ARCHITECTURAL FORUM

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VOLUME 66—NUMBER ONE

THE MONTH IN BUILDING

VOLUME

PERMITS	**$113,650,000**
Residential	59,168,000
Non-Residential	31,474,000
Alterations	23,008,000
October, 1936	$130,883,893
November, 1935	78,193,199
CONTRACTS	**$208,204,200**
Residential	68,080,300
Non-Residential	65,895,000
Heavy Engineering	73,868,200
October, 1936	$225,839,900
November, 1935	188,115,000

Permits are from 1,573 cities reporting to Department of Labor.

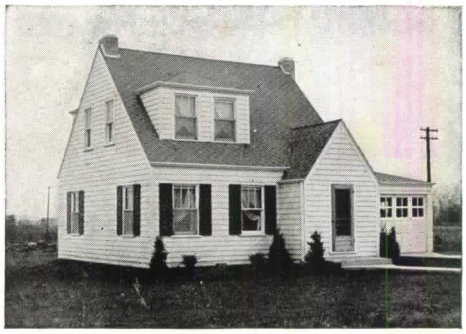
Contracts are from 37 States east of the Rockies, F. W. Dodge statistics.

The decrease in volume from October in both permits and contracts is slightly greater than seasonal. A drop of 12 per cent is usually expected for permits, of 5 per cent for contracts. However, November was the twenty-third month in succession to show an increase over the corresponding period of the previous year.

FORECAST. There was a time during the Depression when financiers used to look to the construction industry to lead the country out of the red. This hope was based largely on the well-known fact that there existed a tremendous shortage of housing, a shortage which was presumably so imperative that it would succeed in making the No. 1 industry in the U.S. pull itself up by its financial bootstraps. But Recovery is now well on its way. Building is not in the lead, and the shortage in housing is worse than it was in 1933.

The fallacy in this Depression hope lay in its denial of the fact that Building is dependent for its solvency upon the solvency of the consumer. The experience of Great Britain seemed to demonstrate the contrary, seemed to show that Building was capable of leading a country out of the doldrums with no impetus other than a wish. That this demonstration was illusory is revealed by two facts: first, British building had to be doctored with nearly a decade of subsidies before it could proceed under its own powers; and, second, the down payment on a house was dropped to as low as 5 per cent, a feat considered outside of Britain as more startling than sound. The fact remains unchanged that in this country there can be no substantial recovery of the building industry until a great number of men get one-fifth the price of a house safely cached in a bank. And the U. S. citizen will not achieve that happy state until general business recovery allows him to. Building's turn is still last in that economic cycle.

Any prophecies for this year must take this basic fact into consideration. The controlling factor has been not how many houses are needed, but how many people can buy them. In fact, the experience of the last three years has shown that, until purchasing power is restored, there exists little or no correlation between need and demand; housing is the most elastic of all commodities. This dependence upon the consumer, melancholy in the recent past, augurs splendidly for the future. For, once the purse has been filled, the demand for a home can be heard, and one impetus is multiplied by the other. Currently it is obvious that purchasing power is up. For THE FORUM's prediction of how far up Building will follow during 1937, see page 34.



For 1937: $1,250,000,000.

TRENDS. Having had thirty days to mull over the unprecedented victory of the New Deal at the polls, Business, Labor, and Government were last month filling the papers with news of their reactions and readjustments. Since most of these reactions foretold year-long trends, the news was important. To the construction industry the following items made portentous news:

¶ In Augusta, 1,000 members of the Investment Bankers Association clapped loud and long when City Manager C. A. Dykastra of Cincinnati lambasted the theory of tax limitation as applied to real property, characterizing it as an effort on the part of realty interests to shift the cost of government. Result of an Ohio experiment in tax limitation had been to penalize the small property owner by assessing him more in sales taxes during the fiscal year than he was remitted in property taxes.* Rest of the Augusta session was taken up with an argument between Chairman James M. Landis of the S.E.C. and the I.B.A. Mr. Landis contended that the responsibility for controlling the coming boom belonged to business, that they would be blamed if another 1929 occurred. The I.B.A., not to be outdone, declared that the responsibility and the blame for another 1929 rested squarely on the shoulders of the Federal Government. Not discussed were ways and means of forestalling another 1929.

¶ In Manhattan, Industry's most authentic spokesmen, the National Association of Manufacturers, performed 1936's most astounding reversals of form. Whereas last year they had flayed the New Deal for every sin in the economic and social calendar, this year they took it to their corporate bosoms and bussed it roundly on both cheeks. Industry's duty toward the unemployed, the soundness of Social Security, the end of child labor, cooperation with the New Deal, the unemployment census which Hoover and Coolidge had quashed—all came in for a round of applause. Policy most likely to receive active support was that advanced by Steelman Ernest T. Weir, who recommended that business spend some time and money selling to the public its management as well as its products. Sole major rejection of New Deal ideals was the refusal to back the principle of collective bargaining.

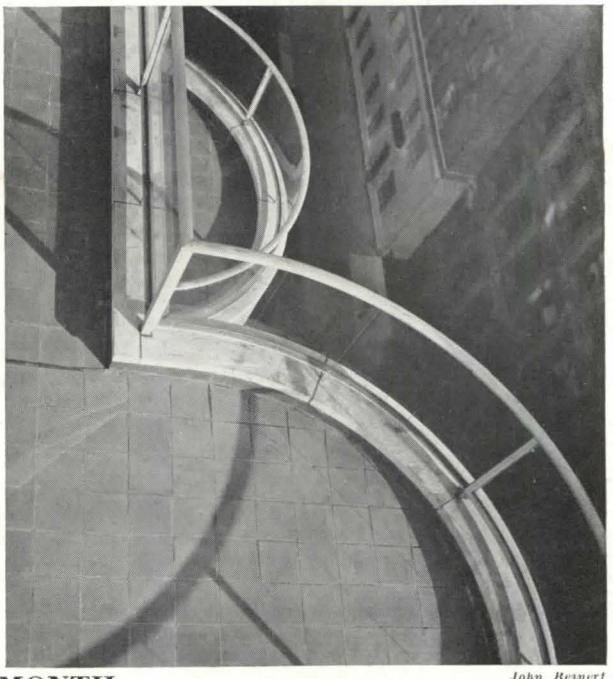
¶ In Washington the ghost of the NRA flew again at the meeting of the Council for Industrial Progress, convoked by the President's Coordinator for Industrial Cooperation, big, loud Major George Leonard Berry, a strong union man himself. Last year Big Business attended the meeting, and got in a fight with Coordinator Berry. This year the biggest Big Businessman the Major could entice to his meeting was a music publisher. Also notably absent was C.I.O.'s John L. Lewis. Result was an extremely inconclusive meeting whose only significance seemed to be that Major Berry and the Blue Eagle were in eclipse.

¶ Back from his triumphant tour of South

*One reason for the failure of the Ohio experiment was uncovered last month in Columbus when the State legislators voted themselves an appropriation of $21,000 for traveling expenses incurred to and from 40 sessions held since July 22. Trouble was that, as Taxpayer Arnett Harbage pointed out in his suit, the Ohio Legislature had not in fact held a single meeting since July 22, was simply voting itself a taxpayers' "gift."

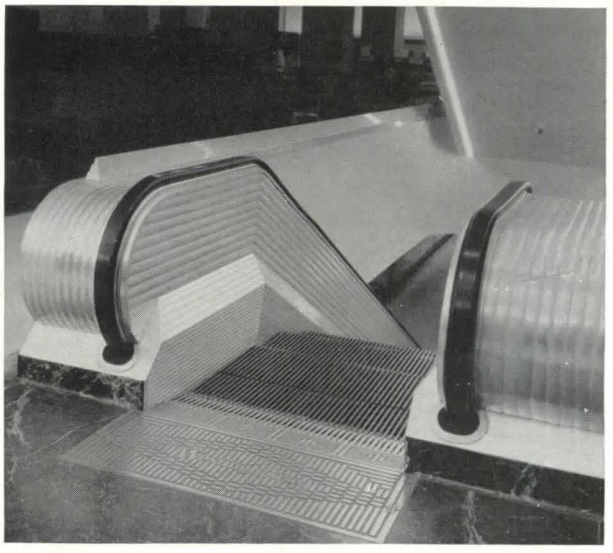
George Nelson

MEN OF THE MONTH . . . the Fair's theme takes form (page 10)



John Bennett

BUILDING OF THE MONTH . . . R is for Rockefeller, also for rented (page 4)



PRODUCT OF THE MONTH . . . no doors, no starters, no delays (page 65)

BUILDING FORECAST FOR 1937

The Architectural Forum predicts a 39 per cent increase over 1936 for a $3,715,000,000 total, for residential building a 49 per cent increase for a $1,250,000,000 total.

For 1937 The Architectural Forum predicts a construction total of $3,715,000,000, an increase of 39 per cent over the total for 1936. In the residential field The Forum looks for a 49 per cent advance to a total of $1,300,000,000, and in the commercial and factory category for one of 64 per cent to a total of $700,000,000. The past year has demonstrated that at least under present economic conditions the construction industry cannot of itself be responsible for general recovery,* but must on the contrary wait on general recovery to reach its own maximum. This is due primarily to the fact that residential building, which now accounts for about one-third of the construction total, is dependent upon consumer demand for its own revival.

In estimating the probable course of business in the construction industry during 1937, the most fundamental fact to be taken into consideration must be the groundswell of confidence which has been riding through the country during the last twelve months and promises to continue even more markedly during 1937. This factor will tend to modify the discernible depressive features in the situation while it encourages those which are bullish. A second preponderant factor is, of course, the ever-increasing shortage in housing and obsolescence in factories and commercial buildings. And finally residential building in particular should benefit enormously from the unprecedented year-end increases in wages, amounting to nearly $400,000,000.

Modifying these facts are the reactions to be expected from certain events which occurred during 1936. The total of Government bounties will be seriously lowered by the absence of another Veterans' Bonus. The unprecedented year-end distribution of wage increases will result in resistance to further raises. The enactment of Social Security legislation will add to the cost of doing business. Increased taxation seems to be fairly certain. The rising cost of materials and labor, together with the increased restiveness of labor, will raise the costs of production.

The Forum forecast for 1937 is based on the F. W. Dodge figures, which cover only the 37 States east of the Rockies. For a rough 48-State total, add 10 per cent; Forum figures are for 37 States only, are therefore to be regarded as a relative, not an absolute set of figures:

	1937	
RESIDENTIAL		**$1,250,000,000**
Apartments, dormitories, hotels, dwellings (owner occupies), dwellings (sale or rent), two-family houses, housing developments.	1936:	840,000,000
COMMERCIAL		**700,000,000**
Factories, garages, service stations, banks, offices, stores, warehouses.	1936:	425,000,000
EDUCATIONAL		**325,000,000**
Gymnasiums, libraries, laboratories, schools, and colleges.	1936:	225,000,000
PUBLIC BUILDINGS		**120,000,000**
City halls, capitols, fire and police stations, military and naval, post offices.	1936:	105,000,000
ALL OTHER		**220.000,000**
Hospitals, institutions, churches, convents, memorial buildings, auditoriums and halls, clubs and lodges, parks, park buildings, theaters.	1936:	185,000,000
PUBLIC WORKS		**1,100,000,000**
Bridges, highways, incinerators, sewerage systems, water front developments, miscellaneous public works, airports, electric light, power plants, gas plants, pipe lines, railroad construction, transportation terminals, water supply systems.	1936:	895,000,000
1937		**$3,715,000,000**
1936		2,675,000,000

1936. For practical purposes, this breakdown is usually compressed into the categories of Residential, Non-residential, and Public Works and Utilities (Chart 6). To afford a check on the accuracy of The Forum's forecast for 1936 such a tabulation for that year (estimated from ten month figures) is presented in the next column, and beside it, for purposes of comparison, are printed The Forum's 1936 forecast figures. The figures in the third column represent the percentage variance of The Forum forecast figures from the estimated actual totals.

	Actual	Forum *Forecast*	*Percent Variance*
Residential	840,000,000	900,000,000	7
Non-residential .	940,000,000	925,000,000	1.5
Public Works and Utilities ..	895,000,000	650,000,000	27
Total	2,675,000,000	2,475,000,000	7

The outstanding event in the building industry in 1936 was the increase in residential building. Not only did it show an increase of 68 per cent over 1935, but whereas in 1935 it had accounted for 26 per cent of the total, in 1936 it accounted for 31 per cent.

This renascence of residential building was dramatized by the emergence on the building horizon of a phenomenon new to the industry—the under-$5,000 house that was fit to live in. During the year more and more speculative subdivisions began featuring houses in this price class which were at least good enough to merit approval by the Federal Housing Administration. About one-third of the one- and two-family houses in all classifications were architect-designed.

Government funds were responsible in large measure for the great advance shown in Public Works—Utilities classification. They also contributed the major financing share to projects in the categories of Educational Buildings, Hospitals and Institutions, Social and Recreation Buildings, and Apartments.

The gratifying advances shown in factory and commercial construction were entirely sound, and occurred as a direct result in the general business recovery. Noteworthy is the fact that totals in this group have shown a steady rise since the middle of the year, presage of a greater increase to come.

1937. In forming an estimate of probable construction during 1937, the factors whose influence are felt primarily in the residential field will be considered first.

SUPPLY-DEMAND. The statistics dealing with the shortage of and demand for new homes have been too well rehearsed during the year to need repetition here. Stated in their most conservative terms, these statistics show that the annual demand arising from obsolescence, fire, marriages, and the natural increase in population required during 1936 the construc-

*This statement is valid notwithstanding the experience of Great Britain, in which is involved a popular misconception. In Great Britain the construction industry during the last four years has led all other types of business toward a general recovery (Arch. Forum, Aug., 1936, p. 85; Sept., 1936, p. 222). But in order to do so it had to receive immense and increasing subsidies for nearly a decade, a procedure which invalidates any comparison with U.S. experience.

tion of 500,000 new homes. Only about 225,000 were built. Thus there is need for at least 275,000 new homes *over and above the normal requirement of 500,000 in 1937*. In addition rents have risen steadily during 1936, increasing from 73 per cent of the 1923 level in January to 80.8 per cent in October (Chart 4). This factor naturally increases the incentive to erect apartments and other multi-family dwellings. **The supply-demand position is strongly favorable for an increase in residential building.**

ABILITY TO PURCHASE. The indispensable prerequisite for an advance in the sale of homes is that a large number of people possess enough money to make the down payment on a house. There are several methods of determining whether or not such a condition exists. The key to all of them resides in the fact that as the difference between wages and the cost of living increases, there remains an increasingly large sum of money at the consumer's disposal to spend on what may in the strictest sense of the word be called luxuries. Such luxuries include radios, refrigerators, cars, and houses.

According to figures compiled by the National Industrial Conference Board, the average weekly pay checks of all U.S. wage earners stood at a low of $14.58 in March, 1933. By January, 1936, it had risen to $23.40. Today it stands at $25.50 (see table). Meanwhile, of course, the cost of living was also rising. That it was not rising as fast as the national wage scale is strongly suggested by this fact: Commitments for installment buying (which are largely "luxuries"), as reflected in the "open account receivables" of commercial credit companies, have shown an advance for the first nine months of 1936 of 53 per cent over the corresponding period in 1935. However, it should be noted that while this rise confirms the fact that the U.S. citizen has more money to spend on luxuries, it also certifies that an increasing amount of this added money has already been pledged to commodities other than houses. The installment purchases now on the books will be paid for during 1937 to the detriment of the sale of other products.

Standard Statistics, in Chart 3, have plotted the composite purchasing power of the U.S. against the total volume of goods sold. In this chart purchasing power equals factory payrolls, income distributed within the service industries as measured by railroad gross income, the actual cash income received by the farmers, and Government bounties. It will be seen that the line representing purchasing power is still running continuously above the line representing goods sold. Again, however, a reservation must be made. Because of the fact that further large-scale raises during 1937 appear unlikely, because taxation and special taxes will both increase the cost of doing business and decrease consumer income, and because the stimulus of the Bonus and the extraordinary dividends of November will not again be paid, it appears unlikely that the purchasing power line will continue to show the same *rate of increase*, at least during the coming six or eight months. **More people have more money to spend. Whether they spend it on houses will depend to an extent on how well and how much that commodity is merchandised.**

CONSTRUCTION COSTS. Prices for both material and labor are rising steadily. Regulation price indices show only a small advance—usually not more than 3 per cent for the year (Chart 2). But these indices fail to take into account the price cutting and sub-union wage scales that any large builder employs today, and which alone have made possible the low prices which now prevail in the housing market.

The rise in material prices is due primarily to a reestablishment of list prices on the part of manufacturers who have sold at any price they could get over the last three years, and are now determined to make up for the profits they have thus foregone since 1930. For the man who is actually building today, material prices—indices to the contrary—are generally anywhere from 10 to 15 per cent higher than they were at the beginning of the year.

Labor itself is already seeking and getting higher wages. Due to the fact that there has been virtually no apprenticeship since the Depression, the fact that pro-

AVERAGE WEEKLY EARNINGS

ALL WAGE EARNERS

1928	1st six months	$27.70	By months
	2nd	27.90	1935 - July - 21.85
1929	1st six months	28.78	Aug. - 22.46
	2nd	28.33	Sept. - 22.54
1930	1st six months	27.05	Oct. - 23.13
	2nd	24.62	Nov. - 23.32
1931	1st six months	23.82	Dec. - 23.38
	2nd	21.42	
1932	1st six months	16.27	1936 - Jan. - 23.40
	2nd	16.17	Feb. - 23.14
1933	1st six months	16.32	Mar. - 23.07
	2nd	19.10	Apr. - 24.33
1934	1st six months	20.26	May - 24.41
	2nd	19.98	June - 24.45
1935	1st six months	21.78	July - 24.66
	2nd	22.78	Aug. - 24.66
1936	1st six months	23.90	Sept. - 25.11
			Oct. - 25.50

Compiled by National Industrial Conference Board

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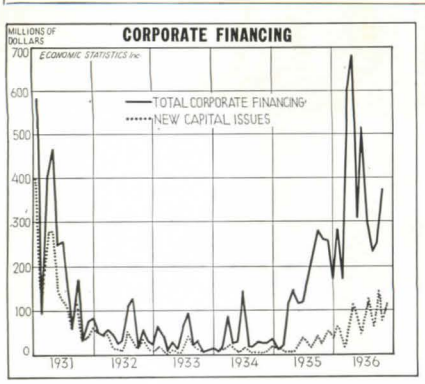

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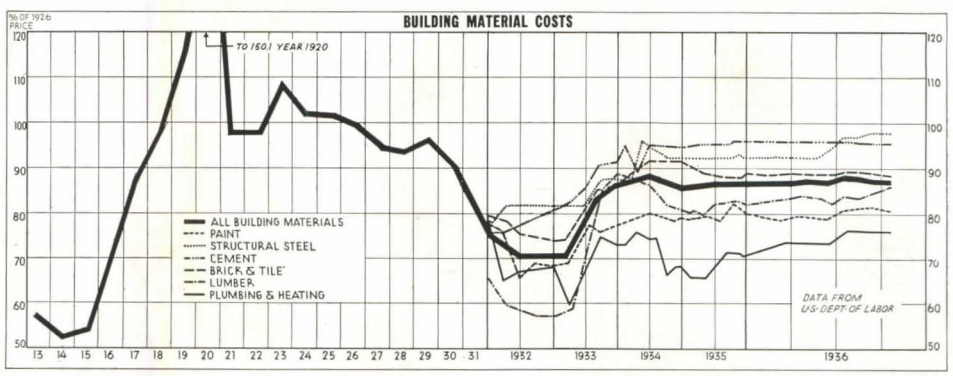

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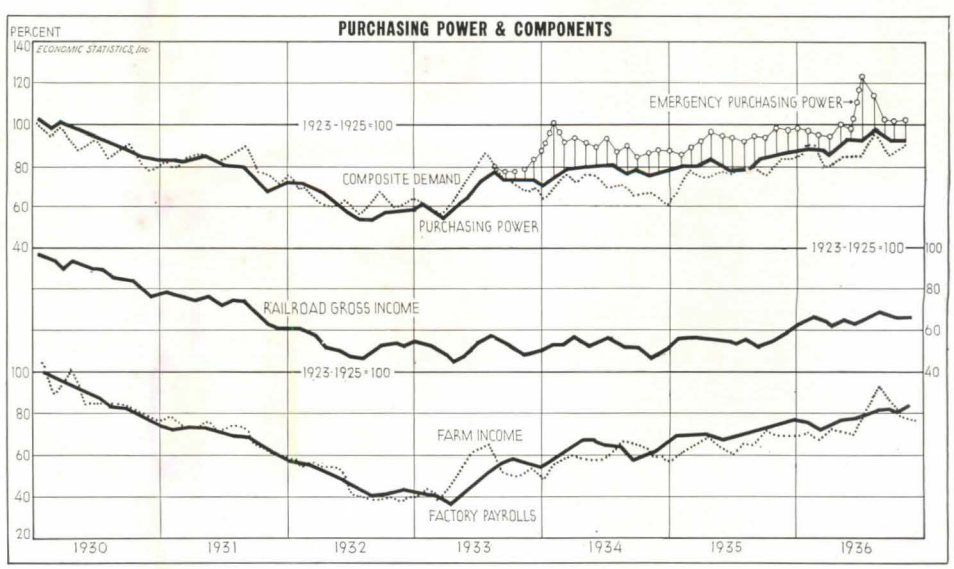

longed unemployment has rendered many in the building trades unemployable, and the fact that every worker is six years older than he was before the Depression, this shortage is of a particularly virulent type, in that it presents no immediately available remedy. Furthermore, there is no *blinking* the fact that Labor today is more alive than ever to the profitable possibilities of organization, and there is every reason to expect that it will avail itself to the full of these possibilities (see p. 80).

Reports from all over the country confirm both the shortage and Labor's awareness of its position. This is a condition which the coming year can only intensify, and it seems not only possible but reasonable to expect a rise in Labor's wages.

