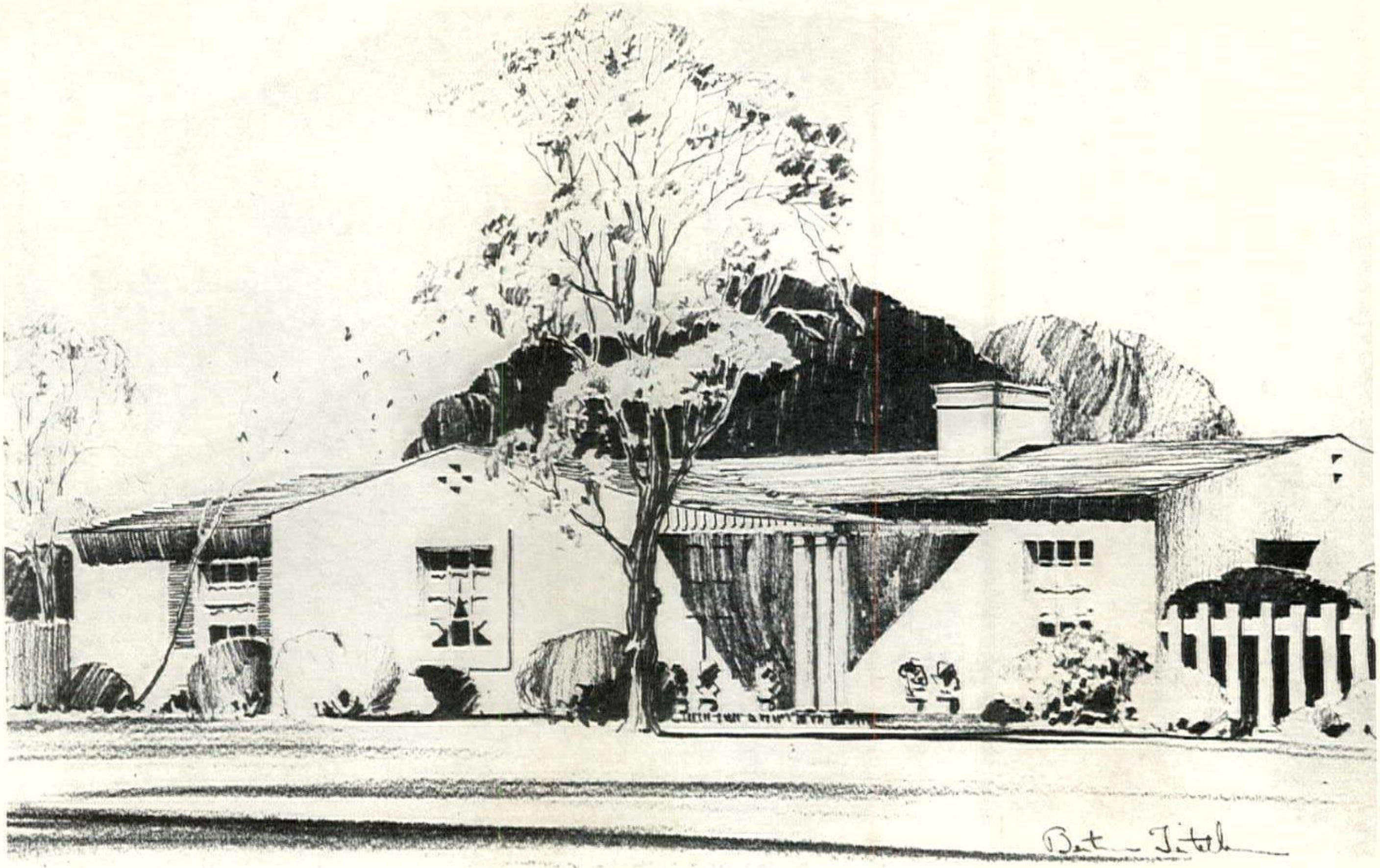
trict health officers for executive purposes, while the operating responsibilities for technical efficiency are in charge of highly trained persons who comprise the bureau heads. Thus the operating responsibilities of the department are discharged through the following bureaus: (I) General Administration; (II) Medical and Social Service; (III) Maternal and Child Hygiene; (IV) Inspections; (V) Public Health Nursing; (VI) Communicable Disease Control; and (VII) Laboratories.

