ARCHITECTURAL FORUM

FEBRUARY 1937

THE ARCHITECTURAL FORUM is published by Time Inc., Henry R. Luce, President; Ralph McA. Ingersoll, Robert L. Johnson, Roy E. Larsen, Vice Presidents; Charles L. Stillman, Treasurer; W. W. Commons, Secretary. Publication Office, 160 Maple Street, Jersey City, N. J. Executive, Editorial and Advertising Offices, 135 East 42nd Street, New York. Business Manager, Robert W. Chasteney, Jr. Advertising Manager, George P. Shutt. Subscription Office, 350 East 22nd Street, Chicago, Illinois. Address all editorial correspondence to 135 East 42nd Street, New York. Yearly subscription, Payable in Advance, U. S. and Possessions, Canada, Cuba, Mexico, South America, $4.00. Elsewhere, $6.00. Single issues, including Reference Numbers, $1.00. All copies Mailed Flat.

VOLUME 66—NUMBER TWO

THE MONTH IN BUILDING

VOLUME

PERMITS	$121,100,000	CONTRACTS	$199,695,700
Residential	59,565,000	Residential	65,487,300
Non-Residential	41,094,000	Non-Residential	72,956,000
Alterations	20,441,000	Heavy Engineering	61,252,400
November, 1936	113,650,000	November, 1936	208,204,200
December, 1935	76,120,000	December, 1935	264,136,500

Permits are from 1,490 cities reporting to the Department of Labor.

Contracts are from 37 States east of the Rockies, F. W. Dodge statistics.

The last month of a year is generally the signal for a small drop in volume figures, both by permit and by contract. However, in the permit column, December, 1936 was slightly ahead, helped swell the year's total to its highest in six years. The decrease in contract figures was due directly to the marked drop in public projects of all descriptions. By contract, 1936 building was worth $2,675,296,000, a 45 per cent gain over 1935's $1,844,544,900. Main increase for 1936 was in the much-heralded residential column, 1936's $801,623,800 being 67 per cent higher than 1935's $478,843,100.

RIGHT TURN. Last month the most popular and the most criticized of the original Brain Trusters both announced their retirement from public life. SEChairman James M. ("Chink") Landis revealed his acceptance of the position of Dean of Harvard's Law School, intimated that he would resign from the SEC some time this summer to take up his new duties in the school from which he graduated at the head of the 1924 class. Also last month RAdministrator Rexford Tugwell left Washington to begin his private career with Manhattan's American Molasses Company.

Such were the two most publicized departures of the New Deal month (see p. 162). In fact, the exodus was much more numerous. During the last four months a round dozen of the smart young men in Government jobs have packed their bags for other towns. Better offers from business, the dissatisfaction of anonymity, lack of sympathy with old-line chiefs, all these have been given as reasons. The prime reason, however, seems to many an observer to have been left unsaid: Roosevelt has turned to the Right, left the crusaders without a leader.

Speaking in Washington at a farewell dinner tendered in his honor one night last month, Professor Tugwell gave expression to the departing smart young men when he said: "The new leaders that will rise during the next four years ought to be searching now for the best methods to bring the greatest assistance to the people at the bottom of the economic heap. Unless this is done, the people eventually will understand that we are well-meaning enough, but are not getting anywhere."

To Business, happy cultivating its recovery, no reform news was good news. Amott-Baker realty bond prices for 200 issues rose 3 per cent in December, largest monthly gain for a year during which bond prices passed the 1932 level for the first time.

SLUM FIGHT. Two million New Yorkers live in housing which has time and again been condemned as below legal standard. Three years of Government aid have succeeded in rehousing about 7,500 of these people, a figure which speaks volumes for the inadequacy of the present scope of the Federal program.

In an effort to remedy this situation the local legislature passed the Multiple Dwelling Law in 1929, providing chiefly for the removal of certain fire hazards. But the new standard thus set was alarmingly high, and at the demands of realty a four-year moratorium on its enforcement was promptly declared, and two million people kept their fire-traps. It was obvious that they should not be allowed to live in such sub-standard housing; and it was equally obvious that enforcement of the new fire laws would in many cases cause landlords to spend more than their profits on making their houses legal dwellings.

Into this impasse stepped Langdon Post, Manhattan socialite, onetime newspaper man, onetime Technocrat, For-Roosevelt-Before-Chicago. Appointed Tenement Commissioner by Fusion Mayor LaGuardia, he announced that the Multiple Dwelling Law would be enforced as of January 1, 1937. Meanwhile he made surveys of large blocks of slums, gave the owners a forecast of drastic action. Faced with the cost of installing fire retarding equipment in their tenements, and criminal liability if they did not install it, owners mailed 4,000 eviction notices during the 1936 Christmas holiday week. Since neither Commissioner Post nor anybody else knew where the evicted would go, there promptly developed a strong move for another moratorium, and the good intentions of good Housers appeared once again to have overstepped practicality.

Last month brought a suit, testing the constitutionality of the Multiple Dwelling Law, which struck at the very foundation of housing procedure. Declared the brief:

"The only effective way of accomplishing the laudable *object of better housing* . . . is through the means of public housing authorities. . . . It cannot, however, accomplish that purpose by imposing such onerous and unreasonable burdens upon existing buildings as to force their abandonment, vacation, and demolition without compensation therefor. . . . The Multiple Dwelling Law can legally only be effectuated through . . . the payment of adequate compensation for property condemned."

Harris & Ewing

Commissioner Post.

In rebuttal, the City Corporation Counsel contended:

"Its (the Multiple Dwelling Law's) purpose is not . . . the elimination of old-law tenements. . . . Its sole purpose is to render old-law tenements safer. . . . We concede, of course, that the enforcement of this law

Harris & Ewing

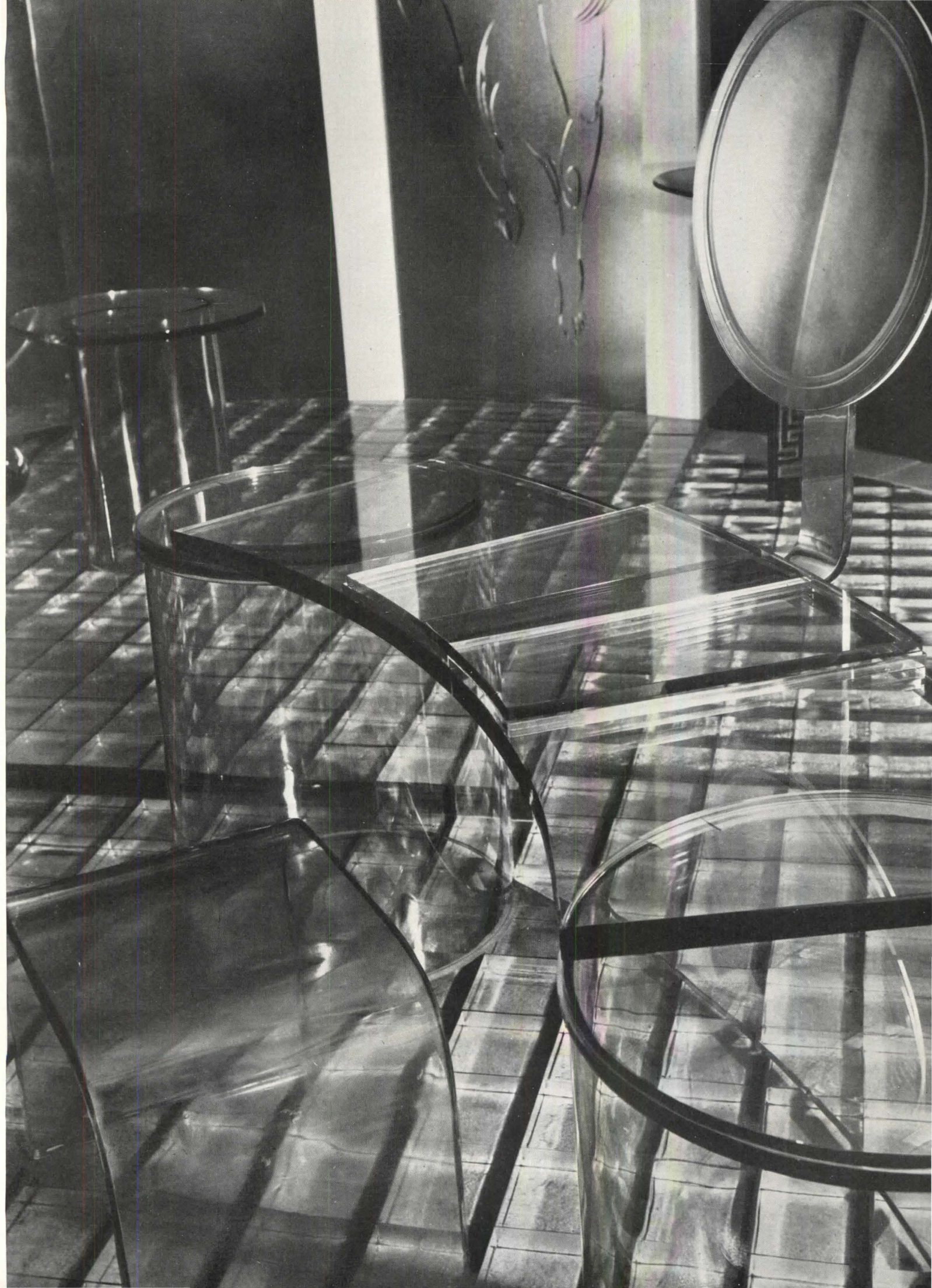
MAN OF THE MONTH . . . to down slums, up housing (page 162)

Courtesy, The Austin Co.

BUILDING OF THE MONTH . . . shelters for superservice (page 186)

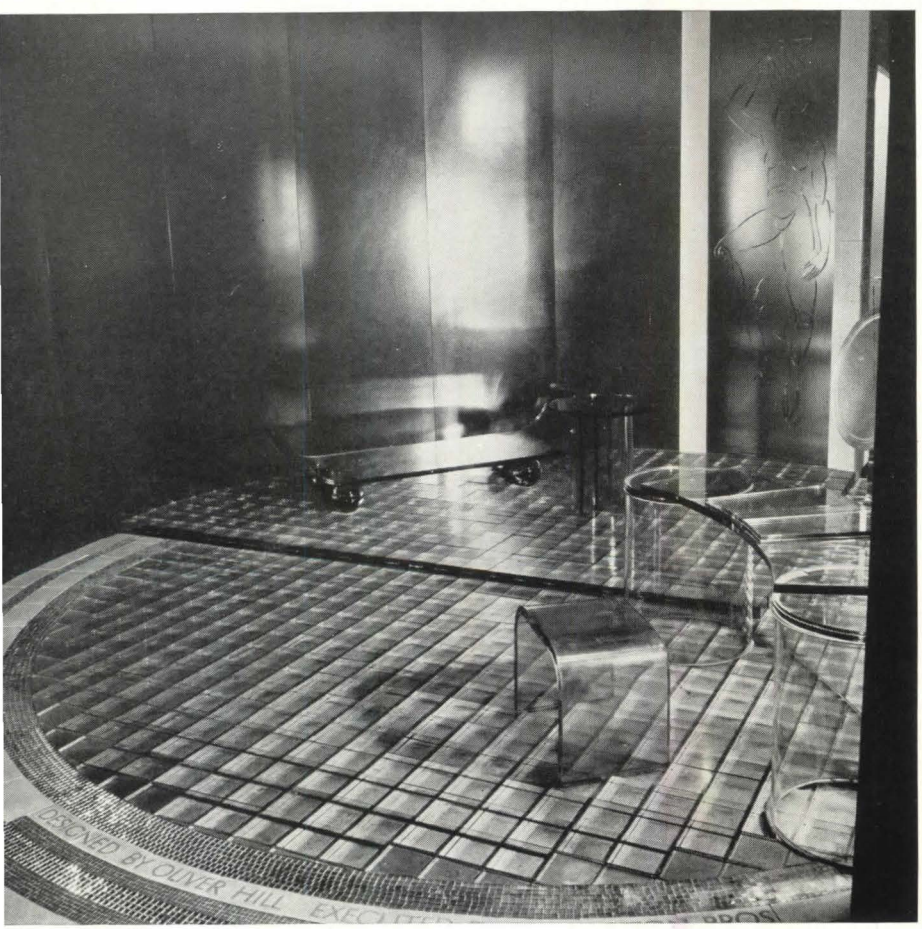
Louis Werner

PRODUCT OF THE MONTH . . . three kinds a million make (page 147)

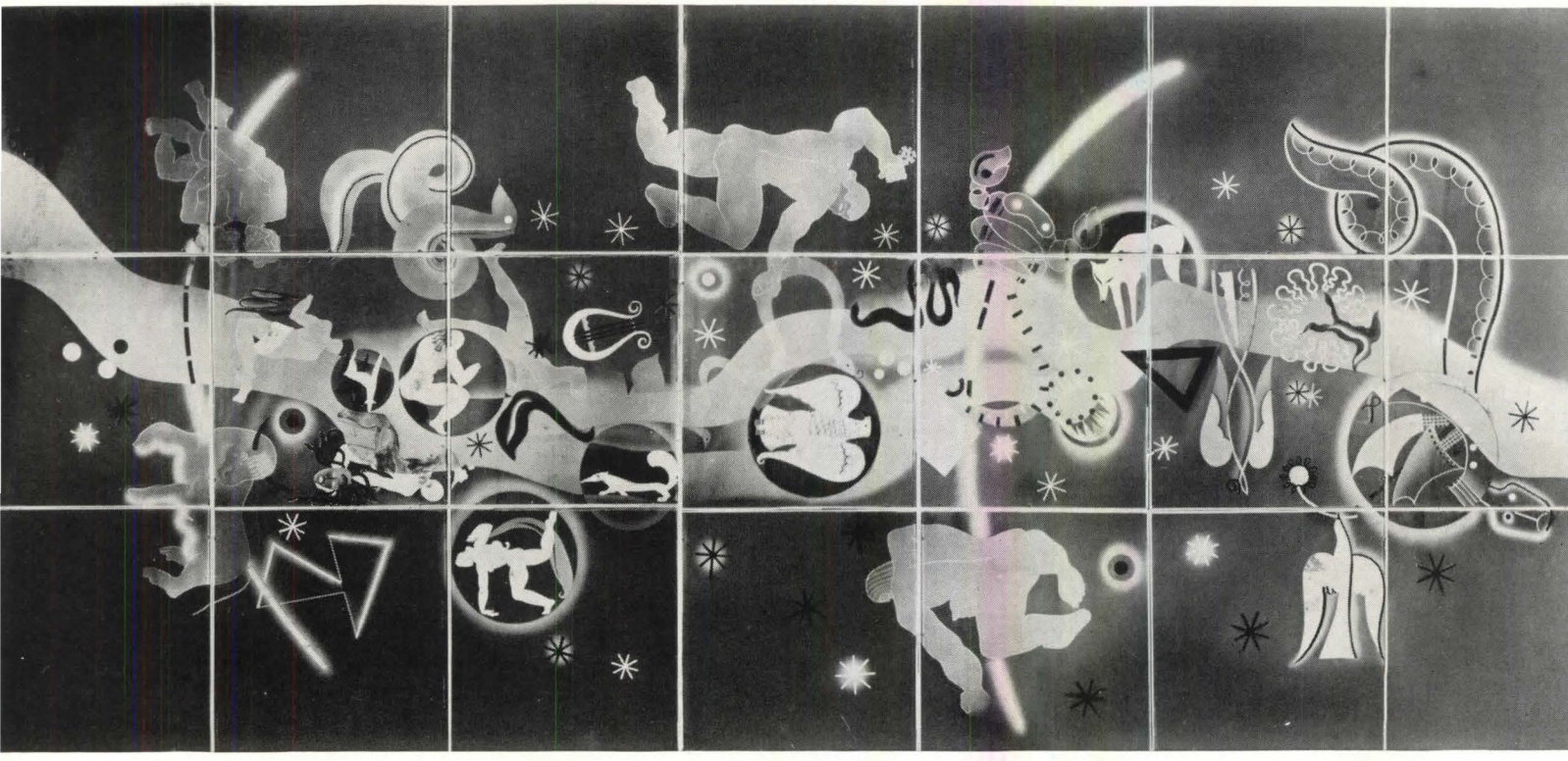


GLASS

If a graph showing the creative use of glass through the ages were to be plotted it would show anything but a smooth curve. The Byzantine mosaics marked an early, and a very high point; the great cathedral windows marked another; after the period of stained glass the material lost its architectural importance, save as utilitarian fenestration, and craftsmen skilled in its use turned to the production of small objects. Venice and then other localities successively took the lead for the quality of their work until the latter part of the nineteenth century brought it to an all-time low. Glass today is at the highest point, technically, that it has ever reached. It can be made to do almost anything; its quality is rigidly controlled and standardized; some types have an exquisite purity that has never been equalled. Illustrated on these four pages are some new, architectural uses of glass which have been designed to take advantage of the new possibilities of the material. They are convincing evidence of the fact that today's craftsmen are quite capable of carrying on a great and ancient tradition. There is no repetition here, no imitation of past efforts, nor is there any lack of vigor.

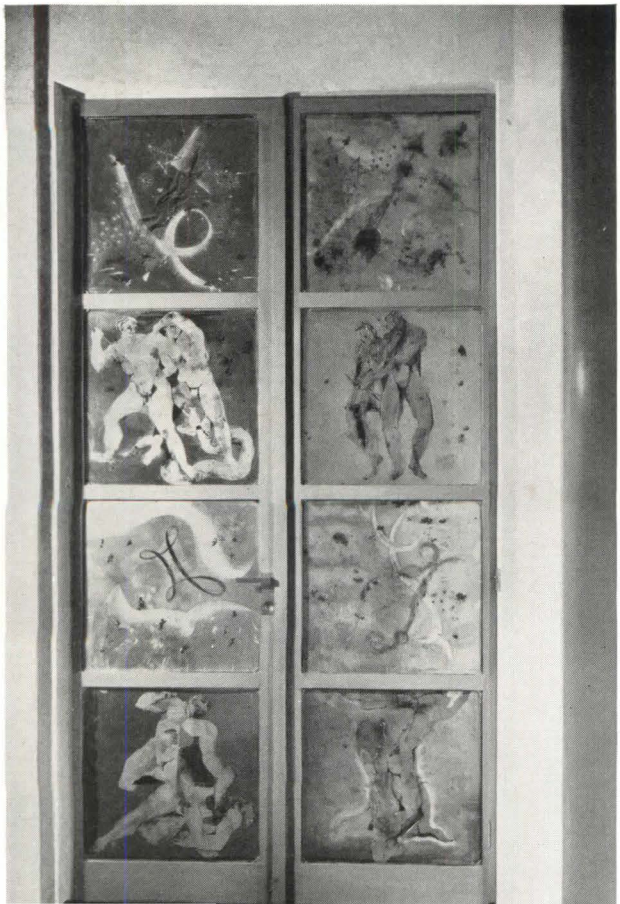


This boudoir, with walls, floor, and furniture of glass, was designed by the English architect Oliver Hill for a building exposition in London. The furniture may be familiar to those who saw H. G. Wells' film "The Shape of Things to Come." The walls are of curved sheets of plate glass of a gunmetal color, which are stippled on the front. The engraved figure on a wall panel was engraved with a carborundum wheel. The floor is of clear glass cubes, some of which have been silvered on the underside. While of dubious practical value, the entire composition is a highly attractive and imaginative demonstration of the possibilities of the material.



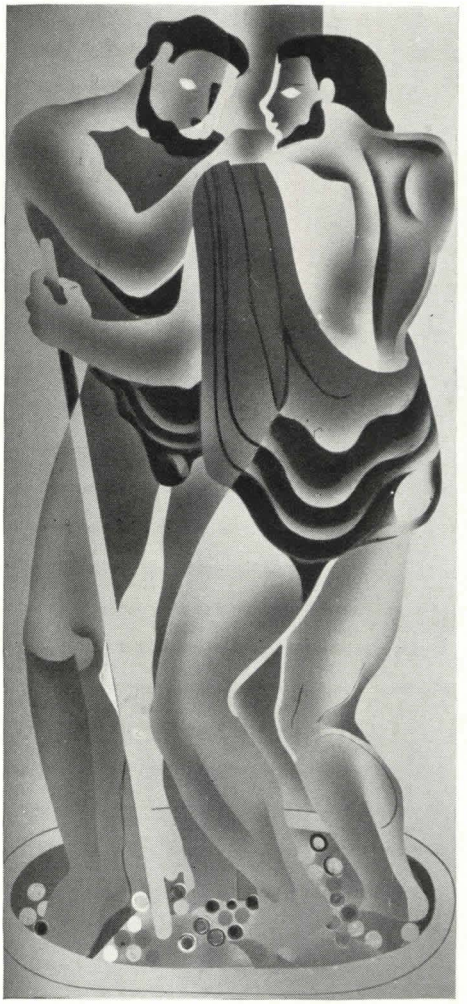
"THE MILKY WAY": TRANSLUCENT GLASS CEILING IN SILVER AND GOLD

ENGRAVED AND GILDED GLASS DOOR



ENGRAVED AND SILVERED GLASS SCREEN

Max Ingrand and his wife Paule are young French artists whose work in glass has received wide recognition. Examples of their skill are to be found all over Europe and a few are shown here. Ingrand has developed a series of new techniques, variations of the wax and hydrofluoric acid method of etching, sand engraving, and direct painting which mark a tremendous advance in the craft. He frequently works on both sides of the glass, thereby obtaining surface as well as color variations. The illustrations show a glass ceiling, a door, a screen, an overdoor treatment, and a detail of a painted panel.

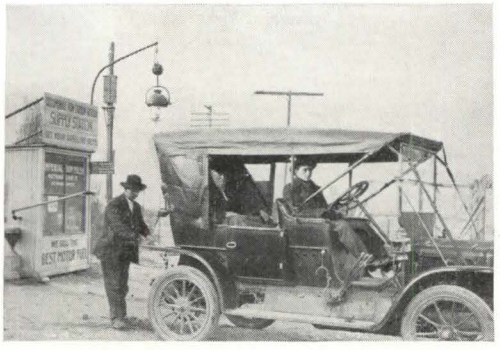


GLASS PANEL OVER BAR

WALL IN ENGRAVED AND GILDED GLASS ON THE "NORMANDIE"

PLANNING TECHNIQUES

FOR NEW AND REMODELED BUILDINGS



1910

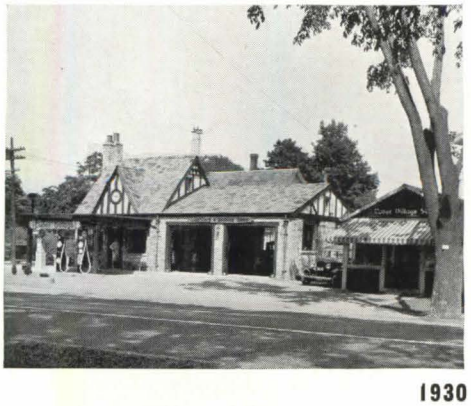
SERVICE STATIONS 1.

THERE is some controversy as to when the first automobile filling station was built; St. Louis claims the honor with a tin shack, no longer in existence, which was built in 1907. Whether this crude structure was actually the first filling station or not makes little difference: the date, in any case, is reasonably accurate. From four cars in 1895 the number increased to 140,000 by 1907, and almost all of the 140,000 were served at garages, grocery stores, and refining plants, filling being done by the can and funnel method. By 1908 there were perhaps a dozen stations; in 1913 the Gulf Refining Co. built its first drive-in station; within two years Standard and Atlantic had followed suit. The builders of these early stations had little to go on save guesswork, and many sites became valueless because of new roads, deteriorating neighborhoods, traffic lights, etc. By 1929 there were some 317,000 places selling gasoline to a total car registration of 26,000,000, or about 80 cars per outlet. The results of this over-expansion were severely felt during the depression years that followed, and the situation was made worse by the installation of pumps in lumber yards, feed stores, parking lots, highway fruit stands and restaurants which also had the problem of increasing their curtailed business.

During the lush years the average station sold gas and oil and little else. The early garage which had sold everything needed for cars was replaced by specialty stores which sold tires, or batteries, or accessories. Today the trend is reversing itself again, and there is a noticeable tendency to house as many as possible of the services and products under one roof; examples of these larger types are shown in the following pages. The change from "filling station" to "service station" was a result of increasing pressure of competition: most business is done in local stations and consists of repeat sales; the public apparently believing that one reputable gas is about as good as another, "service" became increasingly important as a factor in sales, and has been carried to extreme lengths. The oil companies, however, have found that, other things being equal, the highest drawing power of a station is in its personnel.

All other things are not equal, as it happens, and one of the factors soon recognized was that of appearance. Between 1915 and the present time there has been the most astonishing amount of misapplied architectural ingenuity devoted to the beautification of filling stations, with every style that had ever existed, and not a few that hadn't, called upon to desecrate the American landscape in the name of more business. As designers became more subtle the types were reduced in number; there were the neat Colonial stations, more appropriate for

1920



1930

Photos: Charles Phelps Cushing, National Petroleum News, Tidewater "Better Business"

Paul Revere than a Buick, terra cotta affairs with tile roofs and tasteful Renaissance decoration, and, for the more affluent residential neighborhoods, half timber (fireproofed) cottages in an alleged English style. In recent years, thanks to a more intelligent approach, a new type of station has made its appearance. It is clean, unassuming, and has the inestimable virtue of looking like a filling station; materials are carefully selected for appearance, but also for easy maintenance; in many cases it is prefabricated, representing salvage value should the site become unprofitable. It is with this new type of station, its planning, location, lighting, and exterior appearance, that the following pages are concerned.

LOCATION

Location is dependent on available sites, zoning laws, and the business possibilities of any given neighborhood. Dealers now study these factors, and real estate trends, as carefully as any prospective store owner. A series of articles recently published in the *National Petroleum News* analyzed the factors governing the selection of a location; they are eight in number.

1. TRAFFIC. Traffic density can be measured by counting the number of cars passing on an average week day. Taxicabs, buses, and other vehicles which refuel in company garages should not be counted. If the traffic is fast at the site, with no traffic signals or other obstacles, it should be avoided.

2. LOCAL CAR OWNERS. Neighborhood trade is an important item in the business of the average gas station, and its potentialities from this point of view should be studied.

3. COMPETITION. It may be wise to select a site in the midst of several other stations if that site is eminently superior. Otherwise a location where there is no direct competition would be more suitable.

4. VISIBILITY. Formerly the far corner was considered the best one at an intersection because of its visibility; the introduction of traffic lights has changed this to some extent, and the near corner has increased in value. While the inside lot is least effective from a visibility standpoint, it has the advantage of entrance and exit on the same street, with less consequent delay.

5. ACCESSIBILITY. Opinions vary on the size of the minimum plot for easy access and exit. Some companies recommend at least 100 ft. for an inside lot, slightly less for a corner lot. Others consider 85 ft. a workable minimum where the distance from curb to property line is 12 ft.; for each foot added to this distance, 2 ft. should be added to the frontage.

6. SURROUNDINGS. Surroundings have an effect on visibility which must be considered. Obstructions created by adjoining buildings or signs are serious disadvantages.

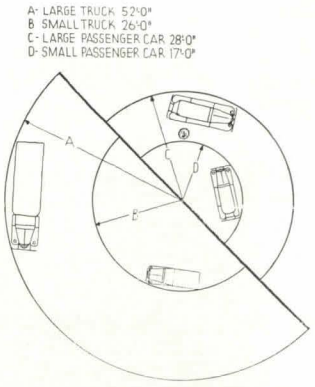
7. QUALITY OF MERCHANDISE.

8. PERSONNEL.

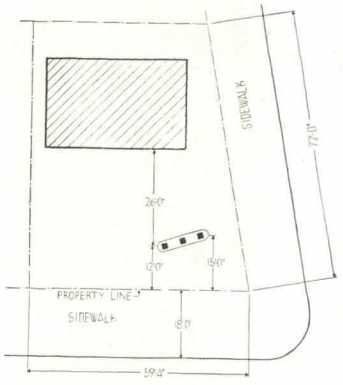
THE PLOT PLAN

Placement of the pumps governs the location of all buildings on the plot, and the pump locations are determined by the type and size of lot. Where there is a canopy extending from the building to the pump island this fixes the placing of the building. A number of companies, however, are discarding the canopy on the grounds that it does not protect the attendant and obscures merchandise placed in the display windows. At least one large company places its lubritory so that the car can swing into it from the pump island. Others prefer to locate this service where access is independent of the pumps, assuming that those who want lubrication service will come directly for it.

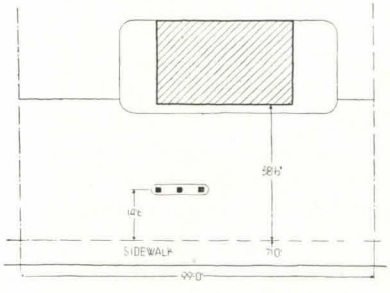
The facilities required in the average station are (1) Office space, often used as a rest room and display space, (2) Heater room, (3) Lubritory, (4) Toilet rooms. The planning of these elements varies considerably. Some companies, for instance, have reduced the office to a minimum, on the assumption that the attendant should be busy elsewhere most of the time. Rest rooms are considered important by some dealers and worthless by others. It frequently becomes no more than a display space. The boiler room is placed in the rear, as a general rule, and local building codes require a separate entrance. Frequently



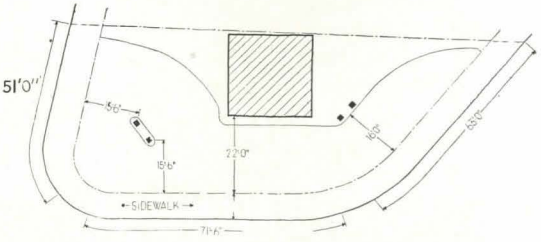
MINIMUM TURNING RADII FOR CARS



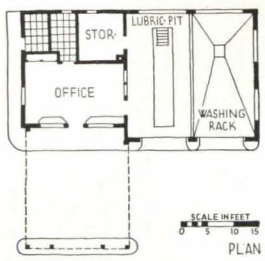
TYPICAL PLAN — CORNER LOT



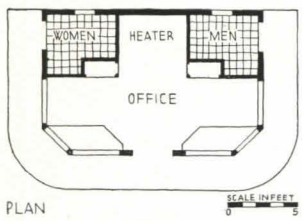
TYPICAL PLAN — INSIDE LOT



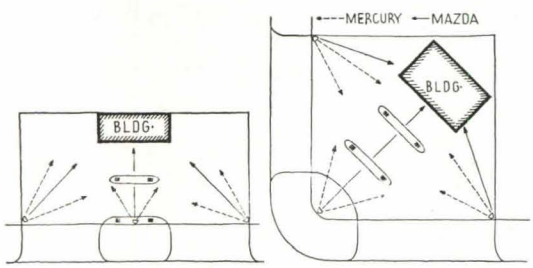
TYPICAL PLAN—INTERSECTION



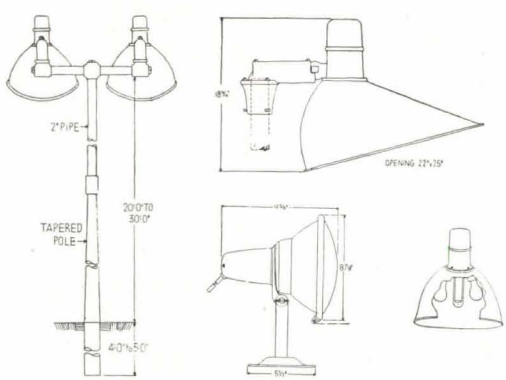
BUILDING INCLUDING LUBRICATION AND WASHING RACK



TYPICAL BUILDING FOR SMALL STATION



LIGHTING PLANS FOR INSIDE LOT AND CORNER LOT



DETAILS OF FLOODLIGHTS

the furnace is omitted, with small heater units substituted. The lubritory is a new element in most filling stations, and is often housed in a separate building. Some stations have a large window in the rest room or office, through which the motorist can watch the work. Lifts rather than pits are used where this feature is incorporated. Toilets are most important in highway stations, and should be clean and attractive. Common practice in the placing of toilet rooms is to have the men's entrance through the office and the women's outside. Entrance through the office is desirable when accessories are on display.

BUILDING MATERIALS

Bright, smooth-surfaced materials are becoming increasingly popular, not only because of their appearance, but for their ease of cleaning. Porcelain enamel has been tested over a period of years in actual installations, and is considered satisfactory. Where building laws require that it be placed over a brick backing the cost becomes an important item, and it is often omitted for this reason. Where a cheaper surface is required, painted or glazed brick is used. Terra cotta can be made in almost any color or shape, with rough or glazed surfaces. Glass is used for display reasons and where night lighting is required. The various kinds of colored plate are occasionally used for wall surfaces, although there is always the objection of damage due to breakage. Other forms are glass tile and glass block. Possible materials, still too costly for the average installation, are the white metals and plastics.

LIGHTING

Adequate illumination, where only a small portion of the total business is done after dark, is considered advisable for advertising purposes. Tests run on stations in various parts of the country demonstrate conclusively that night lighting will increase a station's business, often as much as 25 per cent.

Lighting arrangements which are ideal from a selling point of view are sometimes impossible due to local building regulations. In Washington, D. C., for example, open reflectors are not permitted; other cities require that the lighting standards be placed so far in from the sidewalk that the entire area cannot be adequately illuminated.

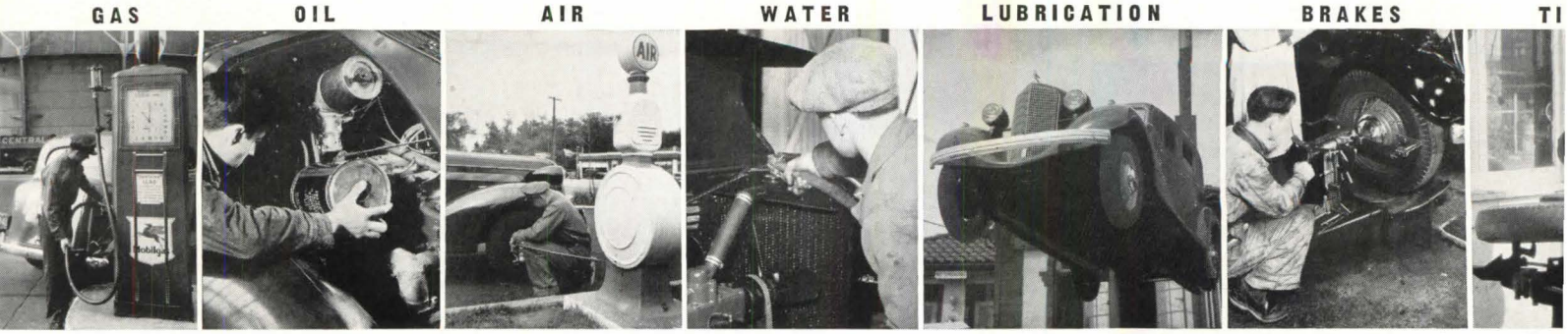
There are two general types of floodlights available. One uses mazda lamps, and the other uses a combination of mercury and mazda lamps in a special type reflector. This latter type has the advantages of high efficiency, giving an illumination equal to 1,000 watts with mazda lamps while consuming only 700, and it has a distinctive quality which attracts attention. These fixtures can be tilted only 10° from vertical. As a general rule, standards for both mazda and mercury incandescent fixtures should be 20 to 25 ft. in height.

In addition to floodlighting there is the method of illuminating the building brightly within, with luminous panels in the canopies to light the pump islands and driveway. Some very striking effects are possible when the building is constructed of plain and colored glass, so that the entire structure becomes luminous; experiments of this kind have been made by a number of the large oil companies, but their use has not become widespread.

Signs are infinitely varied in design, but break down into a few general types. There are light letters against a dark background, usually made of neon tubes, dark letters silhouetted against a bright background, and the non-luminous signs which are floodlighted.

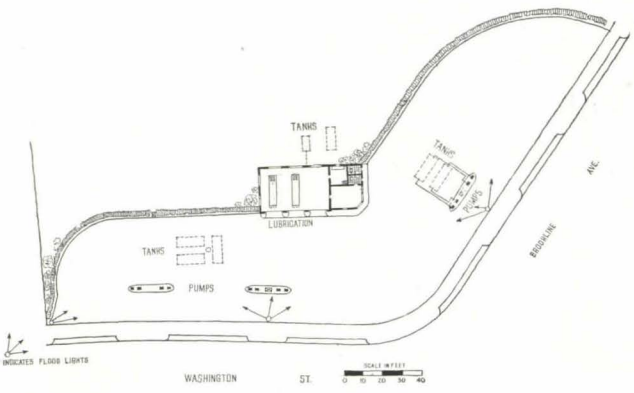
General considerations in lighting the filling station are the attractiveness of the result from the street, absence of glare on customers and neighboring buildings, illumination of drives, pumps, building, and greasing racks, and the avoidance of undesirable shadows and high spots.

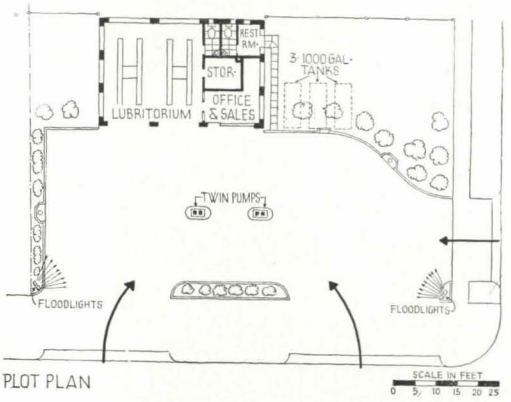
GAS OIL AIR WATER LUBRICATION BRAKES TI



Photos: Goodyear Tire & Rubber Co., Ewing Galloway, Lionel Gr Buick Motor Co., Publishers Photo Ser

SERVICENTER IN BROOKLINE, MASS. STANDARD OIL CO. OF NEW JERSEY



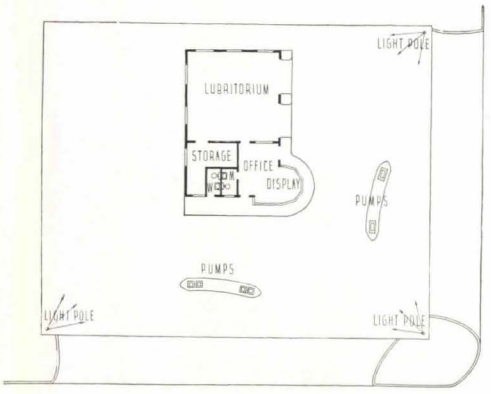


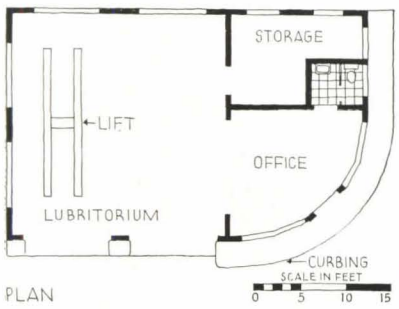
PLOT PLAN

Both of these service stations are of the simple, rectangular type in which the lubritorium, laundry, office and rest rooms have been incorporated in a single building without canopies or other projections. In each instance, the office is located at the corner of the building and made as open as possible. The Esso "Servicenter" above was made small and inexpensive in spite of a large, well placed site, because widening of the street on which it faces is contemplated. This plan illustrates the open, scattered arrangement of pump islands which makes for maximum rush hour capacity. The Shell station, shown at the right, is only slightly smaller, has but one pump island, is obviously designed for proportionately more servicing and lubrication, less gas and oil sales.