Labor plus Materials should show an increase of from 15 to 25 per cent during 1937. A rise of this proportion in the construction price of the small house will serve materially to reduce the number of houses which can sell for less than $5,000; and in that class lies the building industry's greatest market. **Rising construction costs are the major bar to a runaway building market.**

COMMERCIAL EXPANSION. While building in the Commercial-Factory category during 1936 showed an increase of 45 per cent over 1935, a glance at the table on page 3 will show that it is still running far behind the levels of the Twenties. Since this type of construction was virtually at a standstill during the Depression, it follows that there remains a great deal of room for expansion. This conclusion is strengthened by the figures available on new capital issues offered during 1936. The money thus raised is used in great part for plant and office expansion. Chart 1 shows that this type of issue reached higher levels during the past year than it has in any period since 1931. **Increased new capital issues promise a considerable increase in plant construction.**

GOVERNMENT AID. The building categories which in the last three years have been most dependent upon public funds have been Educational, Hospitals, Social, Recreational, and Public. Although there exists no accurate figures on the subject, it is safe to say that the Federal Government has contributed more money than the States and municipalities to these classes. During 1936 about 75 per cent of the money expended on them came either from the Federal, State, or municipal governments, and it therefore follows that their volume is intimately connected with the volume of Federal expenditures on building projects. At this time the PWA has left in its till only about $200,000,000 for all purposes, and there is an even chance that the Beiter Bill for an additional $200,000,000 will fail to pass in this session of Congress. Meanwhile Treasury building is scheduled to continue at its present slow rate until the $60,000,000 it received last year is exhausted, when it is due to get only about $30,000,000 more. Aroused public interest notwithstanding, any figure more than double the puny 1936 Government housing total appears improbable during 1937. The steps between enabling legislation in Washington and local construction projects are too many to permit any fast result. **The volume of Federally aided projects will suffer from a decline in appropriations.**

Last year more than two-thirds of the money spent in the Public Works-Utilities category represented Government funds spent on public works. During the first ten months of 1936, this classification was divided thus: $616 million for public works to $169 million for utilities. The private capital invested in utilities has held back in the face of the uncertainty surrounding the possibilities of Government competition and regulation. With the election over, this uncertainty has only partially abated. However, it is a fact that most utilities are now running at a rate comfortably close to capacity, and an increase in the total output of power of all sorts seems imminent. Whether it will be afforded by private industry or by the Government in competition with private industry is a point which is immaterial to the construction industry which builds the new plants. **An increasing demand for power should cause a rise in utility construction.**

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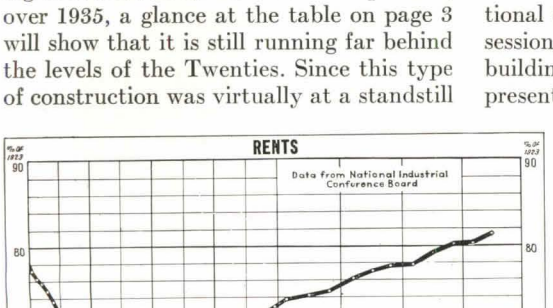

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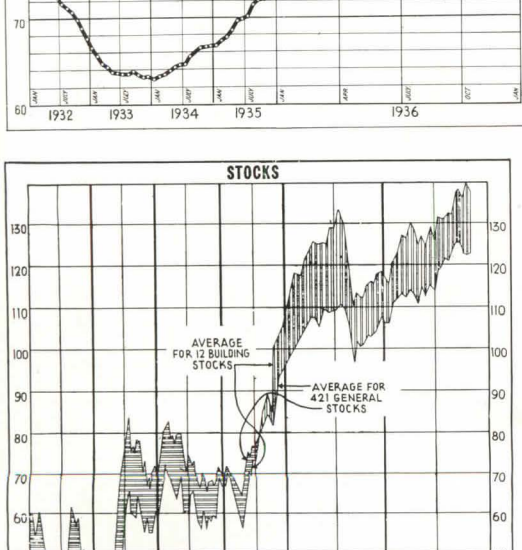

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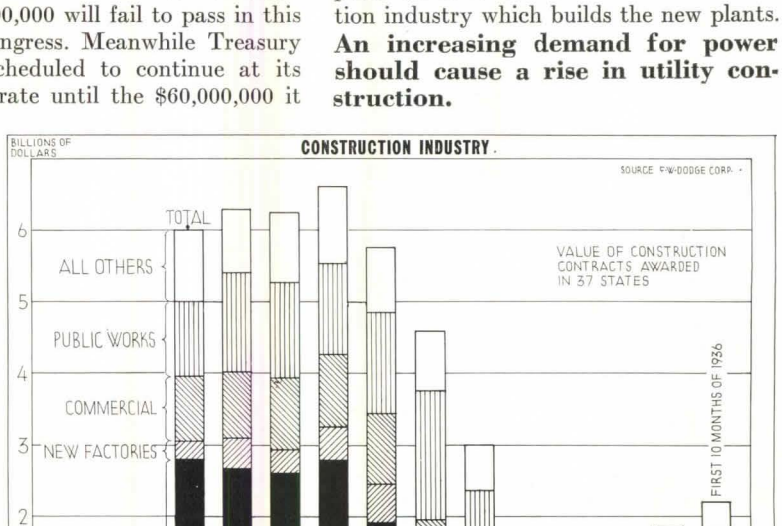

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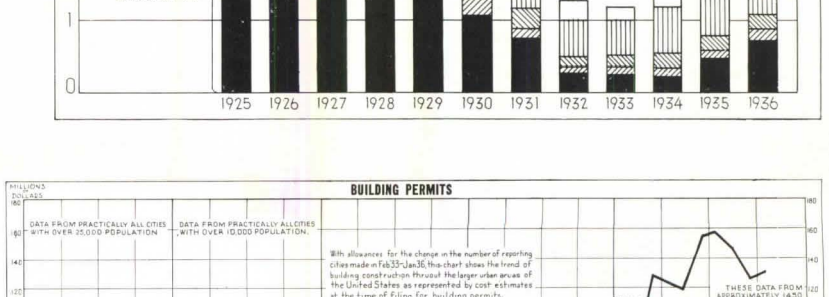


1919 - 1936

YEAR	TOTAL CONSTRUCTION	RESIDENTIAL	COMMERCIAL FACTORY	EDUCATIONAL	PUBLIC BUILDINGS	INSTITUTIONAL RECREATIONAL	PUBLIC WORKS, ALL UTILITIES
*1919	$2,579.9†	$ 849.2	$ 903.5	$119.5	$ 29.9	$160.3	$ 517.1
	100.0%	32.9%	35.0%	4.6%	1.2%	6.3%	20.0%
*1920	2,564.5	570.1	999.5	172.3	39.6	183.0	599.9
	100.0%	22.2%	39.0%	6.7%	1.5%	7.2%	23.4%
*1921	2,355.2	878.7	485.1	240.7	32.9	238.8	479.0
	100.0%	37.3%	20.6%	10.2%	1.4%	10.2%	20.3%
*1922	3,343.8	1,340.1	774.3	302.3	36.0	282.3	608.8
	100.0%	40.1%	23.1%	9.0%	1.1%	8.5%	18.2%
*1923	3,503.7	1,583.9	706.6	271.3	22.1	234.0	685.9
	100.0%	45.2%	20.2%	7.8%	0.6%	6.6%	19.6%
*1924	3,873.1	1,844.0	704.8	317.1	30.2	304.1	672.8
	100.0%	47.6%	18.2%	8.2%	0.8%	7.8%	17.4%
1925	6,006.4	2,747.1	1,199.0	426.4	54.5	512.9	1,065.9
	100.0%	45.8%	19.9%	7.1%	0.9%	8.5%	17.8%
1926	6,380.9	2,671.1	1,392.1	381.1	67.2	529.0	1,340.4
	100.0%	41.9%	21.8%	6.0%	1.0%	8.3%	21.0%
1927	6,303.1	2,573.3	1,308.8	379.8	79.5	579.7	1,382.0
	100.0%	40.8%	20.8%	6.0%	1.3%	9.2%	21.9%
1928	6,628.3	2,788.3	1,393.4	399.0	76.2	506.7	1,464.5
	100.0%	42.1%	21.0%	6.0%	1.2%	7.6%	22.1%
1929	5,750.8	1,915.7	1,475.1	381.9	120.8	398.4	1,459.0
	100.0%	33.3%	25.7%	6.6%	2.1%	6.9%	25.4%
1930	4,523.1	1,101.3	885.4	376.1	139.8	369.2	1,651.2
	100.0%	24.3%	19.6%	8.3%	3.1%	8.2%	36.5%
1931	3,092.8	811.4	435.6	228.8	181.3	273.0	1,162.8
	100.0%	26.2%	14.1%	7.4%	5.9%	8.8%	37.6%
1932	1,340.0	282.0	154.3	82.3	118.0	114.2	589.2
	100.0%	21.0%	11.5%	6.1%	8.8%	8.6%	44.0%
1933	1,250.0	229.0	252.0	39.9	50.9	85.9	592.3
	100.0%	18.3%	20.2%	3.2%	4.1%	6.9%	47.3%
1934	1,544.0	249.0	255.3	117.5	55.7	103.2	763.3
	100.0%	16.1%	16.5%	7.6%	3.6%	6.7%	49.5%
1935	1,884.5	478.8	273.4	173.5	97.8	130.9	690.1
	100.0%	25.9%	14.8%	9.5%	5.3%	7.1%	37.4%
1936	2,675.0††	840.0††	425.0††	225.0††	105.0††	185.0††	895.0††
	100.0%	31.5%	15.9%	8.4%	3.9%	6.9%	33.4%

**For 27 States, all others 37 States.*

1934 - 1937

TYPE OF CONSTRUCTION	THE ARCHITECTURAL FORUM FORECAST FOR 1934	1935	1936	1937
RESIDENTIAL, ALL TYPES	$ 249.0††	$ 478.8	$ 840.0*	$1,250.0
COMMERCIAL-FACTORY	255.3	273.4	425.0*	700.0
EDUCATIONAL	117.5	173.5	225.0*	325.0
PUBLIC BUILDINGS	55.7	97.8	105.0*	120.0
ALL OTHER TYPES OF PUBLIC AND INSTITUTIONAL BUILDING	103.2	130.9	185.0*	220.0
PUBLIC WORKS-UTILITIES	763.3	690.1	895.0*	1,100.0
TOTAL BUILDING CONSTRUCTION	$1,544.0	$1,844.5	$2,675.0*	$3,715.0

**Estimated on a basis of 10 months' construction.* †00,000 *dollars.* ††*Estimated on basis of 10 months.*

Rendering by W. K. Oltar-Jevsky

ROCKEFELLER APARTMENTS

WALLACE K. HARRISON AND J. ANDRÉ FOUILHOUX, ARCHITECTS
BARR, IRONS & LANE, INC., GENERAL CONTRACTORS

Above is a drawing of a New York apartment house. Its large windows, clean lines, and carefully traditional entrance are typical of the better class of residential building, and in the case of most commercial apartment house design this study could well represent the final state of the exterior. In the record of the development of the Rockefeller Apartments it is of interest only as a discarded preliminary sketch.

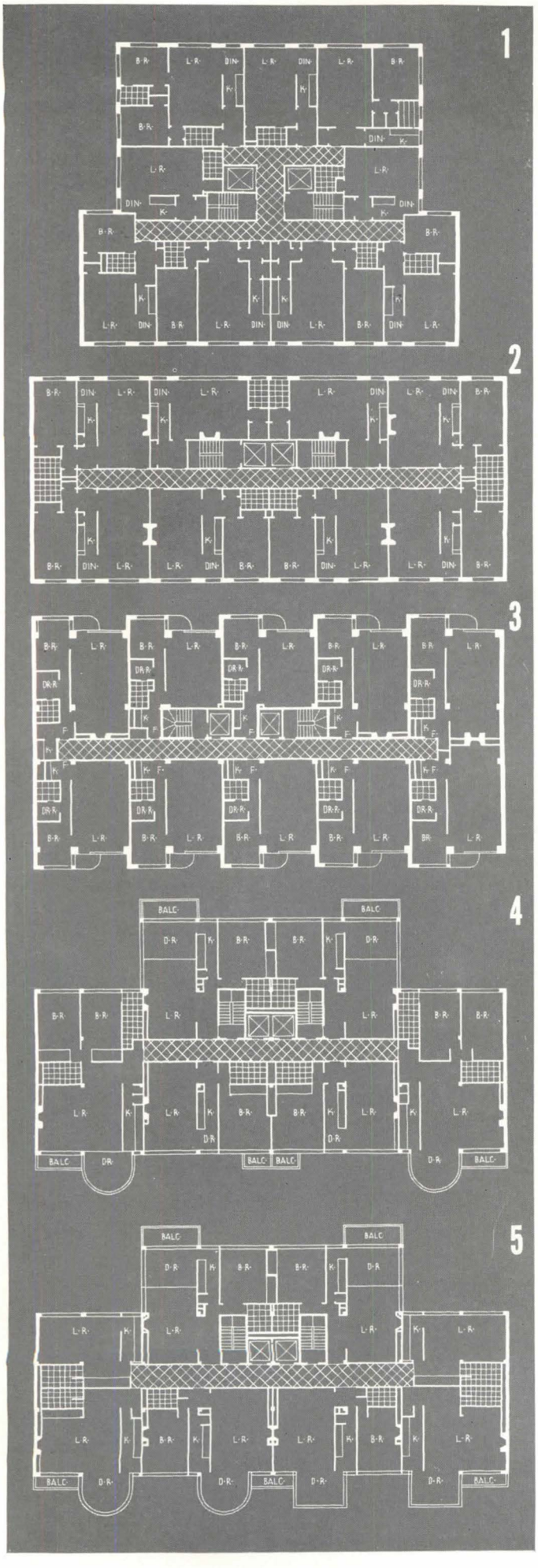
That the study of these apartments began where most designs end was largely due to Mr. Rockefeller's willingness to finance the necessary research to attain the result he and the architects were after, and in the end he approved a most unusual solution because it made sense. The result of this insistence on quality is a pair of very expensive apartment houses—but also a pair of apartment houses 100 per cent rented before completion.

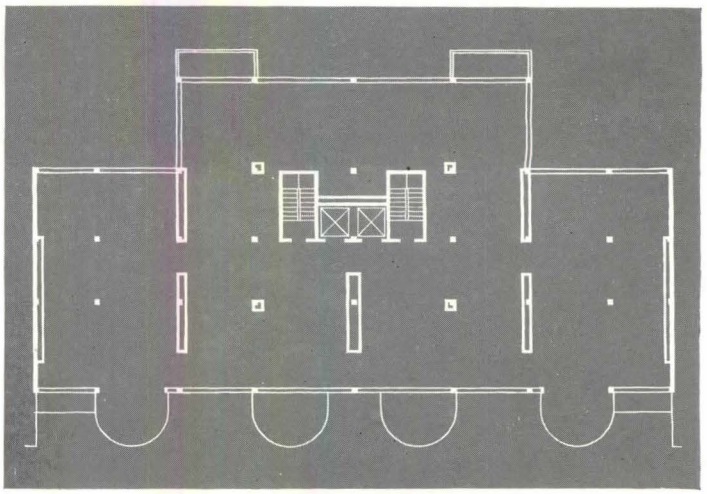
The apartments occupy the middle of a residential block a few streets north of Rockefeller Center. There was no definite scheme at first for developing the property, and even remodeling the existing houses was considered. As studies progressed, however, both owners and architects became increasingly convinced that the proximity of the property to mid-town offices indicated the building of high-rental accommodations for business executives and wealthy commuters. Accordingly several types of small, luxurious apartments were designed, with emphasis on good light and ventilation. Eliminating the usual undesirable apartment locations meant fewer units per floor, but it has also meant no vacancies. The buildings do not occupy the maximum legal percentage of the lot, and a landscaped courtyard leaves room for sun and air.

As modern apartment house architecture, the Rockefeller Apartments stand in a rather lonely position. They have nothing in common with the "modern" tenements going up by the dozen on the city's fringes, no horizontal or vertical "treatments," no corner windows staring into other corner windows, none of the idiocies committed in the name of a new style. Here is sound building, architecture which carries conviction. In all its innovations there are no tricks; its refinements extend from the replanning of a simple corridor to the redesigning of hardware. Opportunity to do these things does not come to every architect: here the solution is more than worthy of it.

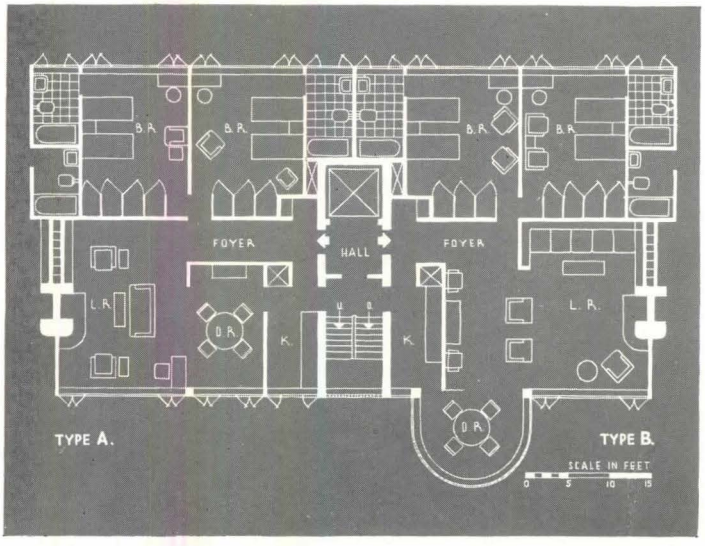
Photograph by F. S. Lincoln

ROCKEFELLER APARTMENTS



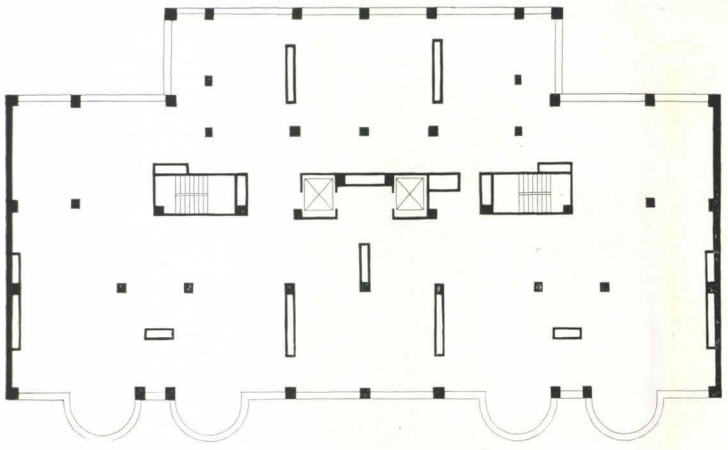


At one stage a uniform steel skeleton was considered desirable; as final plans developed, however, it was realized that the economy of such a procedure was deceptive, and engineering was removed from its controlling position. The final steel plan is at the right.

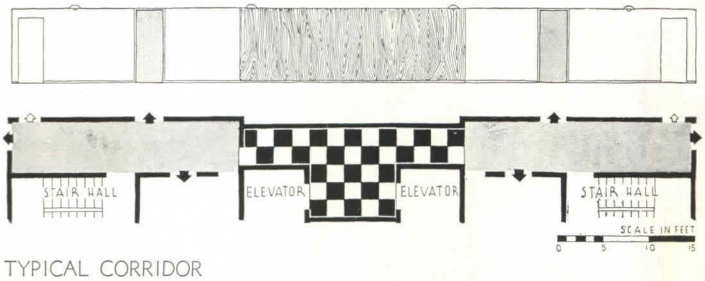


Two unit apartment layouts. As the general plan scheme progressed studies of furniture locations, circulation, window heights and sizes, etc., were carried on. The bay type finally developed as shown to the right. Note how circulation has been simplified; the bath, for example, can be used by guests without disturbing the bedrooms or dressing room; service off the main corridor is unobtrusively handled.

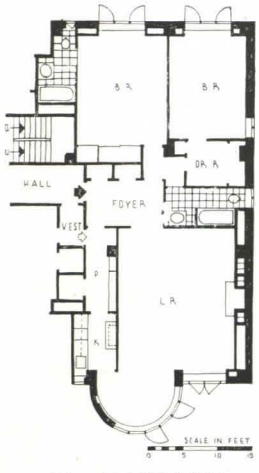
The five plans at the left show various stages in the development of the apartments. 1—Conventional layout, with a maximum of units per floor. It was felt that the two side apartments represented potential vacancies and the scheme was discarded. 2—Scheme with all apartments on front or back. 3—More unusual form of the same unit-scheme, suggested by some recent Swedish work. 4—Enlarged units: a beginning of the final scheme. 5—The distinctive scheme with bays spread across the entire front. The square balconies, front and rear, were not used. (Note the difference between Scheme 5 and the final plan on the opposite page, particularly the beautifully simple way in which the services—stairs, elevators, shafts, etc.—were eventually organized.)



PLAN SHOWING COLUMNS, STAIRS, ELEVATORS AND FLUES

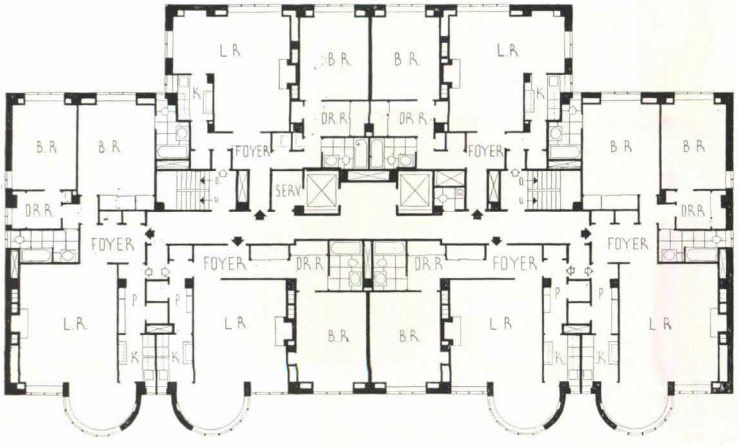


TYPICAL CORRIDOR

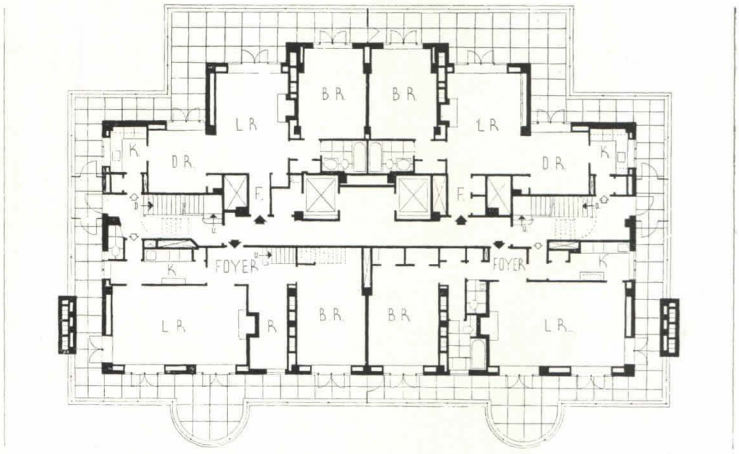


TYPICAL APARTMENT

An excellent illustration of the type of refinements in the plan. The long corridor has been pinched in, producing a hall with much more privacy. Service doors are painted the same color as the walls.

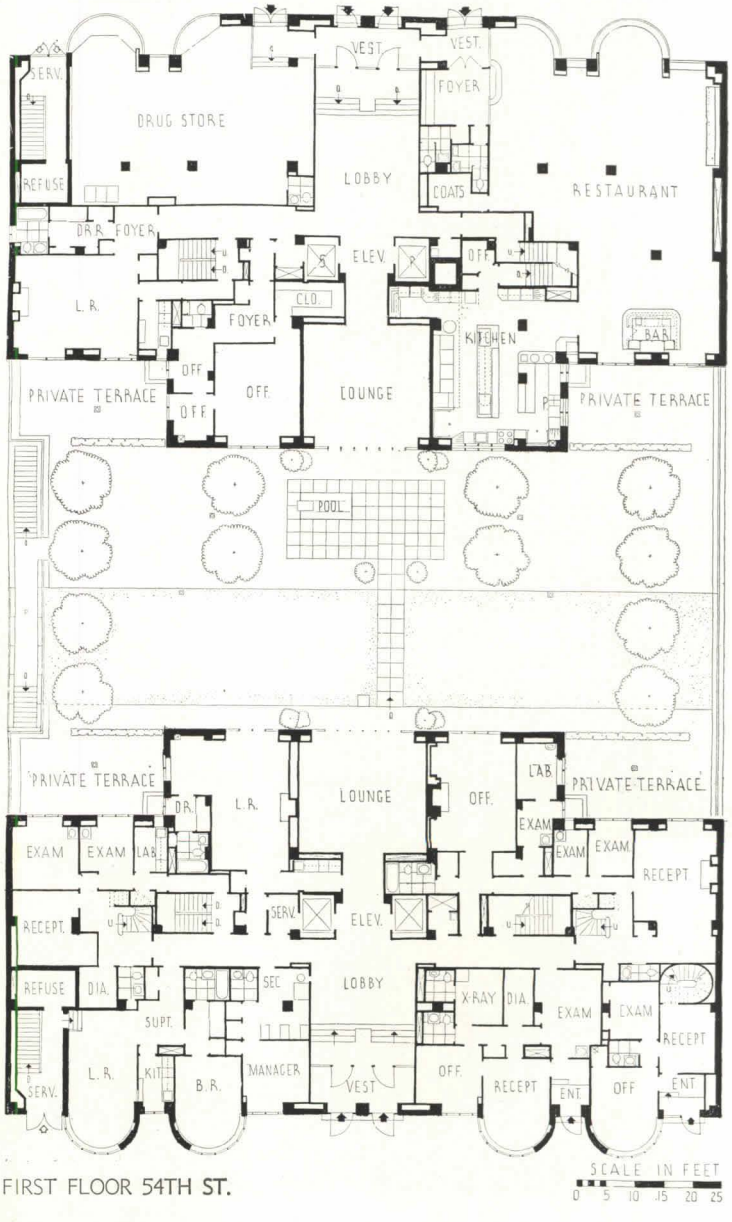


TYPICAL FLOOR 54TH ST.



PENT HOUSE FLOOR 54TH ST.

FIRST FLOOR 55TH ST.



FIRST FLOOR 54TH ST.

Wendell MacRae

FIRST FLOOR LOUNGE

John Beinert

54TH STREET ENTRANCE

F. S. Lincoln

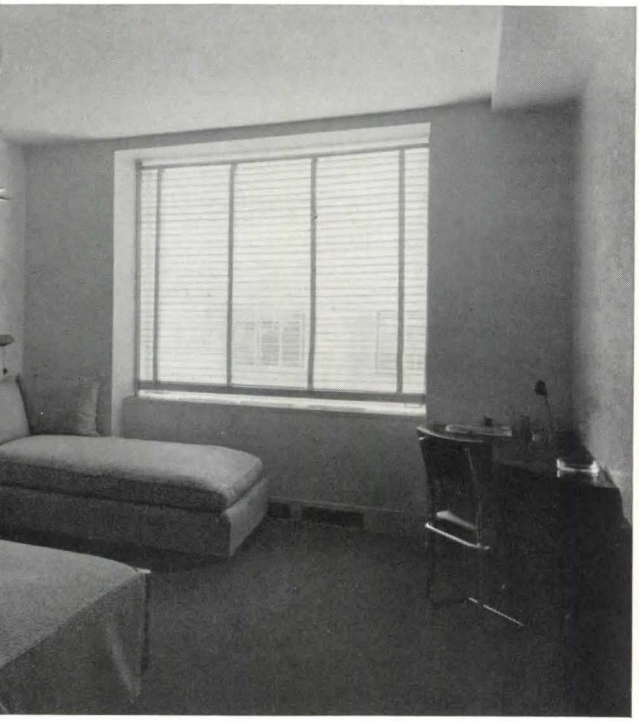
APARTMENT BY MIMI DURANT, DECORATOR

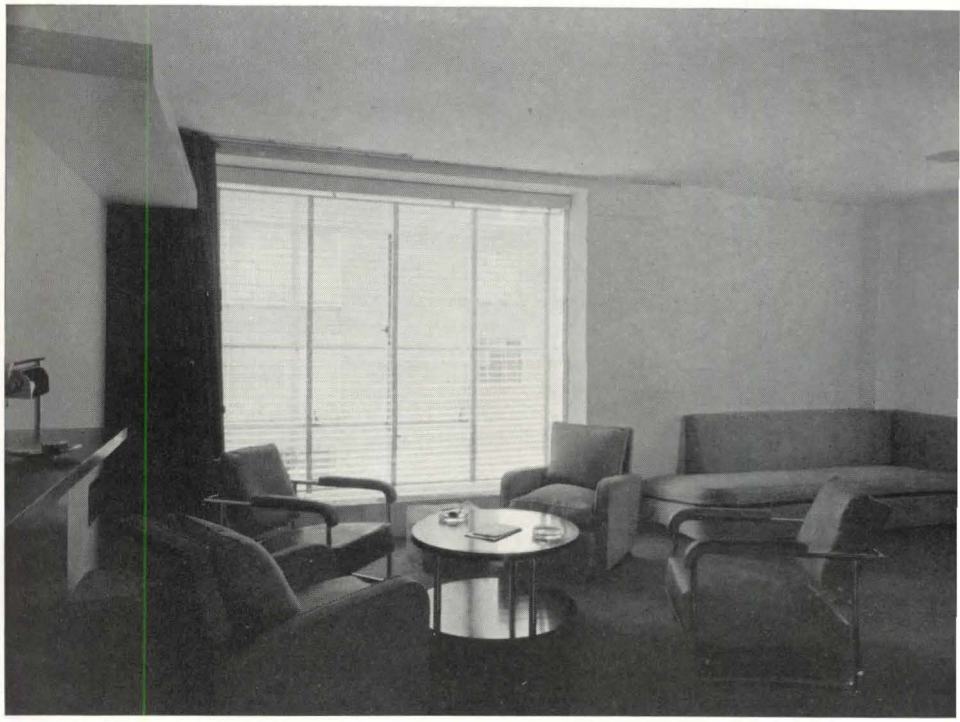
John Beinert Photos

INTERIOR BY WILLIAM LESCAZE, ARCHITECT

John Beinert Photos

The illustrations on these two pages show the use of the interiors for traditional and modern schemes of decoration. In the apartment by William Lescaze, the architect designed the furnishings as well as the decorative scheme.