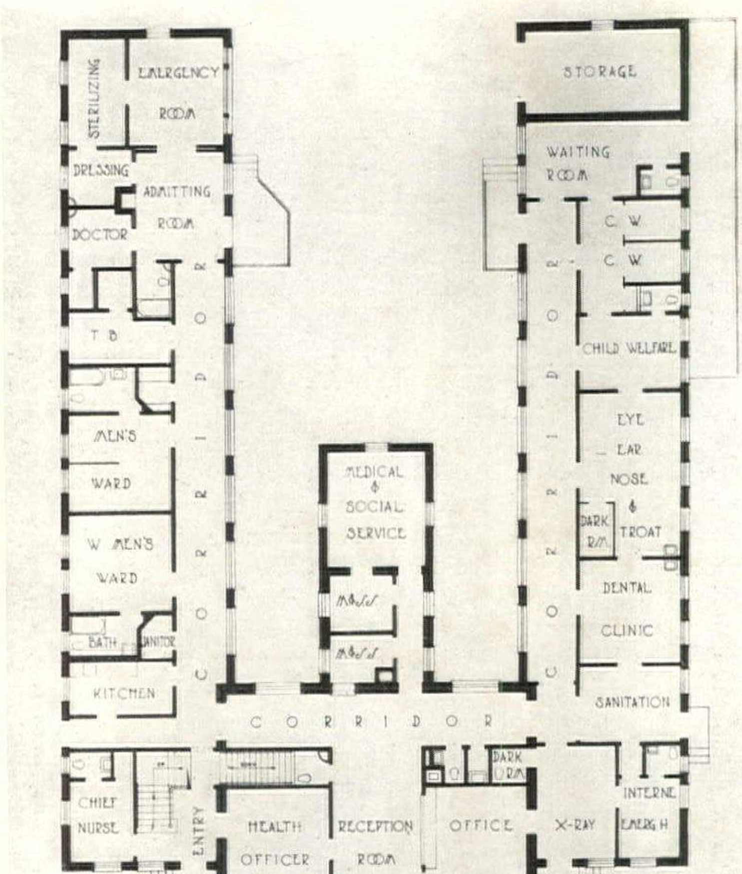
The average cost of the major health center buildings, including equipment, has been $80,000. In practically all instances, the land has been furnished either by the municipality or by private contributions. The total investment in land is $22,570, the total in buildings $630,889, the total in equipment is $307,678, and the grand total capital investment $961,137. The largest building erected, that at Alhambra, cost approximately $134,000 equipped. The size of the building and the character of the equipment are predicated somewhat by the population served and the character and needs of the population. There is in Los Angeles County quite a large Mexican population. The Belvedere Health Center is equipped for teaching, having an auditorium and other facilities. This health center is affiliated with several of the universities and maintains a school of sanitation instruction and public health nursing. Considerable work is accomplished through student service, and all new employees must receive training at the Belvedere Health Center before obtaining a permanent appointment.

The per capita cost of the department at the present time is 83 cents net, deducting earnings; the gross per capita cost is 97 cents. It should be remembered that the County Health Department serves not only the rural area but also 37 incorporated cities. All duplication of services is completely eliminated with the exception of some of the work of Los Angeles City on milk inspection.

The infant mortality rate for the county in 1934 was 29.5 per thousand births. It has dropped during Dr. Pomeroy's incumbency from 120. The death rate from diphtheria in 1934 was 2.3 per hundred thousand population compared to 16 in 1923. Striking reductions have been brought about also in typhoid fever, tuberculosis and other major communicable diseases.