SHELL UNION OIL STATION IN WORCESTER, MASS.

DESIGNED BY THE AUSTIN CO., CLEVELAND, OHIO

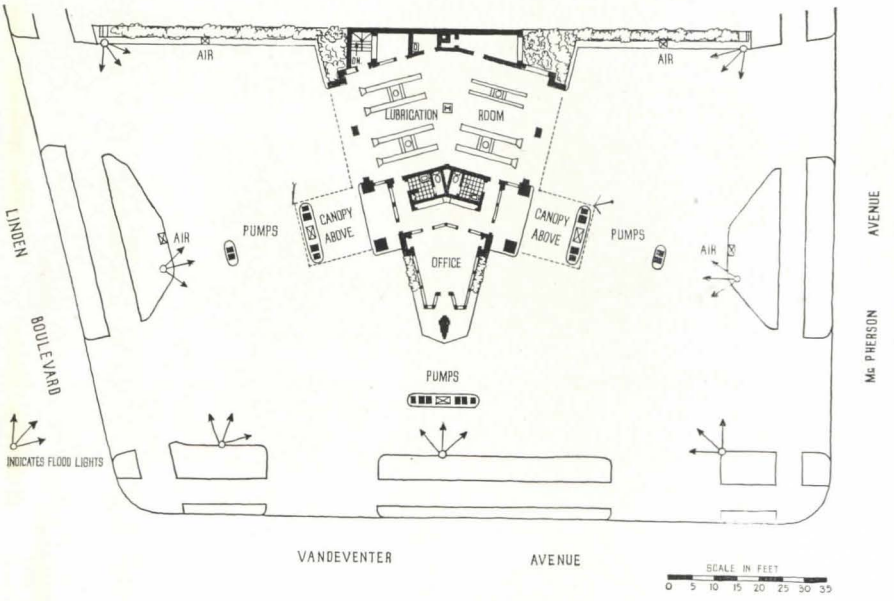




PLAN

DESIGNED BY THE AUSTIN CO., CLEVELAND, OHIO

The Pennzoil station above and the Texaco station at the left, each built by The Austin Company, illustrate the versatility of the prefabricated sectional construction which this company has developed. Exterior wall panels are porcelain enamel steel, insulated with a layer of insulating board which is cemented to the inside of the panel. These panels are easily cleaned and require no painting. The construction is entirely fireproof, as a filling station should be, and has the advantage that the station can be taken down and moved without damage, reerected on another more favorable site if business falls off. Both of these stations have an abbreviated canopy; each incorporates lubritorium, office and rest rooms in one compact unit.

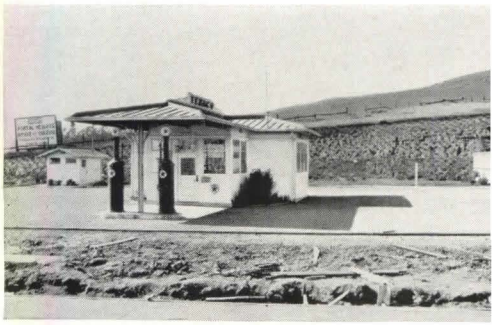


OFFICE

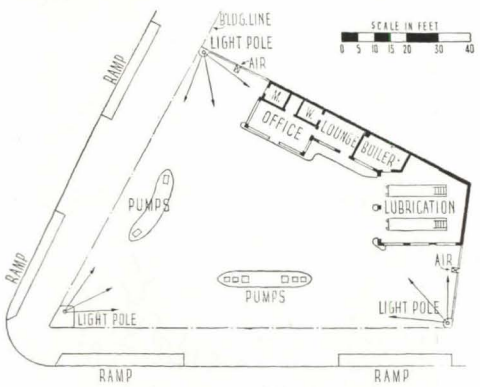
SHELL UNION OIL STATION IN SAINT LOUIS, MISSOURI

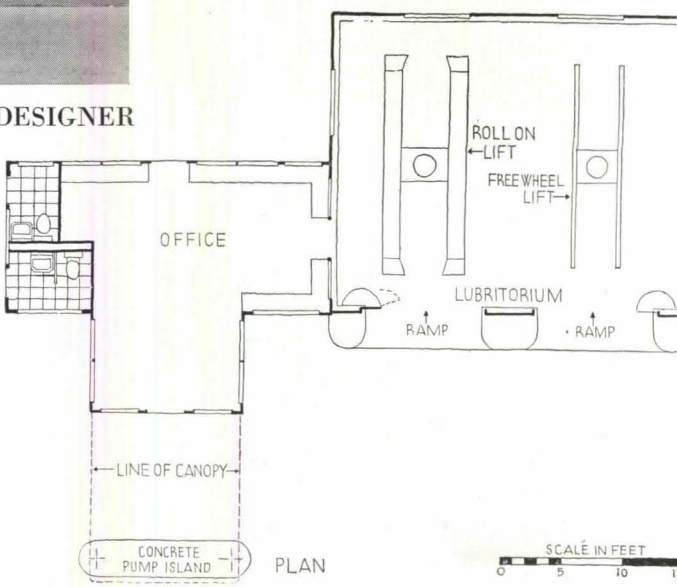
Location at the intersection of three streets, two of which converge, and at a point where traffic is heavy and business brisk, dictated the design and plan of this "superstation." Designed to attract attention and business, the entire building is floodlighted at night, finished on the outside with buff Terra Cotta. A local ordinance which required that the chimney be extended at least six feet above the building on the adjoining plot led to this otherwise utilitarian element being made a feature of the design. The symmetrical plan employs two fully cantilevered canopies which shelter pump islands; three more islands are located out in the open. The office is used as a lounge and sales room as well, and is accordingly made generous in size. Ceramic tile is used for service room walls, and terrazzo for the floors of the service room, toilet rooms and office. The lubrication room, which houses four electric auto lifts, has a cement floor and buff salt glazed tile walls. Special aluminum sash are employed in the office for maximum visibility.

TEXACO SERVICE STATION, WALTER DORWIN TEAGUE, DESIGNER



BEFORE

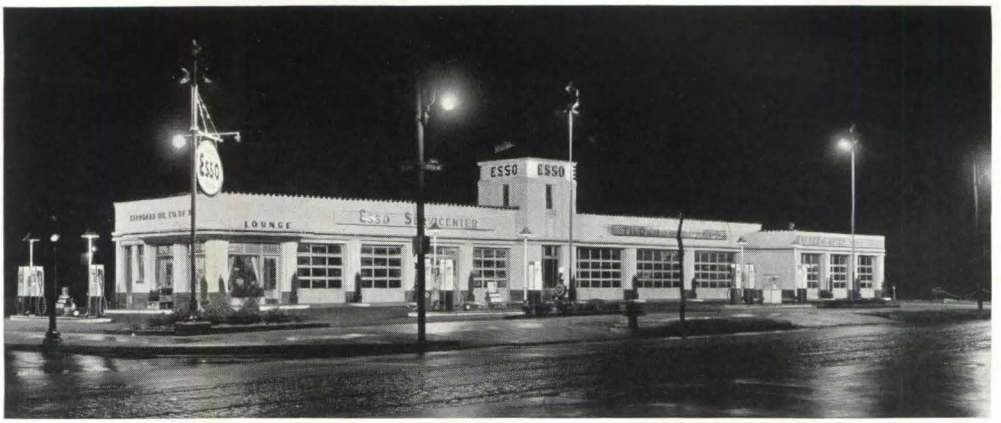




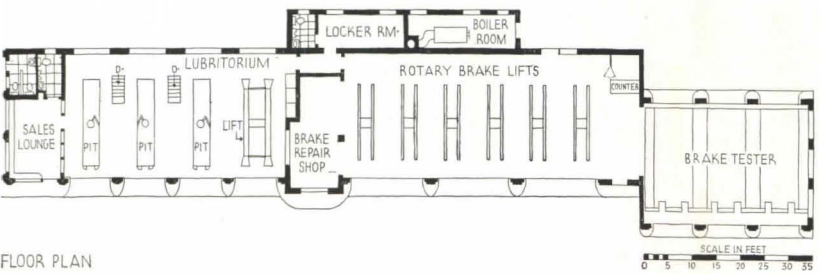
SERVICENTER, SUMMIT, N. J. STANDARD OIL CO. OF NEW JERSEY

The Texaco station at the top of the page is standard design worked out by Walter Dorw Teague, industrial designer, in an effort to devi a service station which could be built in any pa of the United States, in any location, of any m terial, on any shaped plot, with any number service bays or none—and still maintain its ide tity as a typical Texaco station. A conservati design was chosen because the client wanted o which would last a long time without revisio Emphasis is on horizontal lines, trade ma character is established by the use of three gre bands, stars and lettering of vitreous enamel a white surface. The typical Texaco station whi the Teague design replaced is shown in the upp right hand corner.

The Esso Servicenter shown at the left is an e ample of modernization technique applied to fi ing stations. To the original station, containi office and toilet rooms, was added a wing f lounge, boiler room and two bay lubritoriu without interfering in any way with its operatio Recent changes in Esso's standardized *designs a* shown by the different treatment of the tw sections.



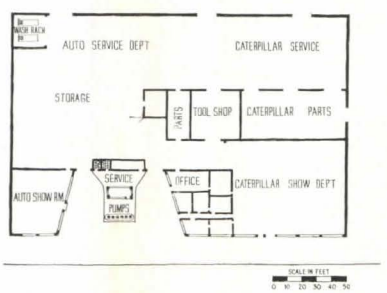
ESSO SERVICENTER, EAST ORANGE, N. J.



FLOOR PLAN

Esso's treatment of the "superstation" is illustrated by the Servicenter above, which has four lubrication bays and nine service bays for relining and testing brakes which are let to a brake service company. The plan is straightforward, very little space being given over to the office and rest rooms. A second story above the brake repair shop provides the feature of the design, which is otherwise simple and restrained. Exterior walls are 8 in. cinder block stuccoed, floor concrete, and roof 2 in. wood sheathing on steel bar joists.

example of successful modernization work, office and show room of the Cousins Tractor Co., vn below, is interesting because of the unique ngement of the service station, located in a haped court in the front of the building. This the effect of increasing the display area for and tractor sales and of calling the attention he customer who stops for gas and oil to this lay. Pumps are grouped in a single island, and office, surrounded by glass, is entirely separate n the main building.



BEFORE

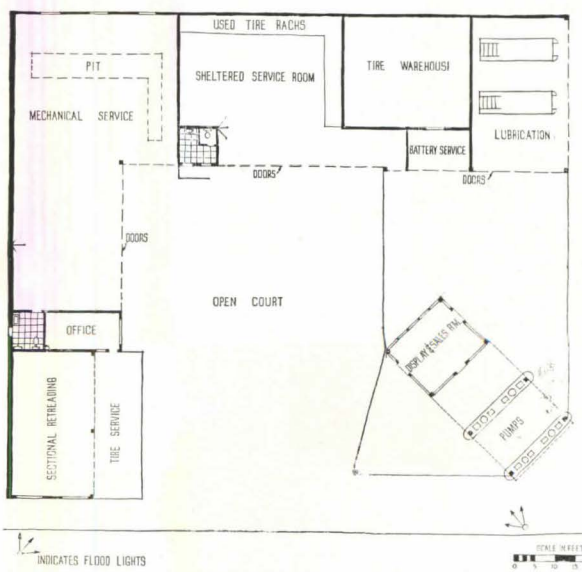
THE COUSINS TRACTOR CO., HANFORD, CALIFORNIA

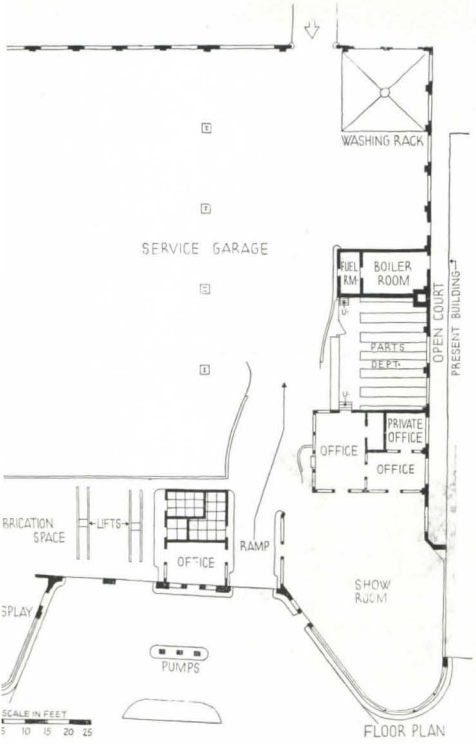
1919

1928

SERVICE STATION FOR McNEECE & McNEECE, EL CENTRO, CALIF.
DESIGNED BY NIGG ENGINEERING CO.

Three stages in the development of a successful filling station and servicing business are shown above. Established in 1919 in a small concrete building with corrugated iron canopies extending over the gas pumps and tire repair section, McNeece & McNeece, the owners, have recognized the necessity for keeping their service station constantly up to date. In 1928 the structure shown in the upper right hand corner was erected, and it, in turn, was modernized early this year. In planning their station, the owners had in mind making all departments easily accessible to the customer and at the same time visible from every point on the lot. This they succeeded in doing with the simple arrangement shown. The wide canopies which have been a characteristic of all of the McNeece stations are a matter of practical necessity because of the extreme heat of the summer sun and the heavy winter rains in their locality.





rage garage as well as repair shop, sales room, ing station and lubritorium, this service station age is a successful example of such a building nned for an inside lot. The arrangement of the o wings, and their rounded ends, provides ex- lent display space for car sales and at the same ne makes access to the pump island easy and nvenient. The front of the building is faced with rcelain enameled steel sheets and is floodlighted night. Floors are concrete slab on earth, the pe of the lot to the rear providing plenty of droom in the garage without the roof showing the front of the building.

STATION FOR PARFET CO., PORT HURON, MICH.

WALTER H. WYETH, ARCHITECT

SERVICE GARAGE

A 20th CENTURY HOME COMPETITION

SPONSORED BY THE HARNISCHFEGER CORPORATION, MILWAUKEE, WISCONSIN

Photos, George Nelson

THE REPORT OF THE JURY

THE Jury, in its selection of the winning designs, was guided by the statement of the problem as expressed in the program: that the house satisfy the essential needs of an American workman's family.

Many of the most attractively presented designs indicated suitability for a week-end house for individuals in the upper income brackets, and were therefore judged as not meeting the problem.

Provision for future expansion, since mandatory in the program, became a major consideration. Many excellent solutions for the first stage did not solve the problem of addition of garage and bedroom in a satisfactory manner.

Circulation through the house, particularly the convenient access to all its parts from the kitchen, was considered important by the Jury. In a servantless house, where the housewife spends most of her time in the kitchen, routes to bedrooms, main rooms, and the front door should be as straight and short as possible.

Houses with unnecessarily large areas in entrance halls were not considered economical solutions; where halls were so arranged that they increased the spaciousness of the living room, however, the Jury considered them as living areas as well as circulation space. Excessive upstairs hallways indicated an incomplete solution. The Jury noticed that in many cases competitors did not understand the proper use of the required module. This does not consist of designing the house in the conventional manner and then warping the dimensions to fit the square, but is rather a process of assembling a number of fixed units to produce a logical and economical plan. Planning with the use of a module is worth study, as this method will undoubtedly become more common in the future. Perspectives which omitted to indicate the panel divisions on the exterior were also criticized as attempts to avoid the requirements of the structural system. A large number of designs were eliminated because of lack of headroom over stairs. This common error becomes particularly important in small house design, which presents its own peculiar, and exceedingly difficult problems in effective utilization of space.

THE JURY

J. ANDRE FOUILHOUX
ROGER KIRCHOFF
R. BINKOWSKI
HOWARD MYERS
Competition Adviser

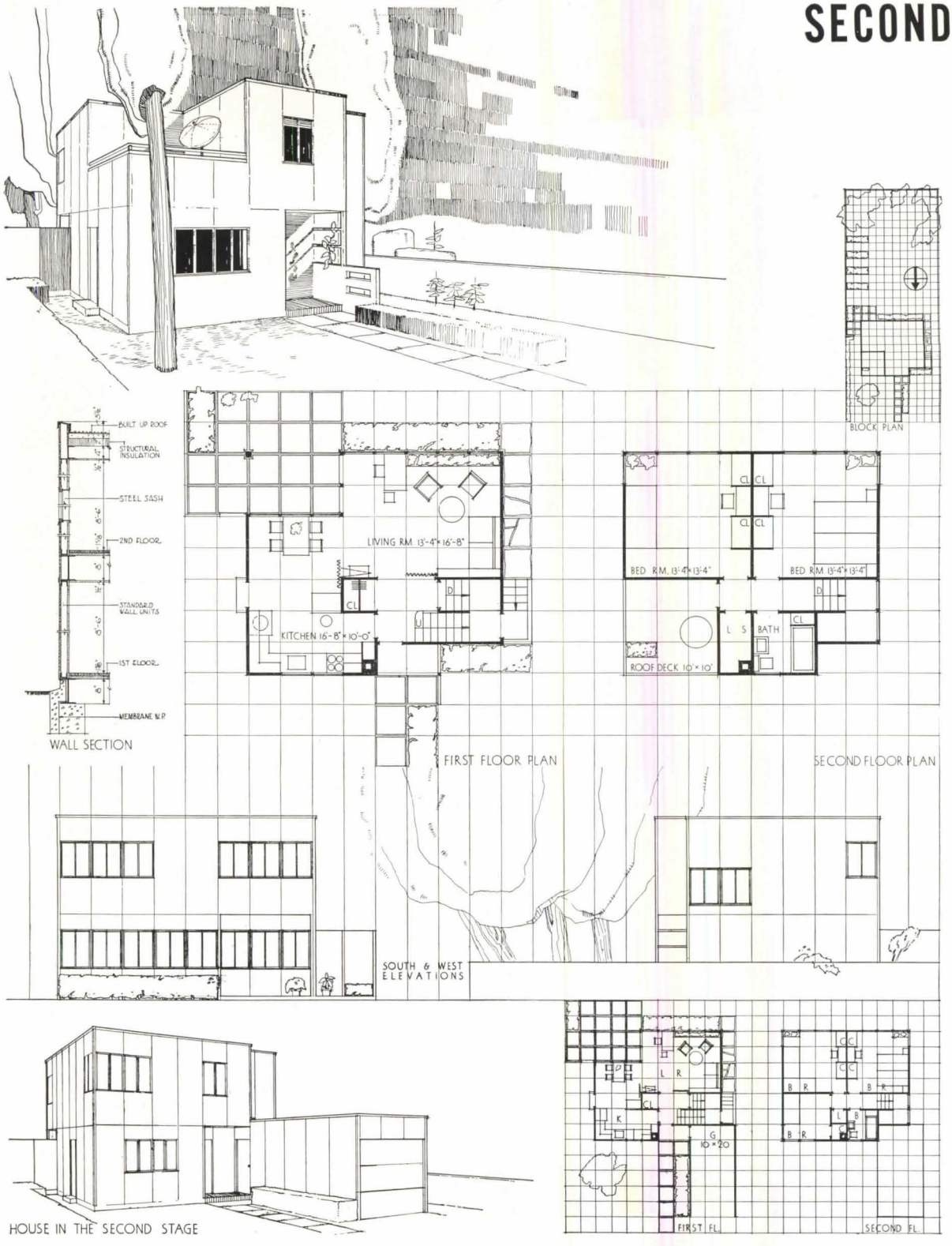
The jury's comments on the winning designs appear on the following pages.

FIRST PRIZE

CHARLES HENRY AND ARTHUR HENRY SCHREIBER, CHICAGO, ILL.

A well-arranged house providing all the necessary facilities for comfortable though simple living requirements. On the first floor the separation of spaces has been accomplished in a logical manner with a minimum of partitions. The design shows definitely the application of prefabricated panels to the plan. The exterior is a simple, direct expression of unit panel assembly, and the only embellishments consist of a massive flower box at the living room windows, and an accent created by the functional combination closet and balcony off the second floor bedroom. This design probably more than any other solved the problem of the addition of the garage and bedroom in a manner which does not detract from the exterior appearance or disturb the original plan.

SECOND PRIZE



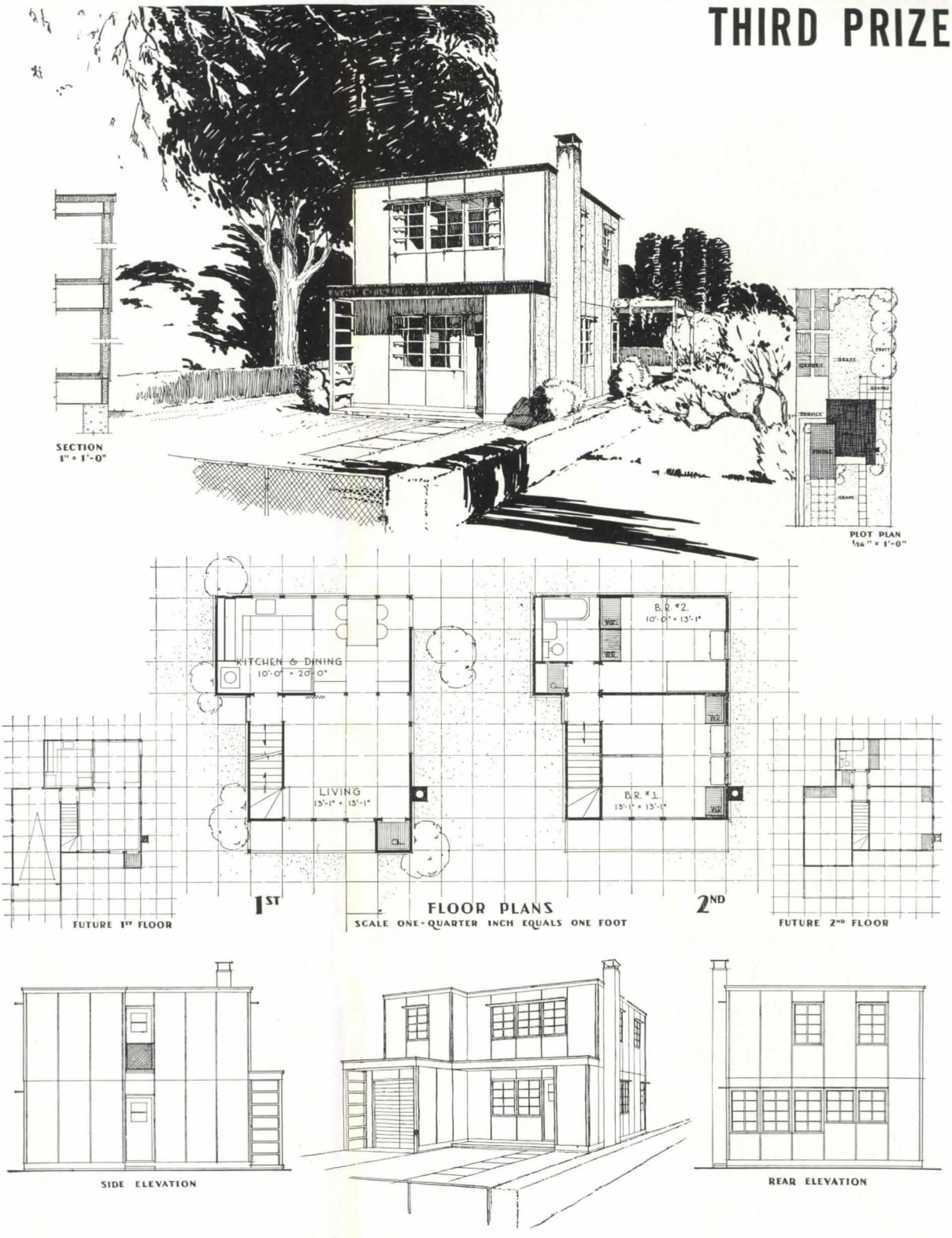
STEPHEN J. ALLING, NEW YORK CITY

A compact plan with good relation between the various rooms, and ideal circulation through the house. While each space on the first floor is reduced to proper minimum size, the arrangement does not suggest the feeling of a small house, due to the absence of complete enclosures around each room. Through the medium of few and small interior partitions a pleasing and very workable plan arrangement has been produced. The second floor is compact, with direct access to all rooms, resulting in adequately sized useful rooms.

An attractively developed rear yard which would be visible from any position in the house.

The exterior is indicative of assembled panel construction, and design permits of expansion for additional bedroom with a minimum of reconstruction.

THIRD PRIZE



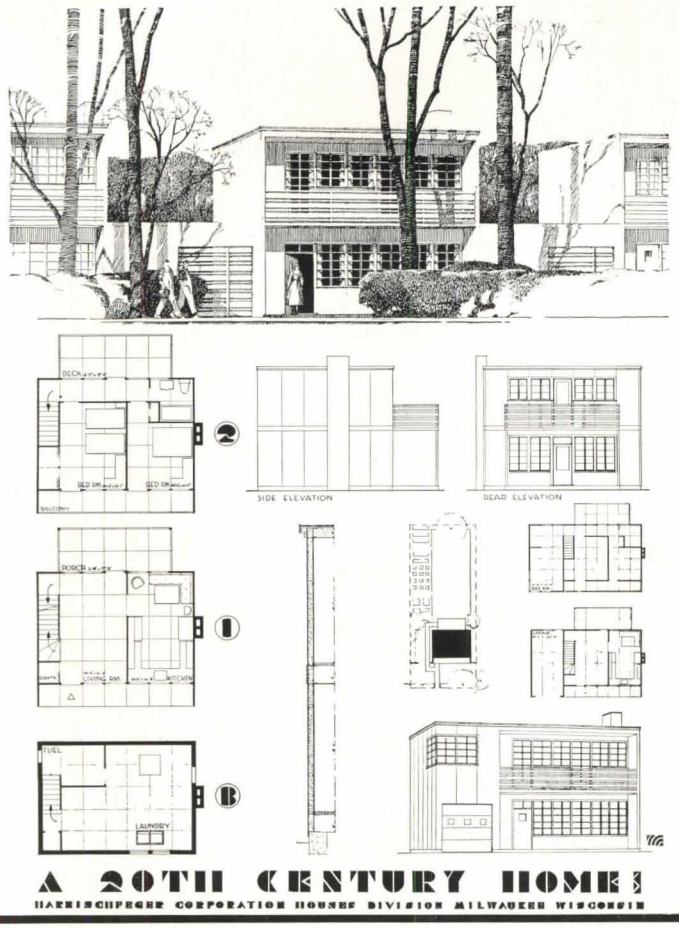
FRANKLIN G. SCOTT, MELROSE, MASS.

A simple, small, well-arranged house, with the solution of the expansion problem well conceived. Further study of the living room, considering circulation within the room and the location of the clothes closet, the door to the terrace, and the lower stair landing, might have improved the utilization of space along the forward wall of the room.

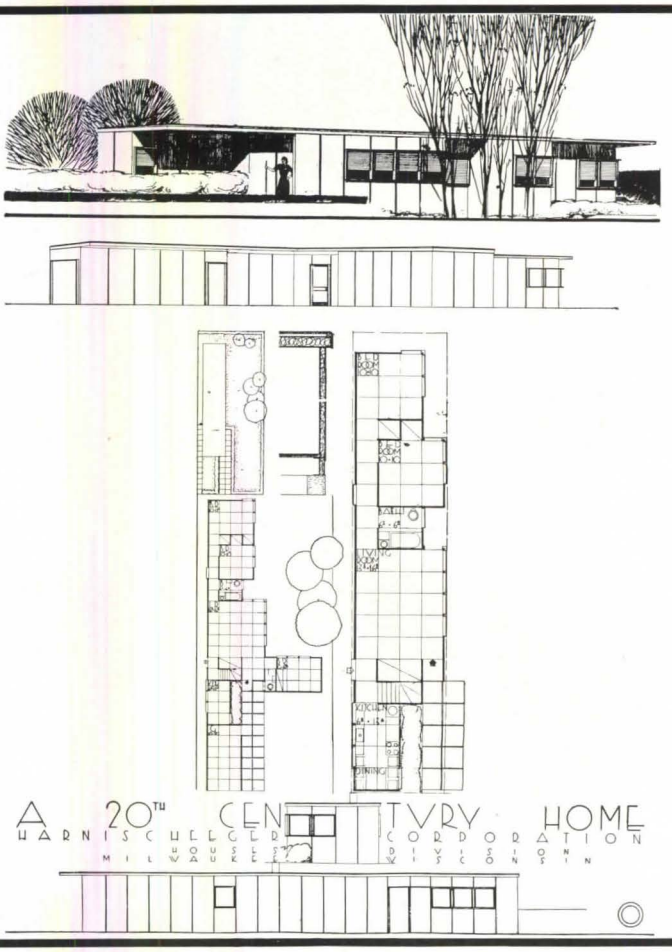
The second floor is an expression of maximum use of available space, with the hallway reduced to an economical minimum. A closet with a raised floor over the high portion of the stair well would have been a useful addition to overcome the usual lack of general storage space in small homes.

The exterior is attractive as presented with a simple shelter over the terrace. Extension of the terrace an additional 40 inches would have produced a more usable area.

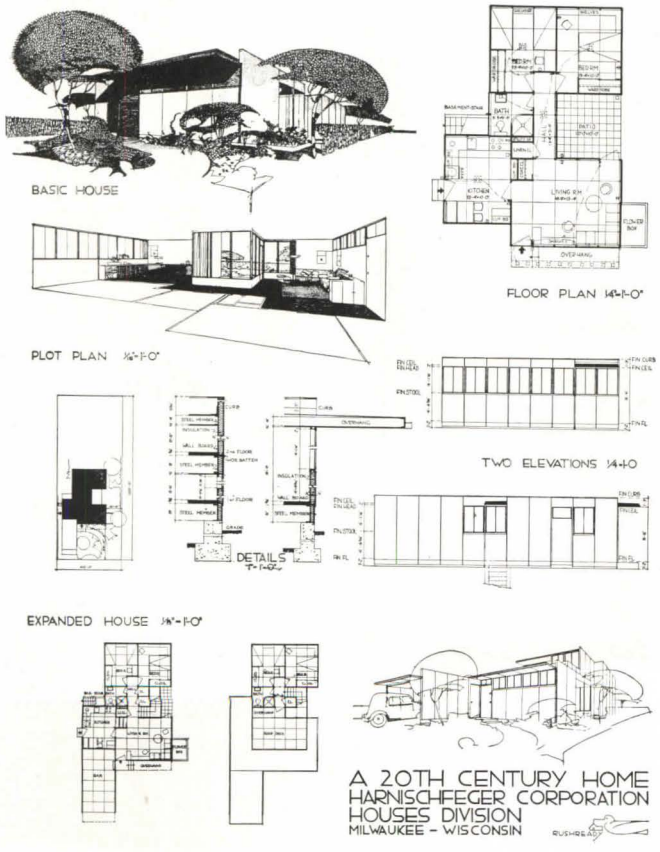
No mentions were called for by the program. The following pages, however, show twelve entries, selected by the editors to illustrate the range of the solutions submitted.



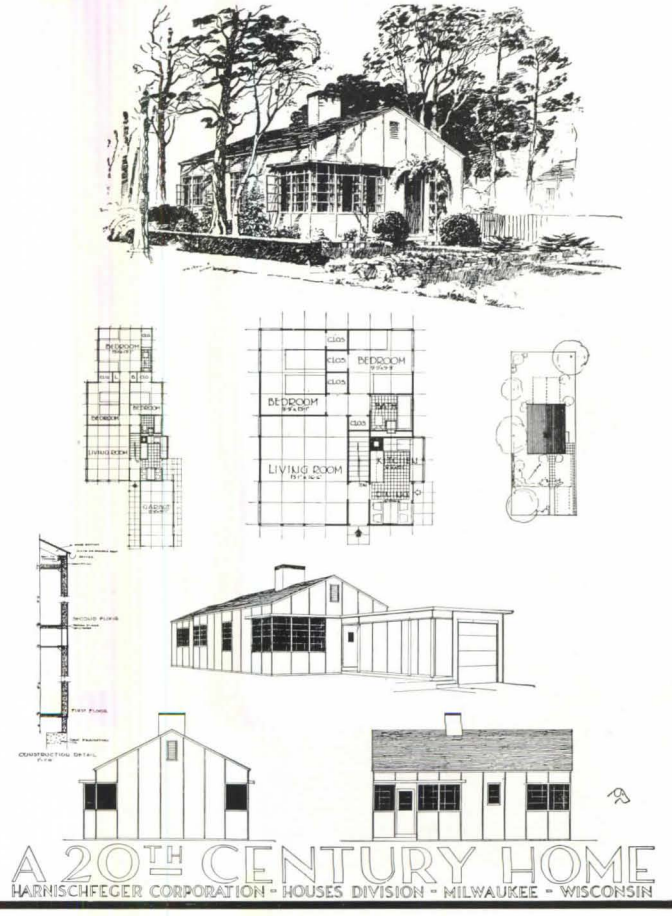
HAYS, SIMPSON & HUNSICKER, CLEVELAND, OHIO



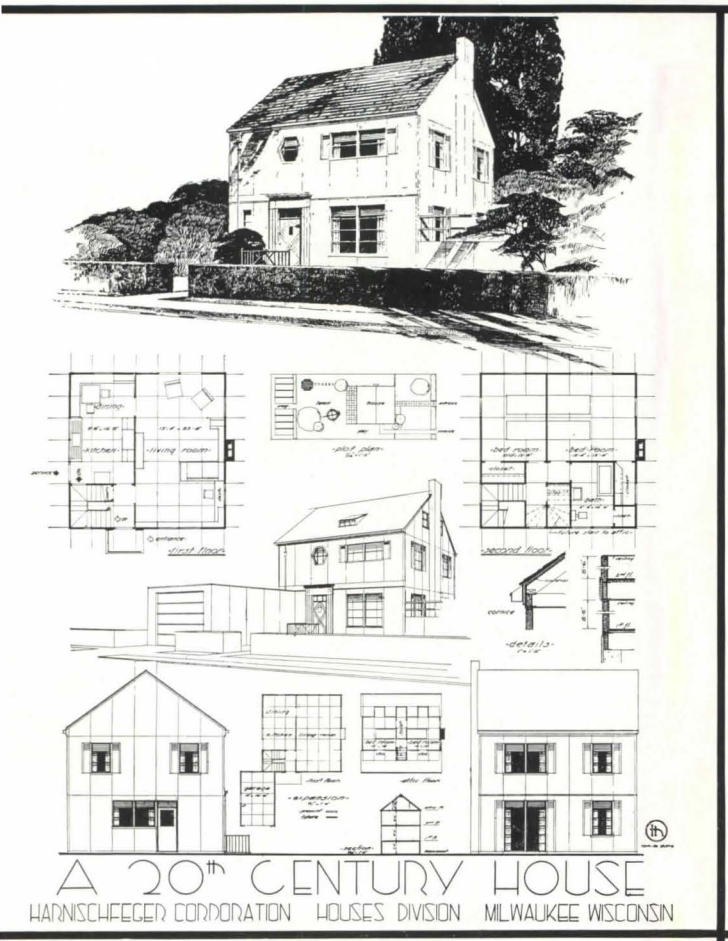
J. R. SPROULE, SEATTLE, WASH.



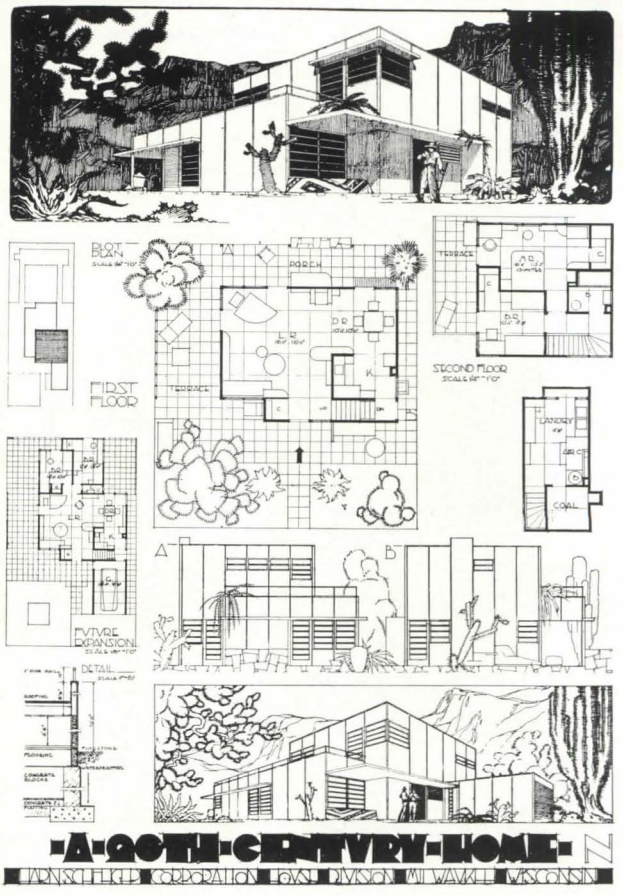
RICHARD J. NEUTRA, PETER PFISTERER, COLLABORATOR, LOS ANGELES, CALIF.



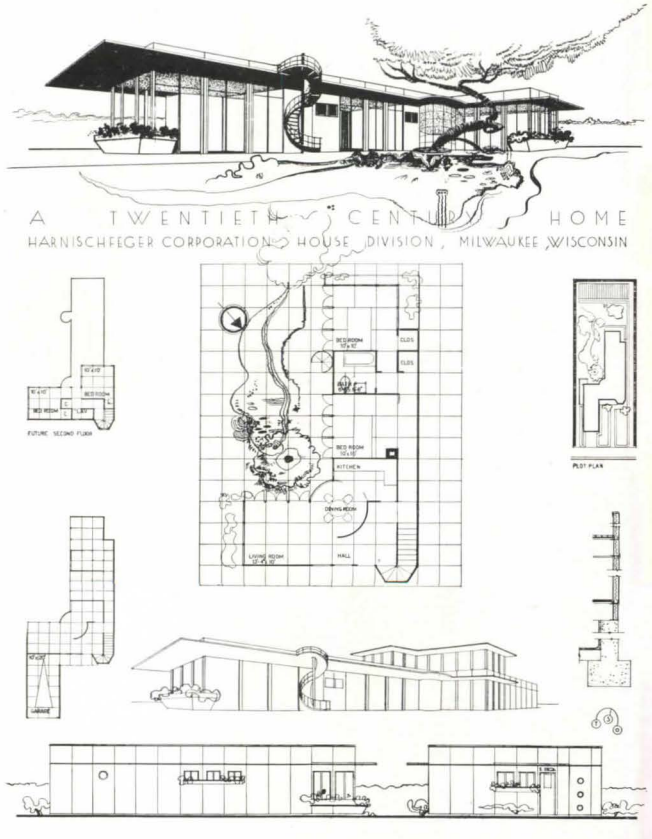
JOHN FLOYD YEWELL, NEW YORK, N. Y.