KITCHEN

BATH

GARDEN

John Boinert Photos

CONSTRUCTION OUTLINE

WATERPROOFING
Entire cellar floor and pits—hydrolithic. Spandrel waterproofing, dampproofing and calking, Minwax materials, Minwax Co., Inc.

STRUCTURE
Exterior walls—12 in. brick, air space on inside formed by free standing, 3 in. Gypsum block, U. S. Gypsum Co. Bricks by Hanley Co., Inc. Interior partitions between apartments—Aerocrete blocks, The Aerocrete Co. Corridor. Bath, shaft and apartment enclosure partitions—4 in. cinder concrete and terra cotta blocks, National Tile Co. Apartment subdividing partitions—3 in. Gypsum block. Metal lath, Consolidated Expanded Metal Co's. Structural steel skeleton frame, Post & McCord. Floor construction—4 in. reenforced cinder concrete slab with ½ in. integral cement finish, 13/16 in. quartered oak flooring laid in hot mastic. Hung plaster ceilings through-hung on G. S. Holmes Co. spring sound insulation.

ROOF: Reenforced cinder concrete slabs, 4 in. gray quarry tile, Ludowici-Celadon Co. Felt and pitch—Barrett Co.

SHEET METAL WORK: Flashing—Anaconda lead coated copper, American Brass Co.

INSULATION: Roofs—1 in. Celotex.

WINDOWS: Sash—Fenestra steel casements. Five transom and vent hoppers, Detroit Steel Products Co. Glass—¼ in. plate, Pittsburgh Plate Glass Co.

STAIRS AND ELEVATORS
Steel stairs, pan cement filled. Elevators—overhead traction, Micro leveling, Westinghouse Electric Elevator Co.

FLOORS
Public corridors and foyer—Terrazzo, Bruno de Paoli. Apartments—quartered oak, laid in hot mastic. Bathrooms—tile. Kitchens—linoleum, Armstrong Cork Products Co.

FLOOR COVERINGS
Carpets in corridors and lobbies, L. C. Chase Co.

INTERIOR FINISHES
Marble—Friedman Marble & Slate Works, Inc. Flexwood in corridors, U. S. Plywood Co., Inc.

TRIM
Steel bucks throughout. Interior doors—flush hollow metal apartment doors, Dahlstrom Metallic Door Co.; others—flush wood. Exterior doors—Steel and glass, chromium trim, General Bronze Corp. Kalamein doors—Acme Kalamein Door & Sash Co., Inc.

HARDWARE
Special knobs and lever handles, made standard by P. & F. Corbin.

PAINTING
Interior: Walls—Lithaphone paint. Ceilings—calcimine; in kitchens and baths—lead and oil. Floors—stained and waxed, Minwax flat finish. Exterior: Sash—metallic paint. All paints by Devoe & Raynolds.

ELECTRICAL INSTALLATION: Wiring system—rigid conduit, Walker Bros. Wire—Habirshaw Cable & Wire Co. Switches—toggle, Bryant Electric Co. Fixtures—special, Shapiro & Aronson, Inc.

KITCHEN EQUIPMENT
Cabinets—Janes & Kirtland, Inc. Refrigerators—General Electric Co. Gas ranges. Sinks—Elkay Mfg. Co.

LAUNDRY EQUIPMENT: Wallace B. Hart, Inc.

PLUMBING: All fixtures by Standard Sanitary Mfg. Co. Accessories—Hoegger, Inc. Metal toilet partitions—Philadelphia Fire Retardant Co., Inc. Soil pipes—cast iron. Vent pipes—galvanized iron. Water supply pipes—red brass.

HEATING AND AIR CONDITIONING
Steam from N. Y. Steam Co. Radiators—concealed convector type, American Radiator Co. Radiator grilles and registers—Tuttle & Bailey, Inc. Vacuum specialties—Warren, Webster & Co. Reducing valves—Kieler, & Muller & Atwood & Morrell. Pipes—National Tube Co. Fittings—Crane Co. Covering—Keasbey & Mattison Co. Fans—B. F. Sturtevant Co. Motor and controllers—General Electric Co. Drives—American Belt & Pulley Co. Sheet Metal—American Sheet & Tin Plate Co. Vacuum pump—Nash Engineering Co.

SPECIAL EQUIPMENT
Maxim Silencers on street bedroom windows, Campbell Metal Window Co. Venetian blinds—Mackin Venetian Blind Co. Window shades—Arlington Window Shade Co. Dumbwaiter, Sedgwick Machine Works. Squash court—Walter A. Kinsella, Inc. Landscaping—Julius Roehrs Co.

CHRYSLER AUTOMOBILE SALON

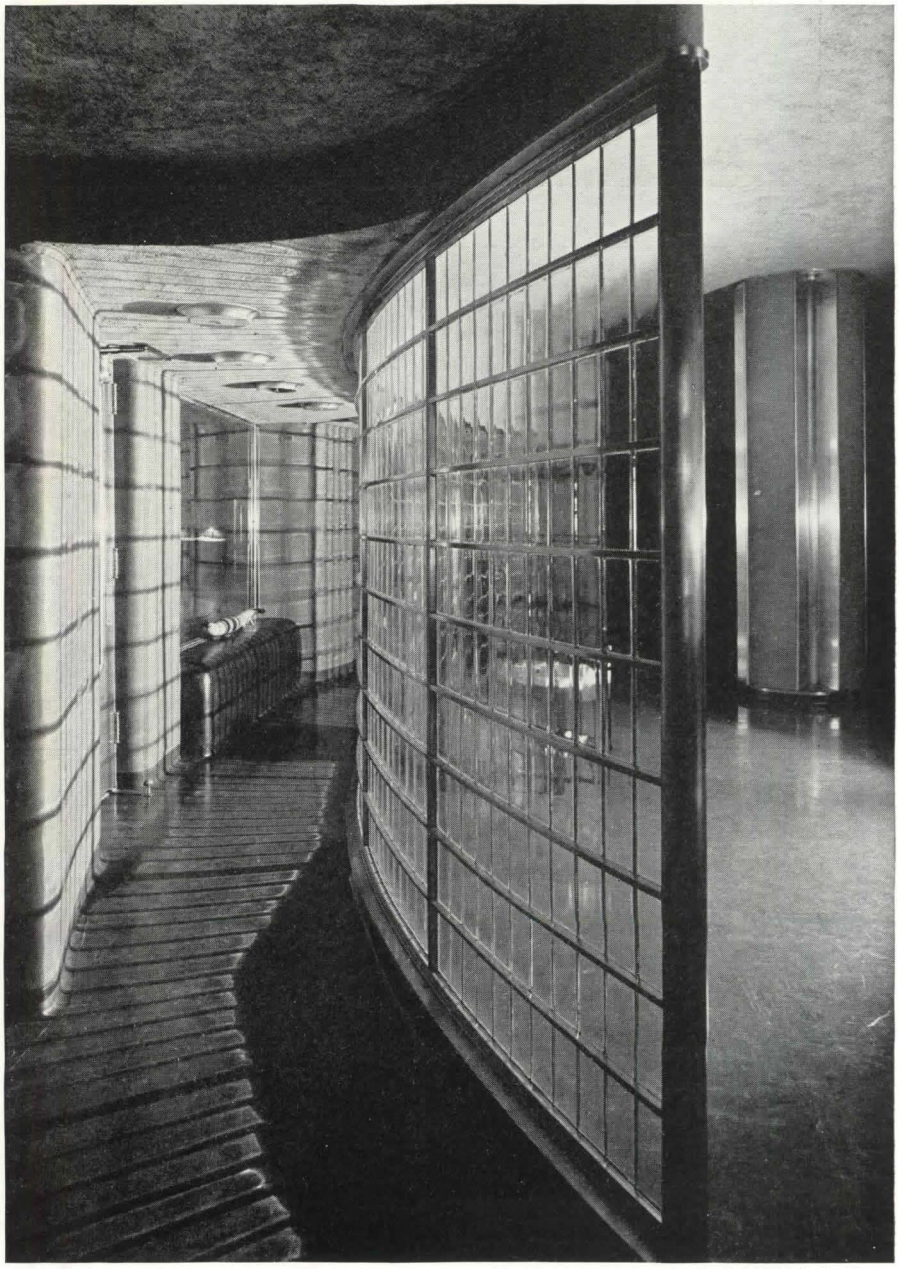
F. S. Lincoln

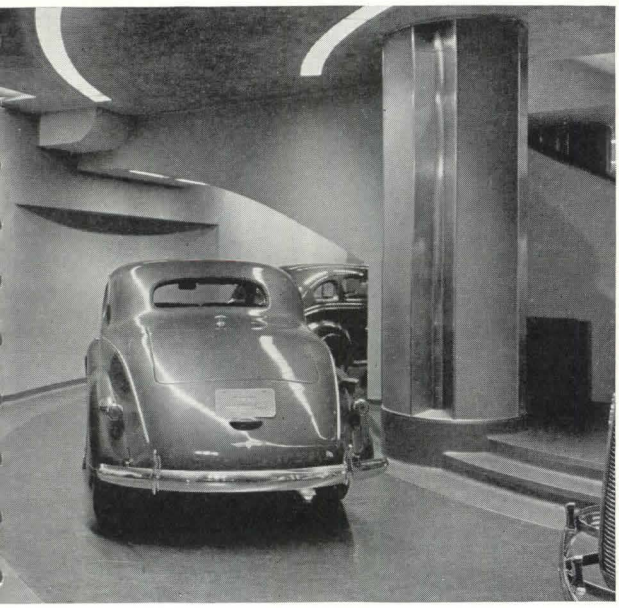
REINHARD & HOFMEISTER, ARCHITECTS
BARR, IRONS & LANE, INC., GENERAL CONTRACTORS

MANHATTAN'S newest, most unorthodox, and most impressively mechanized automobile showroom boasts high-speed moving stairways, a turntable for display purposes, smoothly driven by six synchronized motors, four machine rooms for air conditioning equipment, and invisible glass windows through which crowds constantly stare. Replacing a former, more conventional salesroom in which a liberal use of flowers compensated for the deficiencies in the architecture, the new exhibition space quickly justified itself as a merchandising venture by drawing a record, 8,000 attendance in one day. The room is essentially a glorified show window, with the public on both sides of the glass. The subordination of every factor to the purposes of display is well indicated by the color range, which goes from a quiet blue to a noncommittal gray. The problem of getting people up to the large display area on the second floor, was met by the installation of a moving stairway. Sleek in appearance and located at the center of the turning exhibit it offers the visitor a practically irresistible inducement to go upstairs, if only for the ride. The

Samuel H. Gottscho

mechanical difficulties in remodeling were considerable. The turntable had to be installed without disturbing tenants in the basement, room had to be found for the air conditioning machinery, and the stairway was almost entirely redesigned before it could be fitted into the small space available. Columns arrived at their clover-leaf shape in order to accommodate piping. The second floor has been remodeled in a less elaborate manner, with maximum clear space for cars. Perhaps the essential secret of the success of this showroom is that the architecture provides surroundings in which an automobile looks at home.

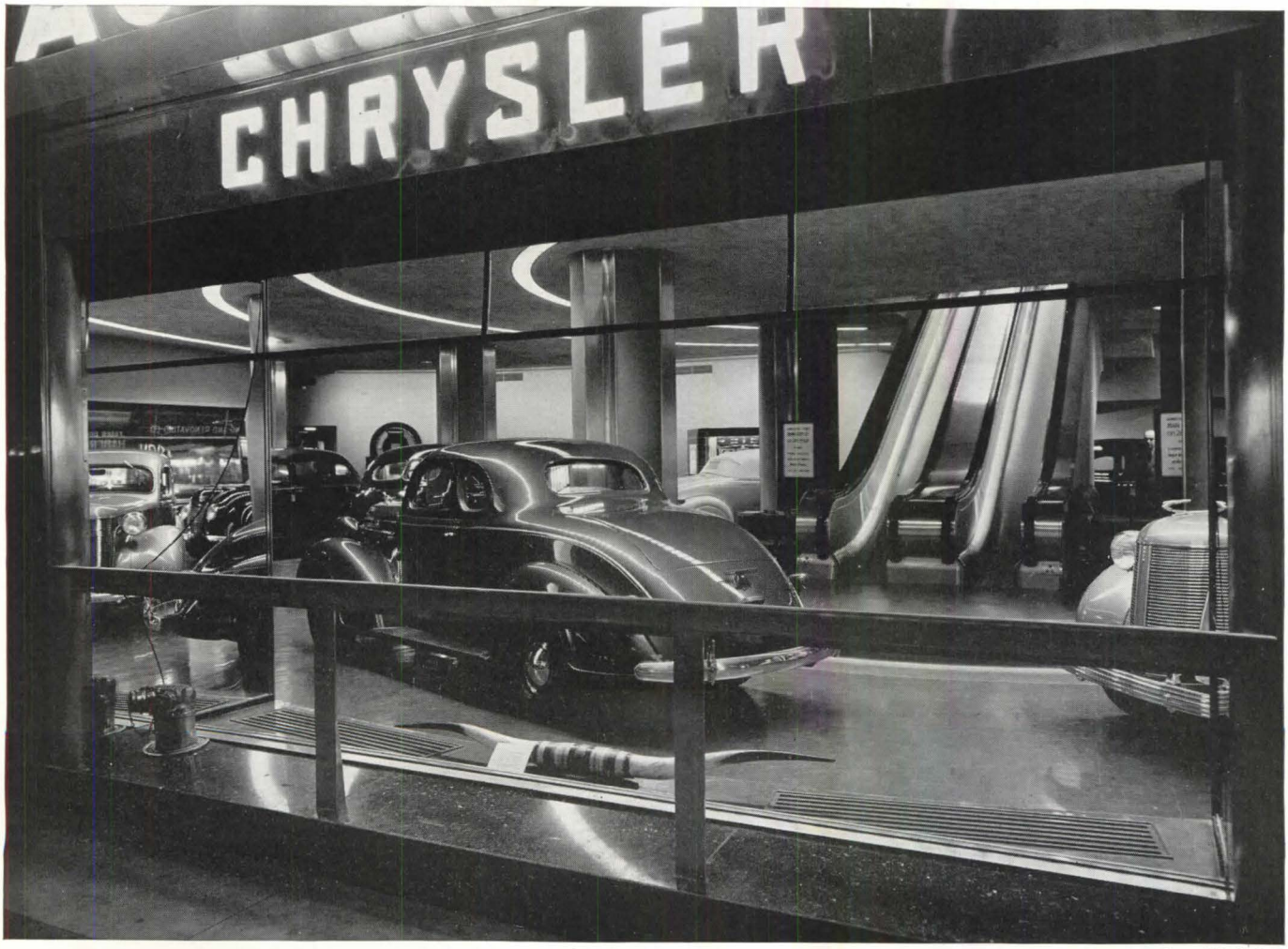




Samuel H. Gottscho Photos

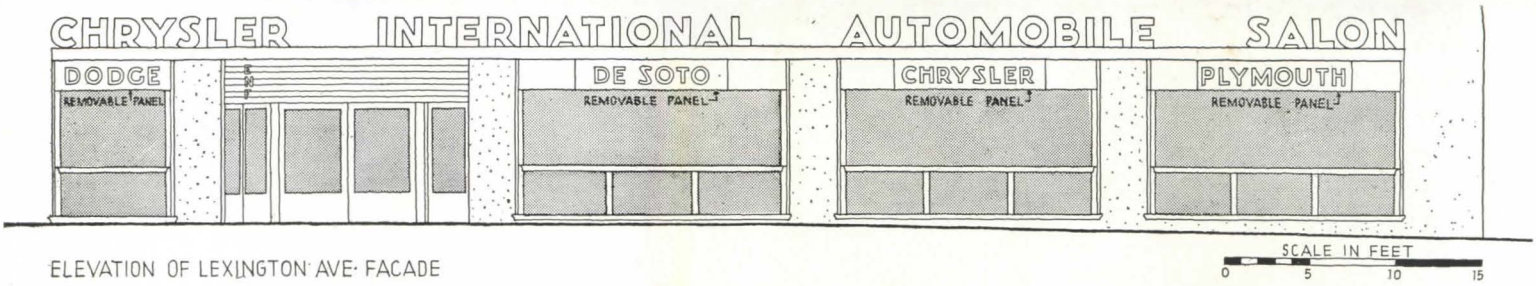
CHRYSLER AUTOMOBILE SALON

F. S. Lincoln

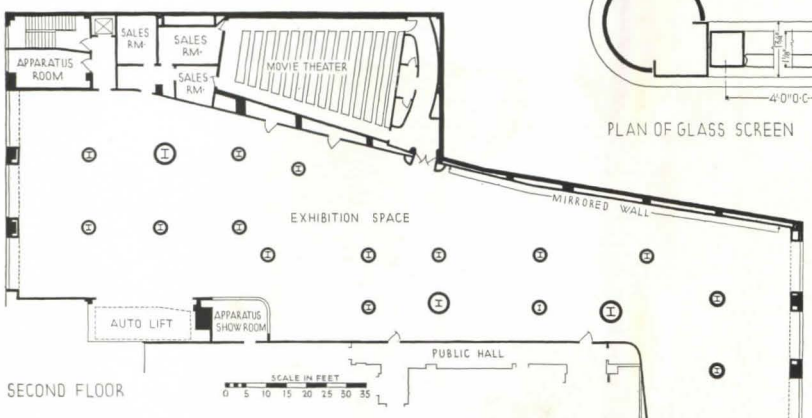


SECOND FLOOR EXHIBITION SPACE—INVISIBLE WINDOW

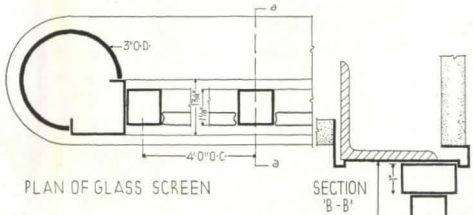
Samuel H. Gottscho



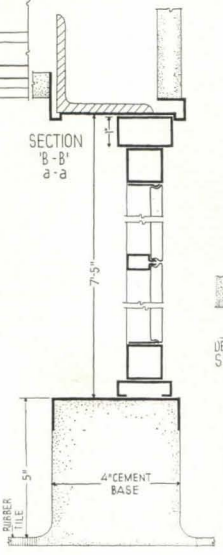
ELEVATION OF LEXINGTON AVE. FACADE



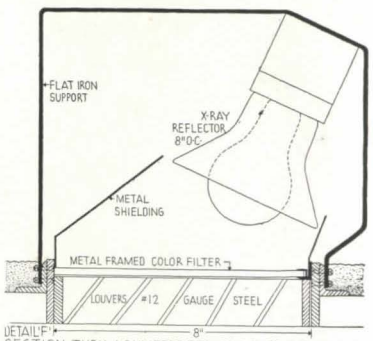
SECOND FLOOR



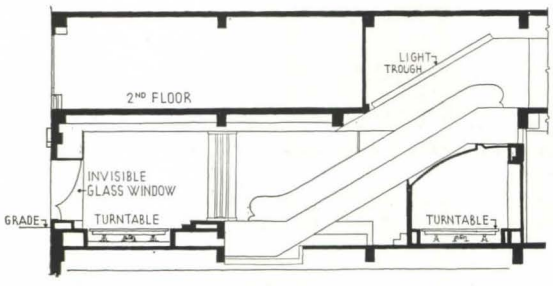
PLAN OF GLASS SCREEN



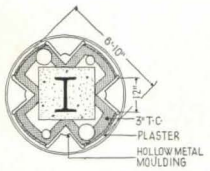
SECTION 'B-B' a-a



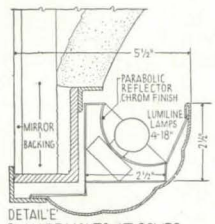
SECTION THRU LOUVERED TROUGHS OVER TURNTABLE



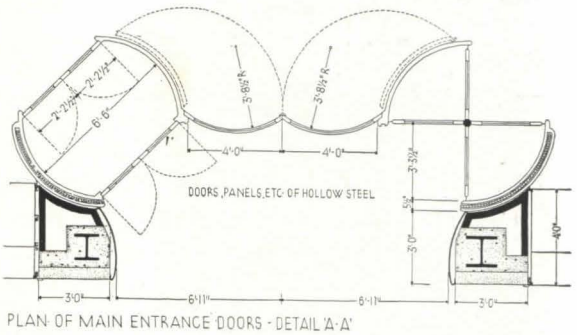
SECTION-'A-A'



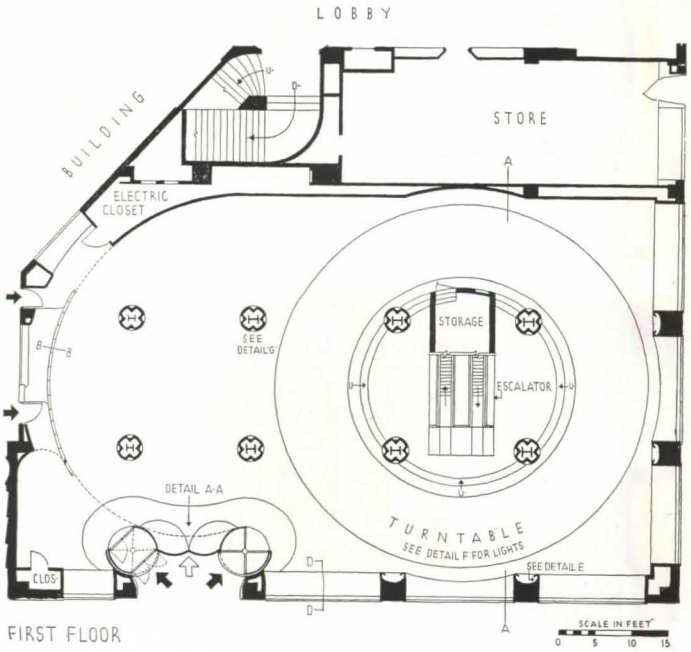
DETAIL 'G' - SECT. THRU COLUMN



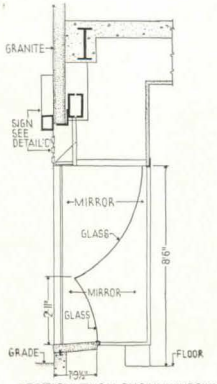
DETAIL E
PLAN OF LIGHTS AT COVES



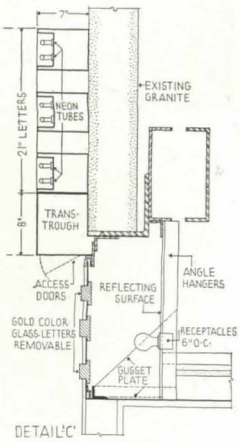
PLAN OF MAIN ENTRANCE DOORS - DETAIL 'A-A'



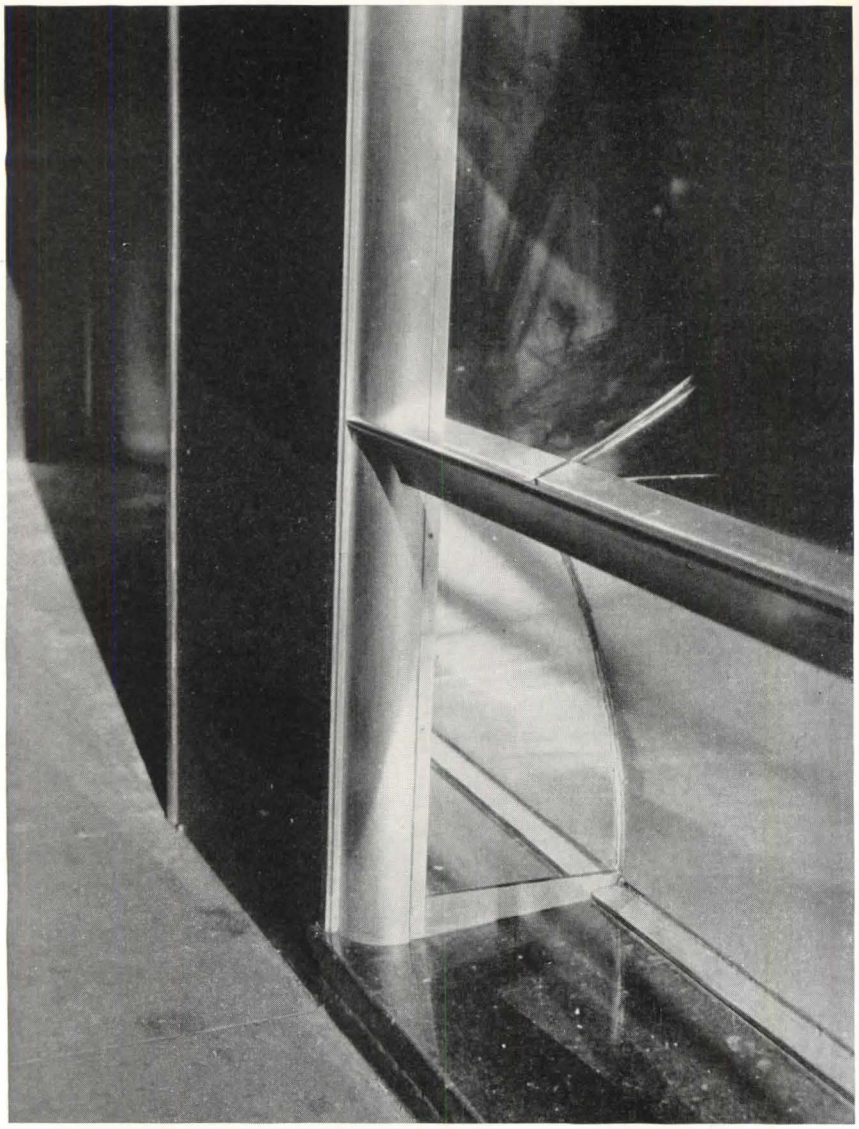
FIRST FLOOR



SECTION THRU SHOW WINDOW
SECTION D-D'



DETAIL C
SECTION THRU LETTERS OVER WINDOWS



WINDOW DETAIL

J. Beinert

ENTRANCE DOORS

Gottscho

CONSTRUCTION OUTLINE

FLOORS
Light and dark gray mottled rubber tile throughout, Goodyear Tire & Rubber Co.