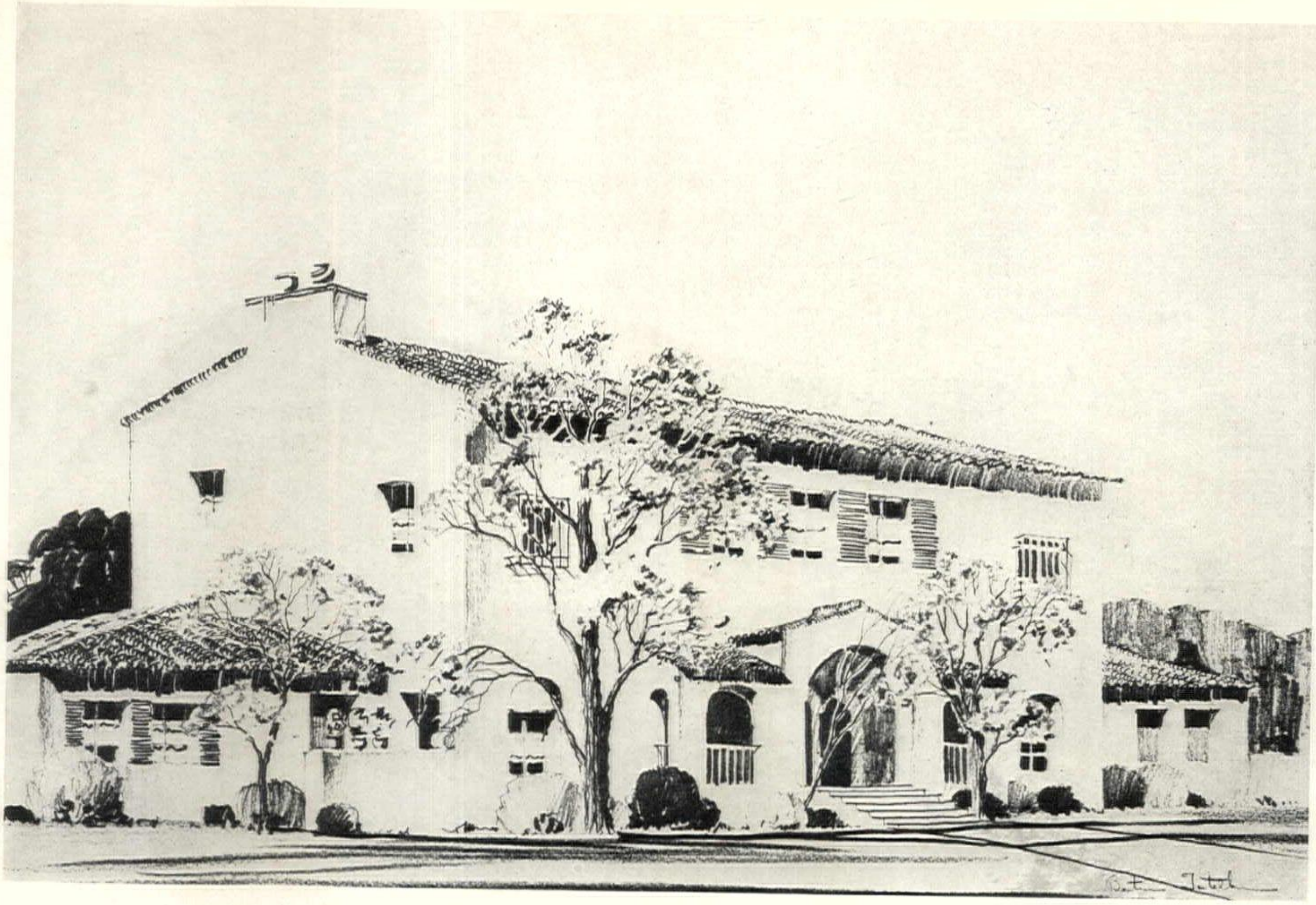
The plan has been cordially supported both by the public and by the legislature. Centralized administration, coupled with decentralized operation, prevents duplication of work and promotes efficiency. In one instance the building also houses the Justice of the Peace, Township Court, and Constable's Office. The health officer needs the support of his community organizations, particularly those having to do with providing food, clothing, housing, medical care, and accessory services. It is obvious that when community services are brought together, overhead expense is reduced and efficiency increased.