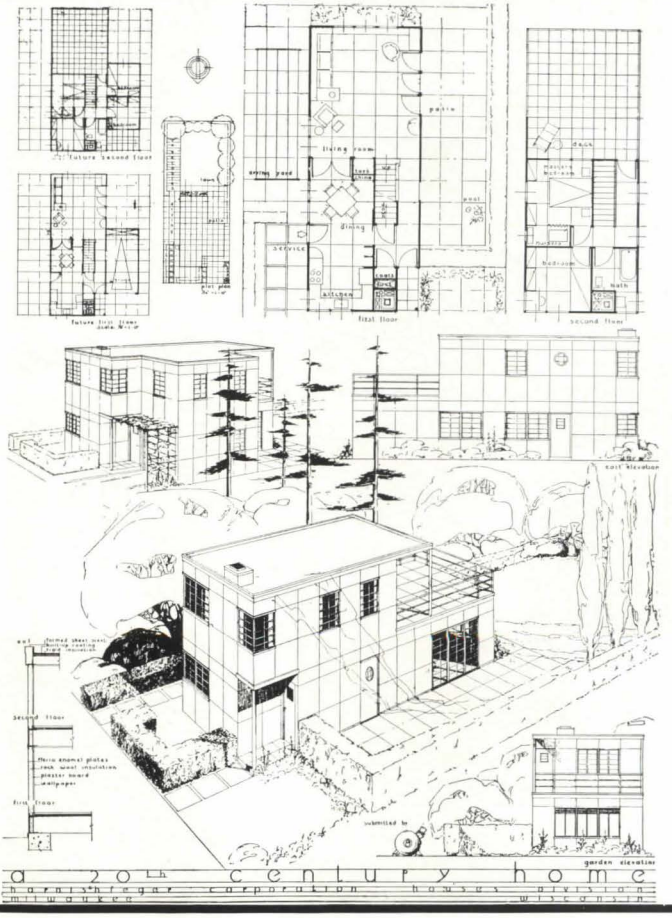
JOHN STENKEN, WASHINGTON, D. C.



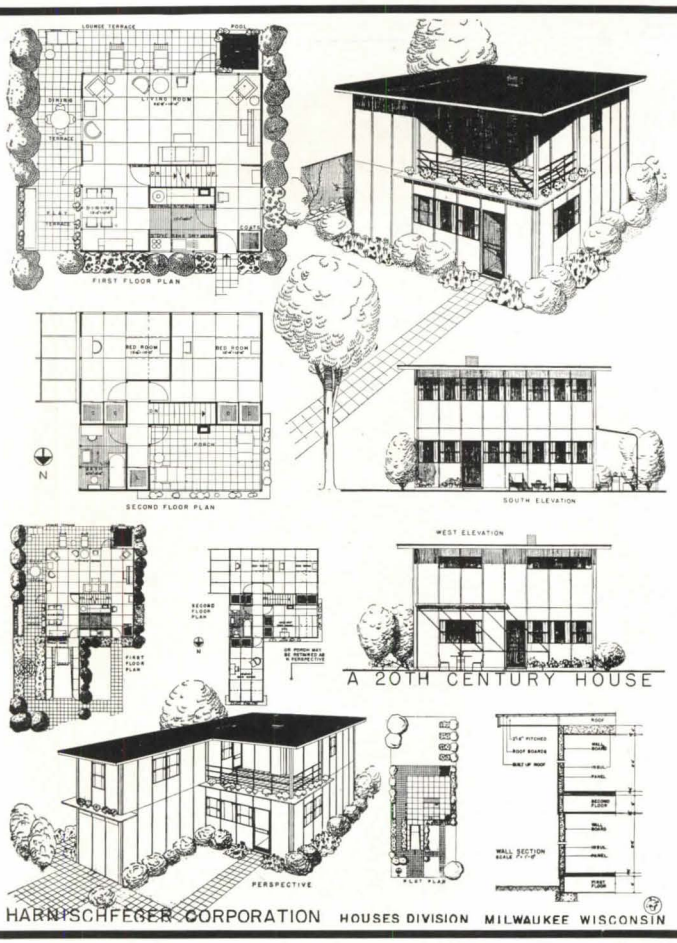
NICHOLAS B. VASSILIEVE, NEW YORK, N. Y.



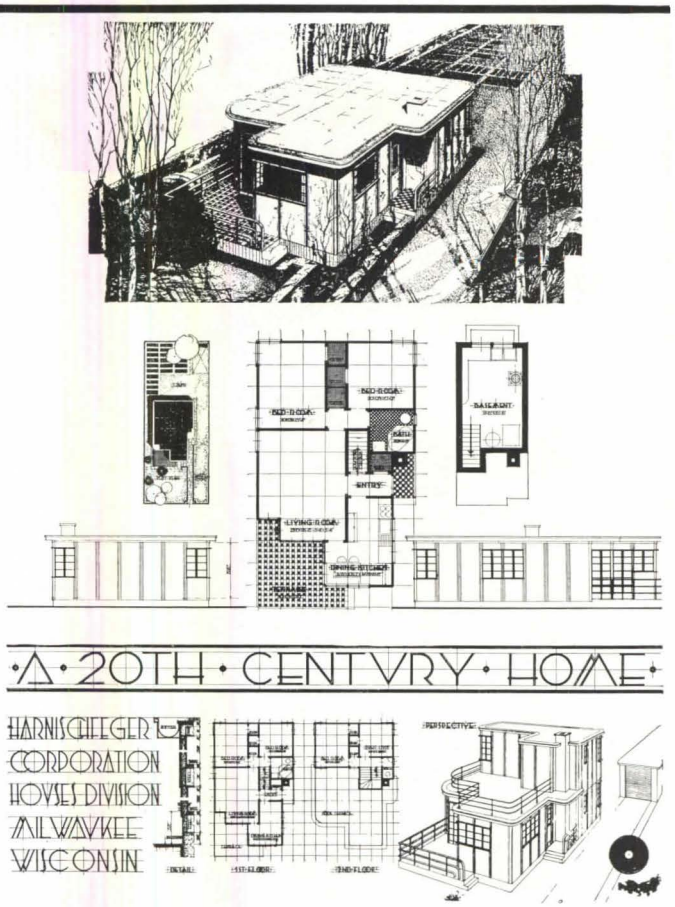
TAINA WAISSMAN, SIDNEY L. KATZ, BROOKLYN, N. Y.,
AND OLIVER LUNDQUIST, PEEKSKILL, N. Y.



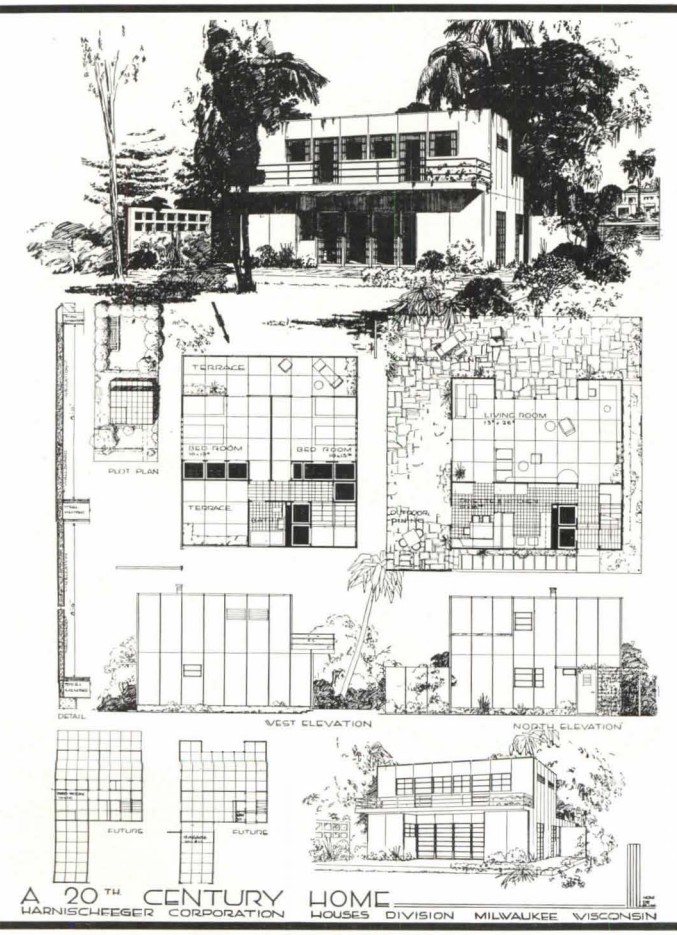
W. D. HOUTZ, MONROE, WIS.



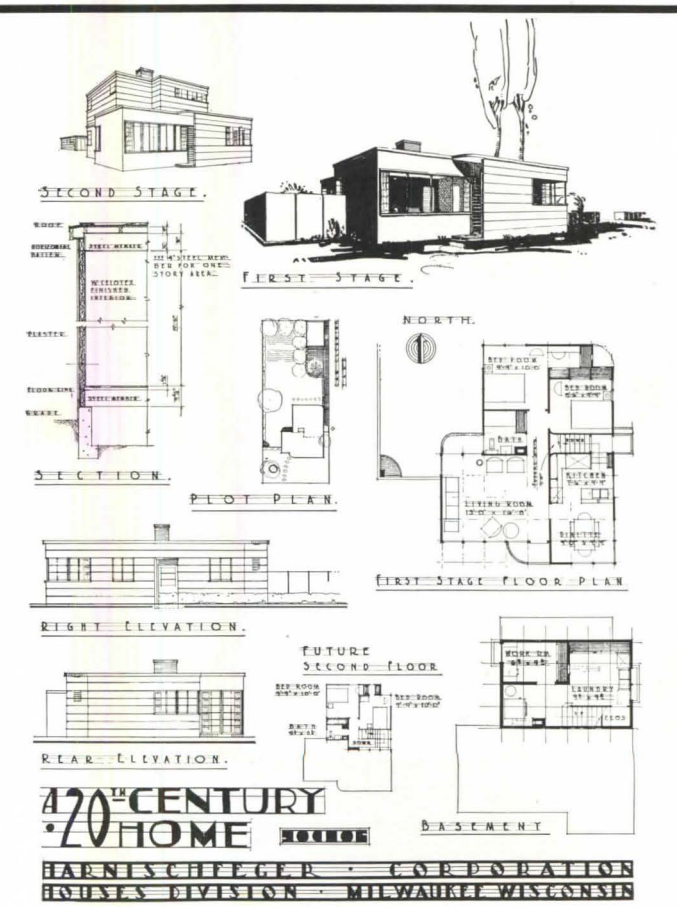
DAVID L. BOCKIUS, JR., PHILADELPHIA, PA.



JOSHUA D. LOWENFISH, NEW YORK, N. Y.



RUDOLPH A. MATERN, WOODHAVEN, N. Y., AND GEORGE NEMENY, NEW YORK, N. Y.



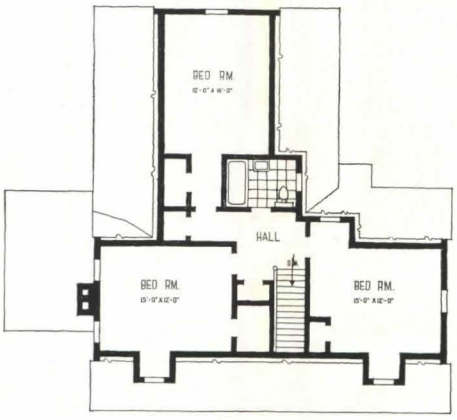
DOUGLAS McFARLAND, LOS ANGELES, CALIF.

)USE FOR H. C. BAUMGARDNER, MANHASSET, LONG ISLAND, N. Y.

Murray M. Peters

NRY W. JOHANSON, ARCHITECT

FLOOR PLAN



SECOND FLOOR PLAN

e irregularity of the plan is rather unexpected after a glance
ne severely symmetrical exterior, and a view of the rear eleva-
would probably be somewhat at variance with the impression
nall scale given by the front. For all its apparent small size,
house contains an astonishing amount of room: living room,
ng room, and kitchen are more than ample, and other ac-
modations include five bedrooms and three baths. The house
ypical, in its exterior appearance, of the great bulk of resi-
ial work being done on Long Island at the present time.
n one- and two-story types show a decided preference for the
nial exterior of the kind shown here. Cubage: 35,000. Cost:
500 at 35 cents per cubic foot.

CONSTRUCTION OUTLINE

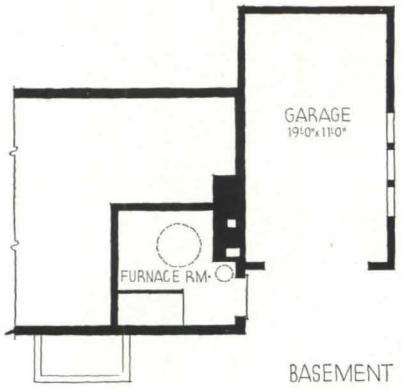
FOUNDATION: Walls—12 in. poured concrete. Cellar floor—concrete.
STRUCTURE: Exterior walls—2 x 4 in. studding, 16 in. o.c., ⅞ in. sheathing; 24 in. No. 1 Royal cedar shingles, 9 in. to weather. Interior partitions—2 x 4 in. studding, 3 coats plaster on wood lath.
ROOF: Royal cedar shingles.
CHIMNEY: Brick terra cotta lining. Damper—H. W. Covert Co.
INSULATION: Outside walls, attic floor and roof—4 in. Celotex, U. S. Gypsum Co. Weatherstripping—zinc interlocking.
WINDOWS: Sash—wood, double hung. Glass—double strength, quality A, Libbey-Owens-Ford Glass Co.
FLOORS: Living room, bedrooms and halls—⅞ x 2¼ in. red oak strip. Kitchen—N. C. pine, covered with linoleum, Armstrong Cork Products Co. Bathrooms—ceramic tile.
WOODWORK: First floor trim—chestnut; second floor—white pine. Shelving and cabinets—mill made white pine. Doors—6-panel Colonial 1¾ in. Garage doors—overhead, Roway, Rowe Mfg. Co.
HARDWARE: Interior—Colonial brass. Exterior—black iron, Sargent & Co.
PAINTING: Interior: Walls, trim and sash—3 coats flat oil paint. Ceilings—calcimine. Floors—Minwax Co., Inc.
ELECTRICAL INSTALLATION: Wiring system—BX cable. Switches—Hart & Hegeman. Fixtures—Lightolier Co.
KITCHEN EQUIPMENT: Stove—gas, American Stove Co. Sink—Monel metal, International Nickel Co.
PLUMBING: All fixtures by Standard Sanitary Mfg. Co. Soil pipes—extra heavy cast iron. Water supply pipes—brass with 85 per cent copper.
HEATING: One pipe steam. Boiler—jacketed oil-fired direct gun type. Radiators—concealed. All by American Radiator Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—60 gal. copper tank, Taco Heaters, Inc.

HOUSE FOR MARIE A. BOYLSTON, LIME ROCK, CONN.

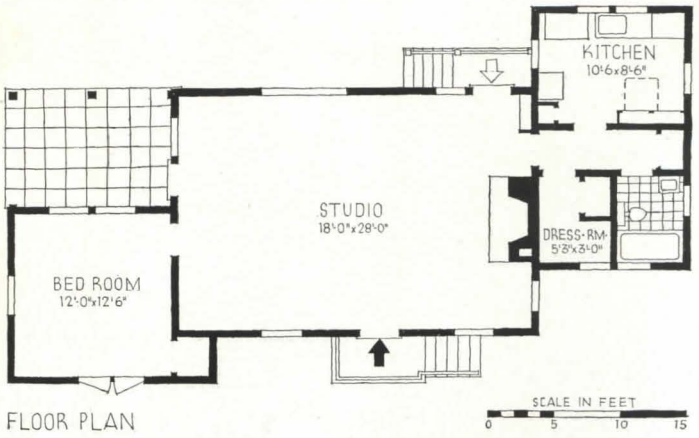
George H. Van Anda Photos

The chief defect in much small house design is its failure to achieve the proper scale, a result, possibly, of the persistent tendency to regard the small house as a large house compressed, rather than a special problem with its own peculiar characteristics. This example has successfully solved the problem of scale by treating the details with an appropriate simplicity; there is no deceptively molded cornice, no ornamentation around the entrance save a pair of plain pilasters, and the broad clapboards give a proper effect of small size. Advantage was taken of the hillside to obtain a garage within the house and an unexcavated basement. The plan is uncomplicated, with all the plumbing located at the unexcavated end. Cubage: 15,239. Cost: $3,900 at about 26 cents per cubic foot.

DEAN BROWN, ARCHITECT



BASEMENT



FLOOR PLAN

UDIO

CONSTRUCTION OUTLINE

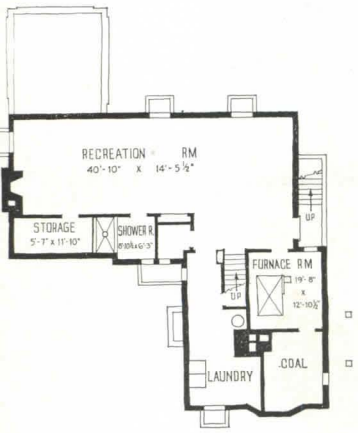
FOUNDATION
Walls—concrete, continuous. Cellar floor—concrete over cinder fill.
STRUCTURE
Exterior walls—18 in. Perfection cedar shingles, ⅞ in. sheathing, building paper, 2 x 4 in. studs and T. & G. pine boards inside. Interior partitions—2 x 4 in. studs, 16 in. o.c. and sheet rock. Floor construction—⅞ in. sub-floor, building paper and 1 x 6 in. T. & G. pine boards.
ROOF
Sheathing, ⅞ in., paper, 18 in. cedar shingles.
CHIMNEY
Lining—terra cotta. Heatilator Co. unit built-in fireplace.
SHEET METAL WORK
Flashing, gutters, leaders—galvanized iron.
WINDOWS
Sash—wood, double hung. Glass—single strength, quality A. Screens—bronze, wood frames.
FLOORS
Living room, bedrooms, and halls—1 x 6 in. T. & G. pine. Kitchen and bathrooms—linoleum, medium grade, Armstrong Cork Products Co.
WOODWORK
Trim and cabinets—stock, Morgan Co. Living room—batten doors.
HARDWARE
Interior and exterior—P. & F. Corbin.
PAINTING
Interior: Ceilings, trim and sash—3 coats oil paint. Exterior walls—2 coats shingle paint. All paint by Pittsburgh Plate Glass Co.
ELECTRICAL INSTALLATION
Wiring system and switches—General Electric Co.
KITCHEN EQUIPMENT
Stove and refrigerator—electric, General Electric Co. Sink—Standard Sanitary Mfg. Co.
PLUMBING
All fixtures by Standard Sanitary Mfg. Co. Soil pipes—cast iron. Water supply pipes—copper tubing.
HEATING
Not included at present.

HOUSE FOR STANLEY IRVIN, WANAKAH, N. Y.

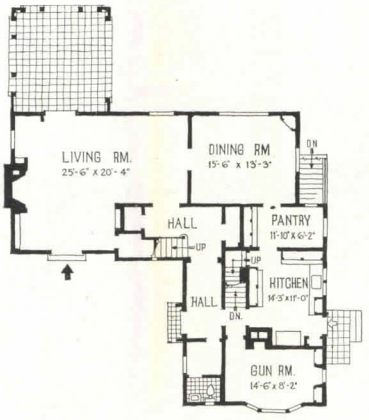
Appleton Studio P

Built on the shore of a lake, and designed for year-round use, the first problem in the design of this house was to arrange it so that it had two fronts. A projecting wing forms a court on the entrance side, with a porch open on three sides, the living room and dining room facing the view over the lake. The wing contains the entrance hall, service quarters and a gun room which is completely private in its location but easily accessible. The most interesting feature of the basement is the enormous recreation room, approached by stairs from outside and by the service stair within the house; the shower on this level is a useful addition. On the second floor the maid's quarters are conveniently placed, and can be completely shut off from the rest of the floor. Bunks in the sons' bedroom provide an attractive way of making the most of the space and include storage facilities underneath. The impression given by the direct, very workable plan and the simple exterior is one of comfort and livability. The cost was approximately $15,000.

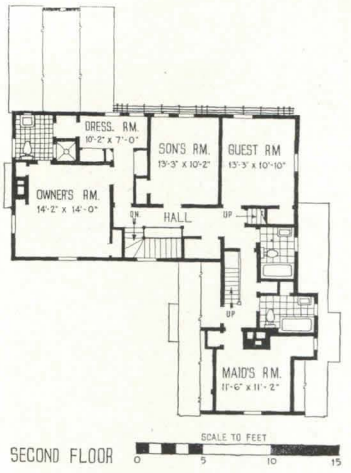
EDERICK C. BACKUS, ARCHITECT



BASEMENT

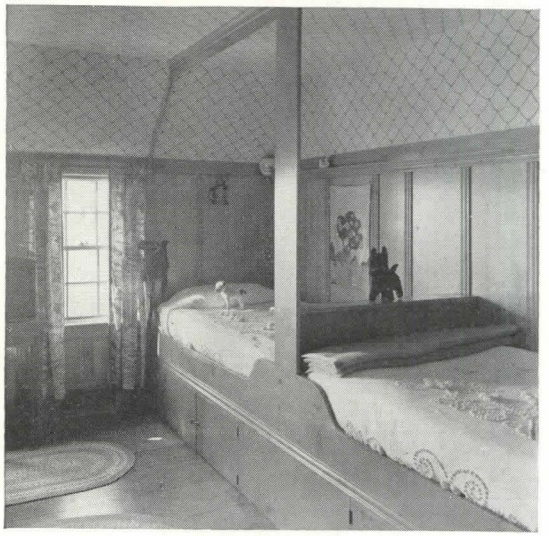


FIRST FLOOR



SECOND FLOOR

ING ROOM



SONS' BEDROOM

ING ROOM

CONSTRUCTION OUTLINE

STRUCTURE

Exterior walls—Creodipt shingles on wood frame, Hemlock sheathing, plaster board lath by National Gypsum Co., and 2 coats plaster.

ROOF

Creodipt shingles, 5 in. to weather.

SHEET METAL WORK

Flashing, gutters and leaders—16 oz. copper.

WINDOWS

Sash—clear white pine stock, double hung, N. S. W. Co., Detroit, Mich. Glass—double strength, Quality A. Screens—wood frames with bronze mesh.

FLOORS

Living room, bedrooms and halls—matched oak, No. 1 common grade. Service wing on first floor—linoleum; second floor—fir.

WOODWORK

All trim and cabinets, except in sun room—Ponderosa pine, to be painted. Doors—Idaho and Ponderosa pine.

PAINTING

Interior: Floors—filled, stained and 2 coats varnish. Woodwork—primed and 2 coats enamel. Exterior: Trim—primed and 2 coats lead and oil.

ELECTRICAL INSTALLATION

Wiring system—rigid conduit in basement, otherwise BX. Switches—lever type.

PLUMBING

All fixtures by W. A. Case & Son Mfg. Co. Soil pipes—cast iron. Water supply pipes—galvanized wrought iron.

HEATING AND AIR CONDITIONING

Warm air, recirculated, filtered and humidified. Gas burning boiler. Hot water heater—automatic gas water heater, W. A. Case & Son Mfg. Co.

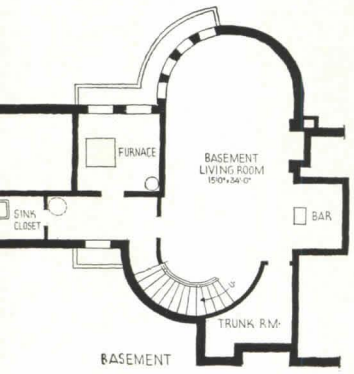
HOUSE FOR BARRY M. GOLDWATER, PHOENIX, ARIZONA

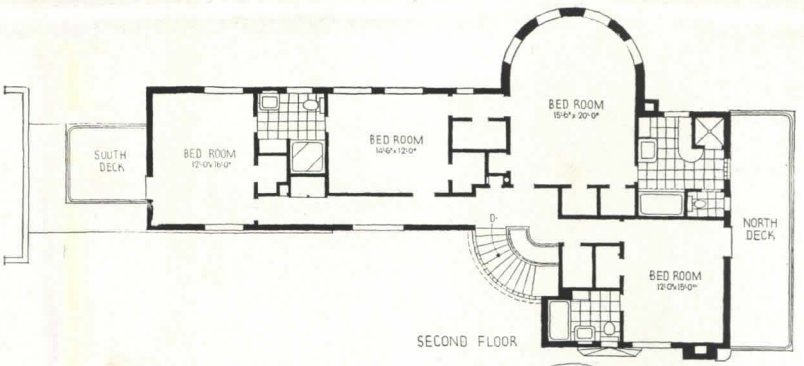
STAIR HA

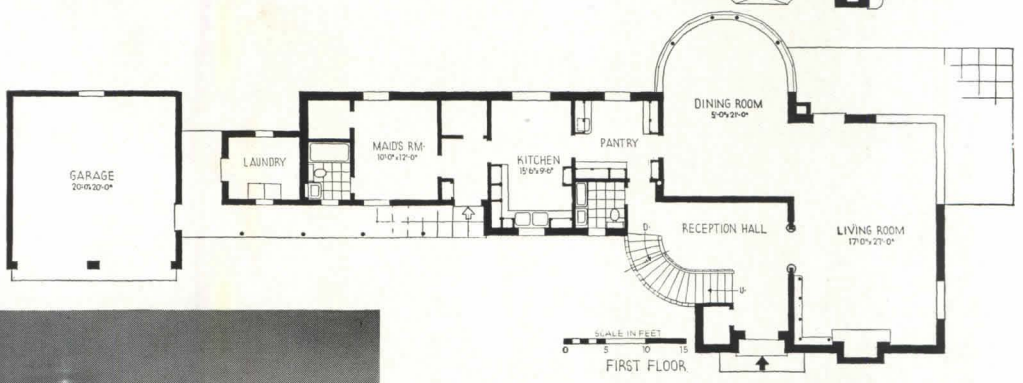
Don R

A curious blend of early Southwestern and modern architecture is revealed in this recently completed residence in Arizona. With small windows as a protection against the intense light, the house has glass blocks where a large opening was desired. Striking on the exterior, this curved wall is even more effective on the interior, and provides ample light for the reception hall. Dining room and living room form one large space, and the services are strung out along the remainder of the first floor. An interesting arrangement is that of the basement living room, whose curved end repeats the shape of the stair. Cubage: 60,000 feet. Cost: $25,800 at 43 cents.

H. GREEN, ARCHITECT







NING ROOM

VING ROOM

Bate Photos

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete, continuous. Cellar floor—cement on earth fill. Waterproofing—10 per cent hydrated lime mixed in concrete.

STRUCTURE
Exterior walls—solid brick, plaster both sides. Interior partitions—stud, plaster both sides. Floor construction—reenforced concrete in service wing; balance—wood joists.

ROOF
Built-up composition

CHIMNEY
Brick, terra cotta flue lining.

SHEET METAL WORK
Flashing—galvanized iron. Leaders—cast iron, concealed.

INSULATION
Roof—8 in. sawdust.

WINDOWS
Steel casements, Truscon Steel Co. Glass—quality A.

FLOORS
Living room, bedrooms and halls—clear oak. Kitchen—cement, linoleum covered. Bathrooms—tile.

WOODWORK
Trim and cabinets—flush mahogany in main rooms; Rezo doors mahogany flush panel, The Paine Lumber Co., Ltd. Garage doors—Overhead Door Co.

PAINTING
Interior: Main rooms—canvased and 2 coats paint. Floor—fill, shellac, 2 coats No. 61 paint, Pratt & Lambert, Inc. Sash—3 coats paint.

ELECTRICAL INSTALLATION
Wiring—rigid conduit. Fixtures—special flush type.

KITCHEN EQUIPMENT
Stove—gas. Refrigerator—electric. Sink—flat rim, 2-compartment; Garbage disposal unit, General Electric Co.

BATHROOM FIXTURES
All by Crane Co., except Standard Sanitary Manufacturing Co. tub.

HEATING AND AIR CONDITIONING
Warm air; 15-ton compressor, complete with blower, controls, etc., Frick Co.; register faces—Waterloo Register Co. Boiler—gas fired. Regulator—Minneapolis-Honeywell Regulator Co. Copper tank—Crane Co.

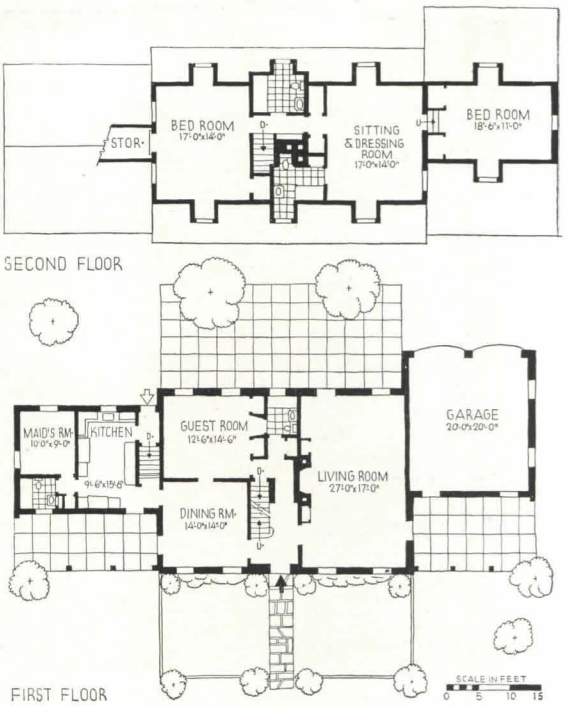
HOUSE FOR JEROME ROBERT CERNY, LAKE FOREST, ILL.

The distinctive quality of this residence, designed by the architect for his own occupancy, lies not in any departure from conventional modes of building, but in the freedom with which a traditional style has been handled. While the house undoubtedly owes much to the attractive setting, it is a most successful handling of broad, strongly horizontal masses combined with detail of considerable delicacy. The contribution of the white fence, with its fan-shaped gate, is all out of proportion to its cost, and is a device that might be much more widely used where the transition from house to grounds might otherwise be too abrupt. The guest room, it will be noted, is completely separated from the other sleeping quarters. The main bedroom gains added living space by the placing of the beds in a comparatively small attic space, leaving the large room for use as a sitting and dressing room. Cubage: 57,000. Cost: $21,000 at 37 cents per cubic foot.

LIVING ROOM

DINING ROOM

GUEST ROOM



SECOND FLOOR

FIRST FLOOR

CONSTRUCTION OUTLINE

FOUNDATION
Walls—continuous concrete. Cellar floor—concrete. Waterproofing—R. I. W., Toch Brothers, Inc.

STRUCTURE
Exterior walls—stone veneer on wood studs, 4 in. mineral wool insulation, plaster ceilings. Interior partitions—wood studs and plaster.

ROOF
Wood rafters, hand split wood shakes.

CHIMNEY
Fire brick and stone.

SHEET METAL WORK
Flashing—copper.

INSULATION.
Outside walls, ground floor, attic floor and roof—mineral wool.

WINDOWS
Sash—double hung, bronze weatherstripping. Glass—quality A, Libbey-Owens-Ford Glass Co. Screens—full length copper mesh.

FLOORS
Living room and bedrooms—oak plank. Halls—X-ite parquetry, E. L. Bruce Co. Kitchen and bathrooms—rubber.

WOODWORK
Trim, cabinets and doors—white pine.

HARDWARE
Interior and exterior—brass.

PAINTING
Interior: Walls and ceilings—white lead. Floors—stain and wax. Trim and sash—white paint.

KITCHEN EQUIPMENT
Stove—gas. Refrigerator—electric, Norge Corp. Sink—Crane Co.

LAUNDRY EQUIPMENT
Sink—Crane Co. Washing machine and dryer—General Electric Co.

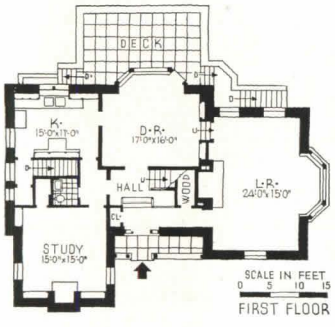
PLUMBING
All fixtures by Crane Co.

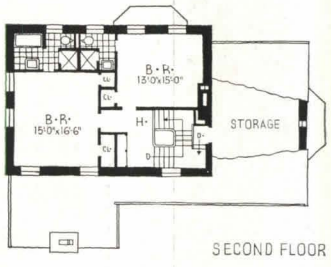
HEATING AND AIR CONDITIONING
System by Reynolds Corp.

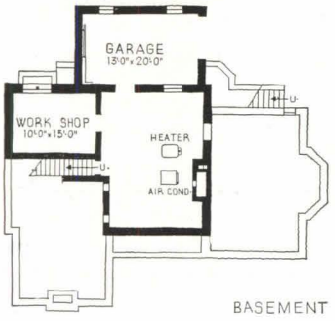
HOUSE FOR R. M. SQUIRES, BRONXVILLE, N. Y.

LIVING ROO

CHARLES H. UMBRECHT, ARCHITECT







This picturesque house is of a type necessarily avoided when low cost is the primary consideration; in this instance, however, the architect was able to develop an interestingly composed irregular plan and to build it in stone. Access to the house is through a small covered porch, into a hall whose central location provides easy access to all ground floor rooms. The hall as designed not only serves admirably as a circulation area, but increases the apparent size of the ground floor by its openness. Two bedrooms, two baths, and storage space are provided on the second floor, and the garage and basement are located at the rear to avoid superfluous excavation. Cubage: 43,626. Cost: $24,500 at about 55 cents per cubic foot.

CONSTRUCTION OUTLIN

STRUCTURE: Exterior walls—6 in. rubble sto waterproof cement coating on interior, 1 in. air spa 2 in. hollow tile and plaster. Interior partitions—g sum blocks, except bearing walls which are hollow t U. S. Gypsum Co. Floor construction—steel joists w concrete slab on metal lath, 2 x 2 in. wood sleeper a double floor.

ROOF: Sheathing boards on wooden rafters, heavy and slate.

CHIMNEY: Flue lining, damper, Peerless Mfg. Corp

SHEET METAL WORK: Flashing, gutters and lead —16 oz. copper.

INSULATION: Attic floor and roof—rock wool, Joh Manville, Inc. Weatherstripping—metal, throughout

WINDOWS: Double hung, white pine. Glass—sin strength. Screens—No. 16 bronze screen cloth on w frames.

STAIRS: Risers and stringers—white pine. Tread oak. Rail—mahogany.

FLOORS: Living room and halls—random width plank. Bedrooms—selected oak. Kitchen—rubber t Goodyear Tire & Rubber Co. Bathrooms—tile, Ame can Encaustic Tiling Co.

WALL COVERINGS: Living room, bedrooms and h —wallpaper, Richard E. Thibaut, Inc. Bathrooms—t American Encaustic Tiling Co.

WOODWORK: Trim and cabinets—white pine. Inter doors—1⅜ in., 6-panel. Exterior doors—1¾ in. wh pine. Garage doors—overhead type.

HARDWARE: All hand wrought iron.

PAINTING: Interior: Ceilings—tinted plaster s float. Floors—filled and stained, shellac and wax. T and sash—undercoat and eggshell enamel, Devoe Raynolds Co.

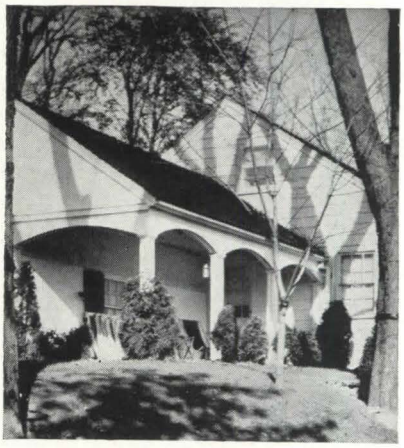
ELECTRICAL INSTALLATION: Wiring system—ri conduit system. Switches—toggle.

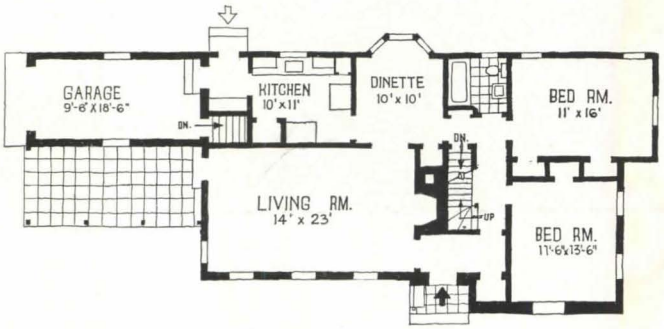
KITCHEN EQUIPMENT: Stove—gas. Refrigerato General Electric Co. Sink—Monel metal, drainbo and splash back, International Nickel Co.

PLUMBING: All fixtures by Standard Sanitary M Co. Shower head and mixer—Speakman Co. Soil pipe extra heavy iron. Water supply pipes—brass.

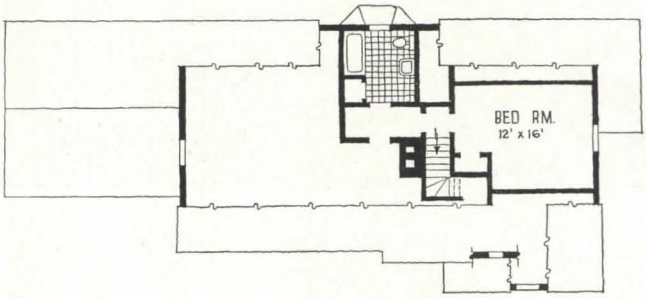
HEATING: Hot water. Oil fired boiler. Radiators valves by American Radiator Co. Regulator—Min apolis-Honeywell Regulator Co.

[OUSE FOR J. B. PETERS, WEST ORANGE, N. J.





FIRST FLOOR



SECOND FLOOR

SCALE IN FEET
0 5 10 15

ARCEL VILLANUEVA, ARCHITECT

his house was built as part of a small residential development a suburban town. The houses are all Colonial, varying from nall cottages to two and a half stories, and range in price from ,500 to $17,000. All were sold on completion. The example own here, while not particularly large, gives an impression of nsiderable size due to its length and to the number of parts nich appear as separate elements. The plan is compact and ell arranged, and has three bedrooms, with the master bedom on the second floor. A porch off the living room is conniently combined with the garage unit. Cubage: 28,000. Cost: 2,500 at about 44 cents per cubic foot.

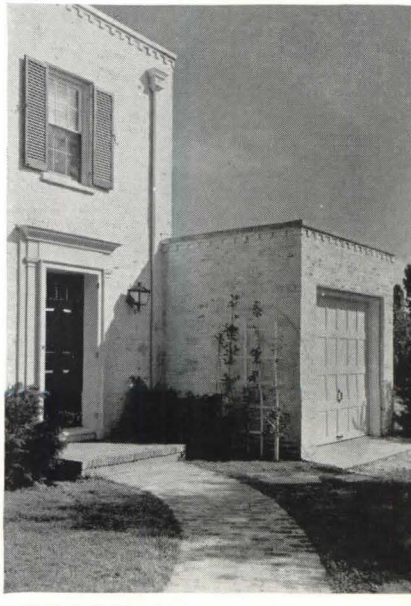
CONSTRUCTION OUTLINE

STRUCTURE: Frame, wood shingles. Front gable—Pennsylvania stone veneer. Interior partitions—rock lath plaster base on wood studs.
ROOF: Wood shingles.
SHEET METAL WORK: Flashing and leaders—copper. Gutters—fir.
INSULATION: Outside walls attic floor and roof—rock wool, Johns-Manville, Inc. Weatherstripping—interlocking zinc.
WINDOWS: Sash—1½ in. double hung wood. Glass—flat drawn, quality A.
FLOORS: Living room, bedrooms and halls—oak. Kitchen—pine, covered with linoleum.
WALL COVERINGS: Living room, bedrooms and halls—wallpaper, W. H. S. Lloyd Co. Kitchen and bathrooms—tile wainscot.
ELECTRICAL INSTALLATION: Wiring system—BX cable.
KITCHEN EQUIPMENT: Stove—gas. Sink—Monel metal, International Nickel Co. Cabinets—Murphy Door Bed Co.
PLUMBING: All fixtures by Standard Sanitary Mfg. Co. Soil pipes—cast iron. Water supply pipes—brass.
HEATING AND AIR CONDITIONING: Direct fired air conditioning, Robeson Engineering Co. Oil burner—Silent Glow Oil Burner Corp. Regulator—Minneapolis-Honeywell Regulator Co. Hot-water heater—automatic, 30 gal. tank.