WALL FINISH
First and second floor showrooms—plaster, canvas covered and painted. Exposed corners protected with metal corner molds, painted to match walls. East wall of second floor showroom—covered with gun metal mirrors. Movie theater and lounge—Tekko wallpaper, Frederick Blank & Co. Decorators—French & Co.

GLASS PARTITIONS
Main showroom—curved glass screen, decorative glass in metal frame, Sealed Joint Products Co. and Macbeth-Evans Glass Co. Second floor partition between office space and lounge—glass masonry, Owens-Illinois Glass Co.

SHOW WINDOWS
Invisible glass, Pittsburgh Plate Glass Co. and Invisible Glass Co. of America.

LIGHTING
Continuous trough, recessed ceiling lights with decorative diffusing glass covers and provision for color changes. Vertical concealed cove lighting in recesses in columns and inside face of piers between windows. For high intensity spot-lighting recessed lens, type fixtures at appropriate points. General lighting—Frink Corp. Special fixtures—Edward F. Caldwell & Co.

METAL WORK
Main entrance doors, window frames and sign panels—extruded white metal, General Bronze Co.

SIGNS
Removable letter, Neon signs (see detail drawings), Flexlume Co.

SPECIAL EQUIPMENT
Revolving platforms, Manufacturers Builders, Inc. Electric stairways—two 2 ft. stairways, concealed lighting beneath handrails, Westinghouse Electric & Mfg. Co.

AIR CONDITIONING
Ventilation and cooling throughout, Airtemp Corp.

SEATS
American Seating Co.

HISTORICALLY, this and a second article tell the story of the planning of Greenbrook, a greenbelt. But the technique which is here set forth is primarily designed for application to any commercial development. Greenbrook is a project under the control of the Suburban Resettlement Division of the Resettlement Administration, which has plans for the construction and operation of three others:—Greenbelt near Washington, Greenhills near Cincinnati, Greendale near Milwaukee. Plans for the fourth, Greenbrook, in New Jersey between New Brunswick and Bound Brook, were practically completed when a court decision halted the field work on May 18, 1936. Each of these towns is planned to include complete community equipment—stores, school, playgrounds, roads, utilities.

The story of Greenbrook may never be finished. But the first chapters are among the most interesting ever to be written in the story of planning a U. S. town. Henry Churchill and Albert Mayer were in charge of architecture, assisted by Carl Vollmer. The late Henry Wright supervised town and site planning, assisted by Allen Kamstra. Ralph Eberlin was responsible for the public utilities, and was aided first by Roland Buchmueller, later by Alexander S. Winnet. Coordination and responsibility for the whole project were placed jointly in the hands of Churchill and Mayer. Called in from time to time as voluntary assistants were such planners as Fred Bigger, Tracy Augur and Russell Black, Warren Vinton in social and economic research, and Catherine Bauer in housing. John S. Lansill acted in a supervisory capacity. Before the injunction which ended its activities, this staff had evolved a set of plans which was as complete as paper plans can ever be, and they constitute a rewarding study in the methodology of town and site planning. It is for their virtues as a technique that THE FORUM presents them here. In form this exposition of the Greenbelt is divided into two installments, of which this is the first. The second will appear next month. In subject matter this installment deals with the community, the second with the house within it.—THE EDITORS.

A TECHNIQUE FOR PLANNING COMPLETE COMMUNITIES PART 1

by ALBERT MAYER

THE purpose of this and the next article is to illustrate a technique of design, a technique that I believe is applicable to the architectural and planning professions, to the building industry generally, and to housing and development work in particular. The social and economic elements have not been stressed. Briefly the process we followed was this: only the broadest elements of a program were given the architects at the start, the theory being that the very bases of program must be the subject of close technical investigation and analysis before plans and details were started. For once the architect was not merely a purveyor of design, but, in cooperation with his client-employer, the Resettlement Administration, a creator of both the conditions of his design and of the design itself. For once it was assumed that the technician understood his job and its implications better than did the promoter.

In order sensibly to formulate the conditions and the design itself, a great deal of research had to be done. Research is used not in the sense of collecting a lot of information and filing it, but in the sense of living research; of really checking up at first hand what others have already done, why they have done it, how it has turned out, and why it has turned out that way. These studies of first costs and maintenance costs of the various possible town plans, house plans, utility layouts in terms of available structural systems and materials, were used as jumping-off places for the actual design. In other words, we did not plunge into design, and then find various systems which would fit it, *but we based our design* on what seemed to us the valid material either at hand, or ready for development. Our research did not displace creative power; it simply found an indispensable adjunct to creative power.

We had to pose, and answer, a lot of primary questions. What were the functions of the town, of the roads, of the *houses?* What was each supposed to accomplish? Will a town that fulfills them be fundamentally different from any existing town, and if so will people's ingrained habits rebel against any too violent innovation? What existing communities come nearest to fulfilling our functions, and what can we learn from the successes and failures of these existing communities? What can we learn from local customs, habits, standards, houses? How many do we want to adopt or adapt, how many—if any—do we feel we have solved sufficiently better than existing practice to justify a change? Habits and statistics were not to be enshrined as permanent or universal, *they had simply to be weighed for what they were worth, along with other factors.* Observed habits may be merely the result of necessary adjustment to undesired conditions, or they may be deep-seated, profoundly significant.

We also concerned ourselves with detail, with such problems as attaining the best kitchen—most economical, most convenient in itself, in distance to the front door, and in the mother's control of children. For a house of given size, room arrangements were studied so that that particular size of house might best accommodate the families of the varying age and sex distributions who might be expected to occupy it. Furniture layouts were made so as not to impose one scheme upon the occupants, but to allow a number of sensible arrangements. Thus, our objective was not only to improve on existing practice in the larger planning, but also to improve on those daily conveniences whose advantages every housewife and every family recognize.

THEORY OF RESEARCH

In that approach seems to me to reside the technical importance of the Resettlement Greenbelt Towns. I think that this is the technique that the building industry as a whole must absorb and follow. For at present we have at the one end of the scale the superior architect who conceives a design, and then sees whether the facts and structural systems cannot be made to fit it; on the other hand we have the practical builder, with or without architect, who relies purely on his own limited experience to put up his houses and taxpayers. Finally, we have the manufacturer's salesman who tries to get his limited amount of information across to both. Perhaps it would be fair to say that on the broad human scale of the creation of a new community we applied the procedure of the industrial architect or engineer and his client: they together study the most advantageous location of plant from the viewpoint of raw material, *production* and distribution, from the viewpoint of available labor; they study the processes of manufacture—not only the client's own but those of his competitors also—study the possibilities of improved processes, analyze the conditions that make for the health and efficiency of the workers as well as of the machinery, and *then* they design a plant to suit these facts and possibilities best, a plant that is not only reasonably good on completion, but one which will best fit the foreseeable future developments. This is exactly what our living communities and our housing should do.

The small speculator cannot afford to do the kind of research and planning that I believe indispensable; and if he decided to do it, he could not apply it anyway because he does not control enough product to be able to change the patterns and physical systems into which he must fit. But that does not mean that our methods were highbrow, or that they are not vitally important. It simply shows that the small individual enterprises into which the immense building industry has been split constitute an obsolete survival. They survive not because of any preponderant inherent advantages, but, first, because of the unwillingness of large manufacturing interests to disturb a method of distribution which might temporarily derange their old business relationships, and, second, because the small speculator makes up for the inherent inefficiency of his general set-up by underpaying labor and skimping on materials. In other words, the present set-up gives the public a continuingly inferior product whose price fluctuates with general market conditions, and is, product for product, no better and no cheaper in terms of man-hours and quantities than it was ten or twenty or thirty years ago.

And not only would the overhead costs of such research be ridiculously high on the ten or twenty or thirty houses contemplated, as compared with the trivial cost of stock plans, but there is really no need for it. One's competitors are not doing it either. They are likewise relying on hunch, on previous experience, on the data of manufacturers' salesmen. So that such analytic research and planning are not necessary on any competitive basis. The public which is to buy the houses has a choice only among competitive houses; it has no choice between the product that is universally offered, and that could be offered if really imaginative and closely reasoned research went into the product.

This is not a slur on individual entrepreneurs, but is a characterization of the system under which they work. Two things at least should be learned from the speculative builder. Some people laugh at his carrying his office in his hat; but large enterprise, whose multiple vice presidents and generally oppressive overhead tend to nullify its production economies, should examine this hat carefully and try to learn from its lack of red tape. Secondly, the speculative builder gets along with a minimum of drawings, while the architect revels in ¾-inch scale details and full-size details and blueprints generally. The speculator carries it too far, but we on our side must

learn to simplify our planning and detailing procedure.

At Greenbrook we tried to establish a community that not only the expert would applaud, but also one which the speculative builder could grasp and learn from, and most important, where those of modest income would prefer to live—a type of housing and community that they would demand once they lived in or visited it.

There is no contention on my part that the results we reached are final and universal. They cannot be, for a number of reasons: first, because until many more such projects are in operation there is no adequate quantity or period for testing the results; secondly, because specific costs vary with locality, as do the requirements and habits of people. Conditions and techniques change so constantly that no solutions can be final. Finally, the element of judgment and interpretation will probably always produce varying results, even on an agreed basis of facts. But there is no doubt whatever that the *methods* pursued are valid, and must be generally adopted if the home building industry is to proceed on a rational basis instead of in the traditional way by guess and by God. For that reason it is worthwhile to detail the methods here, illustrating them by the kind of facts we uncovered, the kinds of alternative plans we considered, the cost data we worked out, and finally how all these things entered into the results at which we arrived.

We did not do a perfect job of it. The time was too short, the method too new, the previous cooperative accumulation of data in usable form too small, planners and architects too fallible. But I do claim this: that we intentionally ignored no data and colored no data that had a bearing on our subject; that we earnestly tried to ascertain other peoples' errors so as not unconsciously to make the same ones, to ascertain their successes so that we might distill the applicable principles of their success into our work. This does not mean that we simply let the facts accumulate and called it a project. It does mean that we tried to be abreast with, and in command of what there was available; from that we jumped off with our ideas.

The reader should not gain the impression that instead of architects, we were statisticians, conference hounds or sociologists. We were always essentially architects and planners who simply did not want to proceed as though nothing had ever been built before, or on the basis that nobody knew anything but us. We wanted to accumulate what there was and what analysis indicated could reasonably be created, so that our planning and our architecture would be the more significant because it was part of our time and part of the locality. Nor were we highbrows who assumed that good sociology and good statistics of themselves mean good architecture. Nor finally, were we snobbish—we looked into speculative developments, as well as into the Radburns, the Welwyns, the Letchworths, and the Chatham Villages.

FUNCTIONS OF GREENBELTS

For greater clarity in presentation of methods and illustrations, a brief outline is here given of the principles of the greenbelt towns, and of their application at Greenbrook.

The objectives are:

1. Housing of moderate income groups in planned communities on such a scale as to achieve the economies of planning, purchasing and operating made possible by large scale operations, and to achieve the reasonably assured permanence of environment which only large-scale planning can give.

2. The creation of a greenbelt satellite which would take the utmost advantage of the natural trends that have accounted for the continuing and accelerating growth of metropolitan areas at their peripheries in the form of suburbs, a growth greater than the loss of population at their crowded centers. The resulting greenbelt town differs from the haphazard growth of suburbs in that:

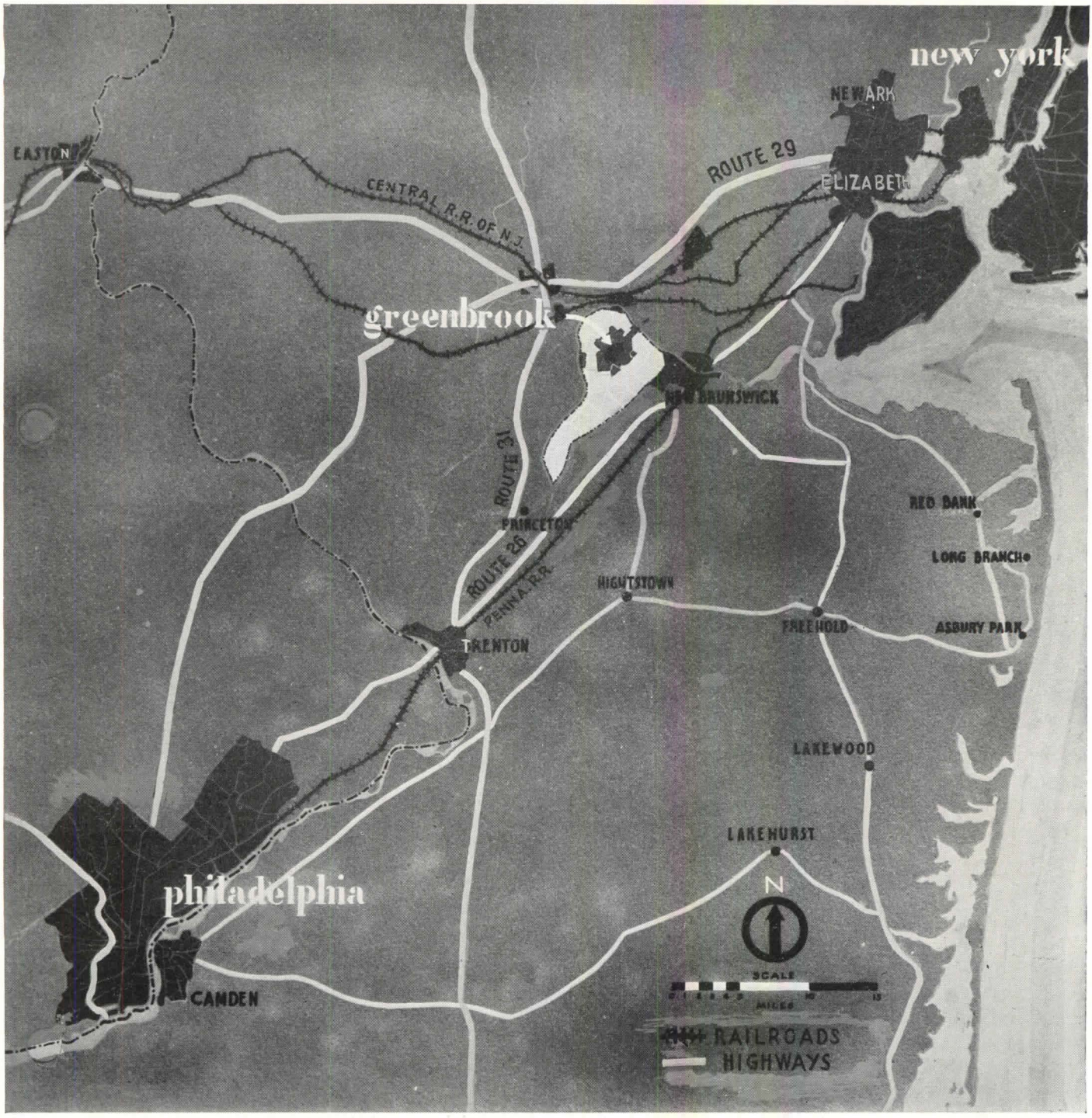
a. It is an independent entity, rather than a suburb which eventually merges with the city. It is near enough to the metropolitan center for larger cultural facilities, but far enough away so that it has a complete life of its own.

b. It is surrounded by a greenbelt which permits it to be planned from the start for a definite ultimate size, and which protects it from encroachment by independent speculative building, or by the spreading out of adjacent towns. The greenbelt likewise, by confining the growth of the town itself, protects the adjacent countryside.

c. It is located sufficiently near to existing highways and railways so that its inhabitants are able to reach other centers conveniently, and so that its industries are advantageously served for highway and railway deliveries; but the town ideally is not crossed by these major arteries, so that traffic safety is not interfered with. Until its own industries are established by normal growth, its proximity to other centers gives its inhabitants the benefits of a free labor market.

d. It is located where land in large quantity is available at a low price, and therefore where price does not rise because of speculative manipulation as it does in the suburban town.

e. By means of its greenbelt of farms and woods, it achieves an integration of urban and rural life, in contradistinction to the typical suburb's ruination of adjacent rural life by indiscriminate spreading of its least desirable features. This is advantageous to the farmer in that it ends his cultural isolation; and from the economic point of view it provides him with a direct market for his produce. It is advantageous to the urban worker, giving him con-



RELATION TO METROPOLITAN AREAS **MAP A**

By Train: 30 minutes to Newark, 45 minutes to New York, or Trenton, 70 minutes to Philadelphia.
By Automobile: 30 minutes to Elizabeth, 45 minutes to Newark, 60 minutes to New York.
Note also convenience to shore resorts. All main highways pass near to, but not through, area.

tact with the soil, through his own garden, through his allotment garden, and through the greenbelt farms. On the economic side he can buy the farmer's produce more cheaply because of the directness of contact which eliminates transportation costs, and probably some of the middlemen's charges.

3. A third objective is to take advantage of the inherent economies in the greenbelt town which result from large-scale planning (noted under 1); from low price of land compared to urban land; from savings in cost of utilities such as roads, sewers, etc., because—due to lower traffic volume—fewer streets are required initially; and because it is entirely planned from the start and hence avoids the expensive road widenings, etc., characteristic of cities.

Due to its being located away from the city, there is the economy resulting from freedom from obsolete and rigid building codes. In addition, the open, semi-rural

character of the town makes formal parks and formal recreation methods with their accompanying costs—so essential to city life—unnecessary here.

These inherent economies are partially masked at the start, because there does not exist the hidden subsidy present in cities due to the heavy real estate tax payments on office buildings, factories, department stores, luxurious residences. Until industries settle there, the inhabitants pay their own way in taxes.

4. The discovery of a suitable area for such a project. Having found in common with other investigators that decentralization in this country was taking the form not of dotting population and industry all over the countryside, but was resulting in increase of population and industry around the peripheries of metropolitan areas, the Suburban Resettlement Administration studied the characteristics of all metropolitan areas of over 100,000 population, showing the facts by means of graphs (see graph, col. 2) of population growth over a period of years, value added to products by industry, number of people employed in industry and industrial payrolls.

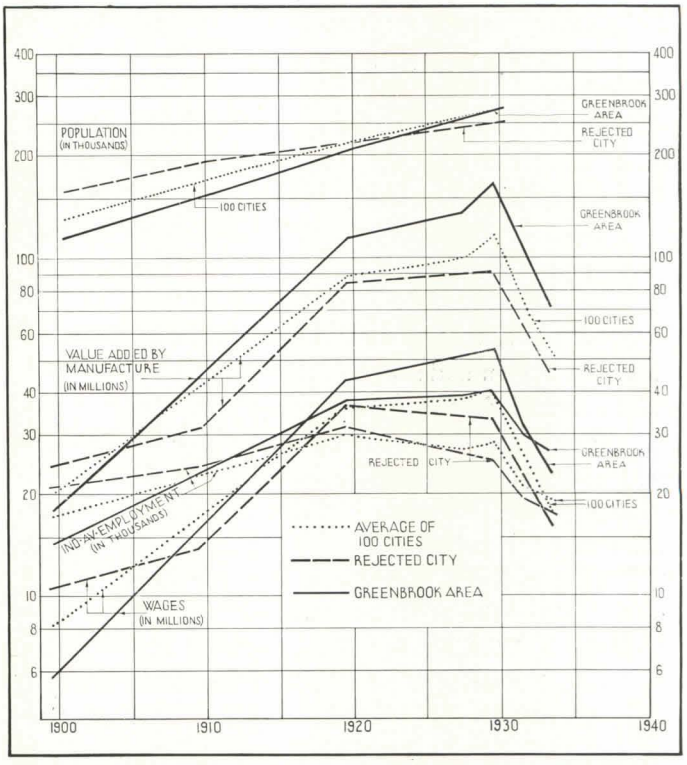
By comparing such data, certain metropolitan areas stood out as meeting the criterion of steady growth and steady superiority over the average of metropolitan areas. The New York area was one.

5. The successful demonstration of these principles, a feat which should act as a most important stimulant to the public to demand, and the building industry to supply, housing and environment of a kind practically unknown in this country at any income level.

THE CASE FOR GREENBROOK

In the New York area, Greenbrook was found to meet the general requirements listed above, as applied specifically to:

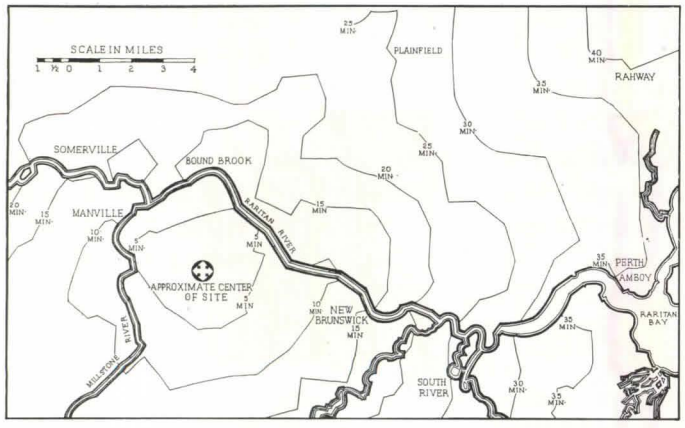
1. *Available Area.* An area of about 4,000 acres was required. On an initial assumption of 5 to 6 families to the gross acre, and including public buildings, a housing area of 800 acres is required. Around this center, a greenbelt of average depth of ¾ mile meant an additional 3,200 acres. It is to be noted that the greenbelt would support about the same tax burden with a greenbelt as it had before, for much the same farms would remain in it. The area marked on Map A is in Franklin Township, which, in a wedge bounded on the east and north by the Millstone and Raritan Rivers, contained unsubdivided acreage many times the amount required for a greenbelt town. It is land now used for dairy farming and fruit growing.



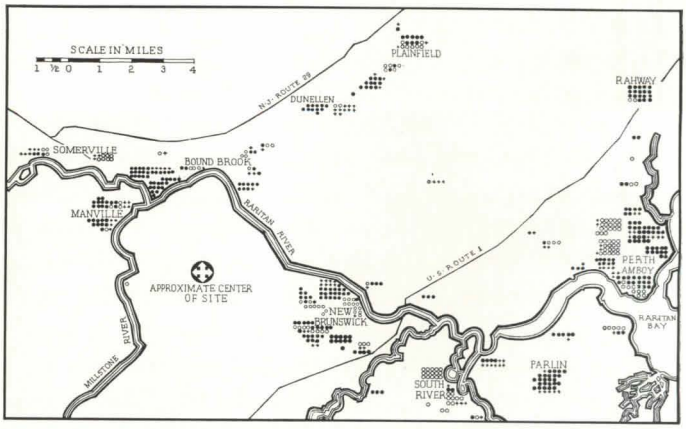
RATES OF GROWTH—VALUE ADDED BY MANUFACTURING, POPULATION, EMPLOYMENT, WAGES.

This graph shows reasons for the selection of the Greenbrook area. By every criteria adopted, the rate of growth (steepness of slope) of the Greenbrook area exceeds that of the average of the 100 cities studied. Note the "rejected city," with lines of flatter slope than the 100 cities.

INDUSTRIAL EMPLOYMENT AND TRAVEL TIME IN THE GREENBROOK AREA



Minute lines show travel time from the town center by bus.



Fifteen Minutes to 18,000 Jobs; Thirty-five Minutes to 50,000 Jobs.

2. *Labor Opportunities:* Map A indicates accessibility to metropolitan areas. The two on p. 23 indicate how *well* the site is located with respect to local centers of employment: 15 minutes motor ride to 18,000 jobs, 35 minutes to 50,000 jobs. On the second map a solid dot equals 100 employed in heavy industries, a circle equals 100 in movable industries, a cross equals 100 expected to be employed in three years. An industrialist employed by the Resettlement Administration indicated the opinion of many local factory managers as to the inadequacy of housing accommodations in the area; and his own careful survey indicated an unusually high imminent industrial growth rate due to the nature of the local industries: plastics and other chemicals, building products, and especially roofing materials, clothing factories and other consumers' good industries.