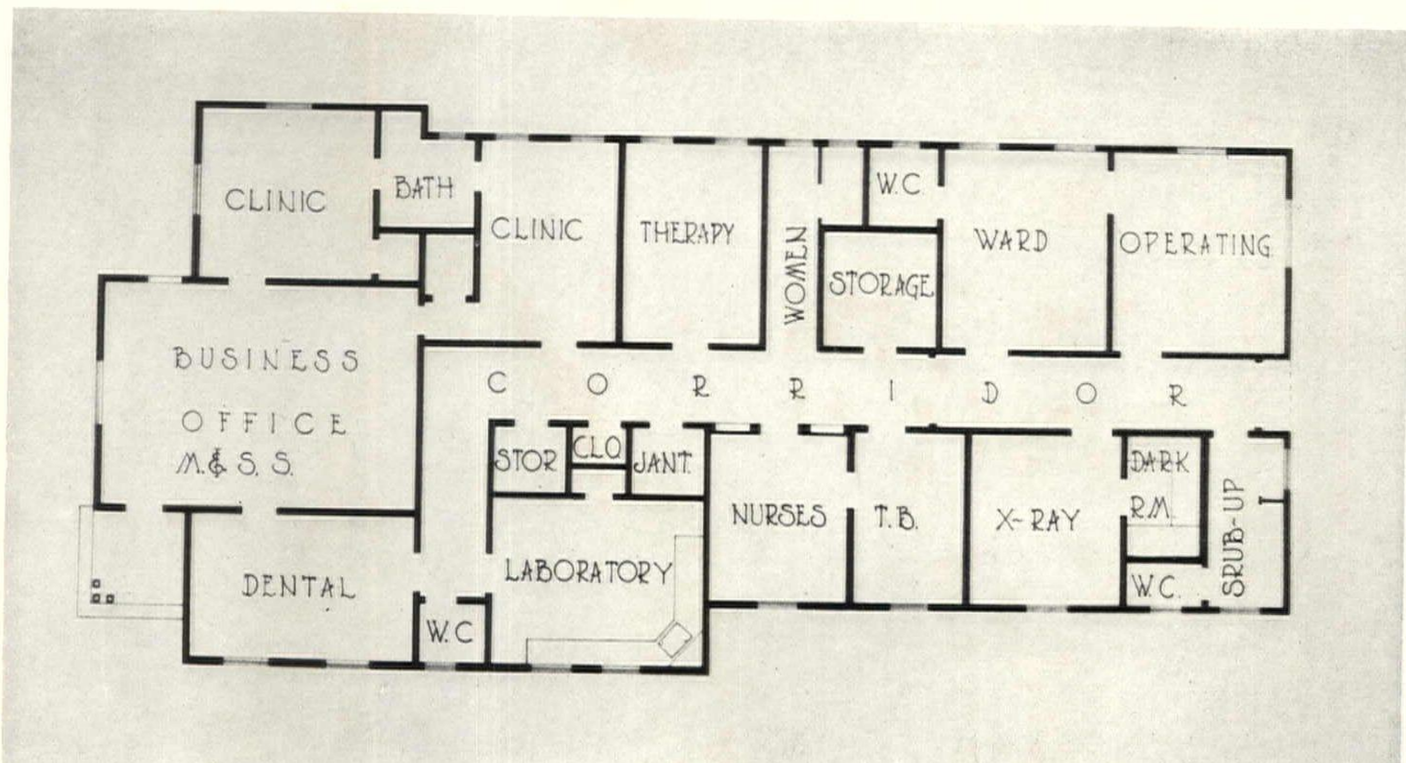


COMPTON HEALTH CENTER

HEALTH CENTERS	Year Built	Building Cost	Square Feet Area	Population Served 1934
Alhambra Health Center	1930	$116,024.94	21,395.02	83,858
Belvedere Health Center	1928	87,551.82	20,769.54	78,259
Compton Health Center.	1927	54,313.21	7,913.97	64,285
Monrovia Health Center.	1931	10,038.52	2,782.18	81,788
Pomona Health Center. .	1927	74,972.56	9,667.64	36,193
San Fernando Health Center	1927	44,559.84	7,284.41	21,179
Santa Monica Health Center	1928	78,586.16	11,541.43	71,950
Torrance Health Center.	1933	38,100.00	9,888.64	55,315