HOUSE IN WESTFIELD, NEW JERSEY

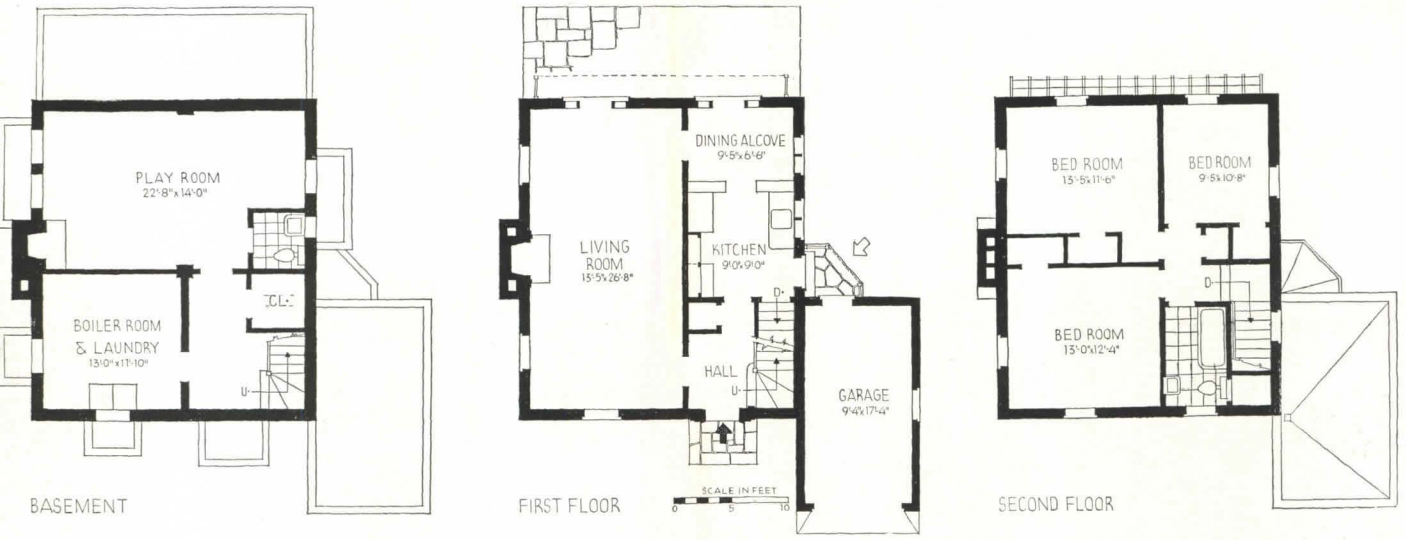
Samuel H. Gottscho Photo

Built as part of a real estate development, this house is based on a design by the architect which received an award in the small house competition held by the New York Chapter of the American Institute of Architects. It is simple and restrained in its design, both inside and out, its severity of treatment contrasting pleasantly with the planting surrounding it. An economical square plan contains a large living room, three bedrooms, and a basement playroom. The garage is located for access through the service entrance. Cubage: 23,000. Cost: $7,290 at about 31 cents per cubic foot.

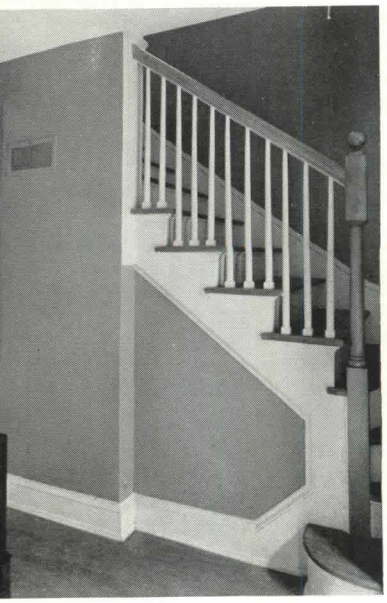


ENTRANCE

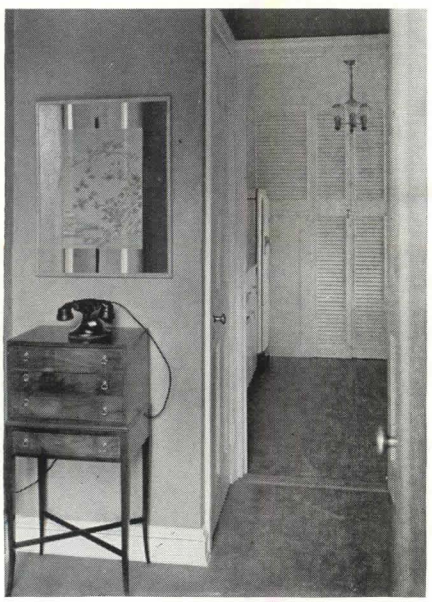
VIGHT JAMES BAUM, ARCHITECT



VING ROOM



AIRS



HALL-KITCHEN

CONSTRUCTION OUTLINE

FOUNDATION
Walls—12 in. cinder blocks, continuous. Cellar floor—4 in. concrete with cinder fill. Waterproofing—2 brush coats liquid asphalt on cellar walls, below grade.

STRUCTURE
Exterior walls—4 in. brick veneer anchored to cement plaster on Reynolds Corp. Ecod lath, no sheathing; 2 x 4 in. stud framing with Ecod lath and plaster for interior finish. Interior partitions and ceilings—metal lath and plaster.

ROOF
Ten ounce copper sheets with standing seams. Deck—three-ply built-up asphalt felt roof.

CHIMNEY
Brick with terra cotta flue lining. Fireplace and damper—Heatilator Co.

SHEET METAL WORK
Flashing—16 oz. copper, lead coated on copings and over doorways. Gutters—16 oz. copper lining. Leaders—copper, rectangular.

INSULATION
Outside walls—Ecod lath with metallation. Attic floor—aluminum foil metallation, Reynolds Corp. Weatherstripping—narrowline weatherstripped window, Andersen Frame Corp.

WINDOWS
Sash—1⅜ in. wood, double hung throughout. Kitchen and dining alcove—wood casement. Glass—⅛ in., quality A.

STAIRS
Main stair—white pine risers and stringers, oak treads. Attic stair—disappearing type, Bessler Disappearing Stairway Co.

FLOORS
Living room, bedrooms and halls—oak. Kitchen and bathrooms—linoleum covered.

WOODWORK
Trim—white pine. Cabinets—knotty pine. Doors—white pine. Garage doors—wood paneled, overhead type.

HARDWARE
Interior and exterior—brass.

PAINTING
Interior: Walls and ceilings—flat wall paint. Floors—stained and waxed. Exterior: Walls—brick painted white.

ELECTRICAL INSTALLATION
Wiring system—BX cable. Switches—tumbler type.

KITCHEN EQUIPMENT
Refrigerator—electric. Sink—double drainboard, Eljer Co.

PLUMBING
All fixtures by Eljer Co. Soil pipes—cast iron. Water supply pipes—brass.

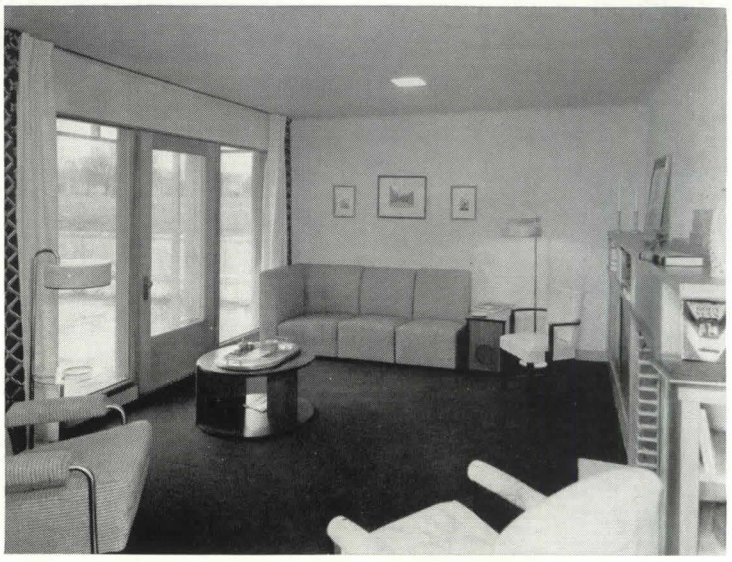
HEATING AND AIR CONDITIONING
Warm air and humidifying, Superfex oil-fired, Perfection Stove Co.

HOUSE IN BATTLE CREEK, MICHIGAN

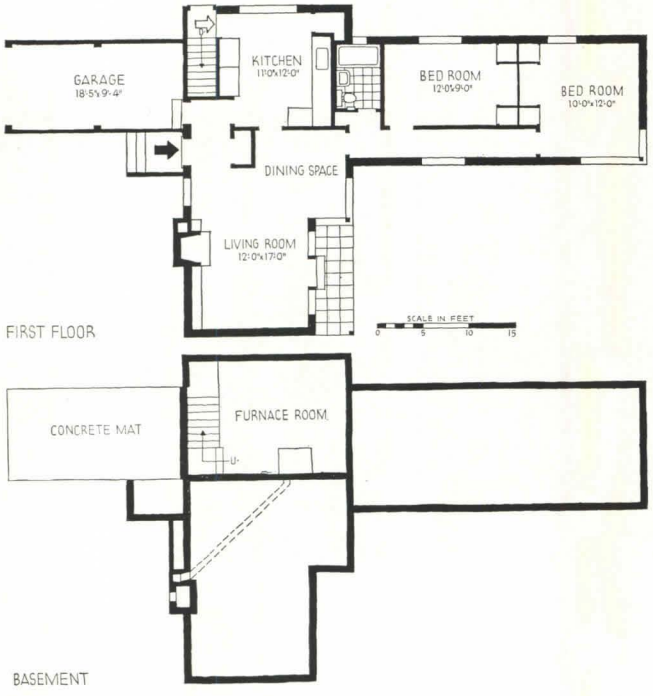
Owl Photo Service Ph

The small house shown here was built for sale. It represents a complete departure from the conventional type of speculative residence and shows a number of innovations in small house planning and construction. Living room and dining room are combined, with a small alcove with windows on both walls receiving the table. The garage opens into an entry at the end of the living room, and bedrooms and kitchen are placed in the extension of this wing. The house is constructed of two four-inch thicknesses of cinder concrete blocks which are separated by two inches of mineral wool. Interior walls are gypsum tile; floors are concrete on bar joists. Except for the roof construction the house is fireproof. Cubage: 18,165. Cost: $6,150 at about 32 cents per cubic foot.

DWARD X. TUTTLE, ARCHITECT, BEULAH SCHERMERHORN, ASSOCIATE



VING ROOM



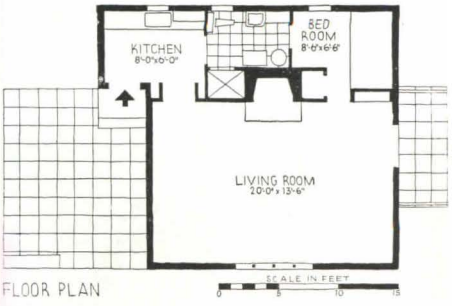
ITCHEN

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete block, continuous. Cellar floor—3½ in. concrete. Waterproofing, outside of walls—Barrett Co.
STRUCTURE
Exterior walls—double wall of 3½ in. cinder concrete blocks, connected by wall ties, 2 in. space between filled with mineral wool. Interior partitions—3 in. gypsum tile, plastered both sides, U. S. Gypsum Co. Floors—steel joists, 2½ in. concrete slab, Gabriel Steel Co. Ceilings—metal lath, U. S. Gypsum Co.
ROOF
No. 1 yellow pine rafters and sheathing, covered with slate coated asphalt shingles, Globe Mfg. Co., Chicago, Ill.
CHIMNEY
Damper—Donley Bros. Co.
SHEET METAL WORK
Flashing, gutters and leaders—galvanized iron, Milcor Steel Co.
INSULATION
Outside walls—2 in.; and attic floor 4 in. mineral wool, Johns-Manville, Inc. Weatherstripping—Accurate Metal Weatherstrip Co.
WINDOWS
Sash—steel casement, frames, storm sash and screens Detroit Steel Products Co. Glass—double strength, quality B., Libbey-Owens-Ford Glass Co.
FLOOR
Living room, bedrooms, and halls—concrete covered with cow hair carpet. Kitchen and bathrooms—linoleum, Congoleum-Nairn, Inc.
WALL COVERINGS
Bathrooms—linoleum, Congoleum-Nairn, Inc.
WOODWORK
Trim, cabinets and doors—white pine, made to detail. Garage doors—Overhead Door Co.
HARDWARE
Russwin, Russell & Erwin Mfg. Co.
PAINTING
All paint material by E. I. duPont de Nemours & Co., Inc. Exterior walls—Kantex, Tamms Silica Co.
ELECTRICAL INSTALLATION
Wiring system—General Electric Co. Switches—Hart & Hegeman. Fixtures—built-in, Kent Lighting Fixture Co.
KITCHEN EQUIPMENT
Stove—gas, A. B. Stove Co. Refrigerator—Electrolux, Servel Sales, Inc.
PLUMBING
All fixtures by Kohler Co. Soil and vent pipes—Alabama Pipe Co. Water supply pipes—National Tube Co.
HEATING AND AIR CONDITIONING
Superfex, filtering and humidifying system, Perfection Stove Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—Ruud Mfg. Co.

HOUSE FOR DONALD D. BICKFORD, SEATTLE, WASH.

Linkletter Studio



FLOOR PLAN

Linkletter Studio

LIVING ROOM

DONALD D. BICKFORD, ARCHITECT

The problem here, to build a dwelling for one person as inexpensively as possible, could hardly be solved for less money than was spent. The living room occupies most of the space, with an interesting arrangement of the other rooms, showing how compact bedroom, kitchen, and bath can be when it is necessary to save space. The bedroom has been planned to hold one bed and a minimum of furniture, but could not be considered cramped. Plain boards take the place of more expensive interior finish. The house was planned for future expansion. Cubage: 8,320. Cost: $1,000 at 12 cents per cubic foot.

CONSTRUCTION OUTLIN

FOUNDATION: Concrete blocks. Fir posts.
STRUCTURE: Exterior walls—frame, sheathing a
paper covered with 6 in. cedar siding. Finish—boi
linseed oil. Interior walls and ceilings—random wid
of knotty cedar, finished with wax.
ROOF: *Wood rafters*, cedar shingles, galvanized i
flashing.
MILL WORK: Casement windows, French doors, c
boards, shelves and door frames—Douglas fir.
FLOORS: Living room—oak. Kitchen, bath and b
rooms—linoleum.
ELECTRICAL INSTALLATION: Wiring and switc
—Trumbull Electric Manufacturing Co.
PLUMBING: Fixtures—Standard Sanitary Mfg
Shower—galvanized iron and concrete. Pipes—wrou
iron.
HEATING: Circulating heater and fireplace.

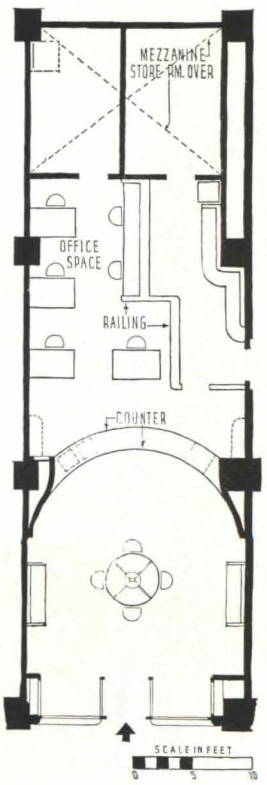
OFFICE FOR WESTERN UNION TELEGRAPH CO.

HENRY DREYFUSS, DESIGNER

PHILADELPHIA, PA.

WESTERN UNION OFFICE

William M. R



A basic principle in chain store merchandising is the adoption of a standardized design which is readily identifiable in any location. Western Union offices fill this requirement, but generally present a cluttered, badly organized appearance which offers the passer-by no inducement to look twice. As an experimental first step in a large program, Henry Dreyfuss, industrial designer, was retained to design an office which might, with various modifications, be suitable for the company's offices throughout the U.S. Its most arresting features are a striking facade, with the usual shop bulkhead omitted, a blue and yellow interior, and a circular desk with which is incorporated the main lighting fixture. Special units illuminate the counter at the rear, and the pads on the counter are mounted on swivels so that the clerk can read messages by merely rotating the pads. The attractive, unified composition marks an important step forward in chain store design.

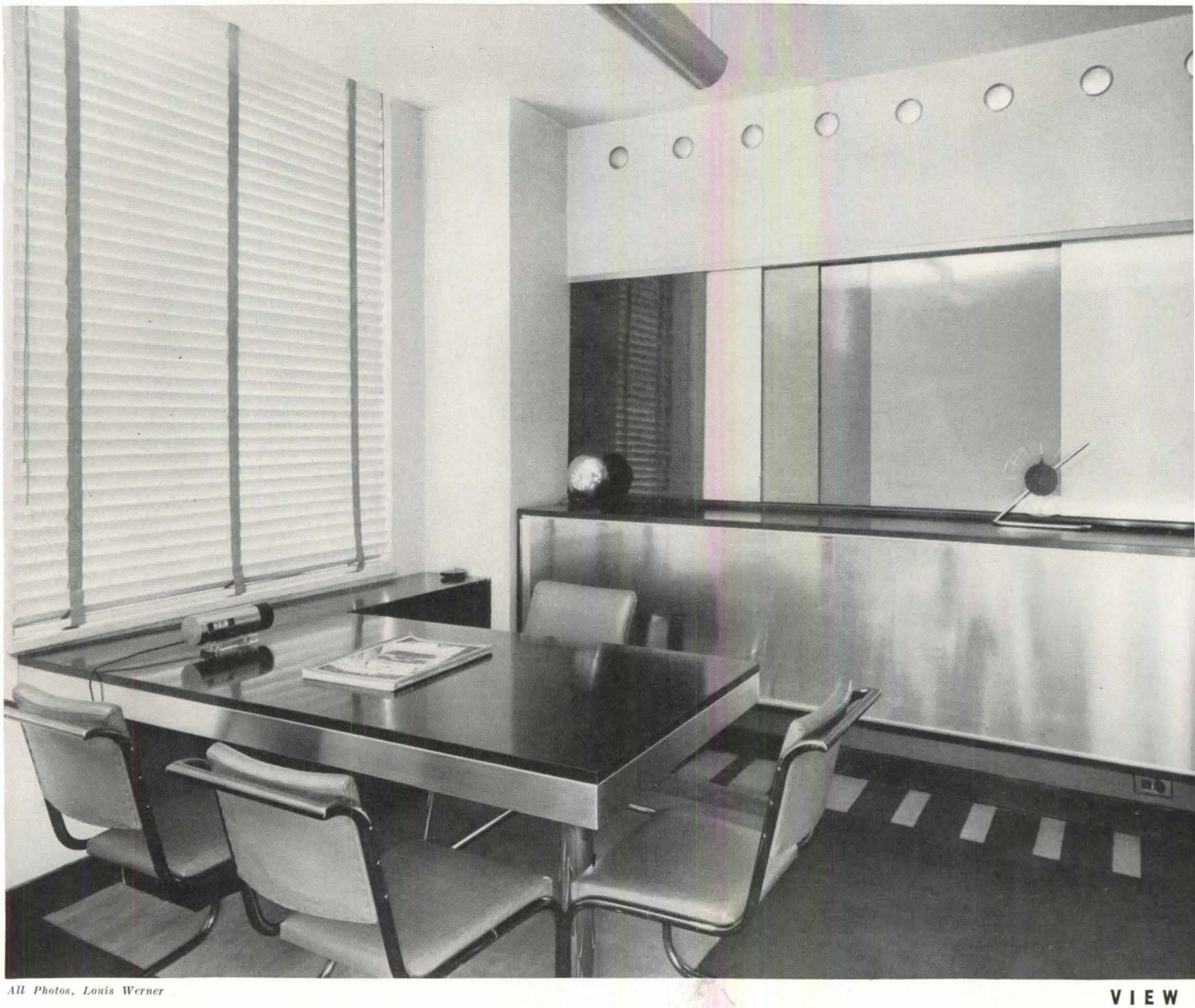
COUNTER: FRONT AND REAR VIEWS

ORK SPACE

CONSTRUCTION OUTLINE

PARTITIONS
Metal lath and furring angles.
WALLS
Plastered, toe space at base of curved wall.
FLOOR AND BASE
Base—blue rubber. Floor—brown asphalt tile laid in 9 in. squares with yellow rubber accents at intervals of 1½ x 9 in.
PAINTING
Lobby walls—blue. Office space walls—yellow with blue dado. Ceiling—white. Doors and trim—blue.
HARDWARE
Stock and special hardware—satin finish aluminum.
ELECTRICAL INSTALLATION
Special circular aluminum switch plate. Electric clock—special hands, numerals of Catalin, concealed fastening.
LIGHTING
Store front—continuous trough lighting, top and bottom of sign; 100 watt lamps 8 in. o. c. with specially designed reflector section.
FIXTURES
Flush recessed louver fixtures in show windows and reflectors. Recessed lens fixtures over counter; hanging glass spheres in office. Lobby lighting—indirect from top of column in center of writing desk; 1,000 watt daylight lamp with reflector.

OFFICE OF GILBERT ROHDE, NEW YORK, GILBERT ROHDE, DESIGNER



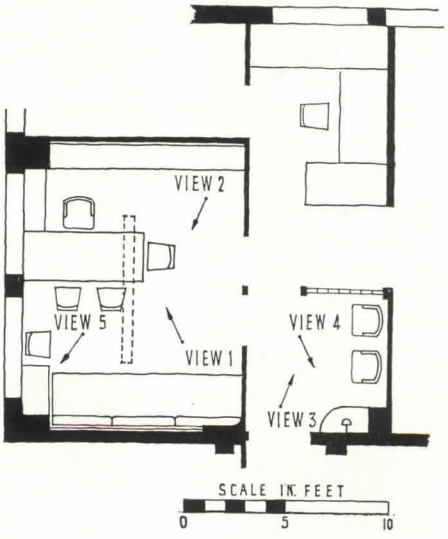
All Photos, Louis Werner

VIEW

Skill in planning within a very restricted area and a convincing use of new materials are demonstrated in this office by Gilbert Rohde, designed for his own use. The largest room is used chiefly for conferences with clients, and contains a large desk of stainless steel with a top of Formica, a long cabinet containing storage space and a refrigerator and liquor cabinet, and a compact radio-phonograph at the end of the settee shown on the opposite page. The lighting, which is totally indirect, is on two circuits so that three intensities of illumination may be obtained, making easy the demonstration of the effect of various light intensities, frequently discussed with clients. The narrow space outside is divided into a small waiting room and a secretary's office, the glass block partition serving to transmit light to the interior. The interesting combinations of materials used in this office are indicated in the construction outline.

VIEW 2.

VIEW 3.



LIGHTING FIXTURE—VIEW 4

RADIO CABINET—VIEW 5

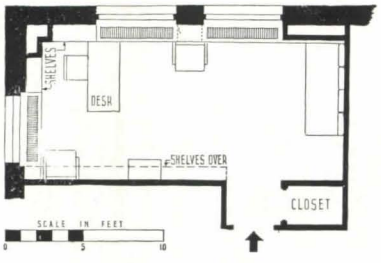
CONSTRUCTION OUTLIN

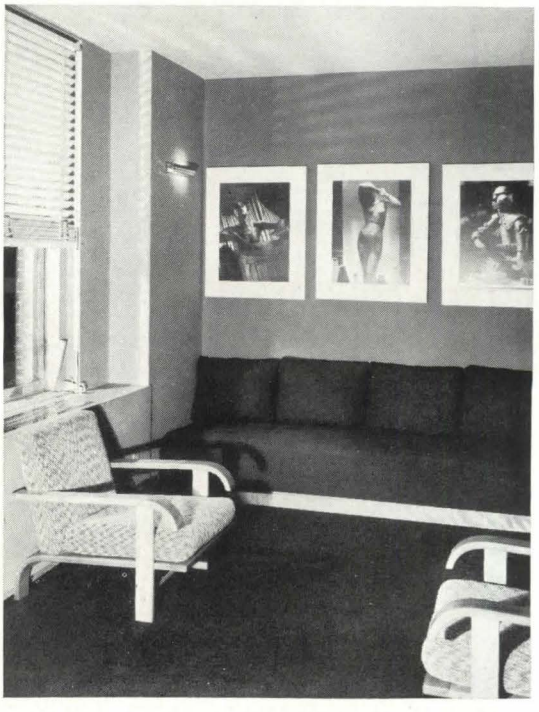
DOORS AND LUMINAIRES
Aluminum—Aluminum Co. of America; alumilite finis
by Philip Sievering, Inc. Flexboard, asbestos facin
on door—Johns-Manville, Inc. Door pulls—transparen
Catalin, American Catalin Corp.
FLOOR COVERINGS
Lokweave carpet, Bigelow-Sanford Carpet Co., In
Rubber flooring—Goodyear Tire & Rubber Co., Inc.
RADIO
Cellophane fabric on radio—E. I. duPont de Nemour
Co. Weaver—Joseph Brandt & Brother.
WALL COVERINGS
Fabrikoid on walls and chairs—E. I. duPont de Nem
ours Co. Formica—Formica Insulation Co. Stainles
steel—U. S. Steel Corp. Subsidiaries. Glass brick-
Structural Glass Corp.
CABINET DOORS
Metal, chromium plated nickel silver—American Nick
eloid Co. Fabrication—Haskelite Mfg. Corp.
FURNITURE
Chairs—steel frame, Troy Sunshade Co. Settee—He
man Miller Furniture Co.
EQUIPMENT
Refrigerator—Kelvinator Corp.

FICE FOR GEORGE BIJUR FLETCHER & ELLIS, INC., NEW YORK

Frank Randt Photos

SSEL WRIGHT, DESIGNER





ıe problem presented here was to design an executive's vate office in a mid-town New York skyscraper, creating impression of comfort and informality without sacri- ıg efficiency. The furniture is stock, made after igns of Mr. Wright. The wall cabinet, open cases, and er accessories were custom built, designed to harmon- with the furniture. Colors are brown for the carpet, e and gray walls, chrome hardware, natural cherry ıiture, blue upholstery, and pigskin accessories.

A TECHNIQUE FOR PLANNING COMPLETE COMMUNITIES PART 2

by ALBERT MAYER

In the first article on the planning of Greenbrook, one of the four satellite towns to be built by the Resettlement Administration, emphasis was placed on the method of formulating the basic program, and the technique used in executing it. First these elements were stated in general, then the program was particularized to show how it was developed specifically for the Greenbelt towns, and finally in more detail for the projected town of Greenbrook. The factors involved in planning the town itself were outlined: Town and Site Planning; Utilities; House-Planning; Architecture. These main headings again were subdivided into the specific items of planning which go to make up a complete job ready to be built. Certain of these items in Town and Site Planning were selected and analyzed to demonstrate the application of the general principles. I propose in this article to do the same for the other divisions of the work. And once again I should like to underline the fact that, while nearly all the specific results or solutions that are arrived at in a changing technology and in a changing society lose their validity with change of time and place, nevertheless the methods of inquiry and formulation do have a more universal validity.

The list of specific items to be discussed in this issue was given on page 28 of the last issue and will not be repeated here. As in the discussion of Town and Site Planning, no attempt will be made to cover the whole job item by item, or to have these articles constitute a manual of procedure. Significant items of general interest will be selected for close discussion, as applied examples of our whole procedure.

UTILITIES

Utilities are simply the means for making possible livable houses in a livable town. But unless the town planners, the site planners, and the house planners are constantly aware of what their decisions mean to the road system, the sewer system, and the water distribution system, the cost of utilities will rise, there will be excessive lengths of road, excessive depths of sewer, unnecessarily large pipes due to difficult gradients. In short, the design of utilities will have been forced into a straitjacket, rather than to have been allowed to flow out of the logic of the terrain. We did not go to the extreme of some subdivisions where the engineer is the boss and the town planner merely goes along; but in all the stages of the major planning the engineer was thinking along with us, constantly checking our ideas in terms of his costs, and advising with us coordinately. We did not in all cases adopt the most economical solution at the expense of important amenity, but when we did not we were always aware of the extra cost involved.

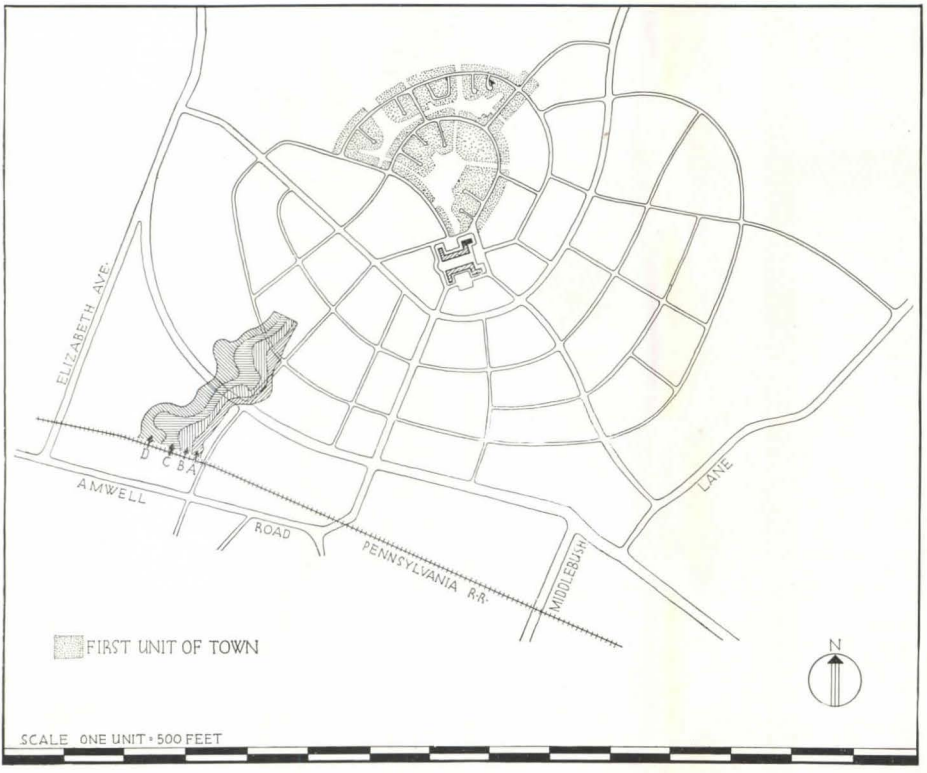
SEWAGE

A specific example of the effect of utilities cost on general design, and of our procedure with respect to it, is seen by referring to Map No. I. Henry Wright and I had wanted to place houses on the hatched areas, which struck us as desirable land. The topography seemed to us to permit it, but the engineers felt otherwise. They prepared the map, showing how much the whole sewer line from there to the disposal plant would have to be deepened in order to include each of the slivers A, B, C, D. For Area A, the line would have to be lowered 5 ft.; for B, 5 ft. more, etc. The extra cost involved for each is noted in the chart, as well as the additional area made available for housing. It will be seen that to make Area A available would involve an extra cost (over the average of the rest of the town) of $480; Area B, of $630; and up to $1,010 an acre for Area D. As the average land cost was only about $300, it was obviously extravagant to include these areas in housing; and they were left as part of the farm belt.

ROADS AND STREETS

The main features of road and street design were discussed under Town Planning. The two points to be discussed here are the theory of road widths, and road and street construction.

1. ROAD WIDTHS. Much more study has been given to the theory of road widths and traffic volumes on major highways and in crowded cities than for smaller communities like Greenbrook. By making it easier for through traffic to go around the town rather than through it, we reduced our problem to its lowest terms: interior circulation within our town. Here again, our planning attempted to subdivide functions so as to achieve maximum traffic safety and minimum paving width and length. Map No. I shows what we did. We laid out:



MAP NO. 1 shows a skeleton of Greenbrook. The upper stippled area shows the location of the first unit. The lower hatched areas are those in which it would be uneconomical to install sewers for reasons detailed on the opposite page. The supporting calculations are given at the right.

	A	B	C	D
Additional Acreage	5.5	9.5	10.7	11.5
Additional Cost at Line	$2,600	$6,000	$11,500	$11,800
Cost per Acre for Area	$ 480	$ 630	$ 1,080	$ 1,010

A. Narrow cul-de-sacs, 18 ft. wide, serving only the houses on their particular lanes—wide enough for two cars.

B. Roads between blocks, probably for local circulation only. These roads are 24 ft. wide (20 ft. plus two 2 ft. gutters). One car may be parked, and cars could still pass each other in opposite directions. Indented parking bays were placed at what were considered crucial points.

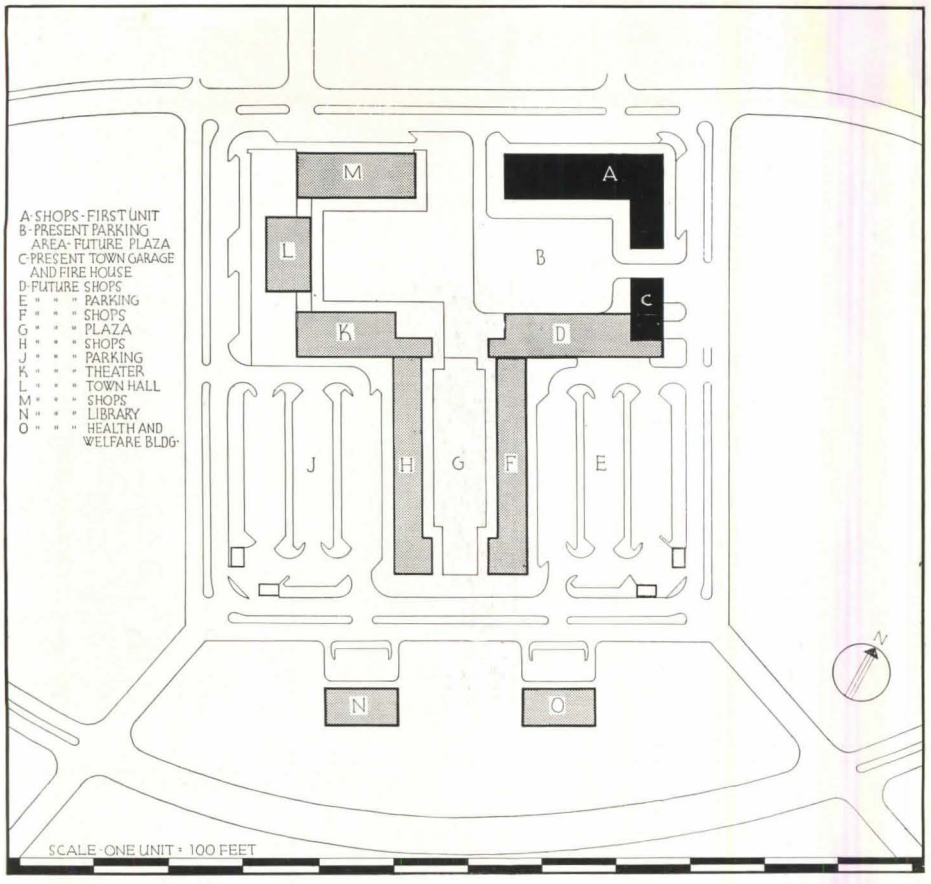
C. Radial roads to town center, and a main collecting or circulatory road through the town. These roads are paved for a width of 34 ft., allowing parking on each side. These roads were conceived as collecting roads. It was felt that, by their directness and additional width, they would naturally attract the traffic trying to get from one part of town to the other, leaving the roads under B for local neighborhood interchange. If our ideas proved correct, we would, by separating local neighborhood traffic from local through traffic, have achieved a saving in the widths of the local roads, greater driving convenience, and greater pedestrian safety.

D. Roads around the town center. It is noted that the major circulating road and radial roads provide a system of circulation that tends to keep traffic that has no actual business there away from the town center. It is seen from the map that this does not blanket the town center or confuse the visitor, because the circulatory road passes quite close to the town center, and the radial roads, although meeting the circulatory road first, lead directly to it.

Generally speaking, the roads immediately surrounding the rectangular town center are for moving traffic only. Map No. 2 (Town Center) shows that we arranged large parking areas near the shops, theater, library, etc. In other words, we again separated the functions of moving traffic and parking. We felt that we had provided ample space and good locations for easy parking, so that there would be no great temptation to clutter up the streets.

Thus our theory of circulation and road widths was not to provide for every conceivable situation, so that parades or truck concentrations could go along any street, but to provide a simple system that would guide traffic along natural ways. The word natural is used advisedly. We wanted to avoid ingenious schemes depending on people doing things in a special way. We thought it would be a more permanent solution to accommodate the natural tendencies of traffic and to mold those tendencies into a logical system.

It will be seen from "Paving Details," on page 128, that we provided extra width of right of way for some roads, so that, in case our premises were not entirely correct, the roads could at a future date be widened without costly or annoying changes to existing houses or lawns. Our normal right of way for 24 ft. streets was 50 ft., but in certain cases we allowed 66 ft.; similarly for the 34 ft.



MAP NO. 2

This map shows the plan of the proposed town center. Note large parking areas B, E, J, near the shopping center, the theater, the separation of moving traffic and parked traffic.

streets the normal right of way was 66 ft., but we established 78 ft. in some cases. While we were confident that our widths were adequate as far as we could foresee requirements, the precaution seemed sensible, especially because it was purely a legal distinction involving no extra expense.

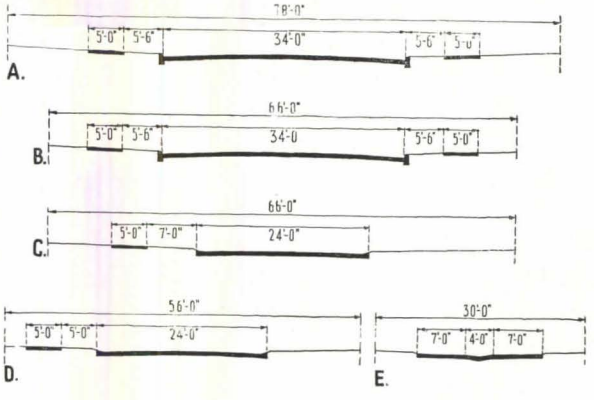
2. **CONSTRUCTION**. There are three matters here worth explaining: the decision to use concrete for roads and sidewalks, the use of curbs versus gutters, and the dishing of the cross-sections of cul-de-sacs.

A. *Use of Concrete*. There were two reasons for using concrete, both illustrating the fact that the result arrived at might be exactly opposite in another case where a somewhat different set of basic conditions existed. In the first place, at the time our project was started the necessity for speed was emphasized. It was important that the various operations of digging utility trenches and installing utilities, building houses and building roads should be as nearly simultaneous as practicable. This meant a minimum time between trench excavation, backfilling, and road paving. It was felt that, where there was a possibility of insufficient previous settling of backfill, a concrete slab would be superior at bridging over any subsequent settlement.

Second, there was the question of cost—first cost and maintenance and repair cost. The figures listed on the next page show that the extra yearly charges on first cost of concrete were more than counter-balanced by the saving in maintenance and sinking fund.