3. *Road and Rail Connections:* Map A also shows the almost ideal location of Greenbrook with respect to roads and railroads. Within two miles of arterial highways to New York, Newark, Elizabeth, Trenton, Philadelphia, Easton, Harrisburg, and within easy access of all the shore resorts, it is not crossed by a single through road—major cause of traffic dangers. The Pennsylvania Railroad passes through New Brunswick; the Baltimore & Ohio, Reading, and Lehigh Valley through Bound Brook —both only a few miles away. The Pennsylvania has a spur right through the area, an important feature for industry.

4. *Topography and Water Supply:* The twofold requirement for topography are pleasantness of terrain, and sewerability without excessive cost. The topography at Greenbrook is gently rolling. There are several well-wooded areas and some good orchards. In spite of the gentleness of the slopes we were able to devise a sewer layout that disposed of all sewage into one disposal plant and outfall.

5. *Adequate water supply* was available through water companies operating in the region.

CONTROLLING FACTORS

The other elements of the program given the architects and planners were:

1. Dwellings to be rented, not sold.

This point means a tremendous difference in approach. Where houses are rented, the promoter and builder have a permanent interest, and yearly operating cost is just as important as first cost. Where the promoter of a sales proposition must inevitably be inclined to favor first cost economy and compromises in quality, even though such initial economies may ultimately cause greater expense to the purchaser by accumulation of annual costs, in a rental development the elements of first cost and operating cost must constantly be compared to see which is the more important over a period of years. This applies both to the house itself (e.g., first cost of insulation vs. annual heat saving), and to the development as a whole (e.g., first cost of concrete roads vs. less cost but greater upkeep of other types).

An equally important implication of rental over sales projects is the freedom to plan, less hampered by the supposed prejudices of the purchasing public. For instance, the superior type of planning, and the greater economy possible with row or group houses in place of free-standing houses—so often demonstrated theoretically, and in practice in such developments as Chatham Village in Pittsburgh—could be carried out here without the prudent qualms of the speculative builder who dares not do it merely because it is sensible.

2. Moderate income groups to be housed. Rental was to be brought as low as what were considered minimum standards of amenity would permit. It was realized that the essential economies of the operations lay in their large scale, low land cost, thoroughly studied planning and house groupings, large-scale utility and plumbing requirements. To try to go further than such essential economies, by lowering standards, may jeopardize the rentability or salability of a project. And, as will be shown later quantitatively, surprisingly little is saved by such devices as decreasing room sizes. Further help in keeping living costs down must come from lowered financial costs in respect to interest and amortization.

3. Living Cost. The renter here, or the purchaser in sales developments, should always have in mind that he is interested not only in rent or monthly interest-installment-tax payments, but in all the living costs that are attributable to shelter requirements. For example, a saving in electric current due to self-generation or wholesale purchase and resale is just as much an economy as a saving in rental. Special assessments for sewers or roads are just as much an item of living cost as the regular monthly payments. In a training school for ultimate consumers these facts should be part of the required curriculum. Weighing of such living economies was an integral part of the Greenbrook planning picture, as will be seen below from cost calculations as to electric current supply and heating costs. To attain some of these economies, it is essential to operate on a large scale, and on a rental basis with one management, where centralized purchase or generation is possible.

4. Construction by WPA at union wage scales. This part of the Resettlement Administration's program permits the speculative builder to win back much of the first cost wastes that his small set-up entails, for generally speaking he has been paying not more than half the union scale. The speculative builder also gains by the use of inferior and skimped materials.

It is important to note these two facts here, because they are what really lie behind the claims that private enterprise can build so much more cheaply than govern-

ment, and not any magic in private enterprise as such. While some governmental building may be unnecessarily costly, I assert that fundamentally our work was designed as practically and as economically as any speculator's could be *for the same type of product.* And I further assert that if the same wage-cutting, material-cutting savings were to be used on this project, then its inherent large-scale economies would bring its costs lower than those of the speculative house. We were not theoreticians blithely spending the government's money, but hard-bitten architects, engineers and planners who tried as earnestly to make every legitimate economy as we ever had done for private owners.

5. Speed. As our projects were set up under Relief allotments, it was urgent to complete plans as quickly as feasible, so that men could be set to work in the field.

6. Limit to experimentation. As the Resettlement Administration's main objective is to produce successful satellite communities which will mark a step forward in living, successful both in themselves and in their influence on future developments, its viewpoint was that it would prefer not to have any elements introduced that were so comparatively untried as possibly to jeopardize the essential result for an extraneous reason. For example, certain new types of material or structure might still be considered too experimental for general application on this principle, and their use confined to a small percentage of the houses intentionally experimental. These would be closely observed by the management under actual operating and living conditions.

7. Specific families to be accommodated. With the above pretty coherent program, how could we get more specific, how could we get a definite picture of the people who would live in our project? While it is not too difficult to write down a list of functions that a house in the abstract must fulfill, differing types of families place relatively different emphases on the various functions of living. The question must be boiled down to: Can we find out who our prospective customers are, and then find out how well their present accommodations meet their needs and desires, can we supply something that does this job far better, at rents they can pay? As architects and planners it was our job to find these things out, create a project that fulfilled these minima, figure what the maintenance and operating costs would be as compared with the rents our customers could pay, the difference if any being the rate of return or amortization the government could get on its investment. If our client-employer, the R. A., agreed that they would stand for such a minimum return, it was a project. If not, there was no project.

REPORT ON RENTALS AND LIVING HABITS IN BOUND BROOK AREA—TYPICAL EXCERPTS

GENERAL

Low grade Bound Brook flats (next to station) of 3 and 4 rooms rent for $12 up, and offer very poor accommodations.

Housing development in East Bound Brook erected by Pierce consists of 200 houses of 4-7 rooms, rent for $20 up to $45. The development is divided roughly in two parts:

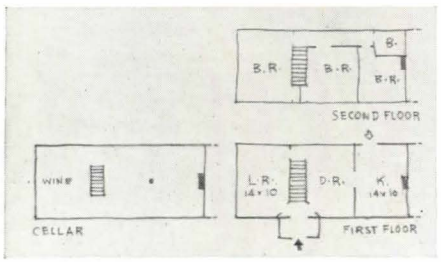
1. For industrial families paying up to about $25.
2. For higher income families paying up to $45.

The development has one vacancy at present. I shall visit it with the rent collector on my next trip.

The Lamont housing in Bound Brook rents at $20-$24 and houses industrial workers who, although enjoying only the average income, are of a better and more thrifty type, as selected by the management. I shall visit this housing on my next trip.

Higher class flats on Hamilton Street in Bound Brook of 4-5 rooms up rent for $25-$30-$35. They are fairly good quarters but are not afforded by industrial workers—rather by bookkeepers and clerks earning $100-$125 per month.

PIERCE HOUSES IN EAST BOUND BROOK:
(About 200 Dwellings, Detached and Semi-Detached Houses and 4-Family Flats).



TYPE & RENT:
$25 per month, water not included, L. R., kitchen, 3 bedrooms, bath, cellar, furnace.

HEAT:
Coal-fired hot water system, no coal record as tenant is new.

LAUNDRY:
Tub in kitchen only.

CELLAR:
Boiler, coal, work shop, also perfectly organized and equipped for production, bottling and storage at just the right angle, of red and white wines.

WATER:
Paid by tenant—initial meter readings and charge of $4 per 3 months sufficient for that family.

GAS & ELECTRICITY:
Gas stove and electric refrigerator about $3 per month.

OCCUPANCY & REMARKS:
Elderly retired Frenchman 14 years with Pathe, his wife or daughter and little boy or grandson. House immaculately kept and all redecorated by landlord. French taste, neatness, and thriftiness at its best. Entire house heated. L. R. not used much. D. R. used more. Attic accessible by trap, not used much.

TYPE & RENT:
$23 per month, including initial $4 per 3 months on water meter, as special allowance for tenant doing all plumbing maintenance.

HEAT:
Coal furnace. 7 tons per year.

LAUNDRY:
Done in kitchen tubs.

CELLAR:
Workshop, furnace, coal, storage, no tubs, well kept.

WATER:
Usually exceeded initial amount allowed in rent and paid $1 or $2 over himself.

GAS & ELECTRICITY:
Gas: $1.50 month approximately.
Electricity: $2.65 per month approximately, including radio but no electric refrigerator used. Runs more when kids use radio too much.

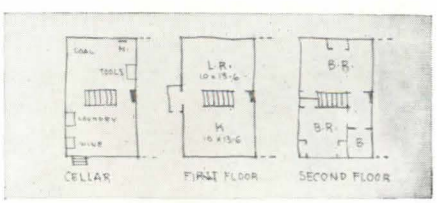
LIVING ROOM:
Heated but not used as much as D. R.

OCCUPANCY & REMARKS:
Man and wife and 4 small children. Chemical plumber from Chipman works. Fairly clean infants. House in very bad condition and very messy, not fixed by company at all. Owner had been living in Type A; somewhat too small, but felt better off there as he foraged forest wood nearby and used only a ton of coal a year. He was urged by his boss and with some misgivings to move to larger house. Wood is no longer much use to him here.

LAMONT HOUSING IN BOUND BROOK:
(64 FAMILIES)
COMMENTS AND EXPERIENCES WITH EACH TYPE:

The following is drawn from my observations of the housing, three talks with Mrs. Powelson, and a visit with her to the houses and families.

Type A. 2 Family Semi-Attached, 2 B. R.



This house is the most frequent, most demanded, the easiest to rent, and the most desired when the families were allowed to buy. They were always preferred over the single because of maintenance, preferred over the row and flat because of privacy. Their entrances being at opposing ends perfect privacy was felt.

The house of this type visited was occupied by an Italian family originally selected by Mrs. Powelson as a tenant but who later purchased the house and now rents the other half out. (The owner earns about $25

Thus the Greenbrook project figured its way in just as hard-headed a way as did those of any banker or speculator.

We needed this specific information as to our future customers as early as we could get it. In addition to questionnaires and census information, we wanted the humanized information that an intelligent and sensitive architect could get and that other architects could interpret. One of the first pieces of research was to send Julian Whittlesey of our staff into the field to feel out and report on local living conditions among the adjacent industrial population to whom we expected to appeal. His report was a first-rate job which succeeded in focusing our program specifically, and whose observations were studied by us again and again in various phases of our work. Typical excerpts from this report are given on page 25 and a part of the summary of his "Conclusions and Recommendations" below.

TYPICAL PROCEDURE

These then were the elements of the program which we were to develop into a project. The work falls under three main divisions: town and site planning; engineering and utilities; architecture, planning of buildings including structural, heating, plumbing and electric design. Though these are recognizable divisions of any such project, the interrelations are so close that in most cases a decision made in one reflects itself back into changes in design in the other branches.

A simple illustration is in the case of street layout, determined by the town planners in cooperation with the engineers who were seeking maximum economy of cut and fill for roads and for sewer grades. The direction of the streets immediately affects house plan, if orientation for sunlight, wind and view are properly valued. For example, if streets run east and west, and it is desired to have the bedrooms and living room face south for sun, then it is obvious that two different plans must be evolved, one for the north and one for the south side of the street. Again, the heating system to be adopted appears at first sight to be a matter which in due course is decided upon and designed when the house plans have been pretty well determined and drawn. Actually it is one of the earliest things to determine. In the first place, the question of fuel to be used fundamentally affects the site-planning and street layout of the whole town. If coal is used, the minimum distance from house to delivery road is the maximum chuting distance, or about 30 ft., unless a premium for handling is to be paid on every ton of coal delivered. Then there is the question of system-individual, central plant, or semi-central plant—for each house group. Adoption of either of the two last systems implies house groupings adjusted to gain the greatest efficiency and economy. Again, certain systems

REPORT ON RENTALS AND LIVING HABITS IN BOUND BROOK AREA (Continued)

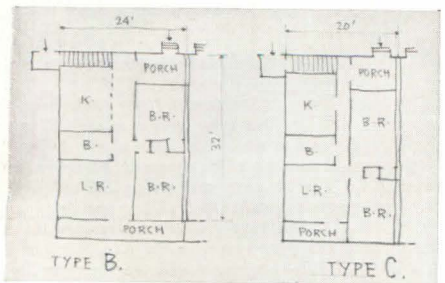
a week.) Two children occupy the small bedroom at all times, and sometimes a third. They never sleep in living room. The living room is only used for "occasions." Original coal stove replaced by gas. Their estimation of families in community was marked by whether or not they still had the old coal stove. The original laundry tubs had been moved to cellar at their expense. (Laundry tubs were originally placed in kitchens throughout, but any tenant might at his own expense move them down. This has been done by most tenants.) Lack of protection over the back steps was acutely felt. Many had built a gable on at their expense, and usually at the same time built a stoop platform, often enclosing it before they got through. This is where the ice box is kept, with lawn and garden tools, children's cart, etc.

The cellar of this house was fully used and well kept. The owner is about to move the laundry tubs over to present coal bin location, in order to make access to build a wine cellar under the front stoop.

The kitchen was used more than any part of the house. They dined in it exclusively except on "occasions."

Strong comment on the fact that such a kitchen suffers by having laundry done in it.

Type B & C 4 Family Flats:



Type B. was the more satisfactory flat as being of better size than the Type C. and having some heating facilities. The porches and galleries were very popular and kept the bedrooms cool, particularly the back bedroom. The wife in this house liked the rear bedroom for the children because it was particularly cool in summer. Owner had removed kitchen partition shown dotted and had grand kitchen space with refrigerator under stairs and cross ventilation.

CONCLUSIONS AND RECOMMENDATIONS:

From reference to commercial housing and the Lamont Housing described above, and Ingersoll-Rand Housing to be later described, various conclusions may be drawn.

1. Maximum possible rent afforded is $30 and this only when there is more than one wage earner or a higher salary worker.
2. Many families which we are concerned with cannot afford $20 in rent.
3. Most families we are concerned with can afford $25 at the most.

Fixed expenses over rent are about as follows:

High

Large House	**Large Family**
Heat and hot water, 6 T. x $11/12 mo. or	$5.50
Electricity,	3.00
Gas $2 for 6 mo., $1.50 for 6 mo. or average	1.75
Water,	1.50
Ice, $18/year	1.50
High Total	$13.25

Low

Small House	**Small Family**
Heat and hot water, 5 T. x $11/12 mo. or	$4.60
Electricity,	2.00
Gas,	1.50
Water,	1.33
Ice,	1.50
Low Total	$10.93

The above refers to houses and families having a bath, and heating plants which by the way are not used to heat the entire house.

Among the families who will afford heated houses with baths, those needing 3 bedrooms are in the minority as compared to those who can live in 2 bedroom type. With each of these 2 bedrooms of good size 10 x 12 or 10 x 13 this house suffices for a family with 3 small children.

In my opinion the architects are right in giving the 2 bedroom type sizable bedrooms in order that this house will serve 3 small children at times. But beyond this point expansion of room sizes, including living rooms, will increase the difficulty of the tenants' paying rent. Heating cost will rise for every bedroom over minimum size. Some people may like large windows, but these families do not—largely because of fuel bill.

Likewise I believe that there should be strict limitation of social and community facilities whose maintenance will be reflected in the rent. The town is surrounded and protected by fine open country. The town will be more rural than suburban at first. A site plan which encourages neighborliness, coupled with the rural nature of the surroundings, will supplant the more elaborate social and community facilities so indispensable in city and suburban housing.

The more detailed report on the Ingersoll-Rand allotment gardens concludes this report. While discussing social and community facilities, it is worth while to jump forward to conclusions about allotment gardens. This type of community facility is one whose maintenance expense by the landlord will be returned between 3 and 5 times in yield to the tenants—depending largely upon the quality of the soil available. The gardening has also shown itself to have value as a natural social activity.

affect the shape of the house, and conversely certain house shapes affect the choice of system. For instance, a simple hot air system is least advantageous in a long house, or a house with a corner staircase. This whole heating question will be gone into more fully in detail later. But it again shows the repercussions of almost any significant item into all branches of the work in rational designing methods.

Another example will illustrate not only such necessary interrelation, but also includes in itself most of the elements of research, cost calculation, and judgment which are the essence of proper procedure. The case is that of inclusion or exclusion of cellars. Bringing up this instance here, out of its proper order at the beginning of our detailed discussion, is not to be taken to mean that it is the most important or that it was a problem that was taken up before others. But it is a simple case that serves as a specific illustration of the general method. Three elements enter in.

1. General advantages and disadvantages of inclusion or exclusion of cellar.
2. Local desires or habits as affecting No. 1.
3. Comparative cost of full cellar, half cellar, no cellar.

The purpose of the analysis was to evaluate the cellar question in terms of cost. The balance of general advantages and disadvantages first had to be weighted by the locally gathered evidence. When a tenant pays for something himself, as here in the case of moving the laundry to the cellar, he must want it pretty badly. The strong local predilection for cellars indicated that a cellar should be included.

Could we afford it? A cost analysis was made. It will be noted that not only were costs within the house figured, but the extra cost of utilities (lowering of storm sewers) had to be taken into account. Not only must the sewer be lowered from house to street, but the whole main storm system is involved. The cost differential per house *in this case* is a little under $200. This figure, of course, will vary. On a hillside site, the differential becomes much smaller. Again, in this section we found water at a high level, so that underdrainage was required. On the other hand, with more difficult soil conditions the cost might have been higher. The presence of a cellar does not increase maintenance or running expense calculably. Hence the increased rental expense or living cost expense consists of interest and amortization on the extra $200 plus the extra taxes based on the higher valuation. At the low interest and amortization rate assumed for this development, and assuming an average 5-room house, the increased living expense comes to about 15 cents per room per month.

This seemed to us to be a sufficiently small addition, commensurate with the advantages, to warrant the recommendation to include cellars. The recommendation was concurred in by our client-employer, the Resettlement Administration and its Management Department. Based on the same set of facts, the judgment of others

FULL CELLAR VS. PARTIAL OR NO CELLAR

GENERAL ADVANTAGES:

Custom—Strong desire for cellar is confirmed by questions to house owners. Such experienced and progressive builders as Englebardt of City Housing Corporation strongly advise against omission of cellar in this section of the country.

Laundry trays can generally be placed in cellar; space for drying wash in bad weather. Laundry and laundering operations completely out of the way and do not interfere with house routine.

Extra storage space, space for workshop and/or play space. Storage space for vegetables, preserves, brews and equable temperature. Space for extra furniture.

Floor of first floor not cold to the touch (children playing).

Placing of gas, water and electric meters out of the way in the cellar.

Soil line and trap can be run exposed.

For coal heating, fuel storage is better located in cellar than on main floor.

Economy of running branch utilities through cellars in certain cases.

GENERAL DISADVANTAGES:

Extra cost. See Calculations Below.

Loss of closet space under first floor stair.

Possibility of wet cellars.

Advantage of laundry on first floor—less carrying up and down—applies to storage also.

LOCAL FACTS:

No permanent local houses however miserable or cheap (including those at Milltown) are without cellars.

Our inspection of the Lamont, Pierce, and other developments in this vicinity indicates that people prefer laundry in the cellar. In many of the houses that have cellars but have laundry facilities on the first floor, tenants have installed laundry tubs in the cellar at their own expense.

COSTS: See below.

FULL CELLAR:

Bulk excavation 115 cu. yd. at $1.00	$115.00
Hand trimming and footing excavation 23 cu. yd. at $2.50	57.50
Footing Drains 71 L. F. at .18	12.78
Lowering Storm Sewer Main 40 L. F. at .60* (Average 2-0)	24.00
House Sewer Aver. 40 L. F. at $1.00 allow 2/3	26.67
Concrete including forms 16 cu. yd. at $11.00	176.00
Fill under basement floor 9 cu. yd. at $2.00	18.00
Basement floor 490 S. F. at $.15	73.50
Cellar Stair 100 B. F. at $.10	10.00
Ceiling protection over boiler 10x10 = 100 S. F. at $.07	7.00
Girder at 18#/L. F. x 17' = 306# at 5c.. plus Lally Col.	15.30 3.00
	$538.75

PARTIAL CELLAR:

Bulk Excavation 40 cu. yd. at $1.38	$ 55.20
Hand Excav. Trench Work 14 cu. yd. at $3.50	49.00
Hand Trim for Shovel 15 cu. yd. at $2.50	37.50
Footing Drains 62 L. F. at $.18	11.16
Lowering Storm Sewer Main 40 L. F. at $.60 (Average 2-0)	24.00
House sewer aver. 40 L. F. at $1.00 allow 2/3	26.67
Concrete including forms 20.22 cu. yd. at $11.00	222.42
Floor Fill 5.29 cu. yd. at $2.00	10.58
Basement Floor 286 S. F. at $.15	42.90
Preserving floor construction over unexcavated area 700 ft. B. M. at $30.00 per M	21.00
Sill bolted to intermediate wall 24 B. F. at $.07	1.68
Cellar stair 100 B. F. at $.10	10.00
Ceiling protection over boiler 10x10 = 100 S. F. at $.07	7.00
	$519.11

NO CELLAR:

Hand Excavation 24.3 cu. yds. at $3.50	$ 85.05
Concrete including forms 10 cu. yds. at $11.00	110.00
Stripping Loam 2.5 cu. yds. at $1.00	2.50
Preserve 1st floor construction 1,249 B. F. at $30/M	37.47
Additional cubage of heating and storage on 1st floor 9 ft. x 9 ft. x 9 ft. high 729 cu. ft. at $.15	109.35
	$344.37

*No lowering, and hence additional cost, of sanitary sewers is involved. Due to the fact that a minimum of 5 ft. of cover is required, that cellar floor was never lower than minus 6 ft. 6 in., the sanitary drain from laundry tubs just about came to the minimum depth anyway.

might conceivably have resulted in an opposite conclusion—our own might have been different if the differential in living cost had worked out substantially greater. But the point is that the method of gathering all the facts and all the costs permits a rational conclusion. The planner and the owner know pretty closely what they are paying for any given feature, and what extra maintenance or rental it will cause.

The above examples of the methods used in certain important instances are typical of other studies not here described. As these involved conceptions of functions of the specific item itself, and its relation to the functions and life of the whole town, and as they involved so much of judgment and assumption due to meagreness of existing data, they were not left completely to any one man. The principals, and others specially involved in the particular item, reviewed the methods and data from time to time, until a final agreed report was drawn up. This was distributed to all concerned, and was available to anyone. I think I may say that these reports really were absorbed by those involved, and were not only specifically applied but became part of the mental background and apparatus of the job.

This example of method and result gives the clue to our entire procedure and objectives. Our first steps were a statement of functions, then fact-collecting and analysis in town and site planning, in utilities, and in house planning and architecture. Fact-collecting meant many sorts of facts: visits to existing projects that might have bearing on ours, discussions with their managers and tenants, study of published sources, careful and prolonged visits (sample noted above) to get first-hand information about the local people of the type expected to become our tenants and about the houses in which they lived, collection of data on traffic, on local farming possibilities for the greenbelt, on structural systems and materials, on mechanical systems.

The next process was analytic: weighing and weighting the information accumulated to see what was valid and applicable for us, cost analyses (first cost and operating cost, resulting in rental cost) of such items or systems of items as were susceptible to it.

Finally, there was the synthetic process. The solution was evolved in terms of the limiting facts unique to the locality and the job: relation to existing road systems, to surrounding towns and their existing facilities such as hospitals and stores and industries, design in terms of obtainable land, of topography, of local customs, incomes, family sizes, of local building materials.*

*A much fuller "History of Greenbrook" was compiled by Emil Klee who was on our staff precisely for this purpose. It collates and records fully all investigations, decisions, reasons therefor, so that the methods and implications of our project would be permanently available. These articles are more or less a distillation of the project history, with such adjustments and rearrangements in reports, tables, charts, etc., as will make these articles intelligible and consecutive in themselves.

The remainder of this and the next article will be devoted to illustrating the above general principles, chiefly by attaching further actual specimen examples which illustrate our procedure and which, out of our work, appear to have most general interest in themselves. With the constant proviso that all planning departments are so closely interrelated that divisions are almost artificial, and that so much of the work and thinking are so necessarily simultaneous that chronological divisions are almost equally artificial, I have undertaken to present certain such divisions in the work. For clarity they must be presented as more sharply separated than they actually were. The order of discussion will be:

TOWN AND SITE PLANNING

Calculation of Area Required for the Town (Preliminary) based on desired general residential densities, and average depth of greenbelt.

Exact Location of Town Site *within the total* assumed available area.

Layout of Streets. Recalculation of Area Required (Final) based on actual densities resulting from specific layouts.

House Groupings.

Schools Community and Civic Buildings (Preliminary).

Store and Town Center (Preliminary).

UTILITIES

Sewage and sewage disposal studies based on topography and geology.

Road and street layout.

Water supply and distribution.

Studies of methods of electrical production and distribution for lighting and power, including studies of the problem of electricity, gas or other fuel for cooking.

Garbage disposal.

HOUSE-PLANNING-ARCHITECTURE

Determination of percentages of houses of various sizes (1, 2, 3, 4 bedrooms).

House plans and groupings.

Layouts of permanent equipment and furniture.

Room sizes.

Specifications, structural systems, and materials.

Plumbing, heating and electric systems, and layout.

Architecture: Form, space relations, and facade.

PUBLIC BUILDINGS AND LANDSCAPING

Final studies and layouts of stores, service stations, motion picture theaters.

Schools.

Community buildings, present and future (fire and police, management office, town hall, welfare center, library, etc.).

The Town Center.

Parks and Landscaping including gardens.

Greenbelt and Agricultural Belt.

This article will deal categorically only with those items listed under **TOWN AND SITE PLANNING.** The remaining material will appear in the next issue. However, because of the close interrelation of one element with another, some of the material included under the heading of **UTILITIES** will also appear along with the subjects dealt with under **TOWN AND SITE PLANNING.**

CALCULATION OF AREA

Basic data included studies of:

Letchworth: About 4,000 acres to house 30,000 people ultimately (now about 16,000).