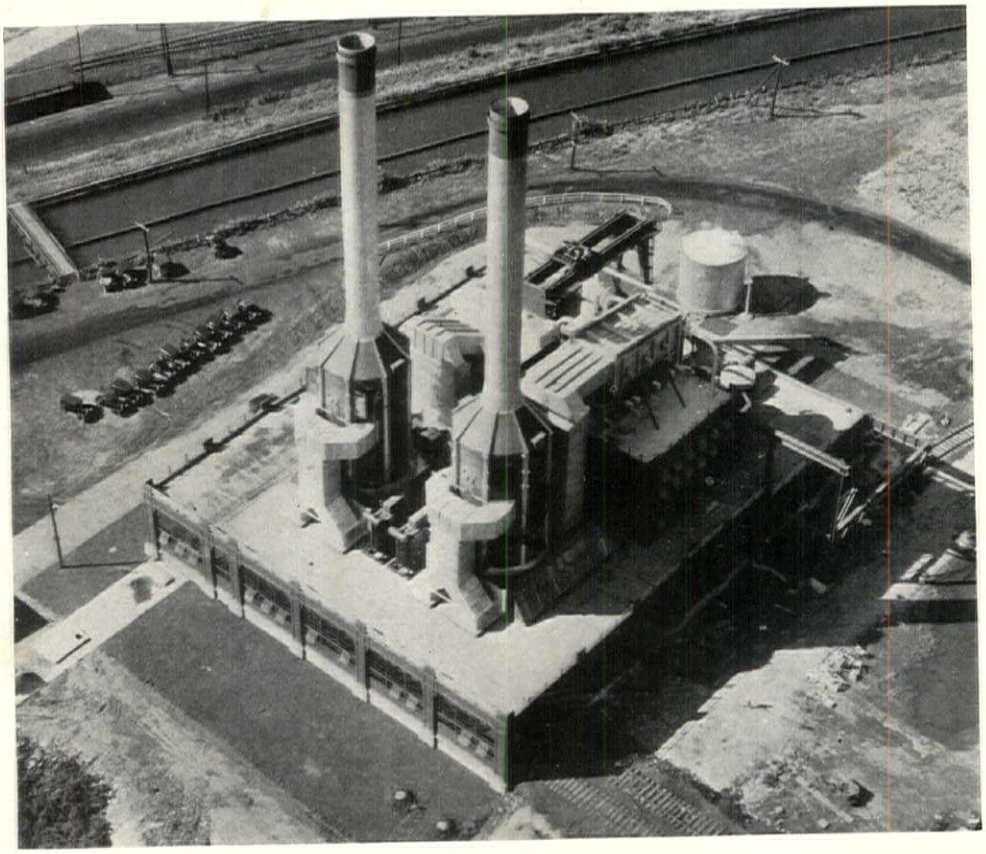
MONROVIA HEALTH CENTER, CALIFORNIA

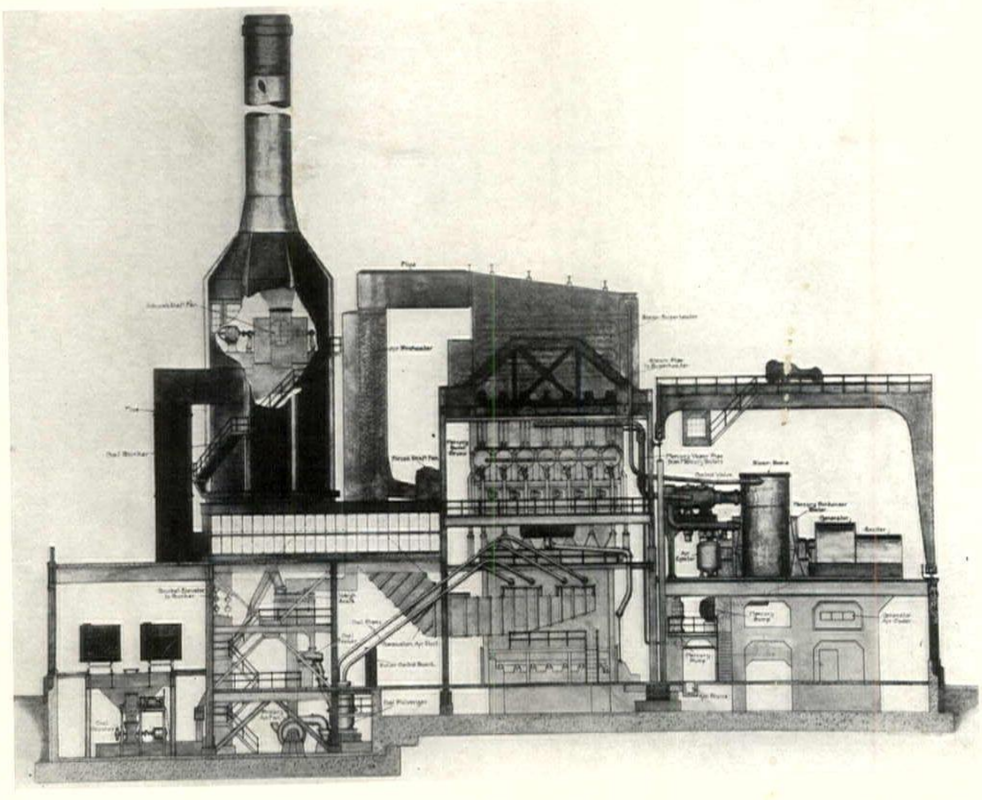


I L L U S T R A T E D   N E W S

HOUSING PROGRAM ACTIVITY . . . . On May 18, property owners throughout the country had pledged, under the stimulus of the better housing program of the Federal Housing Administration, $401,042,062 worth of modernization and repair. This is an increase of $8,274,646 for the week ending on that date. The majority of pledgers indicated their intention of paying cash for the improvements. Credit amounting to $69,199,582 had been advanced to 166,486 applicants under the terms of the modernization credit plan by May 18, an increase of 8,917 credit advances amounting to $3,481,127 for the week.

BUILDING CODES . . . . A special committee, composed of representatives of national organizations having an interest in the entire building code field and private experts, has been appointed, under the procedure of the American Standards Association, to investigate methods for continuing the work on building codes of the Department of Commerce Building Code Committee, recently disbanded.





MERCURY - STEAM POWER PLANT INTRODUCES NEW BUILDING FORM . . . .

An industrial structure of unique form has been built at Schenectady, New York, by the General Electric Co. It is a mercury-steam-electric generating plant supplying the General Electric Co. with steam and furnishing a by-product (electricity) to the New York Power & Light Co. Practically the entire plant—structure and equipment alike—is arc-welded, shop and field, with some of the heaviest details and complicated connections yet attempted with this means of assembly.

Two fundamental ideas governed the design, and it is believed that future growth will be much simplified thereby, according to D. A. Allee, Construction Engineering Department, General Electric Co. First of these is the elimination of practically all building, substituting, so far as practicable, segregated engineering structures. The second is the use of the "unit system," meaning in this case that a cross section or "slice" of the station includes (with some unavoidable exceptions) a complete operating unit.