It should again be noted that the cost figures used throughout are our own estimating figures based on our experience, with union wage scales and on current material prices. Also, in making these figures we tried to play safe so that actual cost would not in any case exceed esti-

CROSS SECTIONS OF ROADS AND SIDEWALKS



B. Main connecting and radial roads. Built with curbs.
D. Roads between blocks. Gutters instead of curbs.
A. and C. are the same paved width and section as B. and D., but in certain cases have extra right-of-way for possible future widening.
E. Cul-de-sac. Dished center in place of crown.

nates. They are not actual recorded costs of the Resettlement Administration because the town has not been built.

B. *Curbs vs. Gutters.* On the 34 ft. roads, where higher speed traffic is anticipated, the curb is used as a matter of safety. But on the 24 ft. local streets this did not seem necessary, and it was desirable to permit parked cars to encroach somewhat on the earth shoulders of the roads. There was also a saving involved. Our figures indicated 75 cents per l. f. as the cost of concrete curb, while the excess cost of the 2 ft. gutter compared with the equal area of paved road that would have been required for a road of equal width was only 6 cents—a saving of $1.38 per l. f. of roadway.

C. *Dishing of cul-de-sacs.* Instead of having gutters at each side, cul-de-sacs were drained by dishing the center. As experience indicates that sidewalks may be omitted along cul-de-sacs, this dishing toward center permits walking along the edges in wet weather. The construction is also cheaper than the reverse curve surface of a crown and two gutters in this narrow roadway.

ELECTRIC LIGHT AND POWER

Nothing could more effectively illustrate the economies in the overall costs of shelter that can be effected by large-scale rental undertakings than the indicated savings in cost of electricity to the householder. Purely on the basis of bulk purchase by the town as a whole and distribution to the occupants—for self-generation of electricity was not considered in our particular set-up—a saving of about $12,000 to $17,000 annually is made possible, the variation depending on whether there would be electric lighting only or electric refrigerators in addition. This is a saving of $1.35 to $1.90 per month per house. In the case of lighting only, this $1.35 is a saving of well over half the electric bill. The result is shown graphically on Chart A.

The calculations supporting the savings just mentioned and forming the basis of Chart A are these: first, probable cost of current consumed by houses, by commercial undertakings, and by management (including street and park lighting), were figured on the basis of each consumer buying his own supply from the electric company at the rate applying to him. In this case the utility furnishes the entire distribution system. The totals in money for the different combinations, lighting, refrigeration, etc., are shown on the top half of the chart. The quantities of current per month are shown immediately below Chart A.

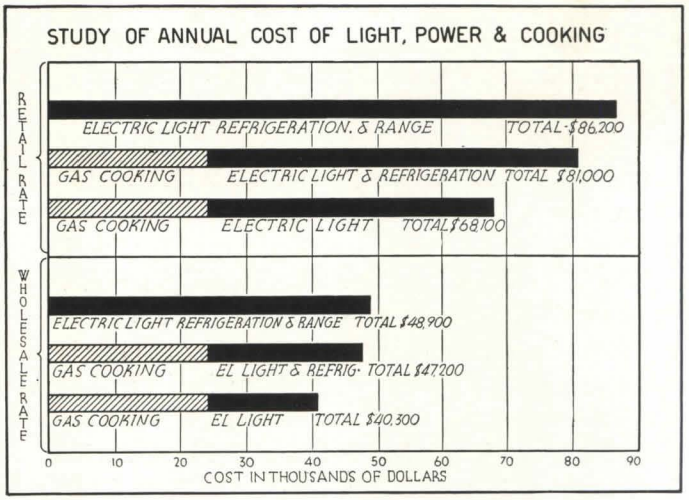


CHART A details the costs of light, power and cooking in Greenbrook. The saving made possible by wholesale purchase is not as great as the chart shows because the use of wholesale power will entail the extra cost of installing a distributing system by the town itself instead of by the utility. The first cost of such a system amounts to $12,500, the annual costs of interest, depreciation, maintenance, and repair to $16,500. This sum must therefore be added to the wholesale cost to arrive at the proper differential.

CONSOLIDATED LOAD SURVEY

ITEM NO.	CONSUMER	METERED	UNMETERED*	
PRIVATE		K.W. Hrs. monthly	K.W. Hrs. monthly	K.W. Hrs. yearly
A—	750 DWELLINGS			
1	Light	22,500	31,050	372,600
2	Light, Refrigeration	52,500	72,450	869,400
3	Light, Ref. and Range	146,250	201,825	2,421,900
B—	COMMERCIAL (Private)			
1	6 Stores (Town)	1,800	2,484	29,808
2	2 Stores (Residential)	450	621	7,452
3	6 Offices (Town)	1,200	1,656	19,872
B	Total	3,450	4,761	57,132
PUBLIC		**METERED**	**UNMETERED****	
C—	MANAGEMENT			
1	Street Lighting	7,350	8,452	101,424
2	Park Lighting	2,500	2,875	34,500
3	Sewage (a) Power	12,217	14,049	112,014
4	& Water (b) Light	100	115	1,380
5	Oil Burners	11,400	13.110	91.170
6	Police & Fire Sta.	225	258	3,096
7	Elementary School	1,500	1,725	20,700
8	Town Garage	210	242	2,904
9	Maintenance Shop	108	125	1,500
10	Apts. Mgt.	1,200	1,380	16,560
11	Incidental Mgt.	1,000	1,150	13,800
C	Total	37,810	43,481	399,648
	Totals A1 + B	25,950	35,811	429,732
	A2 + B	55,950	77,211	926,532
	A3 + B	149,700	206,586	2,479,032
D—	PROJECT TOTALS			
1	A1 + B + C	63,760	79,292	829,382
2	A2 + B + C	93,760	120,692	1,326,180
3	A3 + B + C	187,510	250,067	2,878,680

*Metered amount plus 20% excess use plus 15% distribution losses.
**Metered amount plus 15% distribution losses.

PAVING COST ESTIMATES

(ALL FIGURES EXCLUDE EXCAVATION, SUB-GRADE, ETC., BECAUSE THIS IS THE SAME FOR ALL.)

CONCRETE (6" THICK REENFORCED):	1ST COST	PROBABLE LIFE	MAINTENANCE
1c sq. ft. x 5280'	$1,100.	20 yrs.	$4-5
COURSE MACADAM (4" THICK)			
8c sq. ft. x 5280'	420.	6 yrs.	18-22
COURSE MACADAM (6" THICK)			
4c x 5280'	740.	12 yrs.	15-20

The criterion we used for total annual cost was the result of the formula $I + \frac{F}{L} + M + O$, where I equals annual interest on first costs, F equals first costs, L equals years of life, M equals annual maintenance, and O equals operating costs.

Concrete was the proper choice in our case according to this criterion because its total was the lowest.

Next, figures were made up based on wholesale purchase of all current used in the town and re-sold to the householders, the town installing its own distribution system. As submetering is not allowed in New Jersey, current must be sold to tenants at a flat rate. Research from several sources indicated that under those conditions there would be 20 per cent additional current consumed, to which is added 15 per cent for line losses in the distribution system. The monthly and annual consumptions under these circumstances are shown in the second and third columns of the table; the total costs in money are shown on the bottom half of Chart A. The differences in total costs on the chart are greater than here mentioned, because they are here diminished by the annual depreciation, maintenance, and interest charges on the first cost of the distribution system—as shown in notes on the chart.

Incidentally, the chart clearly shows that, with the existing electric rate structure in New Jersey, and with the comparative cost of gas and electric current, gas is the more economical method for operating ranges in this particular locality even before considering the extra cost of electric ranges.

We found the first cost of an underground distributing system too greatly in excess of the overhead pole system to be able to afford it except in the parks, where park cable could be used in a shallow trench at practically no extra cost.

ARCHITECTURE

The crux of the architecture is the houses. Of course, there is the school, the recreation and community center, the stores, the ultimate town center, the landscaping—all these are interesting architecturally, give more scope as individual cases for architectural virtuosity, and must be satisfactorily worked out functionally and esthetically. But the touchstone of the whole enterprise is the houses, their relation to each other, and the way they build up into a town. This seems to me to constitute the more rigorous problem, one that makes more severe demands on architectural and human understanding, and on imagination.

Even to formulate the elements of the problem, functionally and esthetically, is a difficult job. We do not actually know what our clients deeply want. We know something of the requirements of wealthy people and middle-class people because many of them have built their own houses, and into them they have put their own ideas, gratifying them as far as they could. But the houses our Greenbrook clients live in are either second- or third-hand houses, initially built for the needs of others better placed, or company houses, or houses and flats built by people who never consulted them. Thus, the actual houses do not furnish a direct criterion. Even answers in questionnaires must be used with care because many of the questions place the person in an unaccustomed hypothetical position. The reaction might be quite different when that person is actually confronted with the finished product; and different still after his family has lived in the finished product long enough to know how well it serves them.

I do not mean to exaggerate the difficulties of the problem, or to imply that we felt ourselves powerless. We had our own accumulated experience as architects and as people who lived in houses, we checked on the experience of others both here and abroad, we had the cooperation of practical students like Miss Stanley of the Bureau of Home Economics, we had the really splendid report of the Women's City Club on "Housing for the Family." We visited speculative developments to see what they were doing and had done, and finally, for local data, we had the excellent Whittlesey report, "On Natural Living Tendencies of Industrial Families in the Vicinity of Greenbrook."

What this amounted to was practically a series of interviews and studies with prospective clients, local managers, and real estate people. Its purpose was to get the feel of what was wanted, much as at a higher price level one would spend time in preliminary conferences with an individual client. This report will not be further discussed here, but a list of the subheadings will give an idea of its intimate nature and wide range: Kitchens, Living Rooms, Eating, Laundries, Debts, Storage, Cellars, Gardens, Chickens, Livestock and Dogs, Porches, Automobiles and Garages, Fuels, Single Workers, Miscellaneous Notes.

What sort of houses were we trying to design? What specific purposes were they to serve, and how would they serve them better than what was available? One might answer such questions as to function abstractly; that the house is a machine for living, or that the home is the cradle of our institutions, and develop other abstractions from these. Actually our thinking was a good deal more specific. In the plans adopted, shown on page 133, we tried to satisfy as many specific functions as we could consciously define. In order not to be distracted from discussion of the plans, it is best for the moment to assume certain basic decisions as arrived at, and to see how the plans based on those decisions met the functions we set up. We, therefore, temporarily assume such decisions as semi-central oil-burning heat, wood frame structure, two stories for row houses, etc., and indicate our reasons later.

SATISFACTORY FAMILY LIFE

Elaborating, this function may be translated thus: houses satisfactorily usable over the maximum period by the same family, and arranged for minimum labor. We

vanted to provide houses where a new baby or growing children would not immediately put such a strain on he satisfactory functioning of the house as to cause a quick turnover. On the other hand, we could not afford to provide an excessively large house which the family would grow into, because that would involve a strain on its exchequer, would mean excessive cleaning and excessive heating costs. This general statement establishes two criteria: A. Satisfactorily usable over maximum period by the same family. B. Minimum labor.

A. SATISFACTORY USE.

Living Room. The problem here was found to be completely different from that of a city apartment, where it s desirable not to pass through living room to bedrooms, because the former is often used for sleeping. We discovered that the living room was scarcely used at all, only or "occasions," such as marriages and deaths, and as n abode for the rubber plant. It followed that the stairs ould be in the living room, and in fact that it might be lesirable because the family might thus be induced to use he room more. However, it will be noted that in only one lan of all those adopted must the living room be crossed liagonally to go upstairs. Thus the living room is not imply a corridor as in so many low-priced houses. The iving room need not be very large. However, the principle was followed in Greenbrook that the greater the umber of bedrooms (i.e., the larger the family), the arger the living room.

Kitchen-Dining-Living. No one has yet satisfactorily nswered the question as to the relative desirability of large dining-kitchen, and a smaller kitchen with dining-space in living room. Our solutions were:

1. Large dining-kitchen, in most cases.

2. Smaller kitchen for food preparation only, sometimes with space for two or three people to eat, plus ining space in the living room. In many cases where this olution was adopted, the dining space could be put into he kitchen by simply shifting one partition if our guess as wrong (p. 133, Plans C-1-1, C-2-1, C-2-9, C-3-9).

We recognized that a prime reason for a large kitchen as that it allowed children to play under the mother's ye. Hence in all cases of small kitchen, the living room pace adjacent could be overlooked through the connecting door (e.g., Plan C-1-1, C-2-1, C-3-9), or through the erving-window (see Plan b, C-2-6, on p. 132).

Sizes of Rooms and Flexibility of Occupancy. Our one-edroom house (C-1-1) could accommodate a married ouple, and the same couple with one or two children up o the age of, say, 5 years—or a minimum period of bout seven years. The dressing-room off the bedroom an be left as is for a couple of years after the baby arives, with only a curtain between. Later a partition may e necessary. We also designed a small number of two-tory flats and three-story apartments which provided accommodations more tightly suited to the family of two. They consisted either of living room, bedroom, kitchen, bath, or living-bedroom, kitchen, bath. They also provide a different *type* of living, one with less domestic responsibility; the flat with garden being halfway between the house with its own cellar and garden, and the apartment without either.

In most cases our practice for 2-bedroom houses was to make the second bedroom large enough for two beds (e.g., C-2-1, C-2-9, C-2-6b). These houses could accommodate 3, 4, or 5 people. Here again a family could grow to the point where separation of the sexes was desirable. The three-bedroom houses had two bedrooms for twin beds, and one for double bed.

The extra first cost and operating cost entailed by this flexibility of occupancy was very small. In the case of the conversion of dining alcove space from living room to kitchen, it would be only a couple of dollars for a carpenter, for our partitions were of stud and plywood. In the case of the extra dressing-room space in Plan C-1-1, and the extra bedroom size, the extra cost in rent per room for first cost and heating-maintenance costs over the minimum bedroom figured out at less than 10 cents per room per month. We also felt the extra area requiring cleaning was negligible.

B. MINIMUM LABOR.

Kitchen Layouts (shown and discussed in detail later) were made for minimum waste motion. This involved 1) proper routing of processes, so that refrigerator and storage space were nearest the delivery door, and the range nearest the dining area, and 2) placement of fixtures opposite each other, and not strung along a wall.

Entrances from Exterior. In practically all cases we were able to arrange it so that from one front entrance the living room, kitchen and cellar could be entered independently (see Plan C-2-1, C-2-6b, C-3-3, B-3-5, B-4-1). This minimizes worry as to locking doors, minimizes heat losses, minimizes the number of halls to be cleaned. Also, in practically all row houses, we were able to provide a rear garden entrance connecting to an interior cellar stair without passing through the living room, so that an exterior cellar stair, with its extra first cost, was avoided (e.g., C-2-6c, C-2-9, C-3-9, but not C-2-6d or C-3-3).

Minimum corridor space. Most plans had an absolute minimum of second floor corridor, just enough to obtain the necessary doors to rooms (see C-1-1, C-2-1, C-2-6b, B-3-5, B-4-1). In no case was there an appreciable waste of space in corridors or excess closets.

2. ORIENTATION.

The problem of satisfactory orientation of houses is complex. In the first place, there is not so much objective data that any hard and fast rule can be laid down. Again,

people differ in their preferences for living. But so far as we had the facts we did place high importance on orientation for sunlight and prevailing breezes. Of course, we wanted to avoid main rooms facing north, and so receiving little winter sun. Depending on local data and on some orientation studies made by Henry Wright at Columbia with his Heliodon, we also determined to avoid northwest orientation, which in this latitude is hot in summer and cold in winter. The bitter winter winds here are from the northwest. There was also evidence that the east-west orientation, much favored in German practice, was not so desirable here with the hot western summer sun. Our conclusion was to use south and southwest orientation as far as possible (prevailing breezes are from the southwest), where all main rooms could be so accommodated. In three-bedroom houses we had a maximum of one of the bedrooms facing north. One reason for using the solution of dining space off the living room instead of in the kitchen was to get through ventilation and south light in the living room (e.g., Plan C-1-1 when used on the south side of a street).

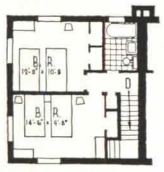
The further question arises: What are main rooms? In higher-cost houses the kitchen is not a main room, and generally the masters' quarters are favored at its expense. But here the question is debatable—the kitchen is certainly an important room. We gave it favorable orientation in most cases. In some cases we took the same house and turned it two ways. House C-3-3 has the whole long dimension of the living room and two bedrooms on the south, with kitchen on the north. We also used a variation, turning it through 90° with the narrow dimension of living room facing south like the kitchen.

Where streets run east and west, and houses are therefore on north and south sides of the street, different designs are required for the two sides if rooms are to be ideally oriented for sun. House C-2-1 is practically perfect for orientation when it is located on the south side of a street, but would not do at all for the north side. For the north side we designed C-2-9 where all rooms but the kitchen face south. This was a useful house where the view was north, for the living room had a north window as well. House C-3-9 (3 bedrooms) was used on the north side of the street, supplementing C-3-3 which were satisfactory for all other positions.

On the other hand, we had houses which could be turned in any direction, and the orientation was still satisfactory, though not ideal. House C-2-6a could be used on the south side of the street—here living room and both bedrooms faced favorably. Turned through 90° it was still a good south side house, with living room, kitchen and one bedroom facing south. It worked well when its exposures were east and west. It could even be used on the north side of the street with the living room and one bedroom getting southern exposure, but the kitchen and one bedroom in that case had northern exposure. C-2-6 was our most frequently used 2-bedroom house. It was good for orientation, it was economical, and, with minor variations shown on Plans C-2-6b, c, d, it filled many different family habits and needs. We also used House C-2-1 turned through 90°, the deep way, with the entrance on the narrow side. It was more economical in first cost and heating cost due to 16 l. f. less of exposed wall. So used, it was reasonably satisfactory for any orientation, but not perfect in any.

For houses with garage, B-3-5 gave practically ideal orientation on the south side of the street. Even the one north room had eastern exposure as well. This was true whether it was used as an end house or a row house. We were not successful in devising an equally economical and satisfactory house-with-garage having equally good orientation for the north side of the street and, therefore, placed the necessary proportion of this type house on the south or east side of a street. B-4-1, a four-bedroom house with garage, worked satisfactorily in any location. When on the south side of the street, no bedroom had purely northern exposure.

VARIATIONS ON A HOUSE PLAN



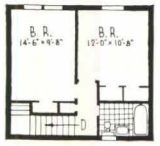
SECOND FLOOR

BASIC PLAN

a.

b.

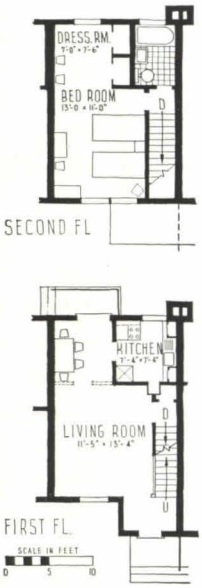
c.



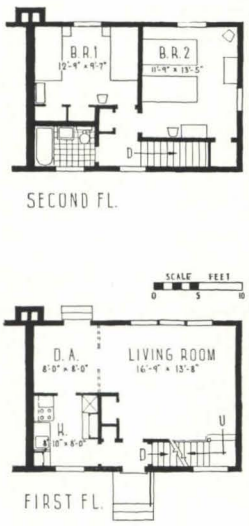
SECOND FLOOR

d.

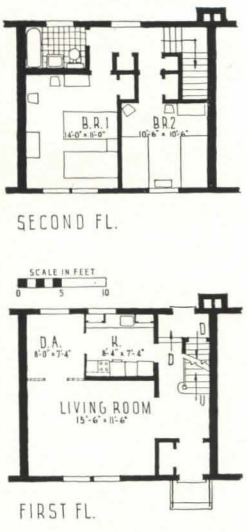
HOUSE C-2-6, in various arrangements, to suit various requirements, *and* as either end or row house. All four houses have same overall dimensions and same second floor plan. In **b.** there is smaller living room and built-in porch. In **c.** there is dining kitchen and convenient rear exit from kitchen. In **d.** there is perfect southern orientation for living room and two bedrooms. Kitchen overlooks main entrance and path.



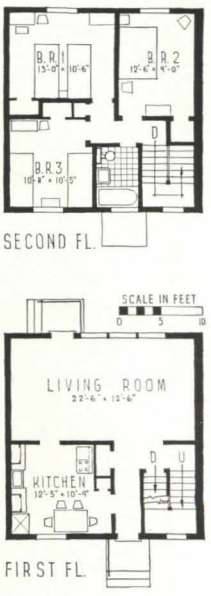
TYPE C-1-1



TYPE B-2-1 & C-2-1

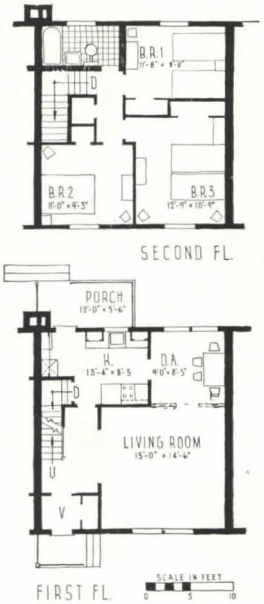


TYPE B-2-9 & C-2-9



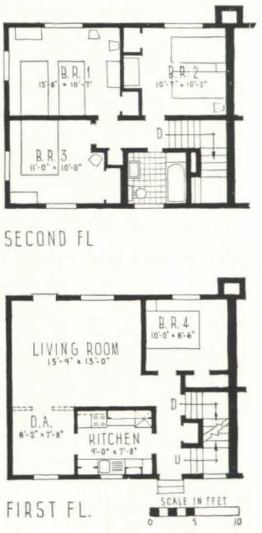
TYPE B-3-3 & C-3-3

TYPE B-3-5

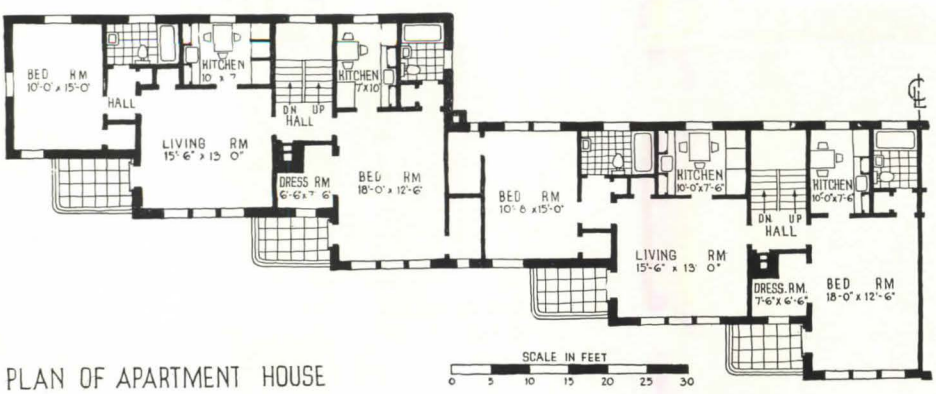


TYPE B-3-9 & C-3-9

TYPE B-4-1

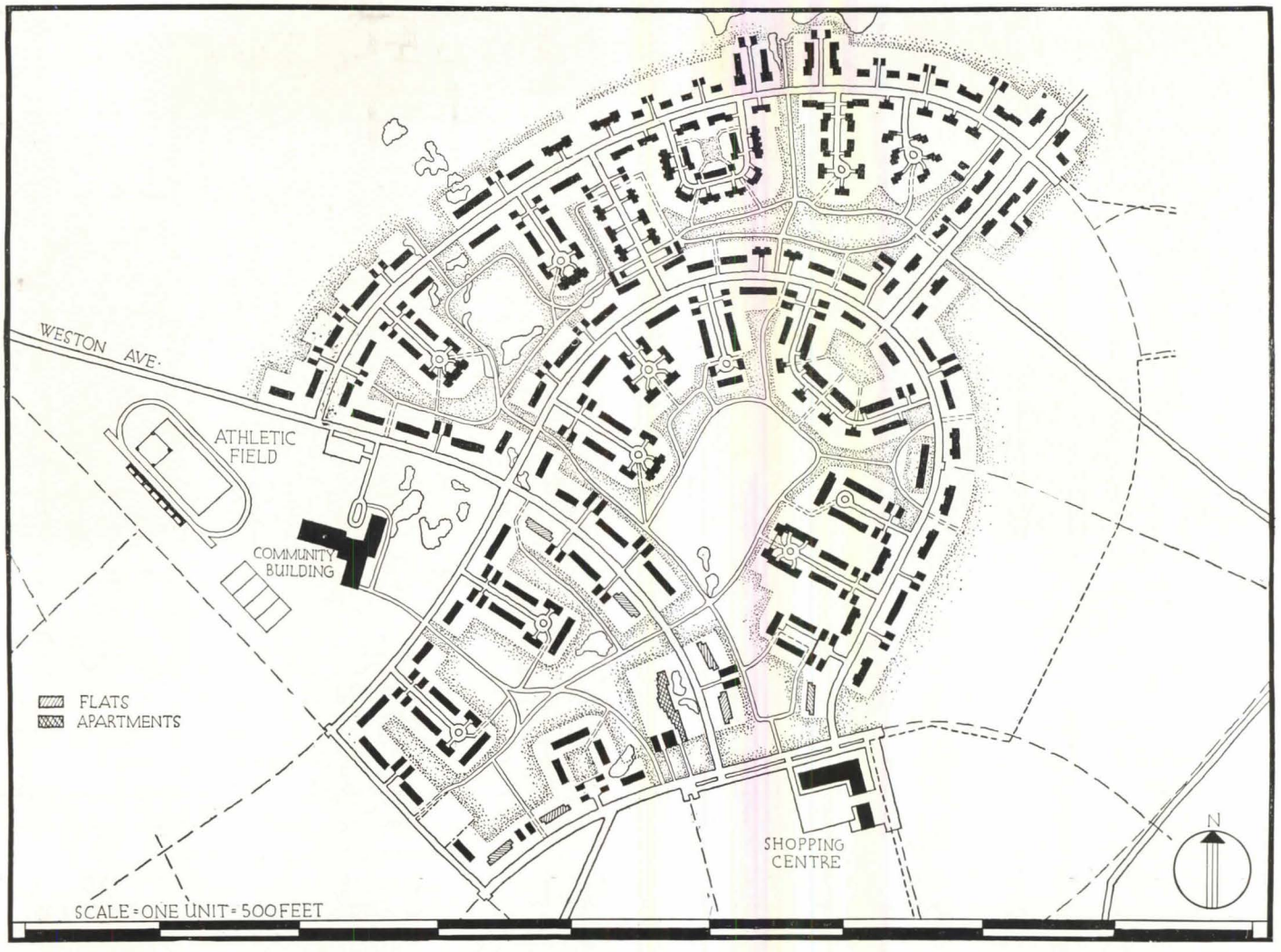


TYPE B-4-2 & C-4-2



PLAN OF APARTMENT HOUSE

EIGHT BASIC PLANS designed for the Greenbrook project. They are discussed at length in the accompanying text. To the left is one-half the apartment house, to be used both for those who might not want the responsibility of house and garden, and for more transient occupancy as industries started to come into the town.



MAP NO. 3 shows the house layout of Greenbrook. The unit at the upper right-hand corner (Block A) is pictured on the next page. The land coverage is higher nearer the center of town. The elevation of the four center houses on its south-bounding street is shown on page 138.

3. ECONOMY.

We sometimes by choice adopted solutions that were not the most economical, where other gains seemed to outweigh extra cost. For example, while most plans had the bath directly over the kitchen, Plan C-2-9 did not. But we felt it was worth adopting because it solved certain problems of orientation and view better than any other we could devise. In this case, the extra cost involved happened to be quite small because of the very small piping offset. Again, Plan C-2-1 used the wide way has more exposed wall than alternative 2-bedroom houses, but it had great advantages of amenity. Wherever we could, we placed a window in the stairway on the second floor corridor though it required extra heating surface. Here, as in every other decision involving windows, we had the chart of heat losses (see page 140), and knew exactly what each extra square foot of window and each extra lineal foot of exterior wall or of terrace roof added in cost.

GROUPING. In grouping houses, it was found most economical to use an even number for each row unit. Utility lines to the street could always be twinned, with the resultant saving in plumbing lines and excavation.

Architecturally, also, this is preferable, for uniform or rhythmical spacing of windows and doors is naturally attained. With an odd number of houses it is either not attained, or attained only at the expense of doing violence to the proper relation of the interior layout.

The average group unit was four houses. Actually there was a small number of one-story detached houses (see Plan A-2-2, page 137), six on one cul-de-sac in Block A, and groups of two, four, and six houses. It has been shown in the previous article that by adopting the row house in groups of four average, we saved some 90 cents per room per month in rental. If we had used an average of six houses to a group, the saving would have been about 11 cents more per room.* As this difference was reasonably

*The reason of course is that in every group there are two end houses which still have three exterior walls. The more interior row houses there are with only two exterior walls, the less is the influence of these excess walls. The extra savings decrease progressively; and beyond six, they become quite small; beyond eight, negligible in terms of room rent. This comparison is based purely on distribution of houses, not on any changes in density or houses per acre. The differential rental costs for variation in densities were analyzed in the first article.

MODEL OF BLOCK A

small, it was a matter of judgment whether to have used an average of four or of six. We felt that it was important not to over-urbanize a community set in the open countryside as Greenbrook was. Map No. 3 shows the layout of house groups for our first unit of 750 dwellings.

JOB CONDITIONS: Maximum speed and WPA labor. Both these requirements played a part in determining materials used. For one thing, any new materials were ruled out which were not definitely in production in numerous plants. We also ruled out plaster, and as much of the wet trades as possible. The drying period is too long, and if the quality of mechanics is not satisfactory, nothing is more disreputable than poor plastering. In any locality there is generally a supply of carpenters reasonably good at the traditional carpentry jobs. This was a contributing reason for the final adoption of wood frame construction, also for the adoption of plywood for interior walls. In addition, having decided against plaster interiors, we eliminated stucco exteriors, for this meant elimination of two trades, and consequently a simplification of the job.

VARIETY AND STANDARDIZATION. It may be considered that we had too many plans for maximum economy. We used seventeen types in all. We were to have 750 dwellings, of which 80 were to be in flats or apartments. This left 670 houses. As all were to be built within a short period, there were plenty of houses of each type so that the men would have their "hand in." Further, the constituent parts of our houses were standardized. For instance, in all the types we used the same windows —four sizes in all—and three door-sizes. Though the shapes of kitchens varied, we were able to repeat our layout of cabinets in all the houses. The standard economical layout of bathroom and roughing dimensions was the same in all except a very few of these 670 houses.

We adopted as many plan types as we did for two reasons. First, there was the question of orientation already discussed. Second, we were not certain enough of what would most appeal to prospective occupants. Possibly when enough good housing is built we shall have enough accumulated evidence so that the number of types can be much reduced. Personally, I doubt it. I believe that the answer lies in standardization of constituent parts, and in developments sufficiently large-scale to embrace enough of each of the various types to achieve the maximum economy.

ESTHETICS OF DESIGN. The underlying basis motivating all the design was that we were building a community, a town, with its own characteristic life and civic spirit. What actuated our thinking was how the houses built up into groups, and how the groups of houses and the public structures built up into a town. We thought in terms of streets, vistas, unity.

This leads to very different results than the customary premise that every house must appear to stand out and identify the individuality and prestige of the occupant, though the houses are fundamentally similar. This same pseudo-principle controls both single houses built by single owners and subdivisions by one builder for single owners. This craze for individuality results in numerous hand-me-down styles, including the half-timbered "Tudor," the Spanish, the Norman, the Colonial, the Cape Cod, and results in houses of stone-brick-wood-stucco, mixed in various proportions, and in multitudinous gables. There is no underlying principle but heterogeneity and diversity. In such work there can be no unity, no cumulative impression.

It is precisely this unity, this continuity that we were

seeking. We wanted to translate into architectural terms the community of interest to the people of our town. People are not independent of each other, nor independent of the community in which they live. One family is not living in the sixteenth century and another in the eighteenth; an Italian family in a Tudor house and a Polish family in a Spanish house. They were all to live in Greenbrook, an American town of the twentieth century.

In our sketches and our models we, of course, considered the individual house and the individual group. But we also considered the cul-de-sac and the street as a unit of design. The moment one thinks in these larger terms, the bugaboo of standardization becomes a boon. The eye is not interrupted by monotonously labored tricks, but is carried along in the rhythm of repeating elements of windows, doors, roof lines. Instead of every house being emphasized separately so that in the end there is no emphasis at all, we tried to pick significant places for emphasis—the end of a vista, the important intersections, the points of high elevation.

Considered in these terms, there is no need to torture the interior for the sake of the exterior. Windows can be placed where they best serve the needs of the plan from the viewpoint of good lighting, ventilation, and furniture. They need no longer be placed inappropriately, either for artificial symmetry or for strained picturesqueness. The essentially economical rectangular form of the house need not be tricked up with needless breaks or ornamental effects. The setting of house groups with respect to each other fulfills the necessities far better and more characteristically. In short, there results an architecture of simplicity which is not a pared-down version of competitively snobbish middle-class houses, but is in itself something more distinguished and significant than the competition of pseudo-styles. This is nothing new or clever, but is simply the same principle that has underlain the good community architecture of any period. It is true of the medieval parts of continental towns, it is true of such villages as High Wycombe and Ditchling, and of such cities as Bath and Edinburgh in Great Britain, it is true of the unspoiled New England towns.

Such a conception gladly avoids the "picturesqueness" of a series of houses in various borrowed styles. The elements making for good architecture in our time, or any other time, include careful consideration of the relative placing of groups of different lengths and different masses; exploration of the possibilities of the best vistas; exploitation of the changing vistas of the curving streets; the study of the landscaping and the house architecture together; and maximum use of existing trees and natural features. This is architecture as contrasted with exterior decoration. How well this concept would have succeeded in Greenbrook we do not know. Some photographs of models are shown on pages 137 and 138 of detached houses, of house groups, and of houses grouped in a lane.

THE PLAN FACTORS

This discussion of house architecture has been mainly directed to plans and houses as finished products, to the question of how well they performed certain requirements of use, economy and appearance. It is appropriate now to select some of the major problems which had to be formulated and analyzed in order to arrive at the final houses. Of course, these studies were made before or at the same time as plans and elevations, but the presentation here is in the opposite order for the sake of clarity in presentation.

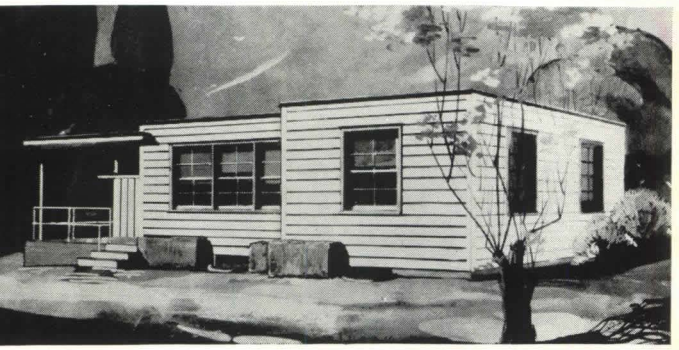
1. Heating system.
2. What are minimum room sizes?
3. Determination of percentages of houses of various sizes.
4. Determination of percentage of garages.
5. Flat roofs and sloping roofs.
6. Kitchen layouts.
7. Structural system, materials, insulation.
8. Plumbing economy.

I need hardly say that this is only a partial list, but the items selected are possibly the most interesting, and some of them are generally agreed to be the most controversial, so that reasonably full analyses are worth presenting.

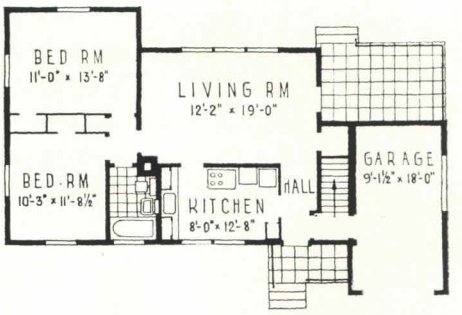
HEATING SYSTEM

The heating system selected affects the nature of the design at all points. Type of fuel determines whether fuel delivery governs maximum distance of houses from roads, and whether ash handling is a problem; type of distribution affects the shape of the house, and in a measure the number of houses per group; the heating system affects first-cost economy; and the cost of heating is one of the major operating costs. It affects comfort and convenience, for the degree of refinement and type of performance of the system determine the uniformity, quality, and distribution of the heat; also the method of heat production determines the degree of effort, if any, that the householder has to expend in producing heat for daily use.

Preliminarily, house heating must be considered as part of the general interrelated problem of power production, which includes house heating, hot water, cooking, lighting and power. It is quite likely that central production of light and power, with heat and hot water supply as a by-product, would be the most economical method for total over-all cost, but it was not considered here because of the size of first-cost investment. Current for light and power was to be purchased, as already described. Likewise, for the minimum heating standards we agreed on, production of house heat from any form of kitchen stove was out of the question. Studies showed that gas was the fuel that should be adopted for cooking in this locality, also that it could not compete for the production of heat and hot water. Hence our detailed studies dealt with the two items of heat and hot water segregated from the rest.

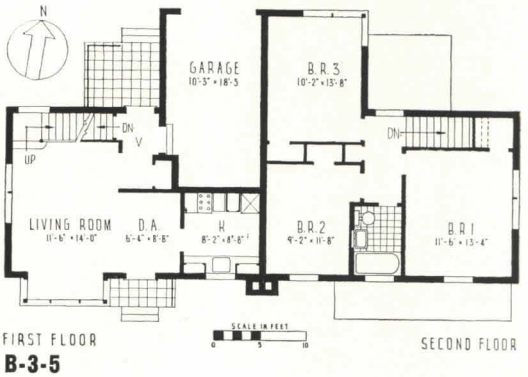


ONE-FAMILY HOUSE — GARDEN ELEVATION

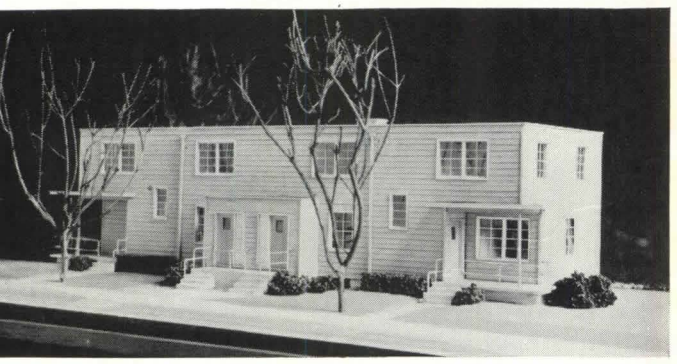


FLOOR PLAN
A-2-2

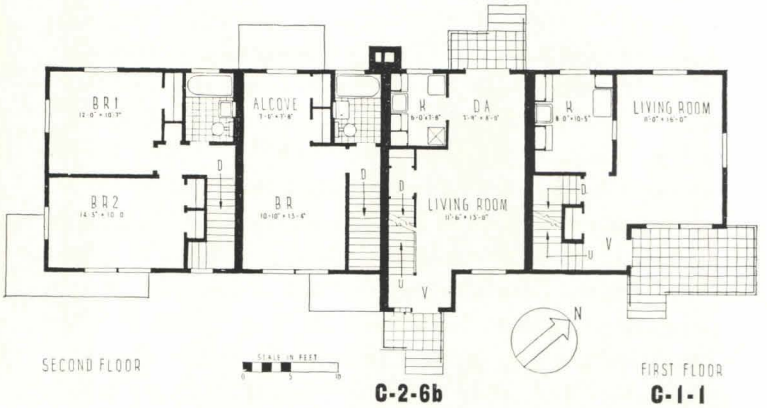
TWO-FAMILY HOUSE — GARDEN ELEVATION



FIRST FLOOR — SECOND FLOOR
B-3-5



FOUR-FAMILY HOUSE — STREET ELEVATION



C-2-6b **C-1-1**

There are three interrelated elements in the selection of the system:

A. Heat distribution:
   Piped systems (steam, vapor, hot water).
   Duct systems (ranging from a simple gravity hot air system to the refined forced air systems).
   Combined or split systems (duct system in main rooms; radiators in baths and kitchens).