Town Area: 120 acres in roads.
150 " " open spaces.
1,200 " " residential*
2,500 " " greenbelt.

Comment: This would give greenbelt of average depth of half a mile, probably too little for permanent protection against foreign encroachment. Five hundred acres additional were later acquired.

Welwyn: 2,400 acres for ultimate population of 40,000 (now about 12,000); of which about 1,600 acres are for the greenbelt. Density of houses about ten to the gross acre. Comment: too great a density of population, too little depth of greenbelt.

Radburn: 5 to 6 houses to the gross acre.

Ordinary Developments: The ordinary development of detached houses on lots 40 x 100 means eleven houses to the net residential acre; or about eight houses to the gross acre (including streets, store areas, proportionate area of school and playground and of parks, etc.).

Greenbrook: Density of Welwyn and of "ordinary speculative developments" were higher than desirable, in our judgment. Nor did Radburn seem to us to offer a correct solution. While no exact evaluation of the cost difference between 6 to the gross acre and 9 to the gross acre was possible in advance of actual final layout from which extra cost of roads, water and sewer mains, and land could be calculated, preliminary calculation was made. Land cost at some $300 per acre meant a first cost differential per house of about $17. Difference in first cost of utilities and roads, based on assumed diagrammatic layouts, was roughly $120 per house. An allowance was made for maintenance and replacement of the extra roads and utilities. It was found that the increase was roughly 16 cents per room per month.

Based on the above, area requirements in a preliminary way were: Residential area for 4,500 families (including stores and public buildings) for ultimate town at between 5 and 6 to gross acre = 800 acres

Industrial Acres	150	"
Greenbelt at average depth of ¾ mile	3,200	"
	4,150	"

*At 6 house per acre and 4.5 people per family.

EXACT LOCATION OF TOWN SITE

MAP 1 shows the 8,000-acre area within which the Land Acquisition personnel were instructed to acquire options. The planners, having determined approximate acreage requirement, had both to guide the land acquisition people in what they should try to get, and in turn had to be guided by them as to what they thought they could get.

From **MAP 1** two facts immediately appear:

1. There are no main through traffic arteries in the area to disturb us by heavy traffic, though they are all within convenient reach. But there are three main local roads: Elizabeth Avenue and Middlebush Lane running more or less north and south, and Amwell Road east and west through center of tract, from Millstone to New Brunswick. This road more or less coincides with a railroad spur.

2. Certain land was reported to be definitely unavailable: the hamlet of Middlebush, the Mettler property, and the Smith property. Thus there was a bottleneck between the north and south halves.

MAP 2 (p. 30) shows a diagrammatic sketch we made at this stage. It showed that within the area there was room for more population than necessary, also that the bottleneck was so narrow that it resulted in practically two towns. It appeared desirable to locate the town completely north or completely south of Amwell Road, so that the road would not cross it. This conclusion was further supported by the results of topographic surveys then being made, showing (see **MAP 2A**) that the two main watersheds divided on a ridge that closely paralleled Amwell Road and the railroad spur.

Based on this set of facts, diagrammatic **MAP 3** was prepared, the cross marked 750 families* being the area, to scale, required on our density basis for the immediate town. This showed a reasonably adequate depth of greenbelt, it also showed that our ultimate town would probably be nearer 4,000 than 5,000 families. It had two main defects, both flowing from the fact that the northwest part of the residential area was west of Elizabeth Avenue:

1. The prospect of a locally important traffic artery from Bound Brook cutting through our residential area.

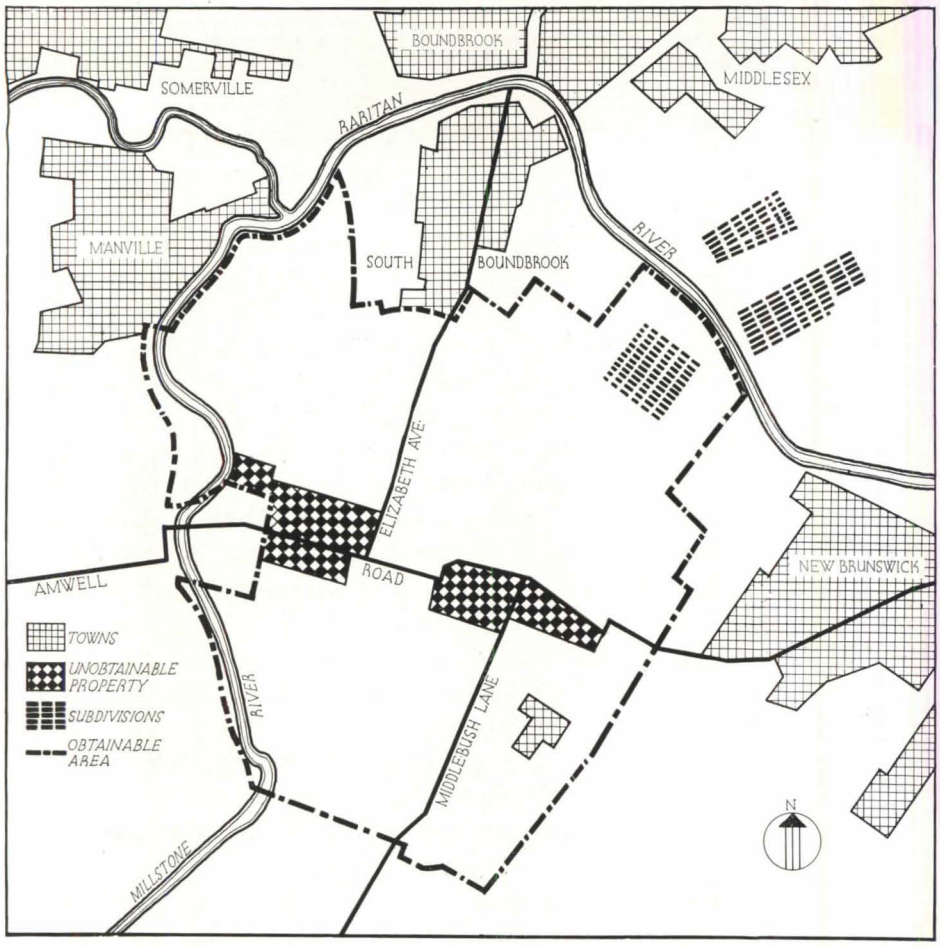
2. Further details of the topographic survey later available indicated that this nib was not sewerable by one plant and outfall.

A later layout (**MAP 4**) shows the residential area shifted to the east to eliminate this nib, the residential

(Continued on p. 33)

*The number of 750 families for the original town was arrived at after initial studies by Clarence Stein, Consultant to R. A., had indicated that this was the minimum number for which local government and education could be supplied at a sufficiently low cost per family to permit the project to proceed. This does not mean that a town of 750 families is the most efficient size. The study indicated that public costs per family continue to decrease with increase in town size beyond this point.

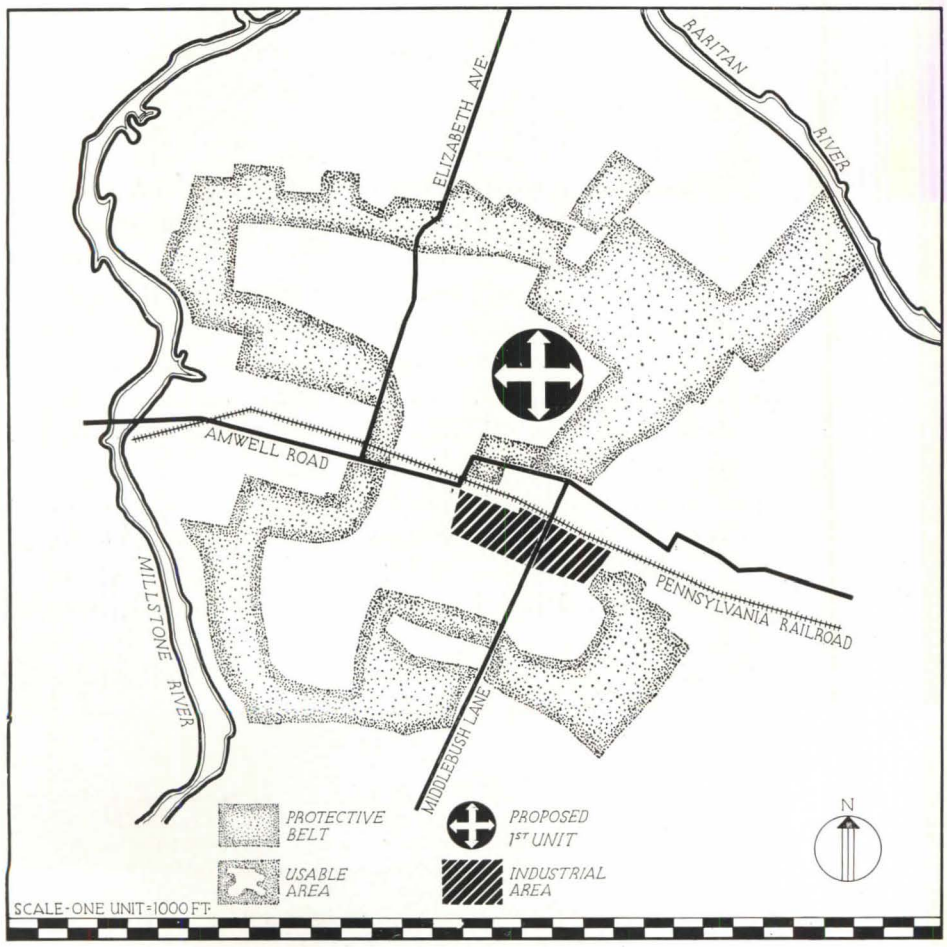
1.



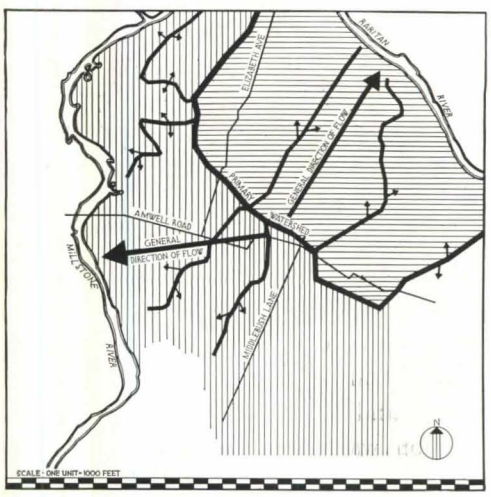
IN THE ROUGH

This map was given to Land Acquisition Dept. showing limits within which approximately 4,000 acres were to be acquired. Note main local roads: Elizabeth Ave., Amwell Road, Middlebush Lane. The unobtainable properties tend to divide site in half.

2.



2a.



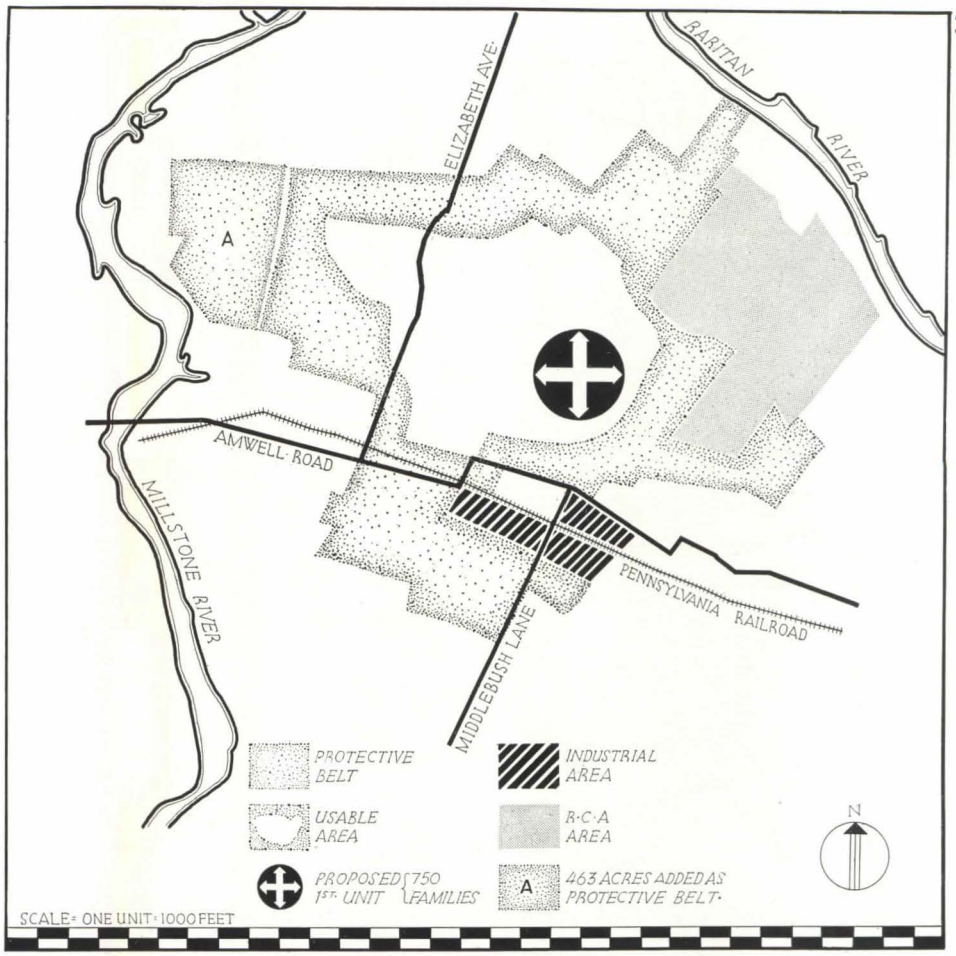
Arrows show direction of flow of two main watersheds. The ridge just north of Amwell Road divides them.

BOTTLENECK

The First Diagrammatic Sketch provides for more families than program requirements. Area can be cut down. Note bottleneck in the middle due to unpurchasable land.

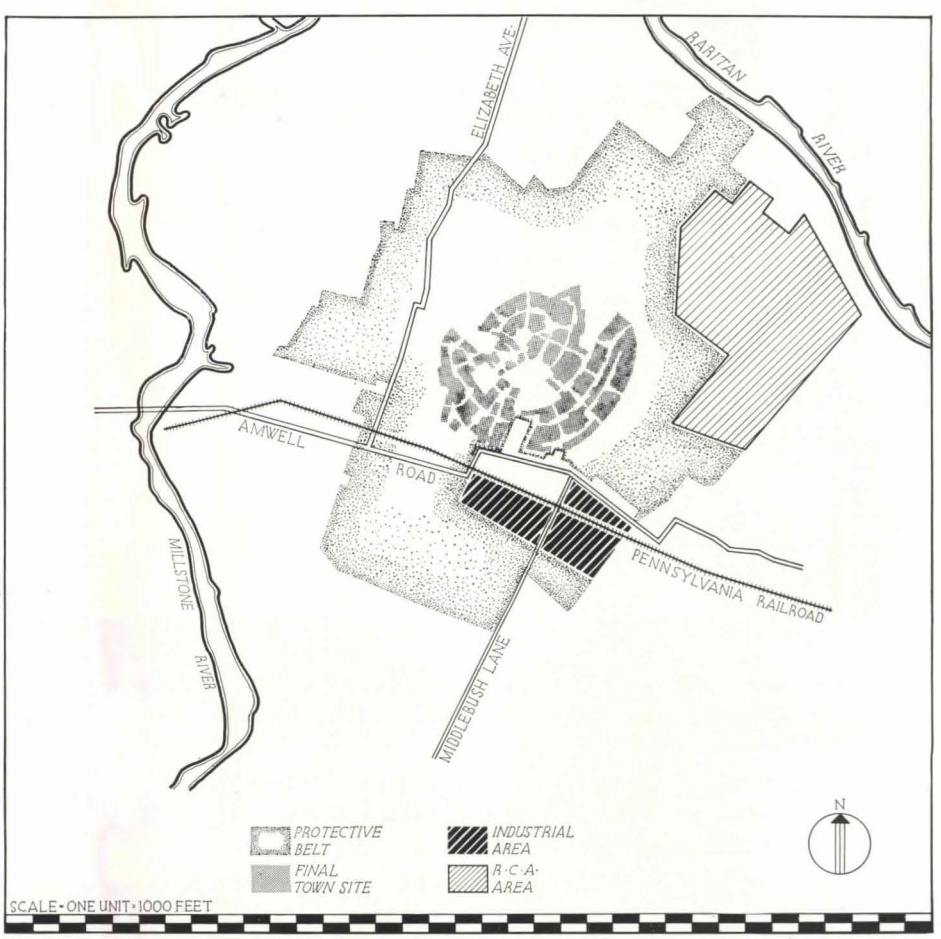
THROUGH TRAFFIC

The Second Diagrammatic Sketch shows "usable" area, which provides for about 4,000 families ultimately. Note reenforcement of Greenbelt by RCA property, not owned by the Government, but a reasonably permanent protection, because used by RCA broadcasting towers.

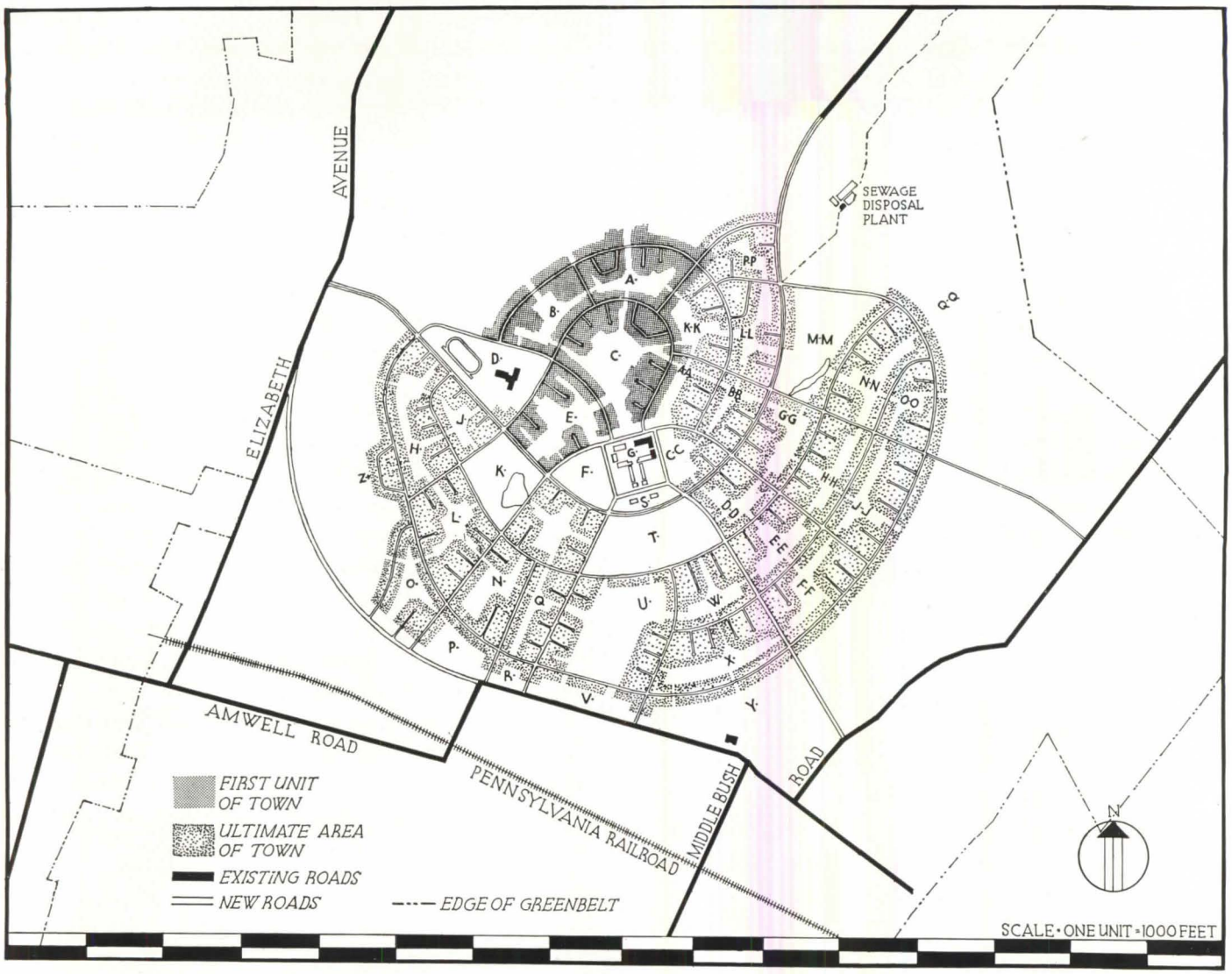


SOLUTION

Final Land Acquisition Map Showing Boundaries. Note spur of land reaching toward Raritan River. This spur is for sewer line to discharge into the river. Area occupied by "Final Town Site" is shown in larger scale and greater detail on Map 5 on the following page. While only two diagrammatic sketches of this map are here shown, there were of course many intermediate sketches between the various stages.



5.



FINAL TOWN LAYOUT

Each block has interior park and play areas (unhatched portions). Note provision for pedestrian circulation THROUGH blocks, indicating the attempt to separate pedestrian and vehicular circulation where possible. Block G: future town center. Black Portions: stores for first unit of 750 houses.

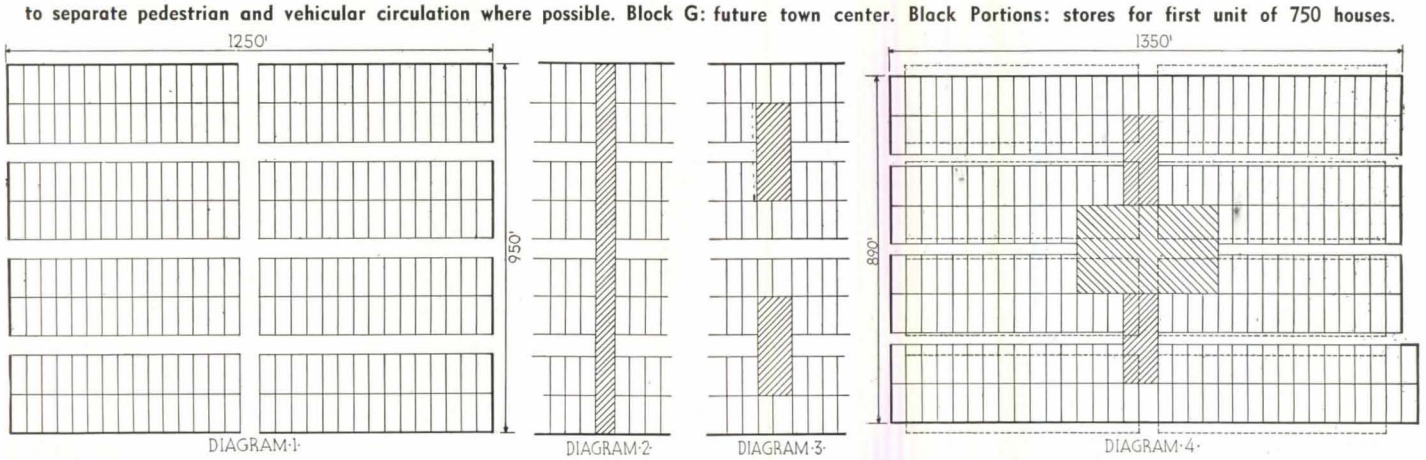


Diagram 1: Shows gridiron layout of 8 blocks, each 200 x 600 with 30 plots each 40 x 100. All streets are through streets, 50 ft. between building lines; 24 ft. width is paved.

Diagram 2: First step, center street is cut out as unnecessary. Hatched area is gain of 50 x 950 = 47,500 sq. ft. for park or other purposes.

Diagram 3: First step with areas and plots transposed to make the park space more concentrated and usable. Park area is the same as on Diagram 2.

Diagram 4: Final step. Cul-de-sac streets are without sidewalks and without through traffic. They can therefore be 30 ft. between lot lines instead of 50 ft. (paved width is 18 ft. in place of 24 ft.). Additional area saving of 71,000 sq. ft. area (20 ft. width x 3,550 L. F.) shown in the center. Shape of area is changed because of narrowing streets, but total area and total number of houses is unchanged. Total area gained for parks at no cost is 47,500 sq. ft. plus 71,000 sq. ft. = 118,500 sq. ft.; just under 3 acres, just under 10 per cent.

These drawings are purely diagrammatic. Cul-de-sacs would not be laid out just this way. Cul-de-sac lengths are longer than any used in Greenbrook; and there would have to be turn-arounds at the ends.

area being now entirely east of Elizabeth Avenue.

The town as finally located has these advantages over the many alternative layouts made:

1. The residential and public areas are not crossed by any of the main local roads. As located, Elizabeth Avenue, Amwell Road, Middlebush Lane are all readily accessible, but do not cross our area. Thus extraneous traffic having no business in Greenbrook does not cause needless congestion or hazard in the town.

2. Location north of Amwell Road and east of Elizabeth Avenue brings the town nearer to present centers of industry such as New Brunswick, Bound Brook, Dunellen, etc., than any other tract in the available area. This means lower transportation costs, a vital point until our own industries would have been established.

3. The entire residential area is sewerable into one plant and outfall.

4. The industrial area is properly at the edge of the town, also properly on the railroad spur.

LAYOUT OF STREETS

Under this head are found some of the major advantages of economy, traffic safety and pleasant living that the large-scale project and the planned community alone can provide.

Analyzing the function of the street system we find the following requirements:

1. Adequate and reasonably direct hook-up to main roads and surrounding towns. It has already been noted how the town avoids being crossed by the extraneous traffic of main through and local roads. This does not mean that we want a town that is isolated or difficult of access.