From these considerations there evolved a fixed two-story structure where the offices, laboratories and controls are located, and appended to this is a one-story station that may be characterized as of "budding" type. Initially, this budding station has two units. A third will soon be added, and more will follow. Each station unit as added will handle its own coal, ashes and smoke and may, therefore, be made strictly modern even to changing the type of equipment. The groups that are thus gathered together to form an operating unit are in general structurally independent of each other and, so far as this is true, may be independently erected and the equipment of the group may be independently installed.

A station operating unit is shown in the cross section of station. Coal enters at the left, is crushed, elevated, drawn off by gravity, weighed, pulverized and blown into the furnace as shown. Forced draft fans supply air to the fire, first salvaging heat from the smoke through heat exchangers (preheaters). Induced draft fans supply the necessary draft and discharge the smoke to the chimneys. Smoke duct arrangement allows cleaning. Ash in the form of molten slag is drawn off from the furnace bottom, shattered by water jets and disposed of by pumps. At the right, serviced by electrically - welded gantry crane, are the mercury turbine generator and the condenser boilers (also unit arrangement) located out-of-doors. Behind these are the steam turbine generator, the evaporators, the deaerating and live steam boilers.

THE

ARCHITECTURAL RECORD

INDEX TO VOLUME 77

JAN.-JUNE 1935

PUBLISHED BY F. W. DODGE CORPORATION, 115-119 W. 40th ST., N. Y.

THE ARCHITECTURAL RECORD

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