B. Heat Production:
   Separate plant for each house.
   Separate plant for each house group (here called semi-central system).
   Central plant for a large number of groups.

C. Fuel.

A. DISTRIBUTION begins with the setting up of criteria or standards for the various systems to meet. These were:

Operating Cost (fuel).
Performance (uniformity of heating and degree of time lag as between rooms).
Installation (effect on construction cost and space requirements).
First Cost.
Maintenance (Repairs, replacements, depreciation).

Our engineers* tried to evaluate each of these elements by means of comparable index numbers. In other words, they adopted our general method of analytic formulation and solution by examination of the relevant factors, and applied numbers to each to express them. The assigning of relative numbers is in itself a matter of judgment and of the same types of facts as in the other fields of the project, so that the result is no more accurate. But it is

*Robert K. Thulman on our design staff; Kopf & Sears, Consultants.

GREENBROOK-STREET ELEVATION

an interesting method with quickly grasped conclusions. The following range of evaluations was made (perfect is 100):

	Piped Systems	*Duct Systems*	*Combination Systems*
Operating Cost	15 — 22	15 — 20	18 — 21
Performance	14 — 20	13 — 21	16 — 28
Installation	14 — 12	10 — 10	12 — 10
First Cost	10 — 7	10 — 5	9 — 3
Maintenance	16 — 14	10 — 13	12 — 18
	69 — 75	58 — 69	67 — 80
	Av. = 72	Av. = 63.5	Av. = 73.5

It is to be noted within each system that those that are best for operating cost and performance are generally more costly to install.

Preliminary layouts and costs were made on systems representative of each general system. The first costs were:

Steam (1-Pipe)	$254
Gravity Hot Water	295
Warm Air Duct Distribution	230
Combination	340

Operating cost was figured as about the same—about $48—for each, except the combination system, where fan and motor would involve current consumption and repairs amounting to some $4 or $5 in excess of the others. The combination system, the most satisfactory in performance as shown in the table of evaluations, involved extra first cost and extra maintenance. It was, therefore, discarded. The pipeless furnace, though it would have shown a substantial first-cost economy, was not considered because of the unsatisfactory distribution of heat characterizing its use even in the plans best suited to it.

Warm air duct system showed a first-cost economy over the piped systems. However, it has the serious disadvantage that, when used in kitchen and bathroom, objectionable odors may be recirculated into the system. To avoid this, they must be vented outdoors, which means higher heat loss, and thus higher fuel cost, which was calculated as more than counter-balancing the saving in charges on lower first-cost.

The discussion was thus narrowed down to one-pipe steam and hot water systems. It was concluded that the extra cost of $30 per house for hot water as against steam was more than counter-balanced by hot water's greater simplicity, and the elimination of the steam traps and specialties, making for a somewhat lower maintenance cost; by the uniformity of its heating due to its lower temperatures as contrasted with the greater heat concentration caused by the higher steam temperatures; by a heated atmosphere which was not so dry as in the case of steam.

B. PRODUCTION: The completely central system was not considered in detail. The customary assumption would be, and ours at the start was, that each dwelling would have its own plant, operated by the tenant. However, on further examination, several points appeared. First, that there were not any boiler units on the market designed for the small heating capacity required by these houses. There is equipment, of course, but it has more heating surface than required, hence is higher in first cost and less efficient (hence more costly) in operation than correctly sized equipment would be. By using one plant for each *group*, this situation would be overcome. An additional first-cost economy would be the saving of stacks; the average group being four dwellings, three-quarters of the stacks would be saved. Second, if management were to supply heat, there would be operation by trained men so that fuel would be used more efficiently.

Our figures showed that in first cost, the average installation price per dwelling was $295. But for the average group unit of four dwellings the cost was only $806, or $202 per dwelling. There was also the saving of some $20 per dwelling on account of the elimination of chim-

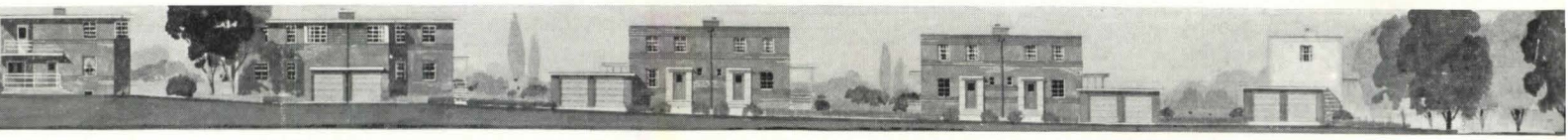
HEATING STUDY

ADVANTAGES OF THE SEMI-CENTRAL PLANT:

1. It frees the site planners from the necessity of keeping houses thirty feet from the road, the maximum distance that coal can be chuted.
2. It makes for a cleaner town and cleaner houses, eliminating both coal and ashes.
3. It makes for more pleasant living in that it relieves the tenant from the necessity of caring for his own furnace.
4. It may be that, in the future, oil-burning systems will become so cheap that this class of tenant generally will have it in future houses. To install oil burners now may insure against obsolescence.
5. The supposed disadvantage noted under #5 below, means simply the same situation that exists in any apartment house. Actually it has the positive advantage of not permitting people to jeopardize their health by underheating.
6. Management's firemen will operate boilers more economically than the individual, i.e., with less fuel cost per degree of heating, and with less abuse of equipment, which means longer life and therefore lower yearly sinking fund.

DISADVANTAGES OF SEMI-CENTRAL PLANT:

1. The very advantage of No. 3 above may be a disadvantage in that it gives the town a "high-hat" flavor, and gives critics a splendid opportunity for criticism on that score.
2. The semi-central system involves an appreciably higher rent per room than our prospective tenants *now pay, though* not higher than rent plus heating bill. This may be an initial handicap which will need to be explained to the tenant and to possible critics.
3. It adds a management job.
4. It does not permit heating of individual houses to a higher temperature than 70°, which may be a source of complaint in individual cases.
5. The individual family cannot benefit by the economy of heating his house to less than 70°. Nor can it benefit by leaving bedrooms unheated during most of the day; or rather any individual family benefits its own pocketbook by only 1/750 of its economy.



GREENBROOK—CUL-DE-SAC SECTION, BLOCK A

neys. Thus, in first cost, the semi-central system brought the price of the hot water system down by over $100, and below the estimate for the low-cost pipeless furnace which had been discarded as unsatisfactory. This economy made possible by row housing is in addition to those already calculated for the row house (see previous article), for at the time of that calculation we had not contemplated semi-central or group heating.

So much for first cost. What about operating cost? Two essential factors are involved:

1. Can supply to each house be metered? If not, there will be waste. After much investigation, the conclusion was that the supply to each dwelling could be metered and charged to tenants, but that the elaborate metering devices would be disproportionately costly to install, operate, read, and charge monthly. The practicable method was to install an exterior thermostatic device actuated by the outside temperature, which would determine heat flow into the houses. Thus no one could get more heat than the quantity so arrived at. If one family kept its windows open all the time, it could not get more than an amount of heat determined by sensible practice, and its house would simply be colder. Thus, a fixed amount for heat could be added to the tenant's monthly bill.

2. Are there available in the semi-central system enough operating economies to pay for the management's employment of firemen?

C. FUEL. This question of operation leads into that of fuel.

The fuel question here was a choice between coal and oil, as gas and electricity could not compete. Obviously, oil is preferable if it can compete on a basis of economic operation, because it eliminates the grime of coal, eliminates ash removal, and eliminates the design necessity of tying house to within coal-chuting distance of the road.

The problem is one of yearly charges on first cost vs. operating charges. For a 4-house group the cost of oil-burning equipment and tank was estimated at $350. Figuring coal and oil at prices then current per ton and per gallon, it was found that oil showed a sufficient operating economy over coal so that its overall cost per year was at least as economical as coal. As amenity and convenience were all on the side of oil, semi-central coal heating was not further considered, and the final choice lay between the single plant burning coal and the oil-fired semi-central plant. The figures indicated that semi-central oil was more economical in operation, including labor cost of an operator. Thus, the decision to use row houses enabled us to use a cleaner fuel, to eliminate ash collection, to design more freely, and to eliminate the necessity for each tenant to fire his own plant. Many of the figures are eliminated in this account, and the factor of hot water supply has not been discussed, for it would take too much space to develop those details. A number of other factors pro and con were considered in reaching the final decision. These factors are listed at the foot of page 138. The balance of these appealed to us as being in favor of the semi-central system.

Of course in localities where the relative prices of fuels were different than at Greenbrook, the differential economies might produce a different answer. In fact, other Greenbelt towns came to different conclusions. While even in our locality the prices will no doubt change from time to time, there is no reason to suppose that such price changes will be relatively in favor of the one or the other.

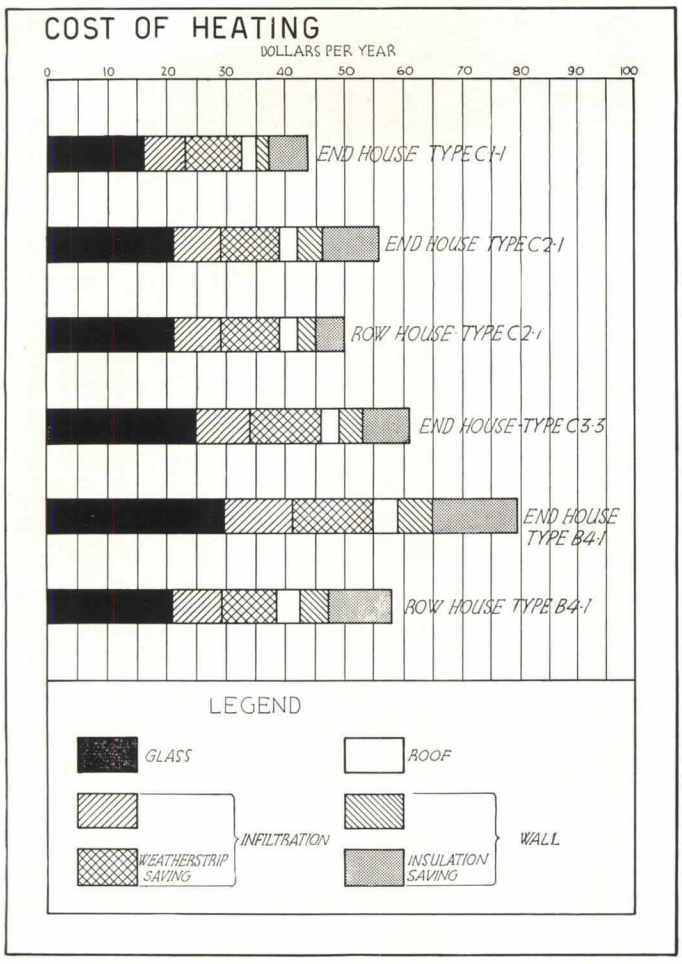
While this account states rather smoothly the facts and the reasoning that led to the final conclusion, there is really no more thorny question of judgment in the whole subject than this one of heating, none more requiring the study of a group of architects, engineers, physicians, health authorities, and the people to be housed. A study of the chart on page 140 indicates that the very points considered advantageous from one point of view are disadvantageous when viewed from another angle of judgment.

Aside from the heating engineers' main job just outlined, they made analyses and prepared charts for our guidance in the choice of economical houses, in the extra cost involved by addition of window units, in the relative heating effects of various types of all constructions and insulations. Specimen chart and rules of thumb are shown on the next page.

MINIMUM ROOM SIZES

In most general housing discussions, in most architectural offices, a concept is vaguely present called the minimum house, or minimum room sizes. We made an effort to see how definite such a concept could be made. Minimum sizes can be:

1. The same or a little better than are at present available.
2. Minimum based on providing a given amount and size of furniture for each room.
3. Minimum based on assumed occupancy per room and per house.
4. Minimum based on points two and three, plus consideration of possible habits of family and resultant use of rooms (e.g. do children study in their own rooms?).



HEATING proved a major factor in shaping the architecture and town plan of Greenbrook. This chart shows the cost of heating required to maintain a temperature of 70 degrees based on degree-days of heating to be expected in this latitude. In calculating the effect of weather-stripping and insulation, simply subtract the corresponding hatched area from the total of its bar.

5. Sizes based on minimum plus a degree of flexibility. If such flexibility or extra size permits occupancy of house by a larger family, or for a longer period by the same family, it may in some cases be a more economical solution than an "absolute minimum" if that can be determined.

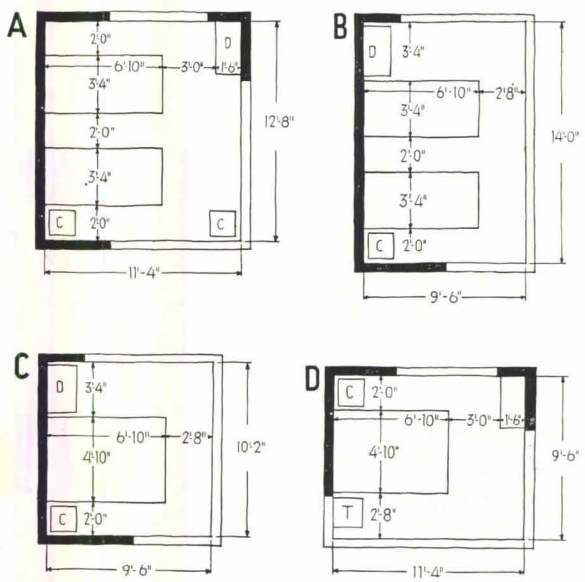
These remarks apply to bedrooms and living rooms. Bathrooms with fixed equipment are, of course, a simple matter. The same applies to kitchen equipment, though it is complicated by the dining question, already covered. Closet depth of 1 ft. 10 in. and width of 3 ft. seem well-justified standards. Bedroom sizes and their relation to living room sizes are here under discussion. Analyzing the five points noted above:

1. Present accommodations throw little light on the question. They vary greatly, and their inadequacy is certainly not a question of size. They are often larger in area than properly arranged space need be. But the quality of space is bad. Often bedrooms are actually corridors, and there is little usable wall space.

2. Minimum based on given amount and size of furniture. This is certainly a rational approach, though in our opinion not an adequate one.

In the first place, there is the mechanical consideration that most people cannot buy new furniture, and possess weird stuff usually much larger than modern furniture.

In the second place, the assignment of a given amount of furniture to each room is an assumption that may be unjustified. Here are some plans suggested as minima by a prominent architect:



INSULATION ECONOMY

Building		Insulation 1st Cost	Annual Saving in Heat
(4 houses)	Roof:	$126	$16
	Wall:	224	32
	Total	$350	$48 or 14%
(4 houses)	Roof:	132	17
	Wall:	190	32
	Total	$322	$49 or 16%

RULES OF THUMB:

Glass Area: Each additional sq. ft. of glass adds 11 c/yr to heating cost for glass area only.

Sash Infiltration: Each additional lineal ft. adds 6-8c/yr. to heating cost.

With Weatherstrips: Each additional lineal ft. adds 2c/yr. to heating cost.

Sample Chart for Calculating Heat Losses and Possible Savings.

(From Report on Comparative Heating Operating Costs) Dated 12/20/35.

PURPOSES OF CHART IN COLUMN ONE:

1. To show comparative heat losses in houses of different sizes. This is one factor in the question of whether rental of 5-room house should be 5/4 of rental of 4-room house

2. Such charts prepared for all houses of a given size—e.g., all 4-room houses, show which are over- or under-fenestrated. Note that windows account for 70% of all heat losses.

Note saving of $9-$14 per year by weatherstripping.

Note in C-2-1 house, saving of $5 per year in heating cost if turned the deep way instead of the shallow way.

Note saving of $23 per year when house is used as row house instead of end house

These charts and "Rules of Thumb" are an instance of how the Greenbrook job incorporated engineering and technical data into design. While the architects were not capable of making the engineering calculations, they could use the resulting figures or "rules of thumb" in determining what houses were economical to use, what was the result in annual heating of adding or subtracting window area.

Plan B shows two single beds, a chair and a dresser. When a window, entrance door, and door to closet are placed in the walls, there is not room for another thing—not a second chair, not a night-table, not a desk. Plan A could only with difficulty get in any other article of furniture. As this is the biggest plan shown in the set, it is presumably the main bedroom where more furniture is almost certain to be wanted. Adding 6 or 9 inches to the length of the room would permit placing additional furniture at the upper right hand corner.

Plan D if used in the same way as Plan C would certainly be a more useful room at the added expense of one foot of extra length.

Such minima are cut too fine and probably defeat themselves because they compel occupancy by a minimum number of people, so that the cost per person may be higher than with slightly larger rooms. This is especially likely because calculations show that the extra cost of such additional space is of the order of one-third of the average cubic cost of the house, and that the extra operating cost is nearly negligible.* Of course, in discussing increases in terms of inches, one must not overlook the fact that in a given house these changes may seriously affect such cost factors as waste in joist lengths, etc. In a prefabricated system based on modules such changes are not possible. But *in setting up theoretical minima,* the factors noted above are admissible.

Nos. 3, 4, 5. Based on such considerations, our room dimensions were made to accommodate more furniture, though it was not expected that every room would have all the furniture indicated. Illustration: having decided on semi-central heating with heat included in rental, it is unlikely that the family will keep any rooms unheated. This makes it likely that children, instead of studying in the midst of noise in the kitchen or the living room, will want to study in their bedrooms where they can concentrate. If this is so, there should be provision for a desk and extra chair. The size and position of living room will affect the functions of bedrooms (whether they be strictly bedrooms, or study-bedrooms, or bed-sitting rooms). In general, we tried to satisfy ourselves that living rooms could be adequately furnished, but felt that the living room furnishing problem involved too many individual differences as between families to be capable of rigorous analysis.

Instances have been given under previous discussion of our plans of examples of larger rooms which make it possible to accommodate more people in a house of a given number of rooms, and in some cases, to provide for longer occupancy by a family growing in size, thus saving the redecorating costs, the moving expenses, and the rent losses involved in moving to another house.

In considering minimum room sizes, the following points should be borne in mind:

1. Dimensions are generally more important than size (area). A rectangular room of the same area as a square room has more wall space, and can accommodate more furniture.

2. Placing of windows and swings of doors affect the usability of a room as much as the dimensions. The best check is to make actual furniture layouts in each case.

PERCENTAGES OF HOUSES OF VARIOUS SIZES

The factors determining the number of houses of various sizes required are Family Size, Family Composition, Relation of Rent to Income, and Management Policy including Selection. These factors are interrelated. Management determines allowable occupancy per house. For example, a family consisting of man and wife and four children might like the new community, want to live there, and have an income allowing only enough rental for a two-bedroom house. Community standards might well indicate that that was overcrowding. Management selection would probably have to exclude such a family. Again, management would set maximum and minimum income for tenants selected: maximum to avoid competition with private builders and to avoid renting to people who could afford more rent; minimum to avoid getting people who might otherwise spend more on rent than they should, at the expense of other necessities.

Thus the steps undertaken by RA's research department under the direction of Warren Vinton in determining proportion of houses of each size were:

1. Study of census figures as applied to our area, both as to size of family, and age, and sex composition.

2. Adjustment of these figures so that they were more particularly applicable to the income and occupational groups we were to draw from, based on an assumed ratio of rent to income.

3. Further adjustment of the "natural" proportion in No. 2, by management selection on various bases such as those just suggested. As family income is not related to family size, such a community at this stage of our public housing should favor the smaller size houses at the expense of the largest size, so that the smaller ones can to a certain extent subsidize the rent for the larger size. Again, in the early stages of such a development, before factories and higher income groups help to carry the tax load, it would be injudicious to include too many large-sized families on account of educational costs.

It is important to be able to predict family size and composition, not only so that the houses will fit them, but so that the school will not be built too large or too small.

4. Translation of family sizes into terms of houses and particularly number of bedrooms per house. After the architects have planned houses to meet as nearly as

* This statement is probably too unqualified. Actually it is possible to figure the extra costs involved by a simple method called "Table of Plan Comparisons" first evolved by the Housing Study Guild. The extra cost is less when the increased dimension is the deep way of the house with no additional exterior wall involved, greater when it involves additional exterior wall.

possible the family sizes and compositions arrived at under No. 3, a recalculation should be made based on the *actual* houses, to see what actual family sizes and compositions will be most likely to occupy them. From this, fairly accurate data become available as a basis for the school designs. As a result of such procedure we arrived at the probable number and age distribution of school children used in design of the school, as described in Part 1. This is another example of the interrelation of the elements of planning—houses and schools—which one had not suspected until one had dug into them.

Some of the significant figures are given below. It must be understood, in this case as in so many others in these articles, that a much simplified and abbreviated version is given for the sake of clarity and space requirements.

Table 1: *Family Sizes in Census Figures of 1930*
(Single persons and families over eight excluded.)

Family Size	Somerset County (Containing Greenbrook)		Ten Industrial Towns (near Greenbrook)	
	Actual	*Converted to 100%*	*Actual*	*Converted to 100%*
7, 8 persons	8.5%	9.5%	9.6%	10.6
6	8.3	9.3	9.2	10.1
5	12.5	14.0	14.1	15.5
4	18.8	21.0	19.1	21.0
3	19.7	21.9	20.1	22.1
2	21.9	24.3	18.8	20.7
TOTAL	89.7	100.0	90.9	100.0

Though Greenbrook is actually in Somerset County, it was felt that its future population would more nearly resemble the ten industrial towns than the more rural population of Somerset County.

Table 2: *Translation of Family Sizes into House Sizes*

Family Sizes				*House Sizes*
All of 7, 8 person families				
2/10 of 6	"	"	into	4 bedrooms
8/10 of 6	"	"		
3/4 of 5	"	"	into	3 bedrooms
1/4 of 5	"	"		
All of 4	"	"		
3/4 of 3	"	"	into	2 bedrooms
1/4 of 3	"	"		
All of 2	"	"	into	1 bedroom

The above table is not based on any census or other statistical figures, but simply a result of reasoning and probable management policy. It is certainly subject to error. The distribution of the same size family into different sized houses is based on family composition on which we had no accurate data. Example of our reasoning: some three person families (with baby as third member) could use our 1-bedroom alcove house. But most three person families would need two bedrooms either at once or as soon as child got a little older. Hence the assumed distribution as between 1- and 2-bedroom houses.

Table 3. *Percentages of Houses of Each Size by Applying Assumptions of Table 2 to the Census Figures of Table 1 House Sizes*

4 bedrooms	All of 10.6=10.6%	
	2/10 x 10.1= 2.0	
		12.6%
3 bedrooms	8/10 x 10.1= 8.1	
	3/4 x 15.5=11.6	
		19.7%
2 bedrooms	1/4 x 15.5= 3.9	
	All of 21.0=21.0	
	3/4 of 22.1=16.5	
		41.4%
1 bedroom	1/4 of 22.1= 5.6	
	All of 20.7=20.7	
		26.3
		TOTAL=100.0%

Table 4. *Actual Percentages of House Sizes Based on Management Selections, Contrasted with Census Results*

House Size	*Percentages Arrived at From Census*	*Actual Percentages (Selection)*
4 BR	12.6%	10%
3 BR	19.7%	25%
2 BR	41.4%	50%
1 BR	26.3%	15%

The final selection of percentages of house sizes gives effect to the factors that management must consider in running a successful community. But it is necessary to have the census figures and analyses in mind so that the eventual percentages do not differ too appreciably from the natural tendencies as indicated by the census.

PERCENTAGE OF GARAGES

We did not have any method for arriving at this even semi-rigorously or semi-statistically. What we did was this:

1. We provided a town layout and block layouts capable of accommodating a garage for every family, either attached or in compounds. Our rule was not to have a garage in a compound further than 200 ft. from the house it was to serve. People do not use garages if they are too distant.

2. The Whittlesey report had indicated that among the type of industrial workers from whom we expected to draw, something like one-third of the families owned cars even during the depression. This was certainly a rock-bottom minimum. This minimum would probably be increased in Greenbrook because the initial lack of local industries would require long-distance transportation for all workers. And as Greenbrook would not have

been ready for occupancy until the spring of 1937, it was anticipated that families would be better off. We provided garages immediately for 60 per cent of the families. About half were attached garages, and half in compounds which were built with open ends so that they could be expanded to take care of all families.

FLAT ROOFS AND SLOPING ROOFS

This is a question surcharged with passion and prejudice. As architects we were not free from prejudice, or what I would rather think of as esthetic conviction. We preferred flat roofs, but as in the case of fenestration and other important elements, I think we would have bowed to the weight of evidence if we had found any preponderant advantages in the sloping roof. The calculation below shows the saving in first cost of the flat roof; the lists show what we felt was an inclusive summary of advantages and disadvantages.

We preferred the serenity and continuity of the horizontal line to the serrated effect of a series of sloping roofs. In a new community where simplicity and straightforwardness were rightly the characteristics of the houses and their architecture, we felt that sloping roofs were an affectation not justified by any compelling indigenous precedent. The fact is that the whole flat vs. sloping roof controversy is a recent phenomenon. Many fine old New England houses have flat roofs, and they stand side by side with sloping roofs. Our characteristic architectural idiom at Greenbrook was to be in terms of the flat roof. But we felt that the current sharp controversy was beside the point. We carefully selected certain lanes and ends of vistas where the emphasis of the extra height of the sloping roof made it an appropriate architectural feature. We felt we were performing a useful function in showing that the two were quite compatible.

KITCHEN LAYOUTS

A number of desirable points are here listed which we sought to attain:

1. Minimum motions and minimum waste walking. In general, arrangement of fixtures to follow processes of food from delivery through preparation, to serving; processes of dishes from dining through washing, back to cupboards. Consideration of minimum motions generally results in fixtures along two walls opposite each other.

2. Refrigerator (representing delivery) near door.

3. Work surface or drainboard at *each* side of sink.

4. Working table with chair, especially where dining space is not in kitchen.

5. Study of number and placing of doors and windows as affecting usability.

6. Convertibility of dining space from living room to kitchen and vice versa.

7. Standardized units of cabinets both in dimensions and arrangement. While at first this seemed difficult and in some cases impossible, we finally achieved two sizes to cover all kitchens—a result not only more economical but invariably more pleasant architecturally than the irregular individual solutions at first considered necessary.

Evolution of kitchen plans for houses is shown, page 144, illustrating progress from sketch to solution, during which we were able to solve most of these points.

STRUCTURAL SYSTEM

This whole question will be only briefly summarized here. To go into the studies of first costs, maintenance costs, characteristics of each wall and floor system considered would literally require a treatise in itself. Though we did a lot of work and thinking to arrive at our final and rather simple traditional solutions, this was probably one of the least generally significant items of our project because:

A. We had neither the time nor the technical resources to make studies that would be contributions to knowledge in this field.

B. Changes and improvement of product are so rapid, especially in the case of new systems, that studies almost a year old have less interest now.

SLOPING ROOF AND FLAT ROOF

ADVANTAGES OF SLOPING ROOF:

Lower maintenance cost. Over the life of a house, probable saving of $4-5 a year as against flat roof repairs and replacements.

Extra storage in attic. Not applicable here because inclusion of full cellar gives ample storage space.

Expansibility: possible attic rooms later. Not applicable because of variety of houses and house sizes expensive investment for a hypothetical gain.

Top floor at more equable temperature and less heat loss. No longer a factor on account of insulation.

Public probably prejudiced in favor of them.

FLAT ROOF

Lower first cost, a saving of approximately $53 per house. This does not include dormers. If expansibility of rooms is a factor, then extra cost of dormers and of stair to attic, and extra space required for this stair, must be added to the first cost differential.

Flat roof places no limitation on floor plan or on joining up of one living unit to another to constitute a unit house group.

Supposed greater suitability of sloping roof to northern climate and snow load. This argument has no demonstrable validity. See interesting report on this subject accompanying 1936 award to house with flat roof in the Canadian small house competition.

COMPARATIVE COST OF FLAT & SLOPING ROOFS

	FLAT ROOF	PITCHED ROOF (30° slope)
Rafters	$ 40.95	$ 57.80
Bridging	4.08	3.84
Sheathing	58.00	58.90
Collar Ties		7.20
Outlookers and Cover	34.00	
Ceiling Beams		30.78
Slate Roof incl. paper		$162.00
Roofing (5-ply tar and slag)	$ 87.60	
Gravel stop	24.00	
Gutters		70.40
Leaders and valley flashing	8.00	40.50
Vent flashing	2.00	2.00
Extra conn. (leader to sewer)		14.00
½ party wall		23.22
Saving on framing below roof		.88
	$258.63	$469.76

Estimated cost peaked roof $469.76
" " flat " 258.63

$211.13; or about $53 a house.

Estimate based on standard practice.

Above calculation applies to Buildings 19 and 24, each one containing four 3 BR houses.

C. Conditions of work in the field made it practically imperative to use materials and methods quite familiar to ordinary mechanics, except for limited application of what might be called unfamiliar materials.

D. The Government could scarcely afford to use "new" materials without a long record of experience in use, especially as the manufacturers themselves seemed to know so little about them.

Our experience with Greenbrook, and similar experience I have had on other projects, leads to two opinions in connection with this question of materials and methods. The first is that a comprehensive study by a qualified group of architects and engineers should be made of the whole subject, such a group to have the aid of the industry as a whole, the cooperation of the interests producing the materials, and the cooperation and use of the laboratories of such organizations as the Bureau of Standards and technical schools such as M. I. T., Columbia, Cornell, Purdue, etc. The state of knowledge in the whole field is chaotic, both as to the existence of an authoritative set of criteria, and as to the manner in which much-propagandized materials and systems offered meet such criteria. Such a study, once made, should be periodically brought up-to-date.

There is an amazing lack of exact knowledge on the part of manufacturers themselves as to what their materials really are good for under varying conditions of weather, temperature change, etc. This goes for the more theoretical questions. It certainly goes specifically for methods of jointing large sheets of wall materials. It goes even for such simple matters as the manufacturer's inability or unwillingness to show reputed examples of installations.

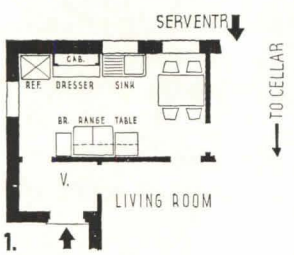
Based on our criteria and investigations, our decision was to use wood joist and studs in balloon frame construction, with paper and sheathing, rockwool batt insulation, exteriors of either brick veneer or wood siding (a few houses were to have transite or marine panels instead of clapboards), ceilings of ½ in. fiberboard, interior wall surfaces of rotary-sawn fir plywood with joints covered by battens, wood floors. For party walls we used cinder block.

While the stressed plywood house and other new forms may soon be able to outrank it, the traditional wood frame house demonstrated itself to be the best answer to our criteria at the time of our investigation. These criteria were:

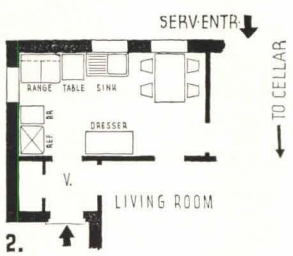
First cost.
Maintenance cost.
Length of satisfactory life.
Watertightness.
Simplicity of installation with available labor.
Appearance.

Without discussing detailed figures of first cost and maintenance, certain interesting points appear. A great factor in favor of wood frame construction as contrasted

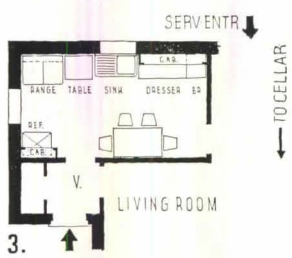
THE EVOLUTION OF THE KITCHEN PLAN



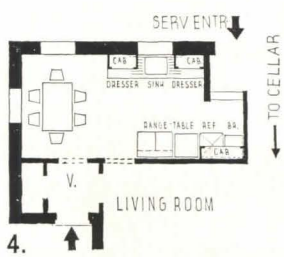
1. All kitchens in this row are in end houses. The dining space above is too small. Note difculties caused by three doors to kitchen.



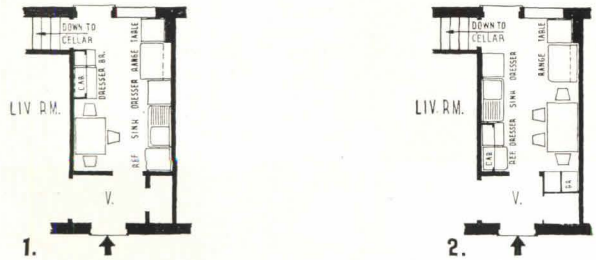
2. Dining space larger; inconvenient arrangement of fixtures.



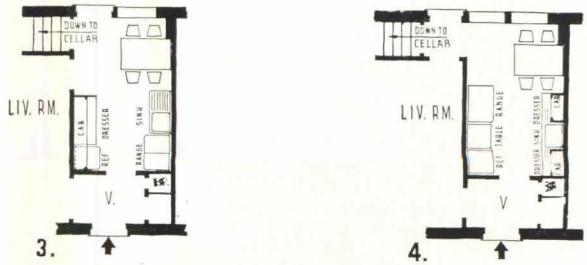
3. Better utilization of space due to elimination of one door.



4. Dining space properly located, and large enough for six people. Standardized arrangement of kitchen equipment, and minimum motions. Dotted lines show alternative door to either living room or vestibule.



1. 2. Awkward exit to rear garden in case of guests. Inconvenient arrangement of kitchen fixtures.



3. Better exit to garden through dining part of kitchen. Broom closet need not be in kitchen except by custom. Kitchen arrangement still not standard.

4. Direct exit to garden from living room without sacrificing cellar exit. Kitchen fixtures in standardized arrangement, with minimum motions.

with masonry is that it has 4 in. of air space that can be insulated, bringing down heating cost to a considerably lower point than is possible with a masonry wall, even when furred. Of course, it is possible to fur a masonry wall with a 4 in. stud and get the same insulating value, but in that case any first-cost economy of the masonry wall is lost. As far as pure maintenance goes—painting and pointing of walls, cinder block, and the like must be kept painted for appearance, and any glazed material such as terra cotta block that requires no painting is far too expensive. Brick veneer is the least in first cost of the finishes that do not require painting, but the extra first cost over wood on the average house was $165.* Metal lath and stucco finish were only $20 more than wood, but with the type of labor we expected it would have been dangerous to go in for stucco. We finally tried the various asbestos boards which seemed to be little higher than siding in first cost, and the appearance of which we felt to be acceptable without paint. The questions we had with respect to them were water-tightness, water absorption, and durability. But after numerous futile conferences and numerous unsuccessful attempts to see installations, we finally gave up this attempt.

As the maintenance saving by the use of brick veneer equaled something like 20 per cent of its first cost, we decided to build as many brick veneer houses as our budget appropriation permitted. The final proportion was some 60 per cent brick veneer, the rest being wood siding—except for a few on which we determined to use asbestos panels and find out about them for ourselves.

In figuring maintenance costs, we obtained data as to relative costs of fire insurance for the different wall and floor systems. We found that the difference in rate between wood frame and fireproof construction was unexpectedly small. This proved to be a negligible factor in our final decision.

Plywood made with phenolresin glue was estimated to be cheaper than metal lath and plaster for interiors, both in first cost and maintenance. Plywood could be waxed or stained, hence entailed less upkeep than plaster which would be painted. Further, our heating engineer reported that the thermal resistivity of plywood was greater than that of lath and plaster. The statement that the first cost of plywood is cheaper holds only when:

1. Joints are covered with battens. When plywood is used with a V-joint, or any other uncovered joint that must be cut and matched, it is more like a millwork job, and becomes costly.

2. When there is minimum cutting of plywood standard panels, meaning minimum labor and minimum waste. Our ceiling heights were 8 ft., just the height of two panels of plywood.

Under these conditions plywood was estimated to cost between $35 and $40 less per house than metal lath and plaster.

Bathroom walls gave us a lot of trouble. Tile was, of course, too expensive, and even stamped metal tile proved to be so. The asbestos boards were expensive, and there was doubt how they would act without paint under the hot water from the shower and the steamy atmosphere of the bath. With paint there would be much the same problems of maintenance as with our plywood wall. Linoleum is expensive. Homasote board on walls seemed the best material that promised low maintenance. While paint is required with it, it seems to absorb the paint in such a way as to offer a resistant surface. Its cost was estimated to be 12½ cents painted in place, about 10 cents cheaper than any equally satisfactory alternative.

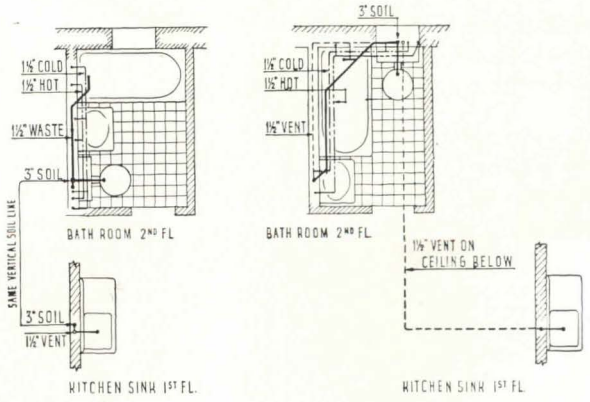
PLUMBING ECONOMY

Architects generally know certain facts about plumbing: that it is economical to have twin house sewers, to place the bathroom directly over the kitchen to avoid offsets and separate lines. They know that the cheapest arrangement in a bathroom is to line up fixtures on one side with a toilet at the stack. But our theory was, wherever possible, to boil such a general fact down into an actual cost difference, so that in a case of alternative economies we could know which was the more important, and, in a case where economy and amenity seemed in conflict, we could weigh the degree of amenity against the extra cost.

The accompanying sketches show the most economical bathroom layout as compared with a pleasanter but less economical layout. The first-cost difference, including the corner tub required in the second case and the notching of joist, was over $20. Our conclusion was that this extra cost was not justified by the greater convenience of having the window over the toilet bowl rather than over the tub.

The sketches likewise show the comparative situation

PLUMBING ALIGNMENT



Left: Bathroom fixtures arranged for greatest economy. Window over tub.

Right: Window more conveniently located, but cost of plumbing is $20 more.

Left: Kitchen under bath; one stack.

Right: Kitchen not under bath; cost of offset: $10-$20.

*These approximate costs are for an average of end houses and row houses.

when kitchen sink is, or is not, directly below the bathroom. This shows an extreme case. The extra cost would vary, depending on the relation of kitchen and bathroom both to each other and to house sewer; but the extra cost would be within limits of $10 to $20. This is a case where the extra cost would be simply one of the factors entering into the whole question of the desirability and price of one house as compared with another. The most frequent situation where this extra expense would be justified would be in a house facing north and south, where it is desired to have the kitchen get favorable exposure, and to use part of the unfavorable exposure for the bathroom.

THE ADMINISTRATION

No further comment will be offered on the significance of the planning of Greenbrook as far as such comment is concerned with it as an individual project. At the beginning of the first article a summary was given of what are considered to have been the factors involved and the contributions made. The reader should now be in a position to judge for himself whether the initial statements were justified. However, it is important to add a description of the set-up that made the work possible.