2. Adequate circulation within the town. This involves not only reasonably minimizing distances of travel from any start to any destination, but avoidance of centers of congestion for those not having business in them—one of the banes of the ordinary town.

3. Adequate access to houses.

4. Traffic safety for pedestrians and motorists. This is a function of the skillful handling of functions 1, 2, 3.

The nub of the economies and amenities lies in the recognition that functions 2 and 3 are quite separate. Where population densities are light, where there is little or no through traffic, traffic streets can be much further apart than is the customary practice. This leaves much larger areas or super-blocks within traffic streets than ordinarily. We must pierce into these larger areas with access roads or lanes, so as to get accessible house frontage. But these access lanes need not and should not be through streets. The conventional gridiron pattern fails to separate functions 2 and 3 so that every access street becomes a through street, at greater expense, greater traffic hazard, less amenity. The contrast can be clearly seen from the three diagrams on the facing page. The figures and facts there used refer to this kind of diagrammatic study which we used preliminarily, rather than to our actual final specific layout. The latter, adapted to the specific site conditions, becomes much more complicated, and figures cannot easily be presented here. Results are of the same order whether the streets are straight or curved, though again more complicated to figure.

In these diagrams, the first shows typical gridiron system—240 houses on plots 40 x 100. The second diagram shows the result of dead-ending the streets: less paving area, the interior area saved becoming park and playground. In the final step (third diagram) further gains are shown. The dead end streets, along which through traffic *cannot* go, can be narrower both because there is less traffic—the through traffic must go on the bounding streets—and because speed along a dead-end street is less than along a through street. Thus there is additional first cost and maintenance saving due to less paving, and the space so saved becomes additional park area. Thus, the super-blocks of the Greenbelt achieve the following:

1. *Economies:* Total saving in first cost of 240 houses (see three diagrams) of $14,500 or $60 per house, due to savings in paving and utilities.

Interior parks and playgrounds are obtained at no land cost as compared with the ordinary layout because they are simply the areas salvaged by the new street layout.

2. *Safety and Amenity:* Park and play space are near at hand, within the block, without the necessity of crossing any street or lane.

Instead of crossing three streets to go from one end of the area to the other, none need be crossed. Passage is had through the park area.

Safety and convenience in motoring. Backing out of the garage, on to the cul-de-sac with little and slow moving traffic, instead of on to traffic streets as ordinarily.

Most houses front on cul-de-sacs or dead-end streets, hence are removed from the noise of through traffic.

The final layout for a town of 4,000 families (**MAP 5**), shows the foregoing principles specifically applied:

1. Easy access from town to Elizabeth Avenue and Amwell Road, but unlikelihood of any through traffic from these going through Greenbrook.

2. Circulatory roads from one part of town to another do not pass through or by the busy town center. But radial streets do connect readily to town business center from all parts of the town.

3. The initial town of 750 houses shows in the heavier hatching. Though it cannot be shown without going into too much detail, the initial town, and various transitional sizes connect with existing road systems, so that at no stage is there excessive cost for access roads to adjacent places, nor appreciable cost for transitional roads.

4. Blocks C, H, L (see **MAP 5**) have almost all their houses on cul-de-sac, or dead-end lanes, few on the periphery of the block. But blocks A and B for example, have

cul de sacs on one side only, frontal development on the other side. The reason is that blocks C, H, L are generally highest at or near their center, sloping out in all directions, while blocks A, B, etc., slope pretty much one way. This means that all the cul de sacs in C, H, L, run *down toward* the main streets. Hence drainage of streets and utilities works out most economically. But to run a cul de sac *up* to the main street and main sewer lines means extra costs which tend to nullify the important economies of the cul de sac principle. Hence in blocks A and B cul de sacs are used only on the down slope side.

5. Typical super-block sizes vary from about 17 acres to 38 acres, with an average of about 25 acres, or about eight times the size of a city block. The smaller sizes are generally those with cul de sacs in one direction; the larger ones are those almost completely developed with cul de sacs.

6. Curvilinear Streets. Though the topography was not pronounced, streets were kept pretty much along contours so as to minimize cut and fill. Our theory of circulation (see 2) is best and most economically served by curvilinear belt streets and radial streets to the center in an area of this general shape. For a distinctly rectangular shaped area, a different concept would have been more appropriate. In addition to the purely factual considerations, esthetic predilection played its part in the curvilinear layout.

7. The final detailed synthesis is predicated on characteristics unique to the locality. Topography has already been mentioned in what may be called its technical or calculable aspects. It also entered in more intimately. Vistas, outlook, spatial relations were studied at all stages beyond the most preliminary, in rough models. Topography became an integral part of esthetic design. Actual location of woods and of important individual trees, first as indicated by the invaluable aerial maps, later more accurately by survey, were influential factors in determining exact locations of roads and houses.

HOUSE GROUPINGS

The house groupings at Greenbrook constitute another of the fundamental economies. The decision to use row or group houses also involves amenities which the low price single house development does not offer. Much as in the case of the cellar analysis, the pros and cons, and the cost differentials were weighed in arriving at the final decision. The table below is based on the diagrammatic plan of row units of four houses. There seemed an overwhelming case for the row or group house, both on the score of the amenities of living, and on the score of economy. The saving is of the order of 90 cents per room per month, a differential far greater than any single item covered.

GROUP OR ROW HOUSING VS. SINGLE HOUSES

GENERAL ADVANTAGES OF THE ROW HOUSE

ECONOMIES

Common wall. First cost saving, and maintenance saving (no painting, no window calking, etc.).

Plumbing. Twinning of plumbing lines both vertically in the house and in house sewer and water mains to street. Similar saving in electric lines.

Heating. Two savings; first due to common wall, saving in first cost and operating cost. Second, economy of one boiler, one chimney, etc., as against separate ones.

Where houses are rented, savings can be somewhat increased by running lines within buildings instead of excavating outside.

AMENITIES

Gain in privacy by elimination of side windows overlooking each other.

Two-room depth with all rooms light; no side rooms close to wall of adjacent house.

With the same density of development, the row house group permits good space between groups, while the space between single houses must be much less. A specific example: rows of four connected houses with 40 ft. between ends, is the same density as detached houses with 10 ft. between. Obviously the effect of the group development is much more free and open.

As a corollary to the above, the family with somewhat higher income desiring more privacy and more grounds, can occupy an end house, which still is cheaper than a detached house, and superior from the point of view of pleasant distance from the next end house.

GENERAL DISADVANTAGES

Traditional liking for definitely recognizable, separate house, a derivative of "A man's home is his castle."

Friction between adjoining occupants where paths, steps, etc., may be common. This is not a necessary condition in group house development, but where adopted accentuates first cost economy (such savings are not included in calculation of costs below).

LOCAL OR MODIFYING FACTS

Chatham Village in Pittsburgh, the War Housing in Newburgh, later sold to private interests, are successful examples of suburban row house development.

Where houses are rented, the sentiment in favor of the independent house seems not to be pronounced. Locally the Lamont housing, best of the low cost development, has group houses.

COSTS (Based on Comparison of a 4-house unit vs. 4 detached houses).

Cost differentials only are figured, not total cost of houses.

FIRST COST DIFFERENCES:

Common walls (including elimination of three entire walls, substitution of partitions for exterior walls, savings in flashings, leaders, parapets, etc.)	$ 940.00
Plumbing and Electric	50.00
Heating*	450.00
1st Cost Saving on Group	= $1,440.00
	= 360.00/House

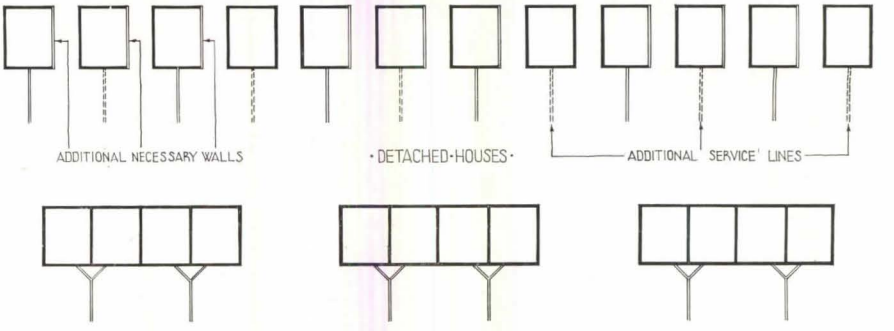
OPERATING-MAINTENANCE:

Six exterior walls eliminated, painting, repairing, etc.

Heating* = $120/yr./group = $30/yr./house.

Based on average sized house, this works out at an annual saving of 82 cents per room per month.

*Calculations based on assumption that all dwellings of a unit are occupied.



DETACHED HOUSES AND ROW OR GROUP HOUSES AT SAME LAND DENSITY.
In Greenbrook, the unit groups were 2's, 4's and 6's, the average being 4. Note extra walls, extra plumbing, freer spacing of the group house units as compared with the free-standing houses.

Even in the sales development, the feeling of independence catered to by the single house is based on a false premise. On small plots of land with 10 to 20 ft. between houses, contact is actually as close and intimate as in the row house—for instance the garage drive is often right on the lot line; windows look across at each other. This pseudo-independence is generally accentuated by costly pseudo-architecture in the form of trick gables over entrances, trick turrets, etc. Emphasis is placed on a non-existent independence, and whatever meaning it has is directed toward promoting an attitude of non-cooperation. *The frank statement of a group house unit is that we do lead interdependent lives, that a man's home in this complex age in which we live is certainly not an unapproachable castle. Such an architectural statement of itself will affect peoples' attitude toward community living.*

At this stage of the town and site-planning work, certain items had to be considered in relation to their effect on a logical plan, their final detailed layout, however, being a matter for later development. In connection with schools, civic buildings, store centers, etc., we at this time had to determine their number, size, area requirements, their relation to town layout.

SCHOOLS (Preliminary)

The number of schools, their functions—community centers and centers for adult as well as juvenile education—the area to be allotted for them, their location, relation to street systems and population distribution, all had to be settled. The number of schools must be arrived at in two ways:

1. Divide the expected number of children by the number of pupils per school that authorities generally agree is desirable. This is generally stated to be not over 1,000 for elementary schools.

2. Elementary schools should be so located that no one need walk much over half a mile to a school, and if possible cross no major traffic streets.

Where both conditions are met the situation is ideal. At this stage we had to settle point No. 2. To do so we had to see whether our tentative planning set-up tallied with the number of schools as determined by requirement No. 1. To get at that we—

1. Consulted census figures on family sizes, age distributions, etc.

2. Settled on percentages of house sizes we were going to build—how many 1-bedroom, 2-bedroom, 3-bedroom, 4-bedroom houses. The method of determining this will be shown in the next article.

3. As percentages of house sizes—and thus expectable family sizes—were for important reasons not the same as census percentages, we applied corrections to the census figures to arrive finally at the probable numbers and ages of children in our town.

As a result of these studies we provided for three elementary schools, a junior high school, and a high school in the ultimate town. For the first town we provided a "unit school," i.e., combination of elementary, junior and high school. This school would contain thirteen classrooms for elementary school and ten for junior high and high, to take care of 560 elementary pupils and 250 high school pupils.*

To avoid cost of duplication of facilities, the gymnasium-auditorium of the unit school in the immediate town, and the gymnasium-auditorium of the high school in the final town were counted on to serve as community entertainment centers. This decision vitally affected the design of these structures, as will be shown and discussed in the next article on Architecture.

STORE AND TOWN CENTERS

As to stores, again the questions to be settled at this stage were simply: size of areas or frontages to be allotted, and location. To arrive at areas and frontages, the number and kinds of store must be known.

An obvious way to determine frontages is to take the various statistical studies of existing conditions and arrive at so many feet per hundred population. But it is well known that there are far too many stores, that a great majority fail to make a decent living. We followed the method used by Clarence Stein and Catherine Bauer in their study, "Store Buildings and Neighborhood Shopping Centers."

We calculated the approximate income of our inhabitants on the basis of five times the rent they would pay. Then by a combination of statistical information available from various sources** and common sense we allocated portions of income to various items of expenditure: so much for food, for clothing, for amusement, for insurance, etc. Thus we arrived at a reasonable total that might be spent in various kinds of stores. These totals had to be adjusted for purchases in neighboring towns. For until the town grew considerably they could buy such items as furniture and clothing more satisfactorily in a large town like New Brunswick.

Having finally arrived at totals to be spent annually, we next checked up on the amount of business that each kind of store must do to earn a fairly decent livelihood.*** Dividing the totals to be spent in each line by the unit amount of business required gave us the number of

*Number of children of school *age* expected in the community was 948; of school *attendance* only 810. These proportions are from census figures.

**Some of the sources used for these calculations were: Cost of Living Data from Bulletins of Bureau of Labor Statistics, Bureau of Home Economics of the Department of Agriculture, Retail Distribution Census of 1933.

***Data based chiefly on unit chain store sales.

stores. Of course, there is so little exact knowledge, and so many assumptions had to be made at various stages, that we do not claim accuracy for the result. But the method is more accurate than most.

Stores and areas in the initial town:

2 food	110 l.f. Frontage
1 general merchandise	50
1 drug	30
1 shoe repair, laundry, cleaner	15
1 barber and beauty	15
Total	220 l.f.

Two hundred and fifty feet by 60 feet was allowed. In addition, there were planned a service station and repair shop. There are also two "home stores" in the residential area—these being small general stores run by a family in addition to its regular job, characteristically requiring only a small turn-over. These shops, with necessarily limited variety of merchandise, supplement the main center.

For the ultimate town, something over 1,500 front feet were allowed, which is in excess of the population ratios, because the ultimate town should be more self-contained, should have automobile show-rooms, shoe stores, millineries, dress shops, a bank, etc.

Store Location. There are two alternative theories of location:

1. A series of neighborhood centers for ordinary shops such as grocery, meats, drugs, stationery; and an ultimate main center which as well would include larger stores—e.g., furniture, clothing, automobiles—and would be part of the town or civic center.

2. No neighborhood shopping centers, but concentration of stores at the ultimate center, a portion of this to be developed immediately to serve the shopping needs of the first 750-family town. This concentration would be supplemented by scattered "Home Stores" noted above.

While at first we had assumed almost without argument that No. 1 set-up was the proper one, we finally adopted No. 2 for the following reasons:

1. Due to the fairly circular shape of the town, it appeared that conveniently located neighborhood centers would be only about 2,500 ft. from the ultimate business center, so that many people would shop in the main center anyway, where they could find greater variety and concentrated competition, and where they would often be for other purposes. Hence neighborhood centers would eventually find it difficult to compete.

2. The business-civic center is not more than 0.6 mile from the furthest point of the urban-residential periphery, not too inconvenient distance.

3. If the first 750-family town was established with its neighborhood store center, the establishment of the main business center would be hampered and probably postponed due to hesitancy at competing with the established local centers. Hence the normal growth of town facilities would be interfered with.

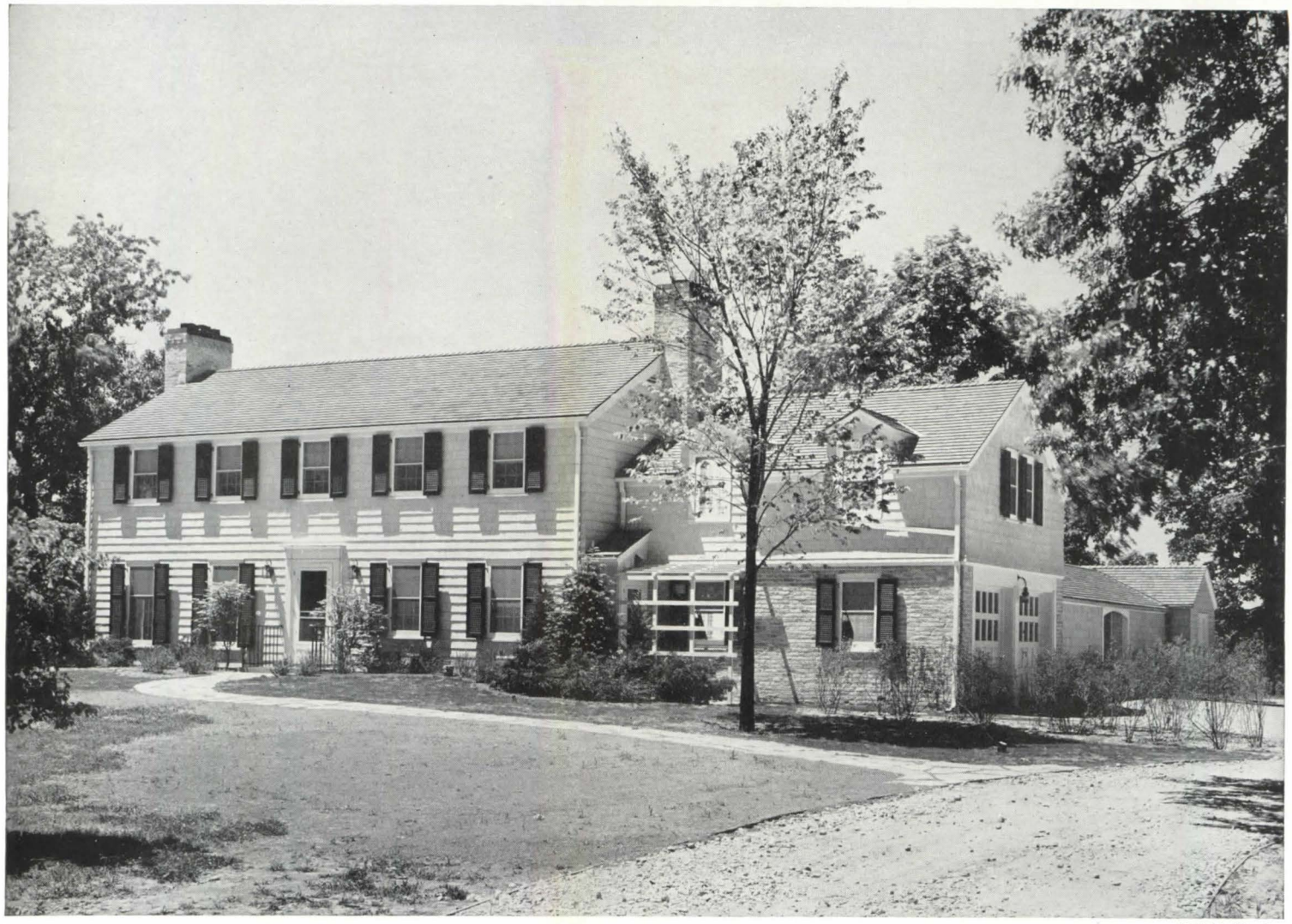
4. While this town-business center might seem to involve extra traffic congestion at that point, we felt from reasons 1 and 2 that this would naturally tend to happen anyway. Rather than try to resist what we considered an inevitable tendency, we determined to plan the roads and traffic at the town center, the methods and areas of parking, so as to meet this expected condition.

Studies were made to determine what civic and service buildings should be included for immediate and ultimate town—such as Police Station, Fire Station, Town Hall, Library, Health Station, office space, amount and layout of parking space. Map 5 shows the location of the town center (blocks G and S). The portions in black show the stores to have been built for the immediate town, the administrative offices, fire station and police station.

(***To be continued next month.***)

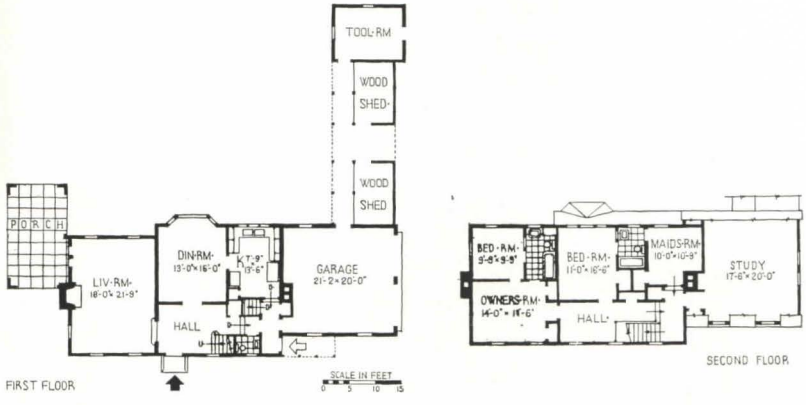
PROPOSED FIRST UNIT OF GREENBROOK

HOUSE FOR DAVIS EWING, BARRINGTON, ILL.



Hedrich-Blessing

WHITE AND WEBER, ARCHITECTS

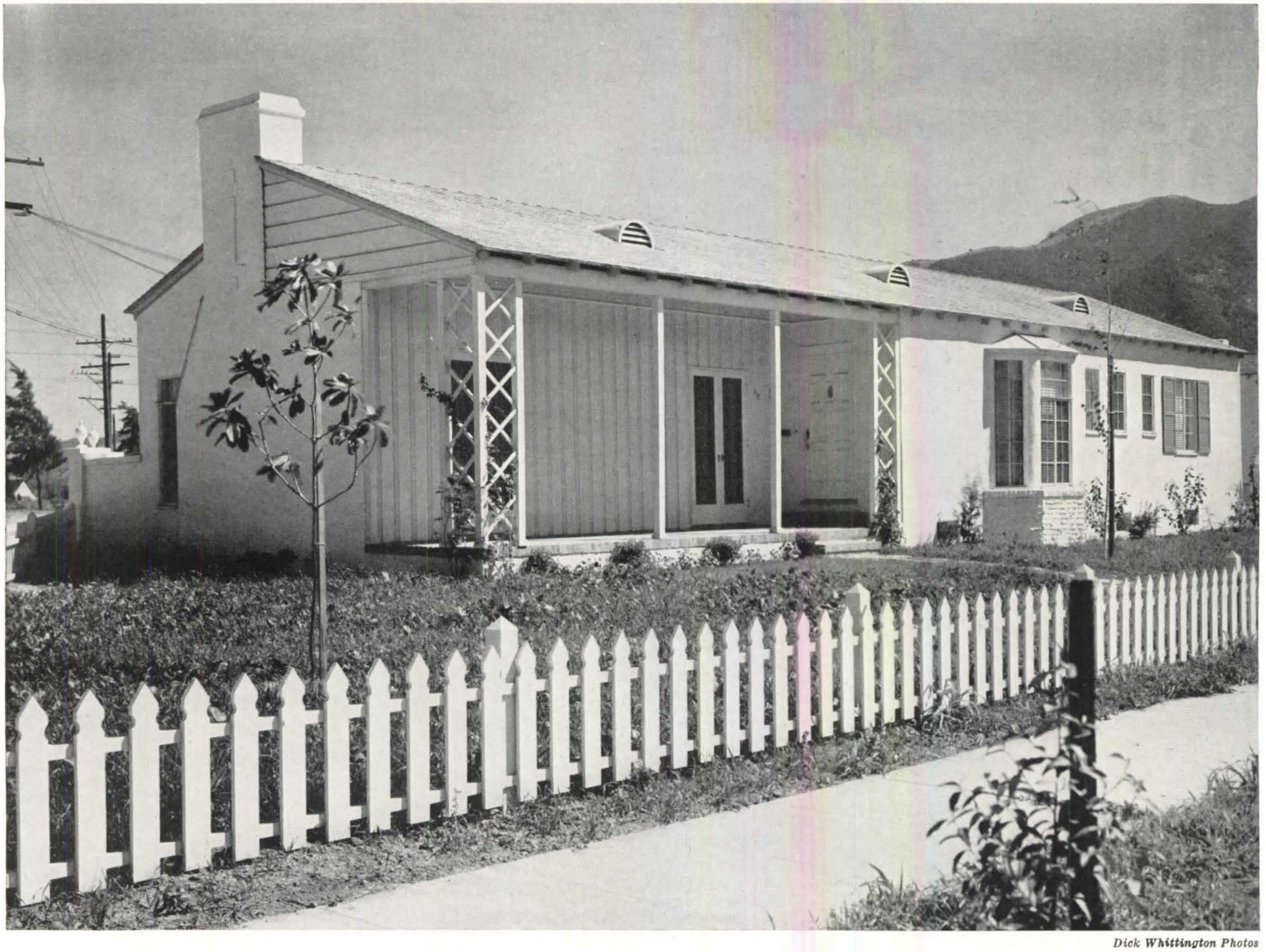


The incorporation of a garage into the mass of the house increases the apparent size of this residence to a greater degree than an examination of the accommodations would lead one to expect. The long one-story wing also helps create this effect, although it merely serves as storage space. Rooms are of average size, and the plan for the living quarters follows typical precedent, except for the unusually spacious stair hall and the large study over the garage. The exterior shows a severity in the main portion which is in pleasing contrast to the less formal service wing. Cost: $16,000.