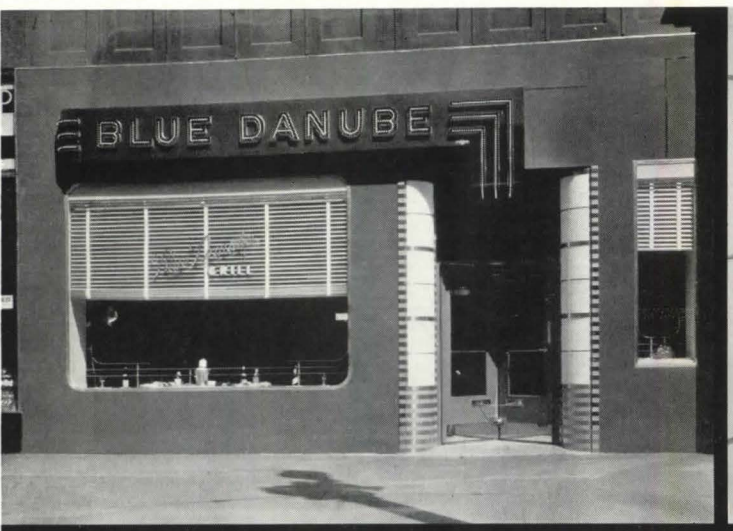
Greenbrook was one of the four Greenbelt towns simultaneously planned by the Suburban Resettlement Administration. In presenting what one project was able to do, the role of the employer-client must be emphasized. It was the RA who supplied the initial conception, who made it possible to do so extraordinary and completely sensible a thing as to build four Greenbelt towns.

Their unusually subtle and flexible form of organization permitted and encouraged the planners to feel that the particular town was their—the planners'—responsibility and contribution, an attitude that evoked the last degree of effort and enthusiasm from all of us, from the project chiefs and from all of our men. On the one end, the Suburban Resettlement kept us out of the coils of red tape unwound by bureaus to whom they were responsible. On the other, they themselves interfered as little as necessary with our procedure and recommendations. They felt that an essentially vertical organization —each job planned by what was practically a separate architectural office with its own engineers, checked by comparisons of findings between these offices and by cooperative research in many cases—was at this stage the most fruitful set-up.

This general practice was supplemented by regular meetings of two kinds, over both of which Frederick Bigger, the Chief of Planning Staff, and John Lansill, the Administrator in charge of Suburban Resettlement, presided. One kind of meeting provided for the chiefs of a project reporting progress and obtaining approval or criticisms of definite recommendations or plans. Often outside critics were present at such meetings. The other kind of meeting was one in which all the projects participated in discussions of problems common to them all.

This simple and responsive mechanism is in contrast to the stratification and remote control which generally characterize large enterprises in this country, whether public or private. The Suburban Resettlement Administration had a minimum of administrative personnel outside of the planning offices. The essential advantages and economies of large-scale enterprise are often outweighed by excessive administration or overhead, and especially by the routine character of any particular individual's interest in any one matter as compared with any other. Suburban Resettlement's set-up fostered the feeling of individual responsibility, the eagerness and verve toward one's own particular creation. In fact, it enhanced them, because the feeling on the part of all the men that they were working on projects they understood, to whose purposes and implications they were sympathetic, resulted in a demonstration of sustained enthusiasm in their work that I have not seen equaled.

There is no contention here that the methods or solutions of the Greenbrook project or of the Suburban Resettlement Administration as a whole, are in themselves an answer to the problem of housing for the lower income groups. That problem involves much more in the way of fundamental change in our economic system than good technical solutions of housing and planning. But the Greenbelt projects do bring out advantages and economies which in the general loose talk about Government vs. private operation are often masked by the subsidy granted the private builder in lowered quality and wage scales, in maintenance charges which mount up after the private builder has left with his profit. Their greatest significance is as a first step in the rationalization of a complex and, in many ways, obsolete building industry, in the realization of economies and amenities of physical layout possible only in large-scale planned operations, in the demonstration to industry and to public that a rental policy with its skilled management and maintenance and its concentration of purchasing power makes for more economical living. In short, the significance is as a pattern of adequate community life which in all price ranges is one of the great needs of the U. S.



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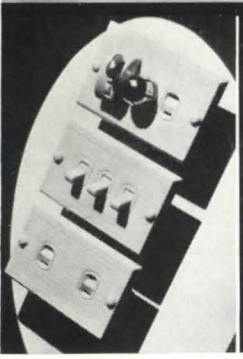

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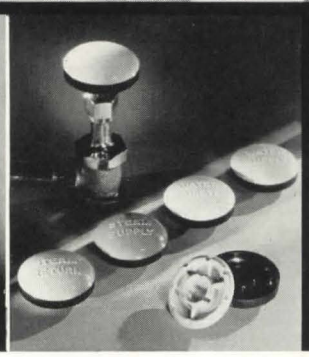

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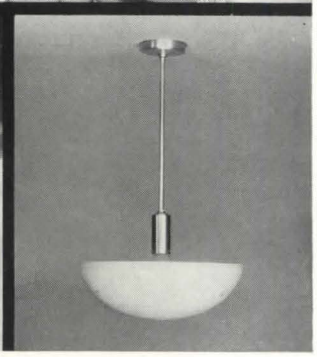


7.

1. FORMICA Store Front. 2. MICARTA Bathroom Walls. 3. PLASKON Switches and Receptacles made by Pass & Seymour. 4. PLASKON Handles on Republic Brass Fixture. 5. TENITE Handle for General Electric Refrigerator. 6. TENITE Handle for Jenkins Valves. 7. BEETLE Diffuser made by Bryant Electric Co. for Chase Brass and Copper Co. Lighting Fixture.

PLASTICS IN ARCHITECTURE

THE unique combinations of properties possessed by the synthetic resin plastics have given them an evergrowing place in the building field. A catalogue of their uses today would be incomplete tomorrow. As the chemistry and technique of plastic production develop new combinations and improvements of qualities, and reduce the cost of manufacture, new and more varied uses are found.

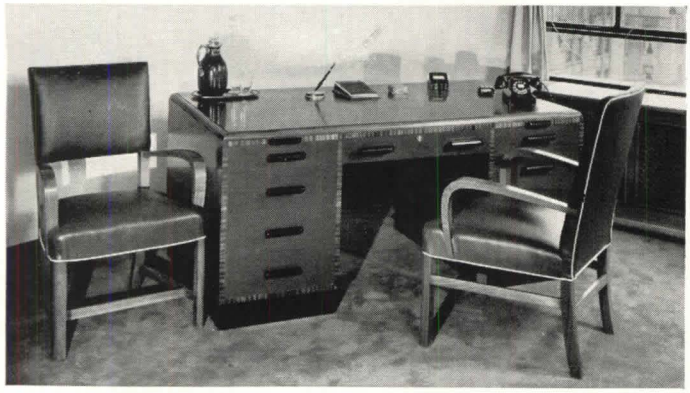
The outstanding characteristic which attracts the architect and decorator is the combination of beauty and permanence; beauty of color and finish which resist wear and weather. The architectural engineer finds that they combine excellent strength with light weight and dimensional stability, the manufacturers that they lend themselves to the rapid production of large quantities of accurately sized parts with minimum processing, the contractor that they withstand careless handling, and are easily sawed and drilled. Not only can the synthetic resins be formed into switch plates, finished hardware, lighting fixtures and panels, but they add their distinctive qualities to other products—plywood, varnishes, lacquers and floor tile. Their properties furnish the designer with a medium readily converted into pleasing forms affording beauty of finish and a variety of color effects and uses.

The class of organic plastics having the widest uses and present possibilities in architecture is the synthetic resins. The natural resins—shellac, rosin, asphalt, and pitch—are well known in buildings and will not be discussed in this article; the cellulose derivatives, such as celluloid, and the protein substances made from casein and soy beans, have, so far, had very little architectural application.

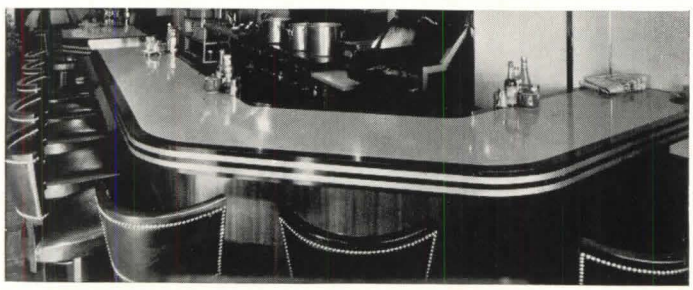
The synthetic resins were first known commercially as early as 1909 under the trade name of Bakelite. Since then new resins have been found, processes of manufacture improved, new uses developed. When the cost of certain forms is reduced, their use will become even more widespread.

In its first stage of manufacture, the synthetic resin is a powder. When subjected to heat and pressure the powder becomes a hard, nearly inert solid. The powder can be mixed with color, with fillers of various kinds or dissolved in certain solvents.

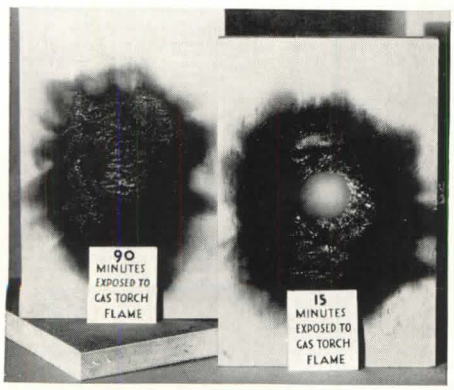
Walls and Cabinets of FORMICA—Industrial Designers Studio designed by Raymond Loewy and Lee Simonson.



Desk is laminated BAKELITE, drawer pulls molded BAKELITE, chairs are upholstered with REVOLITE, woodwork of chairs is protected with BAKELITE varnish, accessories on desk are made of molded or cast BAKELITE.



Counter top is LAMICOID, guard rail at top LAMICOID inlaid with metal.



Right hand panel is ordinary plywood after 15 minutes exposure to a blow torch.
Left hand panel is HASKELITE plywood bonded with GENERAL PLASTICS PHENOL RESIN GLUE, unpierced after 90 minutes exposure to blow torch.

KINDS AND THEIR PROPERTIES. There are three kinds of synthetic resins used in building products: phenol-formaldehyde, urea-formaldehyde, vinyl resins. To a limited extent the cellulose derivatives, another class of organic plastics, are also used. In their final manufactured state all are hard and highly resistant to abrasion, have a natural polish on which finger prints and smudges do not show, a low thermal conductivity which makes them feel warm to the touch, are highly resistive to electricity, moderate heat and moisture, and do not crack under sudden temperature changes. They are immune to attacks by termites and other insects, rot, decay, and corrosion. All are affected by continuous contact with water for long periods.

PHENOLICS

Thermosetting—does not soften on reheating.
Some forms darken when exposed to light, hence used chiefly in black and dark colors.
Resistive to dilute acids and common solvents affected by alkalis and strong acids.
Properties can be varied over wide range.

UREAS

Thermosetting
Tasteless, odorless, and comparatively unaffected by water, hence used for tableware.
Unaffected by light, hence can be made up in varying degrees of translucency, pure white, delicate pastel shades.
Unaffected by grease, oil, alcohol; fairly resistant to weak alkalis such as soap, borax, and similar cleaning agents.
Strong acids and alkalis have a marked deleterious effect.
More expensive than darker phenolic shades.

VINYLS

Thermoplastic—soften on reheating.
Unlimited in color range.
Highly resistant to alkalis, acids, oils, alcohol.
Very tough as baked-on lacquer.
Absolutely tasteless and odorless.
Water absorption rate is very low.
Not made in laminated form, but laminated with glass.

CELLULOSE ACETATE AND NITRATE

Thermoplastic.
Very tough and strong.
Transparent, translucent, all colors and effects.
No laminated form but laminated with glass in safety glass.
Not resistant to alkalis, strong acids, alcohol.
Comparatively high water absorption.
The nitrate (Pyroxylin) burns easily.

TRADE NAME	TYPE OF PRODUCT AND RESIN	MANUFACTURER
Bakelite	Resins, all forms — Phenol	Bakelite Corp.
Beetle	Resins — Urea	Beetle Products Division American Cyanamid Corp.
Catalin	Resins, Cast — Phenol	American Catalin Corp.
Dilecto	Laminated — Phenol	Continental-Diamond Fibre Co.
Durez	Resins — Phenol	General Plastics, Inc.
Formica	Laminated — Phenol & Urea	Formica Insulation Co.
Lamicoid	Laminated — Phenol & Urea	Mica Insulator Co.
Micarta	Laminated — Phenol & Urea	Westinghouse Electric & Mfg. Co.
Plaskon	Resins — Urea	Plaskon Co., Inc.
Resinox	Resins — Phenol	Resinox Corp.
Teao	Glue Film — Phenol	Resinous Products & Chemical Co.
Tenite	Resin — Cellulose Acetate	Tennessee Eastman Corp.
Textolite	Resin & Laminated — Phenol	General Electric Co.
Vinylite	Resins — Vinyl	Carbide & Carbon Chemical Corp.

FORMS: SPECIAL QUALITIES AND USES

MOLDED

Process: Resins in powdered form are mixed with pigment and filler and subjected to great heat and pressure in metal molds of desired shape.

Result: Product of exact size and sharpness of detail of mold, polished surface, color uniform throughout. Can be molded around metal.

Fillers: To add to resistive characteristics.

Wood flour: general purposes, lightness, good dielectric strength.

Colorless cellulose pulp: For translucency and light colors; only filler used with ureas.

Asbestos: For high temperature and moisture resistance.

Mica: For high electric resistance.

Fabric: Shock and impact.

Uses: Electrical receptacles and other parts, switch plates.

Lighting fixtures and their reflectors and diffusers—made in varying degrees of translucency and reflectivity.

Finished hardware: Knobs of all kinds, escutcheons, push plates.

CAST

Process: Cast in molds and hardened by heat. No filler used.

Result: Bars, rods, tubes, sheets, special shapes, having crystal clear, tinted, opaque, or marble or onyx-like appearance, with great beauty of finish.

Uses: Can be cut, turned, sawed, drilled, carved, and if subjected to prolonged temperature of 200° F., somewhat softened and formed. Used chiefly for decorative purposes.

LAMINATED

Process: Sheets of paper or fabric, impregnated with resin in solution are dried, piled in layers for desired thickness, and subjected to heat and pressure in hydraulic press.

Result: Large, hard, dense, rigid plates, which do not delaminate. Sheets of urea and phenol can be combined to give lower cost of phenolic underbody with more delicate coloring and greater resistance of urea covering. Costly because of drying process and attendant loss of solvent.

Surface can be highly polished, satin finished or textured. Plates can be mottled, streaked, imitative of wood or marble, inlaid with metal or bands of other colors. Special shapes can be made with mandrels and forms.

Are veneered to plywood, hardboard, asbestos, steel.

Can be sawed and drilled.

Uses: Wall and ceiling surfaces, baseboards, window sills, and trim of all kinds, store fronts, lobbies and signs.

Table, bar and counter tops: Special blister-proof finish not marred by burning cigarette stubs.

In lighting fixtures instead of glass plates.

As a transparent protection for wood veneers—so far successful in darker woods only.

In buildings, ships, trains, aircraft.

ADHESIVE FOR BONDING PLYWOOD

Process: Thin films of powder, powder in solvent, or resinoid treated paper, inserted between plies of wood, are hot pressed.

Result: Plywood that is not loosened up by moisture, heat or drying. Bond is stronger than the wood. Glue film will not be pierced by termites, other insects, or rodents, or affected by molds or fungi. Resistance to fire is increased.

Uses: Plywood can be used on exteriors of buildings or under other severe conditions.

VARNISHES AND LACQUERS

Process: Solution of powder in solvent is mixed with varnish or lacquer vehicle.

Result: Varnishes, enamels, and lacquers, for brushing or baking, which are quick drying, tough, resistant to abrasion.

Uses: On wood, steel, cement, concrete, and asbestos cement wall panels and imitation tile, and hardware.

Steel with baked-on vinyl lacquer can be stamped, drawn, or spun without injuring the film.

MISCELLANEOUS USES

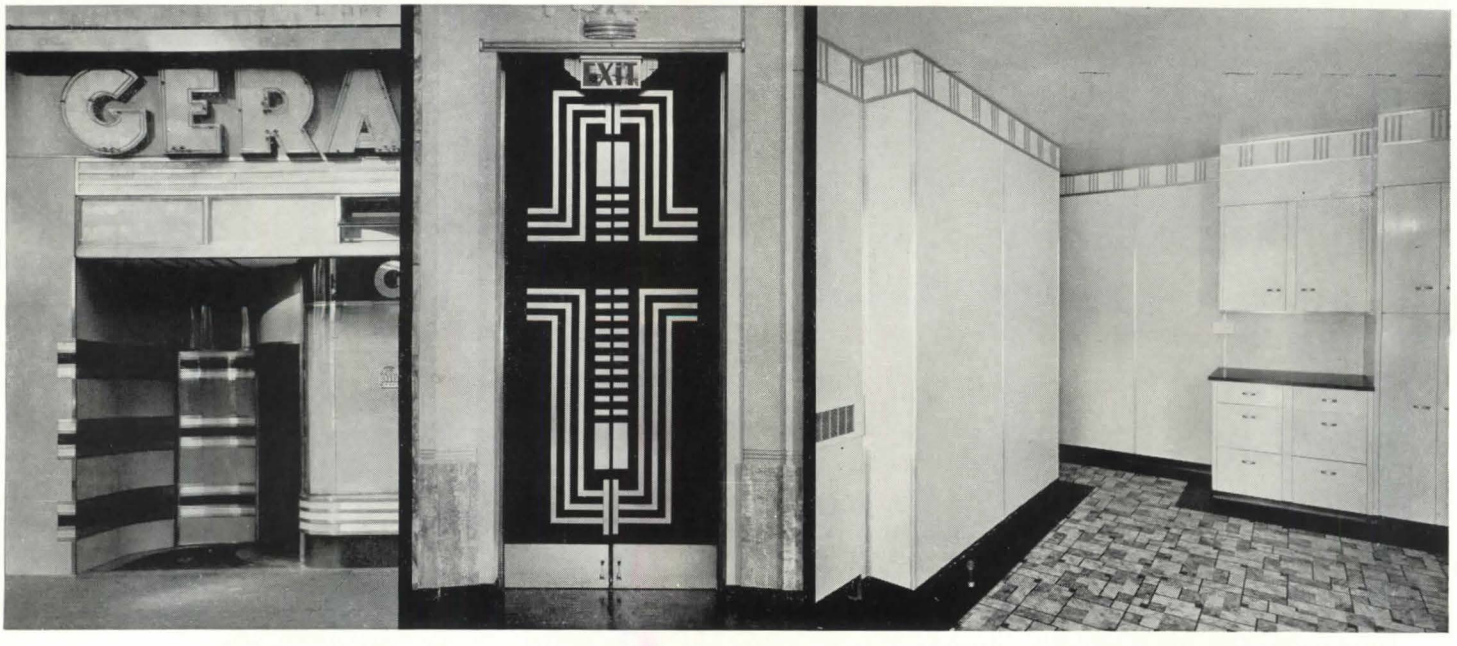
Fabric coated with Bakelite resin—Revolite—is water resistant and washable. Can be had in metallic and many colored effects.

Creaseproofing fabrics and adding stiffness to pile of fabrics is done with urea and vinyl resins.

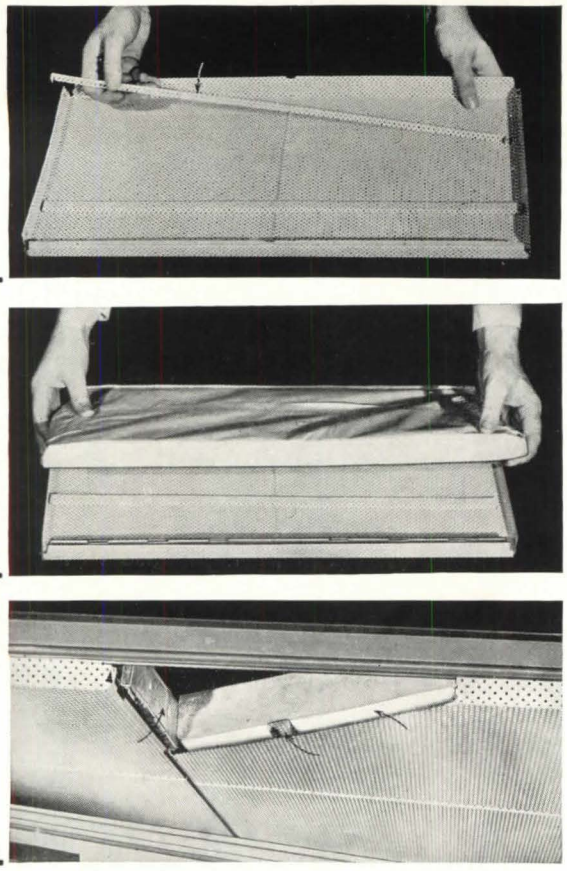
Floor tile, rubber-like in its nature, is made with vinyl resin and asbestos felt.

Cement for cushioning glass is made with vinyl.

1. 2. 3.

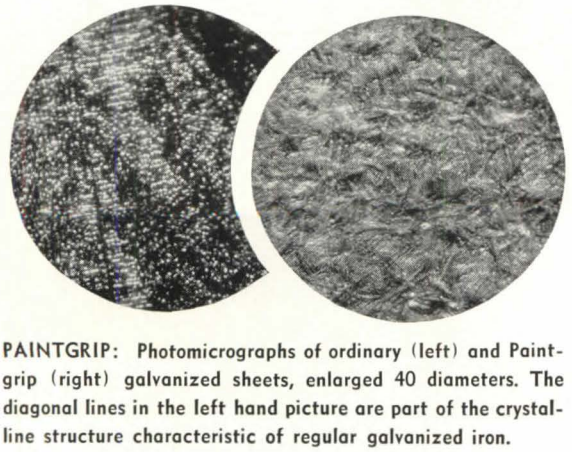


1. Entrance to cafeteria is lined with MICARTA; horizontal bands are MICARTA inlaid with metal. 2. FORMICA Elevator Door inlaid with metal. 3. FORMICA Kitchen Walls and Work Top.



ACOUSTI-VENT: 1. Typical perforated plate and spacing strips. 2. Inserting insulating pad. 3. Completed ceiling construction; arrows indicate spacing strips, insulation and supporting ribs.

SILVRAY "BUCKINGTON": The silvered bowl lamp is an integral part of the design.



PAINTGRIP: Photomicrographs of ordinary (left) and Paintgrip (right) galvanized sheets, enlarged 40 diameters. The diagonal lines in the left hand picture are part of the crystalline structure characteristic of regular galvanized iron.

BURGESS ACOUSTI-VENT

A new system of suspended ceiling construction and air distribution, which solv the dual problem of air circulation without drafts and quieting of occupation room noises, has been devised by the C. F. Burgess Laboratories, Inc., of Chicag The Acoustic Division of the Burgess Battery Co., Madison, Wis., as a licensee, marketing the new product under the name Burgess Acousti-Vent. The syste comprises a perforated metal ceiling, the back of which is covered with sound al sorbing material, installed somewhat below the normal ceiling of the room. Th space between this covering and the room ceiling constitutes a plenum chamb into which air is introduced through ducts from the ventilating fans. A unifor low static pressure is maintained in this plenum chamber, and openings are pr vided in the ribs which support the ceiling, which cause the air to pass to th underside of the sound absorbing material without having to pass through it, an thence through the myriads of small openings in the perforated sub-ceiling int the room. Room noises, upon encountering the perforated ceiling, seep throug the perforations and are absorbed by the material behind. (Noises are not affecte by the air pressure or air movement through the openings.)

Individual ceiling panels measure 12 x 24 in. Spacing strips are laid lengthwise i each panel to support the sound absorbing material about a quarter-inch abov the surface of the metal. An ingenious system of ribs which snap together, an into which the perforated ceiling plates snap, has been developed for the suppor and alignment of the ceiling. Knock-out blanks are provided in the longitudina ribs in order that the number of openings for air circulation may be varied i different parts of the ceiling according to whether they are near to, or remot from, the ventilating supply ducts. Smoke tests are said to have shown that th distribution of air obtained in this way is absolutely uniform throughout the entir area of the ceiling and that the air is perfectly diffused.

The system is applicable to air conditioning installations in restaurants, office auditoriums and other places where the dual problems of ventilation and acous tical treatment must be solved. Substantially the same construction has also bee applied to the construction of noiseless telephone booths and to the sound an thermal insulation of ventilating ductwork.

SILVRAY LUMINAIRES

A new line of indirect luminaires designed especially for use with the silver bow Mazda lamp has been developed by Silvray Lighting, Inc., Long Island City, N. Y Silver bowl lamps are regular Mazda lamps available in standard sizes, the ends o which have been coated with pure metallic silver, forming an opaque reflector. Th lamps are usually installed so as to throw all of the light upward against th ceiling. Advantages claimed for the Silvray units include low cost, ease of installa tion, simplicity of relamping and freedom from reflector maintenance. The mode illustrated, which has a special light-weight shade made of translucent die-formed fabric, sells in quantities for $2.70, complete with 150 watt bulb. It may be at tached to any standard suspension by simply tightening four screws, relamped without disturbing the shade. Since the reflecting surface is sealed in the lamp bulb it requires no cleaning, is replaced periodically as the lamps wear out.

ARMCO PAINTGRIP SHEETS

Commercial production of a galvanized sheet known as "Paintgrip" which assure a good paint bond on iron and steel has been announced by The American Rollin Mill Co., of Middletown, Ohio. These sheets are chemically treated to produce finely crystalline phosphate coating which is neutral to paint and keeps the pain from direct contact with the zinc surface. This coating is an integral part of th sheet and is slightly granular in nature.

In the past the practice has been to prepare the zinc surface for painting b roughening the surface or allowing the surface to weather. Neither of these meth ods has been entirely satisfactory because of the tendency of certain zinc com pounds to dry up the elastic constituents which are essential to the life of paint and lacquers. Paintgrip does not have this tendency.

Armco Paintgrip Sheets are available in any of the grades of galvanized sheet manufactured by the company. The base metal can be either ingot iron, plain o copper bearing steel. Forming properties of the sheets are the same as untreate galvanized sheets and they may be soldered satisfactorily with the use of hydro chloric acid as a flux ("cut-acid" is not strong enough to penetrate the Paintgri film, which must be dissolved before a good solder bond can be obtained). Prac tically any good paint can be applied to the sheets.

(Continued on page 82)

BUILDING MONEY

A monthly section devoted to reporting the news and activities of building finance, real estate, management and construction

CONTENTS

All photos, Pictures Inc.

GOVERNORS LEHMAN, BENSON, HURLEY (see Page 152)

THE OUTLOOK FOR PUBLIC HOUSING

waits on Congressional action. The Governors speak their pieces as Connecticut becomes the twenty-first State to sanction local authorities.

LAST month Connecticut's wispy, 74-year-old Governor Wilbur L. Cross, one-time Dean and "Uncle Toby" of Yale University, picked up his pen and squiggled his name across Chapter No. 3, Public Acts. Connecticut thereby became the twenty-first State to pass legislation enabling local housing authorities.

Two weeks before, on the last day of a special session of the legislature, the measure had come up before the General Assembly and had been defeated, 108-100, temporarily disappointing the housers who for years had tried to ram such a bill through. Two hours later, however, the bill was up again, with a clause inserted providing that authority properties may be taxed. Thus tamed, it went through, 153-64, thereby empowered every city of over 10,000 persons to establish housing authorities. A single opportunist, Bridgeport, led by its Socialist Mayor Jasper McLevy, promptly started angling for a 45 per cent PWA grant to help on a $6,500,000 slum clearance project.

Last month's second item of good housing news came from Chicago, when the Illinois Housing Board approved a local authority for Chicago. Mayor Edward J. Kelly appointed Sears, Roebuck's Executive Vice President T. J. Carney, the State Federation of Labor's V. Olander, the National Association of Housing Officials' Director Coleman Woodbury, Architect J. R. Fugard, and Contractor W. J. Lynch to a committee which has yet to hold its first meeting. It is expected to take over construction and management problems, after suitable arrangements with the Federal Government, of three Chicago projects: the Jane Addams Houses, the Trumbull Park Homes, and the Julius C. Lathrop Homes.

Such controversial aspects of public housing as tax exemption, subsidy, and the definition of the public domain in housing do not need to be labored. Apart from any consideration of public housing's pro and con, the significance of its success in Bridgeport and Chicago bears witness once more to the amazing strides it has made in the past four years in the fields of legislation, organization, and public consciousness. More and more, housing is earning the respect due a hard-headed, realistic fact, and is outliving the stigma which nearly dragged it down: that it was no more than the wish-bone of a few socially minded crackpots.

Credit for this maturity in thinking is due many quarters, the most spectacular of which is obviously Washington. More recently, and more quietly, a three-year-old organization called the National Association of Housing Officials has been assuming the job of pushing housing legislation, advancing housing thought. The NAHO is no lobbyist, no publicity seeker. It prefers to be known as an expert and experienced group which, when legislation has been passed establishing housing agencies, will give technical advice as to the best methods of operation.

Local authorities have preferred to mark time until Congress lays down a permanent housing program. Local participation has also been minimized by the activities of the PWA and the Resettlement Administration. For the future, NAHO officials see practically no local progress unless Washington continues its help. For only in a few cities such as New York, Cincinnati, and Philadelphia is public opinion developed to a point where active support of an authority is likely without the immediate stimulation of Federal grants.

Associated Press

Connecticut's Cross

The NAHO's realism in the past and astute alertness for the future is largely due to its Director Coleman Woodbury. Thirty-four-year old Director Woodbury taught economics at Northwestern University for a time, later became a consultant on housing for PWA. He directed the studies leading to the enactment of Illinois housing laws, is a recognized expert on urban land problems. Association members who have multiplied rapidly, include chiefly the best housing brains in Washington such names as Ernest Bohn, Howard Gray Langdon Post, John Fahey, Horatio B Hackett, Catherine Bauer, Miles Colean

The States. Thus, last month, centralized public housing was crouching in its starting holes, ready to sprint at the first sound o the Federal starting gun. And at home, in 34 States, watchful waiters thumbed their papers during the first two weeks of the year's first month to read what their Governors had to say about housing or realty either in their inaugural addresses or in their messages to the legislature. Returns in the main, were slim. Of the 25 Governors who delivered inaugurals before the middle of the month, only ten touched on housing, realty, or mortgages. Of these ten, only four showed a true grasp of the problem. Franklin Roosevelt's message to Congress came too late for all the Governors to take their lead from him, but what he had to say gave others a hint: "Many millions of Americans still live in habitations which not only fail to provide the physical benefits of modern civilization, but breed disease and impair the health of future generations. The menace exists not only in the slum areas of the very large cities but in many smaller cities as well . . ."

New York's Herbert H. Lehman needed no cue from his great and good friend to attack slums and the evils of the mortgage market. This incumbent of the nation's No. 2 elective office became interested in social problems when, upon graduation at the turn of the century from Williams College he worked in a New York settlement house. In his inaugural he reviewed generally past distress, viewed generally future hopes.

To his legislature, few days later, he outlined an eight-point program of medicine for mortgages, including the establishment of mortgage banks, a permanent ban on the sale of guaranteed mortgage certificates, the licensing of brokers and dealers, stricter regulation of title insurance, expansion of the Torrens system (State registration of title), outlawry of the system of deficiency judgments, extension of help to investors in the ill-fated guaranteed mortgage certificates (page 52). Of the mortgage moratorium, he de

clared: "Sooner or later it must come to an end. While I favor its extension for a year, I urge that it be amended so as to compel the payment of amortization upon the principal of a mortgage where funds are available and also to compel the reorganization and refinancing of mortgages where funds for that purpose are obtainable through the regular channels of mortgage loans."

For housing, he recognized the necessity of Government aid to private initiative: "It is my strong hope that Congress will [provide] for subsidies and loans such as have been extended in the past by the PWA. Federal financial aid is absolutely essential; let there be no illusion on that score."

He further recommended amendments to the State constitution (1) to enable the State to issue bonds to procure funds for loans to municipal housing authorities, and (2) to modify the debt limitations and restrictions upon cities to permit them to participate financially in low-cost housing.

Massachusetts' Charles Francis Hurley, a strapping, vigorous boating enthusiast, stepped into Democratic Boss James Michael Curley's shoes after three terms as State Treasurer, can be expected to mean what he said about Bay State banking: "In 1931 and 1932 because of the collapse of our banking system through loss in investments and values in real estate, and because of unwise and reckless management . . . Massachusetts experienced the closing of sixteen trust companies and two savings banks in fourteen months . . . The victims are the unfortunate depositors . . . I shall insist that the Department of Banks and Banking take steps to reduce the cost of future liquidation."

He also peered doubtfully at the unfamiliar housing question, parried: "Expenditures for the relief of involuntary destitution, for the improvement of living standards, the preservation of morale are not only justified but required . . . "

Minnesota's Elmer Austin Benson went to the Senate last year to fill out the term of the late Thomas Schall. Well-known was the agreement by which, that term ended, he and Floyd Olson would change places, Elmer Benson would become Governor. By last month the deal was complete, and polite Governor Benson, whose conservatism extends to stiff collars and abstemious habits, but not to politics, was saying to his legislature: "A low-cost housing program is essential."

Minnesota's slum problems are restricted to Minneapolis and St. Paul, but Socialist Benson is of the mind to heed Franklin Roosevelt's admonition about the smaller cities, and then pursue his aims down through the towns as well. He realizes the need for "adequate, modern, housing facilities for our low-income groups," agrees with New York's Lehman that it is "possible only upon the basis of an outright governmental grant of funds to pay land and construction costs." His recommendation is that Minnesota set up a public housing agency to cooperate with Federal Housing agencies, and avail itself of all possible grants.

Illinois' Henry Horner is that State's first liberal executive in some years, has managed to retain his job for three terms despite the enmity of the powerful Kelly-Nash machine. A bachelor, he keeps several dogs, two deer, and innumerable rabbits. Famed as no politician, he has the habit of antagonizing the legislature by browbeating it. Last month, to that legislature he murmured, in closing, "To the members of the State Housing Board . . . I express my very grateful appreciation."

Rhode Island's Robert E. Quinn: "Steps should be taken . . . to determine the possibility of a modification of interest rates to borrowers and mortgagors."

Georgia's Eurith Dickinson Rivers (The Man Who Beat Talmadge), took a leaf from that gentleman's notebook, showed he could rouse the rabble with the best by trumpeting for "a State of home owners. Then communism and radicalism cannot gain the slightest foothold." His program pointed largely at easing mortgage terms.

Kansas' Walter A. Huxman is the Democrat who was surprised and dismayed to find that he was to fill Alfred Mossman Landon's shoes. In keeping with Kansas caution, he felt his way carefully: "Frankly, I do not think it a wise or good policy to try to accomplish in two years what should have been done through a series of years."

To most Governors, a look at housing or building boiled down to a look at their State institutional needs. Thus **Nebraska's Robert LeRoy Cochran,** to the first session of his State's new unicameral legislature: "The need exists for new buildings and for repair of old buildings, for repairing and repainting of old buildings in the towns and cities, as well as on thousands of farms throughout Nebraska."

In the agricultural Dakotas, most aggravation has resulted from the farmer's plight. Said **South Dakota's** strapping, baldish **Leslie Jensen:** "I recommend . . . legislation placing HOLC mortgages upon the same basis as other mortgages with respect to the period of redemption, assignment of rents and receiverships, during foreclosure and the period of redemption." **North Dakota's** stocky, big-mouthed **William Langer,** who was impeached and ousted from office in 1935, was inaugurated again last month, promptly moved to try charges brought by his Republican predecessor that he had violated the Corrupt Practices Act during the election campaign. Holding actions in higher esteem than words, in his second administrative act he stopped all mortgage foreclosure sales on real and personal property.

Summation. Of the 48 States, 34 last month inducted Governors, ten of whom succeeded themselves, 24 of whom assumed a new position. Of the 34, 25 had been inducted to office by the middle of last month. Ten regarded housing, realty, the mortgage market, or a construction program as worthy of mention to their respective legislatures. Mum on housing were the Governors of **Michigan, Idaho, Montana, Maine, New Hampshire, Colorado, Florida, North Carolina, Missouri, Arkansas, Vermont, Arizona, New Mexico, Wisconsin, Ohio.**

HOUSING AUTHORITIES

Housing authorities, whose jurisdiction may extend over the State or simply to a municipality, have now been created in 21 States. Generally speaking, an authority is empowered to build and manage shelter. Besides the Hawaiian Housing Authority, Statewide jurisdiction exists in **MARYLAND** and **NEW JERSEY.** Municipal or metropolitan authorities have been set up in **ALABAMA** for Birmingham, Andalusia, Florence, Red Level, Selma, and Colbert County; in **CONNECTICUT** for Bridgeport; in **NEW YORK** for Amsterdam, Buffalo, Lackawanna, Port Jervis, Schenectady, Syracuse, New York City, and Yonkers; in **OHIO** for Cincinnati, Cleveland, Columbus, Dayton, Toledo, Warren, and Youngstown; in **MASSACHUSETTS** for Boston, Cambridge, and Chelsea; in **ILLINOIS** for Chicago, Peoria, and Saint Clair County; in **TENNESSEE** for Knoxville and Memphis; in **SOUTH CAROLINA** for Charleston and Columbia; in **MICHIGAN** for Detroit; in **KENTUCKY** for Lexington; in **CALIFORNIA*** for Los Angeles; in **NEBRASKA** for Omaha; in **WISCONSIN** for Milwaukee; in **MONTANA** for Billings; and in the **DISTRICT OF COLUMBIA.**

States with enabling legislation which have nevertheless not as yet established any local authorities are **COLORADO, DELAWARE, LOUISIANA, NORTH CAROLINA, RHODE ISLAND,** and **WEST VIRGINIA.**

During the past three years, with no success, attempts were made to push through enabling legislation in Florida, Georgia, Idaho, Indiana, Iowa, Minnesota, Missouri, Oklahoma, Pennsylvania, and South Dakota. In Oklahoma, the bill passed the legislature, was vetoed by the Governor.

*California as a State has no legislation for authority, Los Angeles qualifying under its municipal charter.

Associated Press

Pictures Inc.

Intern

TORNADO OVER GAINESVILLE

gives eight Federal agencies a chance to show their wares, shows Rent-to-Space in action in a devastated Georgia town.

TOWARD midday in early April of last year, a black and irregular spot appeared in the Georgia sky to the southeast of the average, middle-sized Southern town of Gainesville. The spot, with time, assumed the shape of a funnel, the habits of a spinning top, the speed of the wind, and the proportions of the sky. It touched some Georgia towns, but smacked Gainesville dead center. Of the 18,000 persons living within a three-mile radius of the city square, 210 were killed, well over 1,000 were injured, 1,500 were rendered homeless. Property damage, both from tornado and consequent fire, reached a total of some $10,000,000.

Happily for Gainesville, there were at hand two men, one of whom could set in motion all the necessary wheels for relief both short- and long-term, the other who had ability to fit the cogs of those wheels and make them coordinate smoothly. The first was Franklin Roosevelt, who was paddling in the waters of his Warm Springs Foundation, 100 miles away. The other was swart, heavy-set Erle Cocke, State Director of the National Emergency Council, in his Atlanta office, 50 miles away. Through the initiative of the one and the perseverance of the other, Federal agencies faced and jointly met a project calling for immediacy and large-scale efficiency.

By last month the coordination of the National Emergency Council, Reconstruction Finance Corp., Public Works Administration, Works Progress Administration, American Institute of Architects, U. S. Army Engineering Corps, American Legion, Red Cross, Salvation Army, National Guard, Federal Housing Administration and local hospitals, planning committees, chain-gangs, and city and county officials had brought about what was to all intents a new city. Two subdivisions, one for whites, one for Negroes, had been finished; a new civic center was functioning; the business section had been harmonized architecturally; streets had been widened and extended; the railroad station had been located more conveniently; an open parking and market lot had been provided; school facilities for both Negroes and whites had been improved; public utility services had been restored; fire limits had been extended; zoning ordinances had been effected and enforced; a building code had been passed and was being religiously followed.

Gainesville, as it stands now, is no model city. Its reconstructors were forced to follow the lines and keep within the limitations of the old town. Old streets could not be ignored, nor old foundations forgotten. A further handicap was the essentials of speed and economy. So, today, the houses pictured on page 156 are not esthetic achievements from an absolute point of view, but they do constitute realistic housing, cheap, sturdy, and erected with no loss of time.

Viewed relatively, Gainesville is an amazing achievement. The old town was any and every old town in the U.S., haphazard, out-at-elbows, gray, disjointed. It took catastrophe to focus sharply in the minds of Gainesville's citizenry the fact that the architect is a good man to see when you want to build.

The NEC. Three days after the tornado had passed over Gainesville, Franklin Roosevelt was there. He stood on a train's platform (see cut), and spoke briefly. His promises were not destined to be hollow, as could have been adduced from the presence on the platform with him of three potent National Emergency Council officials. For the NEC has earned the distinction of being the coordinating agency for the various emergency organizations. Least publicized of all Federal agencies, it is also closest to the President's heart. When it was first organized, the President appointed as its director his great and good friend Frank Walker, a man completely self-effacing, who sought no headlines for his achievements.

Georgia's NEC Director Erle Cocke is of that school. Born 41 years ago in a Georgia farmhouse, he followed up a degree from the University of Georgia with a two-year period as teacher and football coach, later put in thirteen months overseas. On his return he was successively in the newspaper, the real estate, the farming, and the fertilizer business, taking time out for a Georgia State senatorship. Two years ago he became RFC manager for Georgia, later taking over the NEC directorship as well. The Gainesville disaster was not his first encounter with the President: he had managed the Georgia homecoming at Warm Springs for him year before. Director Cocke's black hair is thinning, but his eyebrows are still bushy. His most apparent habits are white shirts and black cigars. On this man, well-versed in the Georgia scene because of his business experience, his political record, and his one-time vice-commandership of the American Legion, was dumped the assignment of NEC field man for Gainesville.

Spadework. The President was interested in Gainesville's plight, as he saw in it a chance for his emergency bureaus to show

what they could do. Thus Director Cocke's way was to an extent paved for him. He communicated some of his own enthusiasm to Georgia's Senators Walter F. George and Richard B. Russell, Jr., who were already more than interested, then left for Washington. Lyle T. Alverson was then Acting Executive Director. Looking back on Erle Cocke's days in Washington, Lyle Alverson reports, "He was a damn nuisance. But he had to be."

The damn nuisance was up to his neck in the most arduous part of his struggles on behalf of Gainesville: coordinating Federal potentialities for something besides emergency. Result was that Federal talent and Federal gold were dispatched to Georgia in something near record time.

From Florida came Lieutenant Colonel Brehon B. Somervell, now New York City's WPAdministrator, to draw up the town plan. From Washington came specifications for dwellings drawn up by the PWA Housing Division, as well as the division's E. B. Johnson. Also from Washington came the RFC's Chief Engineer, Morton Macartney, whose duty it was to shear and prune the PWA specifications to something near what the RFC intended to pay out.

All these Federal officers were billeted in the town. They found the townspeople eager to assist, but still somewhat dazed, as would be anybody who had been dealt such blows of disaster and death. These people were anxious primarily for a roof over their heads. It was a Roman holiday for the jerry-builders, who went about with wagons full of brick, offering to throw up in a week a shell which would last a year. Thus was marked out clearly the first task.

Full Speed Ahead. Less than three weeks after the tornado had passed out over the Atlantic, the city and county commissioners had met and, acting upon advice from their visitors, had framed and passed a respectably rigid building code and provided for an Inspector of Buildings to enforce their ordinance. Then, having legislated out of existence the possible dangers of improper building, they set in motion the wheels for proper planning and housing.

In Erle Cocke's Atlanta office these local leaders met with Army engineers and Federal officials, approved the proposals for their new city square. On three blocks in the heart of the downtown section were to be erected a courthouse, city hall, public library, and city hospital. This civic center was to be surrounded by a square of shops built with architectural control to insure a uniformity which had been unknown. Those shops before the tornado were in buildings averaging 30 years in age, all were in need of new fronts, none had any considerable physical value.

Further, these same leading Gainesville citizens banded together, formed a limited dividend corporation called the Gainesville Replacement Homes, Inc., and floated a loan from the RFC to the tune of $170,000. This was done by the liberal interpretation of Public No. 525, 74th Congress, an Act authorizing the RFC to make loans for ". . . financing the repair, construction . . . and replacement . . . of structures or buildings . . . destroyed or rendered unfit for use by reason of catastrophe." As collateral, the RFC took first mortgage on the entire properties of the corporation. Fee simple title in the land was vested in the corporation by the issuance of preferred stock in the corporation to those from whom the land was acquired. PWA architects went to work on plans for the homes: 50 for whites, 75 for Negroes.

This by no means completed the RFC share in Gainesville's proceedings: loans were also authorized to about 100 individuals, corporations, partnerships, and institutions, amounting to some $1,200,000, involving the rebuilding of private homes, business blocks, several churches, the hospital, a hotel, and some of the buildings of Gainesville's Brenau College. The PWA added $126,000 for the courthouse.

Homes. Low bid for the Gainesville Replacement Homes, Inc.'s contract was the Daniel Construction Co.'s $156,550. Amended schedule of prices was:

Type	Space	Cu. Ft. Area	Sq. Ft. Area	Building Cost
	Colored			
I	LKB 2 BR	7,670	600	$ 980
II	LKB 3 BR	7,900	550	1,000
	White			
III	LKB 2 BR	9,815	805	$1,610
IV	LKB 3 BR	13,175	1,150	1,900
V	LKB 2 BR	8,490	850	1,560
VI	LKB 3 BR (2 st.)	10,500	1,080	2,010

Key: L=living room; K=kitchen; B=bathroom; BR=bedroom.

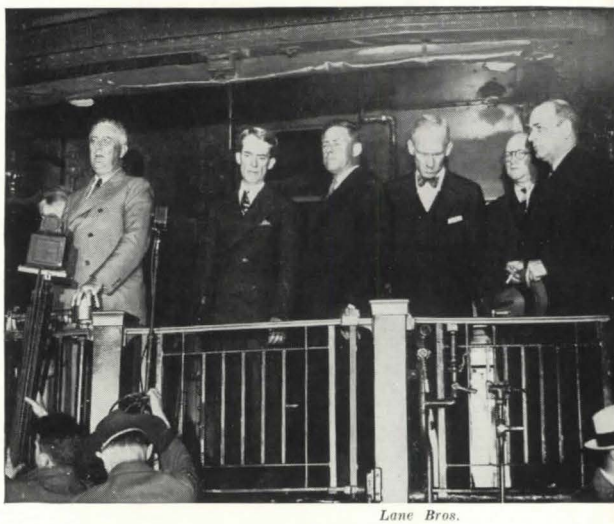
The amount of money furnished by the RFC was 80 per cent of the total appraised value of the completed project. Period of the loans was ten years.

Homes for Negroes are of two types: both are one-story houses, both are located on lots 50 x 150 ft., one has four rooms, the other five. They are of frame construction, plastered inside, have a fireplace, toilet, sink and provision for wash bowl and tub later. Conveniently located for the several industries thriving in Gainesville, they are also near enough to the better residential districts for the Negroes to be easily accessible as servants. A new school for Negro children is being built to replace the old one, completely wrecked.

The development for whites is to the northwest of the town center, includes four types having four, five, and six rooms. Lots average 75 x 150 ft., cost some $500. Set on a wooded, rolling piece of ground, close to the residential district, these houses are better equipped, include some with two stories. Close at hand, with an improved approach, is the high school.

Prices. Terms could not have been more liberal. Realizing that few if any prospective tenants had money for a down payment, the mortgagee offered a rental contract with option to purchase. Units in the site for Negroes were priced at $1,055 to $1,230 with land, calling for monthly payments of from $10.69 to $12.45 for 120 months. Unit sales prices in the site for whites ranged from $1,910 to $2,710, the monthly payments ranging from $19.34 to $27.44. These prices included payment of principal and interest at 4 per cent, eliminated down payments.

It was also stipulated by the RFC that construction comply with the building code, and that Gainesville Replacement Homes, Inc. furnish proper streets, walks, sewage connections, fire plugs, water connections, and other utilities. The streets are being graded and surfaced with gravel by the city, which is also taking care of the other requirements. A further clause by the mortgagee called for a binding agreement establishing a sinking fund for the payment of State, county, and city taxes and fire and tornado insurance, one-twelfth of the estimated annual cost to be deposited monthly with the housing corporation by the individual purchasers. This assessment was set at $4.50 per month for the white, $1.50 a month for the Negro,



Lane Bros.

To the extreme left and right are the two men deserving most credit for the reconstruction of Gainesville. The faces of both mirror the solemnity of the occasion, for they are facing townspeople whose souls are still touched by an Act of God. Franklin Delano Roosevelt hurried to Gainesville from Warm Springs, 100 miles away, NEC State Director Erle Cocke from Atlanta, 50 miles away. The one started the ball, the other kept it rolling. Others in the picture, left to right, Presidential Secretary Marvin I. McIntyre, the late "Gus" Gennerich, former NEC Acting Executive Director Lyle T. Alverson, NEC Acting Executive Director Eugene S. Leggett.

over and above the monthly rental charges.

By last month all 125 homes were ready for occupancy, work having been started in the middle of September. As might have been expected, the applications for these homes were far in excess of accommodations, the project being able to take care only of some 30 per cent of the need for homes. Preference was given to those who suffered most, then to those who were considered best financially equipped. Local officials of the housing corporation, after examination of rent-paying power in the community, set the price level of houses where it was felt most would benefit, were also the ones to select the tenants: they have determined that the tenants are safe mortgage risks, since what they pay toward shelter is in nearly every case less than 20 per cent of their income.

These trim, unassuming cottages frankly cater to Southern traditions along certain lines: they have considerable porch space, most of it unenclosed; and they are built up on brick piers, to afford better ventilation and to ward off termites. Neither of these practices has resulted in particularly attractive architecture. Inside, the houses reveal intelligent, realistic planning. Heating, because of the climate, can be amply furnished by the provided fireplaces. The bedrooms have cross ventilation, the living rooms are in most cases big and cheerful. In this community and for these people, the important room is the kitchen: it has been made the house's nucleus.

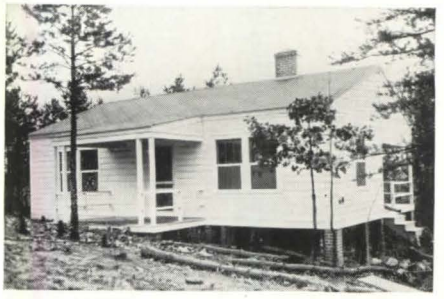
In a more general sense Gainesville's new houses are truly significant, for they represent Federal housing which has grappled with the fact of shelter instead of pursuing the ideal of perfect housing.

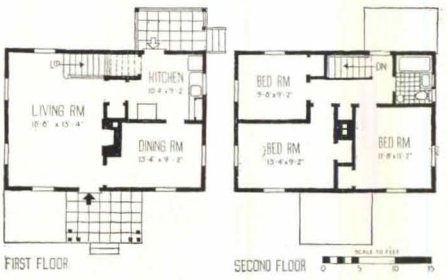
People needed homes, and needed them cheap. Officials of the local housing corporation eyed this problem wisely, built houses on the basis of what could be paid rather than what should ideally be provided. The space followed the ability to pay rental. No critics can say, as they have been able to say about Atlanta's Techwood, or about Manhattan's First Houses, that the rents are not economic rents. The result is a thorough example of the operation of the theory of Rent-to-Space

FLOOR PLAN


Price: $1,000

FLOOR PLAN


Price: $1,568



FIRST FLOOR SECOND FLOOR


Price: $2,010

Here now live 50 white families (lower left), in far better style than that to which they were accustomed. Their homes cost about $30 a month, and they will own them free and clear before 1947. Still to be done: the laying of sewer lines, the surfacing of roads, the strengthening of underpinnings, the landscaping. The school is a quarter of a mile distant, the shopping center three-eighths of a mile distant.

The Negro still lives down by the railroad tracks (lower right). His plight, however, is far better than it was. He needed no down payment to occupy his home unless he demanded extras; in that case he paid the cost of the extras. He lives some twelve blocks from the shopping center, and his children will go to a new school nearby. He, like the white, can rejoice in a large park, with facilities for vegetables. Advice on farming and landscaping is being provided by the University of Georgia's horticultural department.

Photos, Gainesville's Photograp

(ARCH. FORUM, June 1936, p. 445 *et seq.*).

By last month, other developments were:

¶ Near completion of the civic center, combining, within an appropriate space and under a uniform architectural treatment, Federal, county, and city activities. The Federal building, happily little damaged, was repaired at the expense of the Federal Government. Construction of the county courthouse was boosted by a 45 per cent grant on the total cost ($280,000) from PWA. The city hall was built and paid for by Gainesville, with the aid of the WPA. The hospital was taken care of through private capital, and the library, to be built where none existed before and because it is felt that a city the size of Gainesville requires one, is also being financed largely through private channels.

¶ Existing fire limits were extended, both to encourage the expansion of the business section away from the civic center and to provide for the protection of fire limit restrictions.

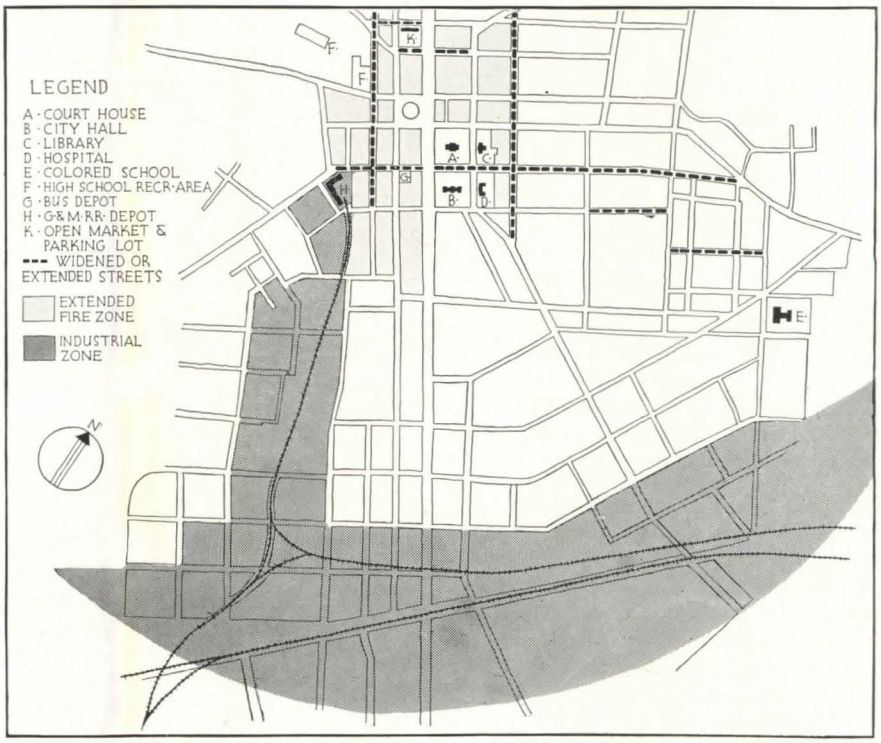
¶ With sensible respect for existing conditions and possible development, zones were laid down for residential, business, and industrial areas. Enabling legislation by the State Legislature is considered a formality.

¶ Like every old country town, Gainesville was not equipped for the advent of the automobile. The need for a parking space was further intensified by the city's recent growth. Therefore a parking lot and open market have been provided.

¶ Restoration of the city's electric distribution and street lighting system, as well as repair to the damage to city streets, for $65,000, financed by the city with WPAid.

Achievement. A year ago Gainesville was a city marked by the age-old stigmata of metropolitan development: the old mansions leaned over the shoulders of the business section and they had, through depreciation, passed at least twice down the social scale of tenantry. Another contributing factor to the city's slums was the Negro element, which had rarely if ever been afforded the chance to live in houses where even a pretense of plumbing was provided. It had grown from a town equipped for the Nineties into a city more congested than at the turn of the century but still equipped only for the Nineties.

In the intervening time, Erle Cocke and his associates have dosed the city with potent medicine. The residential section has been decentralized to the suburbs, the depreciated and near-slum residential district has been destroyed and forgotten, Jim Crow and his brothers have modern houses which by reason of the climate do not need better insulation or heating equipment than they have, the building code has demanded sound construction of the citizens, the civic center and the business district are just cause for Gainesville smugness. Gainesville is now a city intelligently conceived for modern conditions, with a record of achievement as extended as the limitations of time, money, and existing circumstances permitted.



Potent Medicine by Erle Cocke and Colonel Brehon B. (Bill) Somervell fitted the arteries and nerves of Gainesville's commercial section for modern demands. Off the map, to the northwest, is the development for whites; to the east, that for Negroes.

This is the heart of Gainesville (lower left), morning after the day before. By this time, working at top speed, such varying groups as Miss Gay Shepperson's WPA and some of Georgia's chain-gang convicts had cleared the débris into some semblance of order. What Architects Daniell and Beutell, abetted by a new building code and Erle Cocke, were able to accomplish with a drab and out-at-elbows city square is apparent in the recent picture (lower right). Uniformity in height, some modernity in materials for shop fronts, wider streets, all have contributed to giving the shopping center greater efficiency. Gainesville can look down its nose at those unfortunate towns which were not wrecked by tornado.

A PANEL OF TAXPAYERS

which have helped change the face of Manhattan with marble, glass brick, enameled steel.

THE most succinct symbol of a realty depression is the empty building on an expensive site, its taxes, overhead, and interest piled up against rental receipts of zero. A modern solution to this old dilemma, widely popularized over the last five years, is the Taxpayer. A small, one- or two-story building of usually modern design, the taxpayer is essentially a hedge on real estate futures. As the name implies, it is large enough to bring in the price of the taxes; and it is generally figured to pay out in a decade. But a bigger, more lucrative building cannot rise on the same site before the decade is over without assuming the unamortized debt of the taxpayer. In order to appraise the taxpayer and its new architecture, THE ARCHITECTURAL FORUM has prepared and examined a panel of six culled from Manhattan.

Land Cost is a basic factor in determining the size and shape of a taxpayer. The rule-of-thumb is an obvious one: the higher the land cost, the more money can economically be spent on the taxpayer. Thus, since a second floor adds about 30 per cent to the construction costs, it will prove a more economical addition on more expensive land. Similarly, the decision as to whether or not to include air conditioning will be governed to a certain extent by the same considerations.

The Short Life of the taxpayer as compared to other forms of urban construction makes heavy construction an unsound practice; there remains no point in digging deep foundations, or using heavy steel, while the exterior can well be finished in relatively impermanent materials. Sole exception to this rule is the trick of building heavy foundations on a two-story building with the idea of later adding a number of stories. This practice imposes severe limitations on the interior layout. Furthermore it tends to invalidate the function of the taxpayer as a hedge on realty values by upping the capital cost to an extent which only a problematical rise in values can justify. Thus to install in a two-story taxpayer foundations capable of later carrying six floors will add about 15 per cent to the total construction cost. Assuming that rentals cannot be raised to absorb the added 15 per cent, this means that the building will operate at a loss. It will be economical to operate a two-story building at this level only until the loss equals the added price of the heavy foundations.

The Neighborhood shapes the design much as the land cost limits the budget. An expensive neighborhood calls for more expensive exterior finishes just as expensive land justifies bigger investment. Further, the neighborhood provides a sound clue to the type of tenant a taxpayer will get. Thus a taxpayer in a night-life district will do well to attract its own cabaret (No. 2); one in a smart residential district to make special arrangements for a specialty store attractive to the near-by and discerning clientele (No. 3).

But a more significant contribution to the importance of neighborhood is a consideration of buyer traffic. In the last analysis, it will be this factor which will determine whether it is profitable to erect a two-story taxpayer. In a smart shopping center, where tenants for a second floor will not be hard to find, the taxpayer with a second story simply denotes an owner who is taking full advantage of possibilities (No. 2). Similarly, where buyer traffic is thin, it would entail a loss to build the second story (No. 4).

Many taxpayer owners deal largely in futures. In building their improvements, they are watching the trends of buyer traffic and trying to anticipate it. One such trend in Manhattan has shown that the smart shopping centers are gravitating east. Thus, although at present Third Avenue is a near-slum from a shopping standpoint, the thinking cannot be far wrong which has dictated the erection of a smart two-story taxpayer in that neighborhood (No. 5). The same type of trend impelled another owner to push into the highly restricted residential district of Park Avenue with a commercial enterprise (No. 1).

In a more limited sense, locality is important from the point of view of position on the block. For, with a center-of-the-block lot, the owner is forced either to have a sidewalk elevator or, as in Taxpayer No. 4, use his front entrance for service delivery. The corner lot can make use of a small easement. The front entrances likewise will incline to suggest the type of tenant to be expected: the cantilevered corner entrance will attract the chain drug or cigar store (Nos. 3 and 6), while a florist or a specialty shop owner will be content with a front entrance flush on the sidewalk (Nos. 1 and 2).

Display is the third factor at work in shaping a taxpayer, and it is that factor which has brought about most of the improvements in its design. Because of its smallness, and the fact that its life is relatively short, the taxpayer has attracted small shops rather than offices or banks. This has vitally increased the need for display in taxpayer construction. Chief step in this direction has been the use of cantilever construction. The use of this method permits the supporting piers to be placed well back from the building line, thus allowing a display front virtually without interruption. The price is about equivalent to that of straight piers.

With the taxpayer, more than with any other type of building, selling begins on the sidewalk. The problem of affording the second floor tenants some compensation for their distance from the point of sales contact has led to some interesting solutions.

This question cannot be answered by the use of an elevator since the initial cost is prohibitive for a temporary building, is perhaps best solved by a large arcade indented on the first floor, leading the shopper to a stairway in the back (No. 2). Escalators, which can be purchased for some $20,000, might well be considered as a further possibility, since they have the virtue of high salvage value as well as being able to transport a great many persons on a low upkeep.

Another solution has been advanced by Architect J. M. Berlinger, who has designed many and many a Manhattan taxpayer. His contention is that the second floor of a taxpayer should be in the basement, store entrances and displays to be provided with the help of an arcade. His reason: people instinctively would rather walk down than up, down to any department store's basement, down to subways instead of up to elevated trains.

Finally, display has fathered the use of glossy exterior materials. Bronze (No. 1), glass brick (No. 3), marble, chromium, enamel, aluminum, black glass (No. 5), any material calculated to attract attention has been brought into service. In cost the common facing materials run from enameled steel — the cheapest — through black glass, glass brick, and limestone, up to marble, the most expensive.

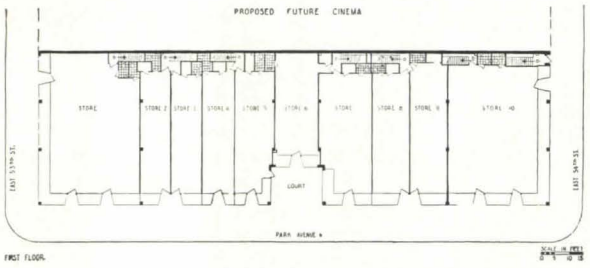
Rents for taxpayers are based on a graduated scale of percentage leasing, no new system with the rental agent. Until recently, however, Manhattan's swank taxpayers were rented for the first two years at practically nothing, with a 5 per cent increase the third year, another the fourth year, and a 10 per cent increase the fifth year. This practice was popularized by the Rockefeller Center buildings, has been successfully applied to taxpayers. Nor would the rental agents accept contracts for more than five years, in anticipation of the sharply rising market. Today it is difficult to get a contract for longer than two years. Such a technique is especially useful in pioneering a new neighborhood, as with Taxpayers Nos. 1 and 5, where the owners are figuring on future trends rather than present facts, can more easily entice doubtful tenants with the low rents for the first two years.

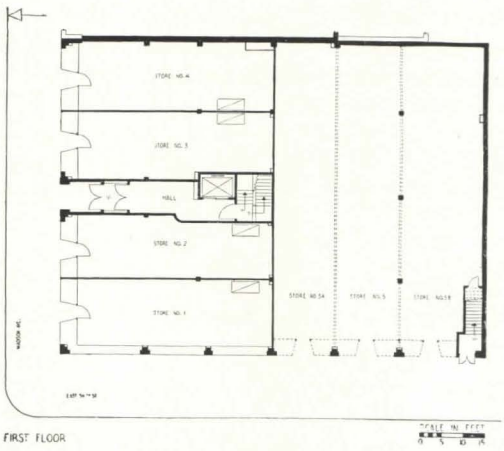
, Robert Walton Goelet, a major owner of anhattan's swank Park Avenue land, built is imposing bronze and marble taxpayer. To ect it, he tore down over a score of small uildings ranging from two to five stories in ight. He considers it a 10-year investment, ntemplates building a small theater behind e present structure. His tenants include the ggest volume florist in New York, and Mrs. lwin C. Feigenspan (P. O. N. beer), who ans for the center store a Brides' Bureau. rchitect: Rosario Candela.

	BEFORE	AFTER
SESSED VALUATION	$2,272,000	$2,150,000
.XES	61,344	58,050
NTS	39,000	67,500

ORTGAGES: None

st of demolition and new building: $120,000





. In May, 1936, the Oheka Corp. (estate of e late Banker Otto H. Kahn) acquired Man-ttan's Academy of the Sacred Heart and a rrounding group of brownstones, built this eek taxpayer on the site. First tenant was luesinger Helen Morgan ("Chez Morgan"). hat part of the building not designed for en-rtainment caters to smart specialty shops, hich, due to the Madison Avenue Associa-on's requirements as well as the owner's, ercise considerable restraint in their signs. rchitect: William L. Rouse.

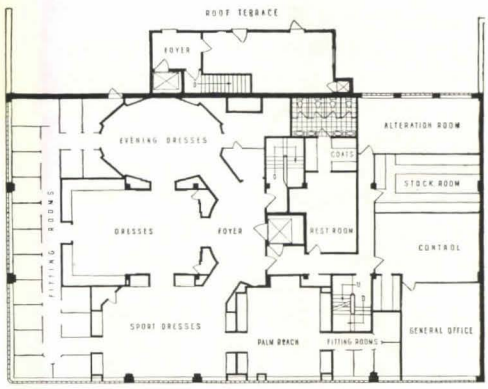
	BEFORE	AFTER
SESSED VALUATION	$900,000	$785,000
XES	24,480	21,195
NTS	none	25,000 (approx.)

ORTGAGES: None

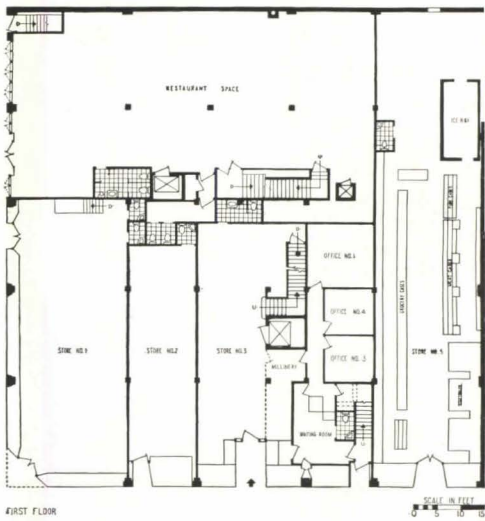
st of demolition and new building: $103,500

John Beinert Photos

Karl von Romerheim



SECOND FLOOR



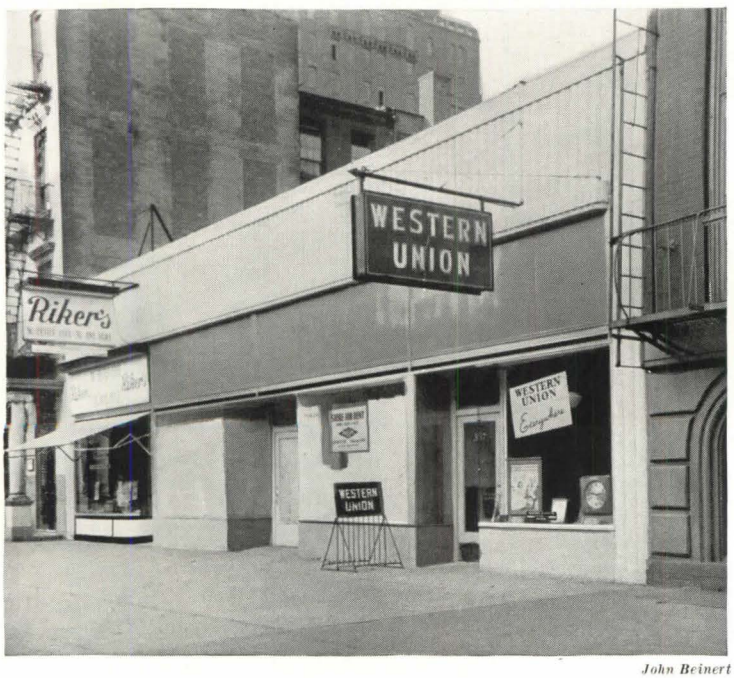
FIRST FLOOR

3. This Manhattan taxpayer stands on land owned by Sportsman William Woodward, owner of Omaha, famed racehorse. Although in the smart residential center of town, the plot had stood unimproved for six years while plans for theaters and apartments were successively proposed and rejected. Last September the present building was opened with a night club and second floor dress shop walled in glass brick, promptly won a prize. Architect: Roy Clinton Morris.

	BEFORE	AFTER
ASSESSED VALUATION	$625,000 (unimproved)	$710,000
TAXES	16,875	19,170
RENTS	none	42,000

MORTGAGES: None

Cost of demolition and new building: $80,000



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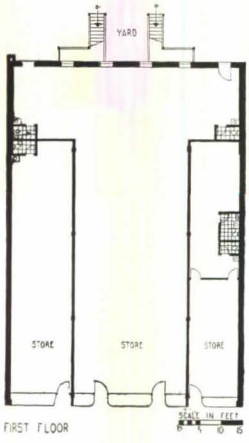
4. Two five-story, vacant residences stood on this property prior t the taxpayer, gradually going further and further into debt with firs second, and third mortgages. Its history is testimonial to the increase respect in which operators hold a taxpayer as an investment: the ne building has changed hands three times, made a profit for each selle Demolition and building costs for this profitable building amounte to only $17,000. Its simple and inexpensive exterior treatment stresse cast stone and porcelain. Architect: Horace Ginsbern.



FIRST FLOOR

	BEFORE	AFTE
ASSESSED VALUATION	$100,000	$85,0
TAXES	2,700	2,2
RENTS	none	12,0
MORTGAGE	75,000	55,0

Cost of demolition and new building: $17,000

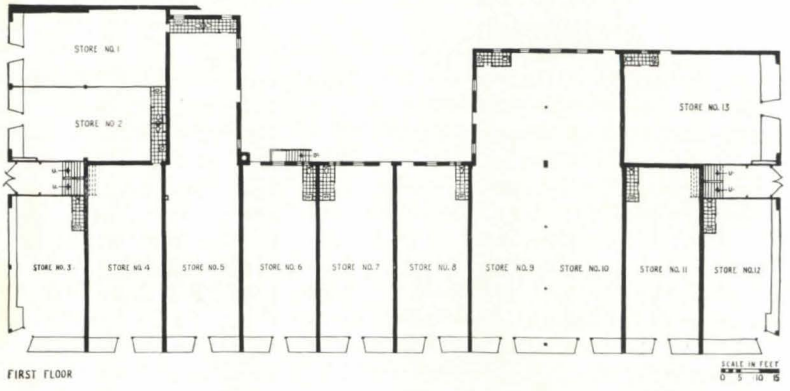
Affiliates of the Wheeler Engineering . took over this property on a lease from e Gerry Estates, composed of Socialite errys, who have, like their cousins the Solite Goelets, amassed their fortunes from anhattan real estate. Where ten five-story ements had stood, the company built a ock-long, two-story building which houses ank shops entirely strange to a near-slum ird Avenue shopping clientele. Theoretilly, renters can figure on the eastward end of the shopping center. Actually, the tempt to raise the standards of the vicinity is yet to be shown practical. Architect: Arur Weiser.

	BEFORE	AFTER
SESSED VALUATION	$425,000	$550,000
XES	11,475	14,850
NTS	22,000	54,500

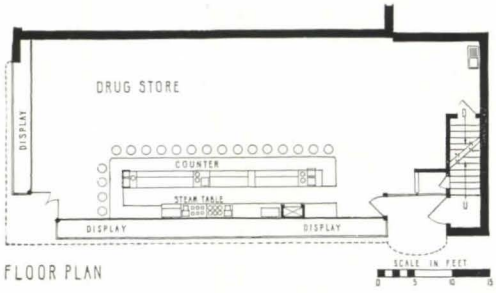
ORTGAGES: None

ost of demolition and new building: $150,000

Knickerbocker



FIRST FLOOR



FLOOR PLAN

5. This building exemplifies the tradition of verage midtown taxpayers. The purse-strings ere tightly held, yet through the use of lossy and startling materials the owners ake a strong bid for attention. Costs were ept down by using the old foundation, inluding the vault for the sidewalk elevator, nd by retaining the party wall. This buildng also typifies, like Nos. 1, 2, 3, and 5, the ew restraint in signs which prohibits flagigns, restricts the height of lettering. Architect: Harry P. Jaenike.

	BEFORE	AFTER
SSESSED VALUATION	$140,000	$150,000
AXES	3,780	4,050
ENTS BEFORE	none	12,000

ORTGAGES: None

ost of demolition and new building: $15,850

BUILDING AND THE 75th CONGRESS

A look in the hopper, whence may come a new Housing Bill, new life for the FHA. The New Deal on a new tack.

THE inauguration of the 75th Congress last month was prefaced by a significant exodus from Washington. Into the molasses business went the Resettlement Administration's Rexford Tugwell; to Harvard University went the Securities and Exchange Commission's James M. Landis; to the International Paper and Power Company went the FHA's smart legalite, Martin J. Roess, Jr.; to many another business had already gone a round dozen of the New Deal's smartest. Chief and never mentioned reason for these departures was simply that President Roosevelt was supposed to have turned slightly to the right on his second Presidential tack, was laying a course his socially minded aides found incompatible.

That these premonitions were well-founded appeared likely when the President welcomed Congress last month in a message which preached consolidation of New Deal objectives, put the quietus on the move for a Constitutional amendment to curb Supreme Court action, and was notable for the tameness of its declared objectives. Same week he promised the Nation a black budget for 1939. Insofar as a Roosevelt future is ever predictable, it appeared safe to bank on a two-year interim in which laws would be overhauled, expenses pared, and Recovery assiduously cultivated.

Government Reorganization was the topic of the first White House request to the new Congress. Purpose of the reorganization is to achieve economy by the elimination of overlapping functions; in the consolidation of two or more Governmental agencies, it is hoped to eliminate up to 25 per cent of the personnel from each agency. The drafters of the report—Director Louis Brownlow of the Public Administration Clearing House, Director Luther Gulick of the New York Bureau of Municipal Research, and University of Chicago's Professor Charles E. Merriam—also recommended the creation of two new Governmental Departments: Social Welfare and Public Works. The duties of the latter are "to advise the President with regard to public works. To design, construct and maintain large scale public works which are not incidental to the normal work of other departments . . . to administer Federal grants, if any, to State, or local governments or other agencies for construction purposes; and to gather information with regard to public works standards throughout the nation." These two departments would be headed by two new Cabinet officers, and Public Works is generally conceded as the agency to be designated administrator of any housing Act. As the President was at pains to make clear, the reorganization program could not be made fully operative in less than three years. Its chances of passage in a somewhat modified form appear good. Chief objection that now stands against it is that it will cause a further remission of power by the legislative to the executive.

The Housing Program is currently in eclipse for lack of funds, currently hopeful of new life because of the persevering efforts of Senator Robert Wagner. The revolving fund of PWA—moneys collected from loans made in the first PWA housing program—now amounts to about $200,000,000, all unallocated. PWA administrator Ickes wants to use it for loans and grants to local housing authorities. Probability, however, is that the President will commandeer this sum for a straight public works program under Hopkins' WPA. Meanwhile Senator Wagner has been busy reshaping his old housing bill, seems determined to fight it through Congress this session. Currently he has signified his willingness to make the bill into an omnibus for everybody from the FHA to the farm credit group, providing their requests are reasonable; in fact, he is angling for rural support with a full program for rural rehousing and credit. Actual public housing provisions in his bill will appear under the label of "demonstration projects;" this label will allow the Government to erect projects in cities where large industrial interests might be hostile, block the formation of local authorities. Clearly recognized in the bill is the principle that slum clearance and low-rent housing can never economically be linked together.

Public Works were originally ballyhooed by the President as a No. 1 method of "priming the pump" during bad times. Actually, expenditures during the last four years for public works have approximated only 60 per cent of their pre-Depression level, can hardly be said to have primed any full-sized pump. With recovery well on the way the President last month somewhat illogically requested $465,466,000 as against the $385,537,000 which stands in this year's budget. Most of this fund is earmarked not for straight building, but for the Bureau of Public Roads. Second biggest item is $47,000,000 for public buildings. In his budget message the President made no provisions for funds to be used as loans and grants to local municipalities. For this purpose he hopes Congress will transfer PWA's $200,000,000 revolving fund to the WPA.

For Building, the diversion of public works money into highway construction and a probable tightening of WPA relief standards will mean little save a diminution in materials contracts, perhaps a slight easing of the labor shortage. Not yet considered a fit subject for Government action is the labor shortage caused by Federal projects which pay union wages, and thereby set a wage pace which many private builders still are not willing to meet.

Mortgage Credit priming, as exemplified by the three titles of FHA, has proved the most controversial undertaking on the New Deal's program. This fall, while the FHA was piling up new records in total mortgages insured, it was also being roundly lambasted by mortgage bankers and investment groups all over the country. In the new budget only $8,500,000 was asked for FHA, a reduction of $2,540,000 from its 1937 appropriation. This reduction was explained on the grounds that Title One expired April 1, and that less money was being earmarked for "educational purposes," i.e., publicity. However, since the budget may not anticipate anything not yet on the statute books, the first reason has no significance so far as the life of Title One is concerned. Fact is that the FHA has discerned a strong desire on the part of private business to continue Title One, will probably back it.

The mortgage guarantee feature of Title Two (mortgage insurance on homes) expires this July. Its renewal will be sought, probably granted. Also possible is the expansion of Title Two to cover all forms of building, commercial as well as residential. However, it seems more probable that this function will be given the FHA under Title Three, under which operates the Large Scale Housing Division.

Under the plan for Governmental reorganization, the FHA, in company with the Farm Credit Administration, the Home Loan Bank System, and the RFC, would be placed under the Treasury. Such a move would, of course, relegate the FHA administrator to playing second fiddle to Secretary of the Treasury Henry Morgenthau.

The Lunatic Fringe is nowhere near as vociferous, nor as powerful as it has been during the last four years, principally because recovery has removed the public's taste for strong and freak measures. So far as measures dealing with money and credit are concerned, the Administration will be the first to quash any original moves from pressure groups. It is currently faced with more refundings, and its own promise of a balanced budget by 1939, and wants nothing but quiet and cheap money for many moons to come.