CONSTRUCTION OUTLINE

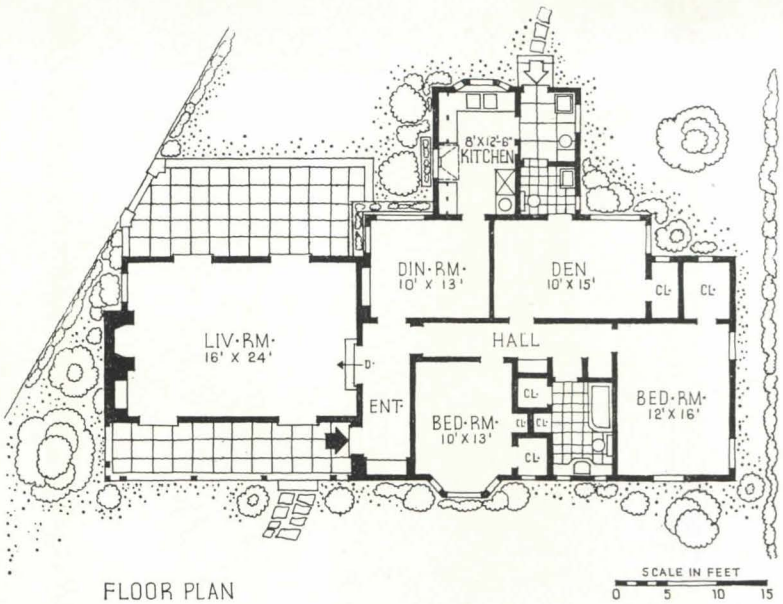
STRUCTURE: Exterior walls—wide wood shingles, paper, sheathing, studs, rocklath and plaster.
ROOF: Thick butt cedar shingles.
SHEET METAL WORK: Toncan iron, 24 gauge.
INSULATION: Outside walls, ground floors and attic floor—4 in. rock wool.
WINDOWS: Curtis patent double hung sash, complete with storm sash. Glass—double strength, quality A.
FLOORS: Living room—oak. Bedrooms—pine, carpeted. Kitchen—pine covered with mastic tile. Bathrooms—linoleum.
WALL COVERINGS: Paint and wall paper.
PLUMBING: All fixtures by Crane Co.
HEATING AND AIR CONDITIONING: Forced warm air, filtering and humidifying. Oil Burner—Joliet Heating Co.

HOUSE FOR JOHN H. BRAGG, LOS ANGELES, CALIF.

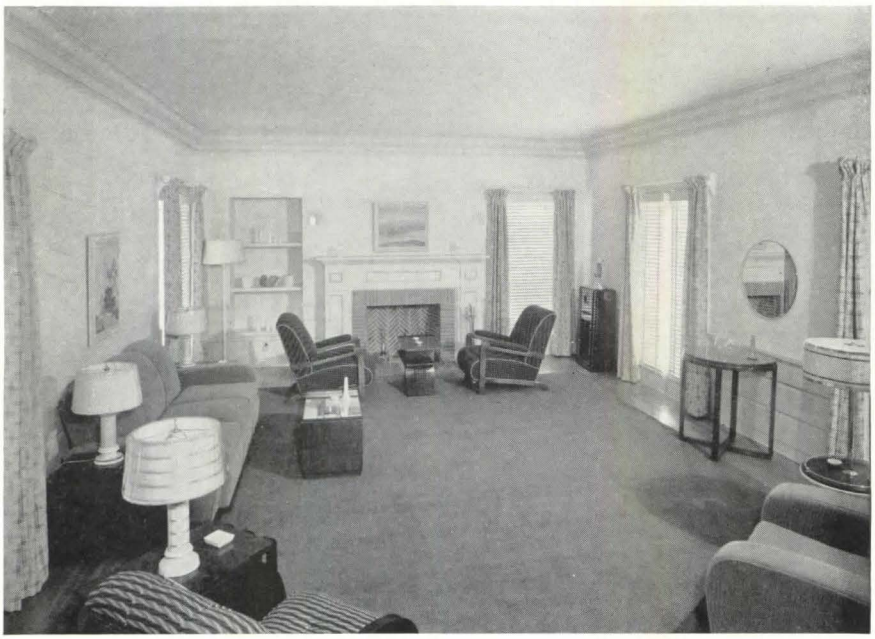


Dick Whittington Photos

The emergence of a distinct type of house in California becomes increasingly apparent. Its lines are long and low, one story is the rule, symmetry is more or less disregarded, and materials are employed in a simple manner. The Spanish, New England, "ranch," and modern influences are tending to blend more and more into a suitable style which is not an obvious derivation. This house is to some extent typical of the trend. While its use of materials and forms would seem to be dictated by fancy more than by exigencies of construction, it does exhibit the characteristics enumerated above, and it has, in addition, a plan in which rooms are widely spread out with a tropical disregard for the economics of heating. Cost: $6,500 at about 30 cents per cubic foot.



FLOOR PLAN



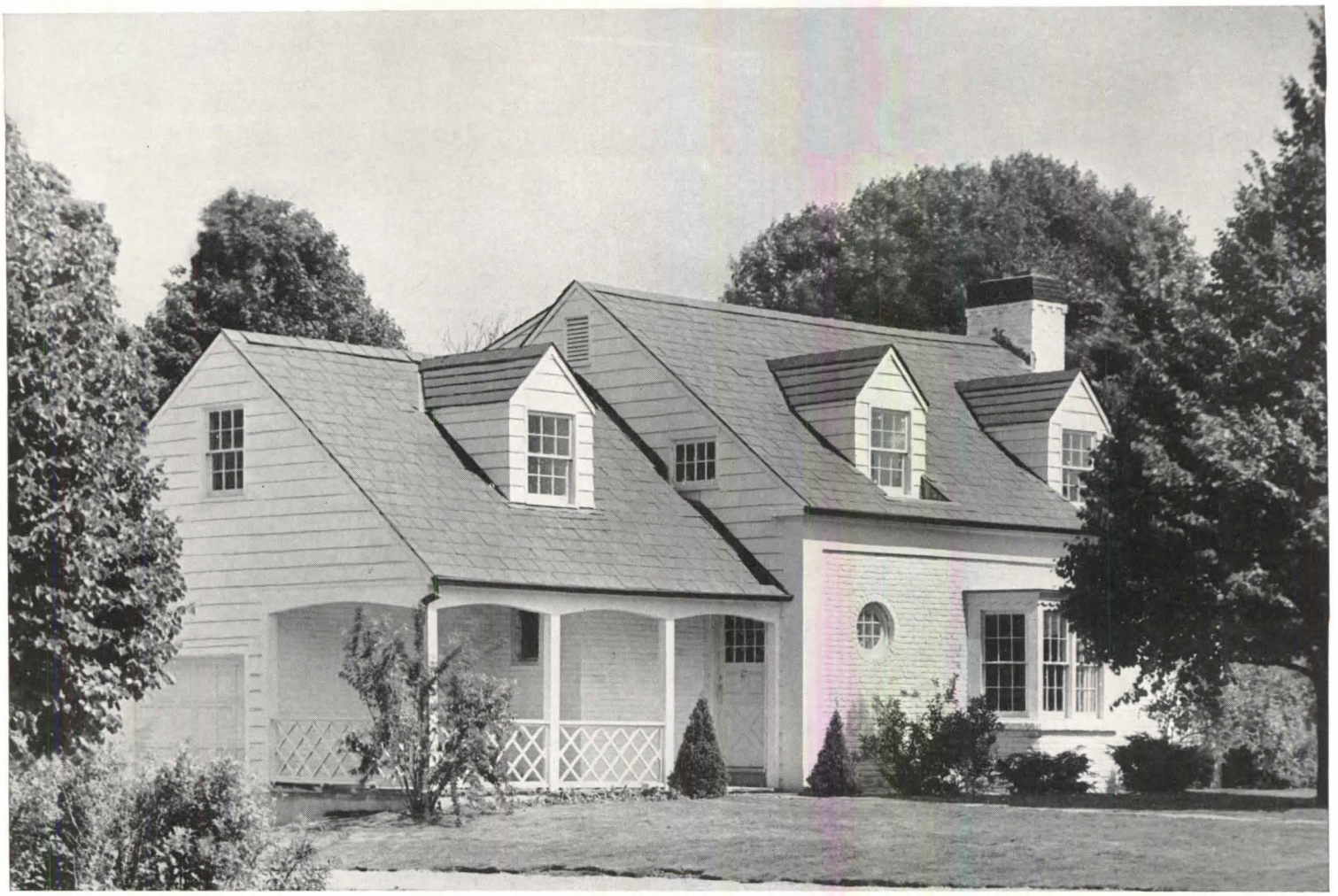
LIVING ROOM

KITCHEN

CONSTRUCTION OUTLINE

FOUNDATION
Continuous concrete.
STRUCTURE
Exterior walls—Douglas fir wood frame. Floor construction—10 in. Douglas fir joists and 1 in. sub-floor.
ROOF
Wood frame, clear cedar shingles.
CHIMNEY
Brick with terra cotta flue, Superior fireplace friction damper.
SHEET METAL WORK
Flashing—Armco iron, American Rolling Mills Co.
INSULATION
Roof—Silvercoat reflective paper insulation.
WINDOWS
Sash—steel sash out-swing casements, trough screen crank operators. Glass—quality B, Libbey-Owens-Ford Glass Co. Screens—Nu-frame flat screens, Roll Away Window Screen Co., Ltd.
FLOORS
Living room, bedrooms and halls—clear ½ x 1½ oak. Kitchen—Douglas fir, covered with Armstrong linoleum. Bathrooms—Romany tile.
WALL COVERINGS
Living room—California interior stucco. Bedrooms—wallpaper. Kitchen and bathrooms—Sanitas, Standard Textile Products Co.
WOODWORK
Trim and cabinets—Douglas fir. Doors—sugar pine. Garage doors—Overhead door.
HARDWARE
Locks—Schlage Lock Co.
PAINTING
All paint material by W. P. Fuller & Co.
ELECTRICAL INSTALLATION
Wiring system—conduit.
KITCHEN EQUIPMENT
Sink—acid resisting, enamel, Standard Sanitary Manufacturing Co.
BATHROOM EQUIPMENT
All fixtures by Standard Sanitary. Seat— C. F. Church Mfg. Co.
PLUMBING
Pipes—galvanized iron and Mueller pressure valve, Dayton coupling.
HEATING
Individual Thermador electric wall heaters, fan type throughout. Hot water heater—40 gal. Thermador electric heater.

HOUSE FOR BERTRAM PASHLEY, EAST WILLISTON, L. I., N. Y.

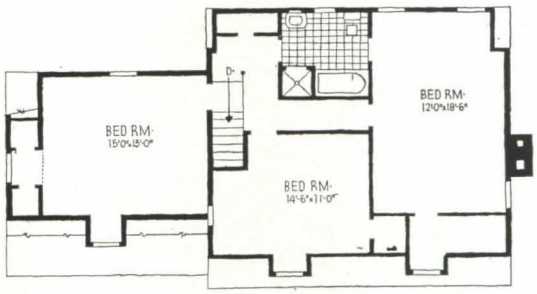


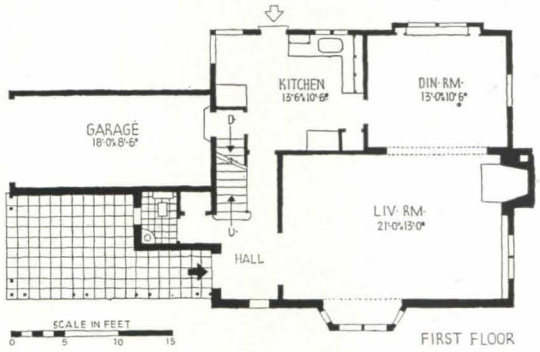
Murray M. Peters Photos

The house is a successful treatment of brick and wood, and uses its large dormers to emphasize the intimacy of the scale. Like most Colonial houses of the present day it puts its best face forward, using a much-needed but less attractive shed dormer in the rear to light the upstairs rooms. Interiors are commodious, and follow the accepted pattern in their use of pine paneling, exposed beams, and figured wallpaper. The plan is convenient and economical, and follows a growing trend in its incorporation of living room with dining room. Cost: $8,950, at 34 cents per cubic foot.

LIVING ROOM

ENTRANCE HALL

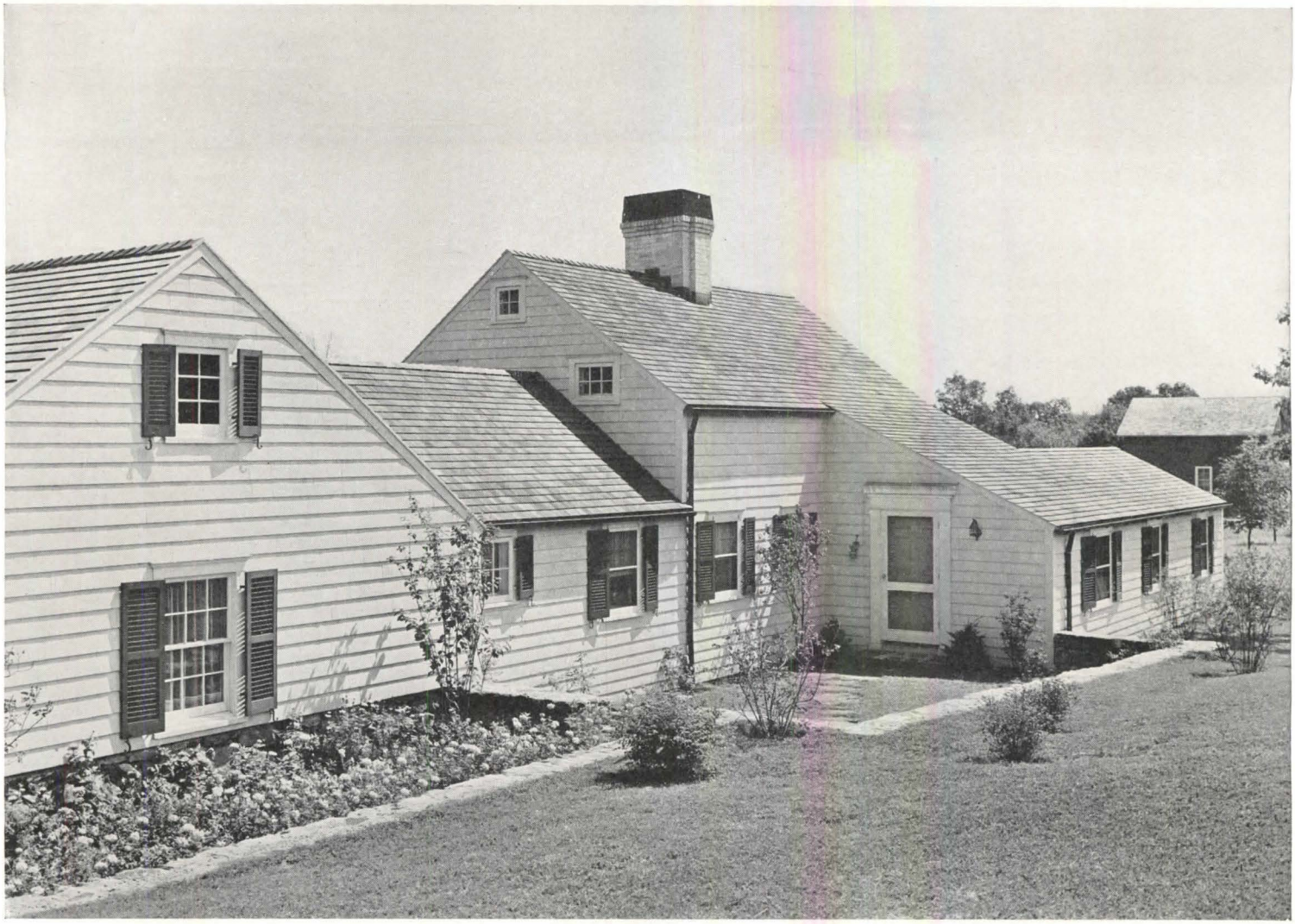




CONSTRUCTION OUTLINE

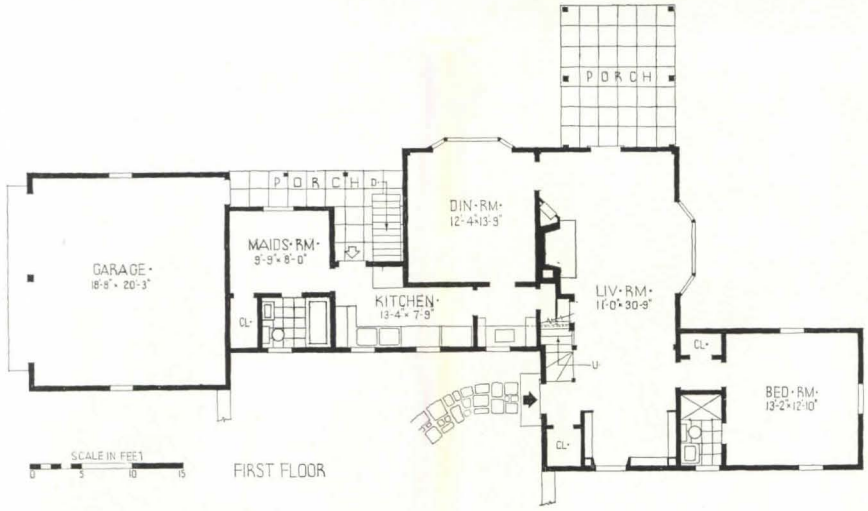
FOUNDATION
Walls—10 in. concrete. Cellar floor—4 in. concrete.
STRUCTURE
Exterior walls—brick veneer in front, otherwise shingles on wood frame. Inside—Celotex lath and plaster.
ROOF
Frame, covered with slate.
SHEET METAL WORK
Flashing, gutters and leaders—16 oz. Revere copper.
INSULATION
Outside walls and attic floor and roof—Celotex. Weatherstripping—zinc.
WINDOWS
Sash—wood, double hung. Glass—quality B, single strength.
STAIRS
Treads—oak. Risers and stringers—pine.
FLOORS
Living rooms, bedrooms and halls—wood, Colonial Floor Co. Kitchen—linoleum, Armstrong Cork Products Co. Bathrooms—tile.
WALL COVERINGS
All rooms—wallpaper, Richard E. Thibaut, Inc.
DOORS
Garage doors—Overhead type, Rowe Mfg. Co.
HARDWARE
Interior and exterior—brass, Sargent & Co.
PAINTING
Floors—Minwax. Exterior walls—whitewashed brick.
ELECTRICAL INSTALLATION
Wiring system—BX.
KITCHEN EQUIPMENT
Stove—gas. Sink—Monel metal, International Nickel Co.
PLUMBING
Soil pipes—extra heavy cast iron. Water supply pipes—copper tubing, Chase Brass & Copper Co.
HEATING
Gilbarco warm air, Gilbert & Barker Mfg. Co.

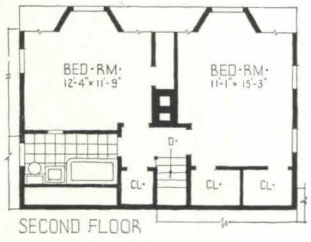
HOUSE FOR J. L. ALLEN, DARIEN, CONN.



Gottscho Photos

An old barn provided the starting point for this house, and set the unpretentious character of the design. Set on a slope, the rambling plan fits the incline with ease, and the house grows from a series of low sheds to a full two stories and attic on the garden side. Here again the virtue of simplicity in small house design is apparent, for in spite of the changing roof lines and broken mass, the essential plainness of the historic work has been maintained. The wings of the house give many exposures for sun and ventilation and are as convenient in plan as they are attractive on the exterior. The plan is worth careful study for its relation of services to living quarters; the manner in which the long, narrow living room has been broken up is also of interest. Cost $10,000.





GARDEN

LIVING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—rubble stone. Cellar floors—concrete on gravel fill. Waterproofing—integral in mortar.

STRUCTURE
Exterior walls—hand split cedar shakes, Neponset building paper, Bird & Son. Sheathing, studding with 4 in. Red-top rock wool, U. S. Gypsum Co. Ecod lath and plaster, Reynolds Corp. Interior partitions—studs with Ecod lath and plaster.

ROOF
Covered with Perfection cedar shingles.

CHIMNEY
Terra cotta flue lining. Damper—H. W. Covert Co.

SHEET METAL WORK
Flashing, gutters and leaders—copper.

INSULATION
Outside walls and roof—Red-top rock wool. Weather-stripping—Curtis Silentite windows, Curtis Companies.

WINDOWS
Sash—Curtis, double hung. Glass—double thick.

STAIRS
Oak treads, pine risers.

FLOORS
Living rooms, bedrooms and halls—oak plank. Kitchen and bathrooms—linoleum.

WALL COVERINGS
Living rooms—pine paneling.

WOODWORK
Trim—pine to paint. Doors—pine paneled. Garage doors—Overhead Door Co.

PAINTING
Interior: Walls—some lead and oil, others papered. Ceilings, trim and sash—lead and oil. Floors—stained and waxed. Exterior walls—whitewashed.

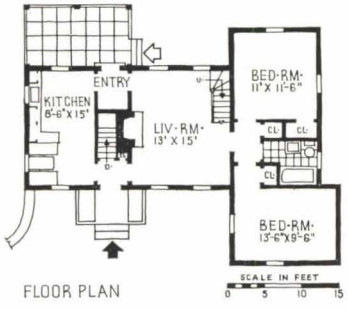
ELECTRICAL INSTALLATION
Wiring system—BX cable. Switches—Toggle.

PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Soil pipes—cast iron. Water pipes—brass.

HEATING AND AIR CONDITIONING
Boiler and radiators—American Radiator Co., oil burner. Thermostat—Minneapolis-Honeywell Regulator Co.

HOUSE FOR VERNON F. BROWN, GLENBROOK, CONN.

WALTER BRADNEE KIRBY, ARCHITECT



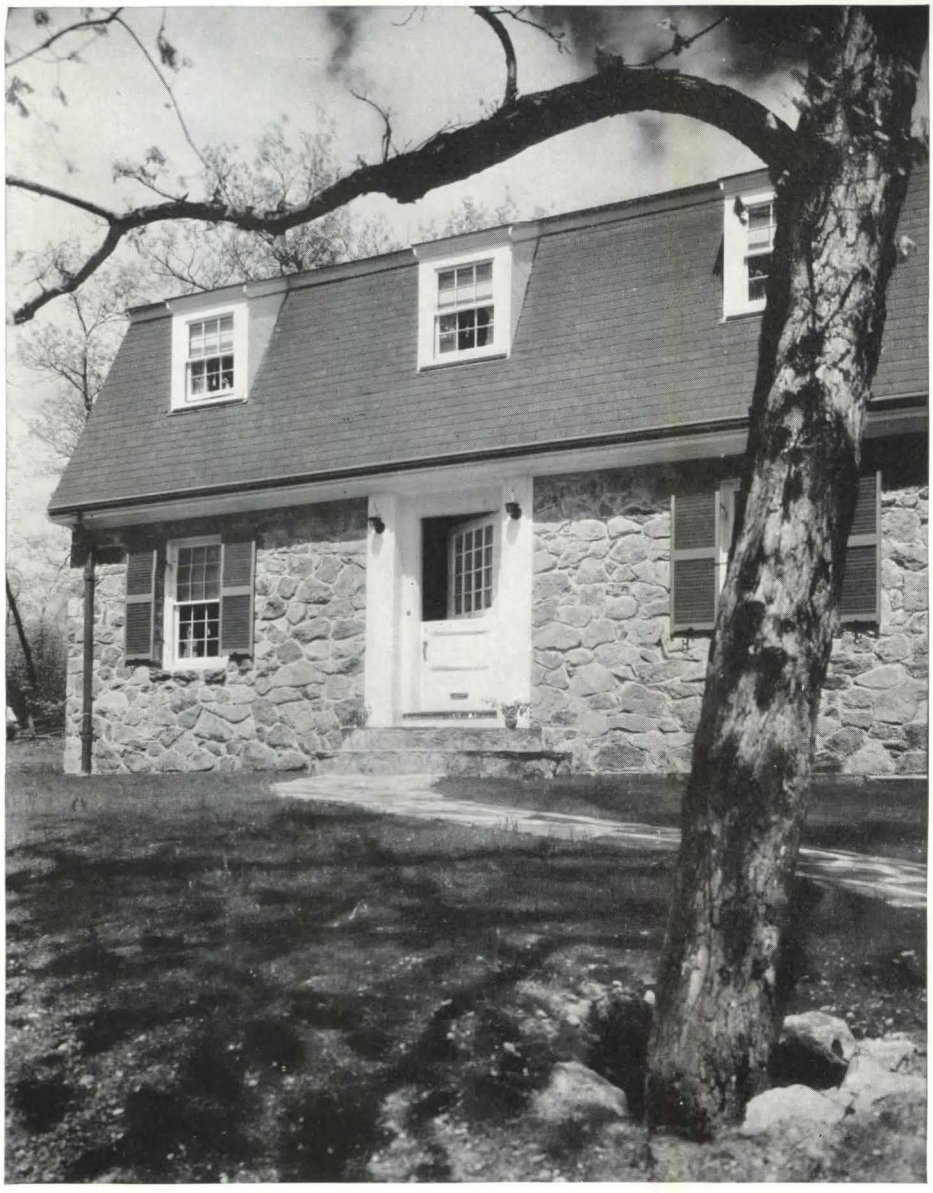
FLOOR PLAN

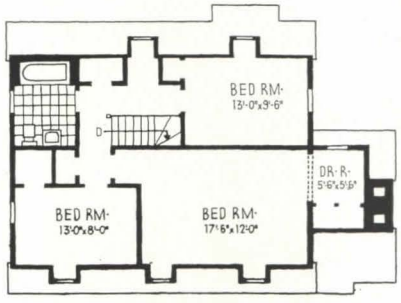
An unusual site adds to the effectiveness of the small house shown above. There is a sufficient drop in level from front to back of the house for a basement completely above ground. Save in this one feature, however, the plan does not recognize the irregular site, being a simple four-room layout similar to one designed for a more regular piece of ground. With the exception of the kitchen, where room for a dining alcove has been provided, the rooms approach minimum size. Cost: $6,000.

CONSTRUCTION OUTLINE

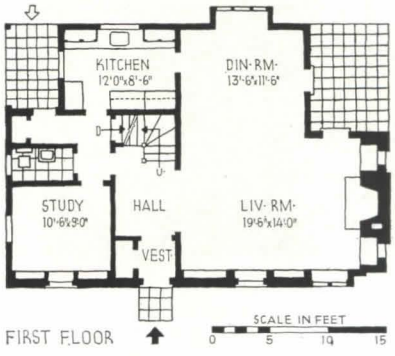
FOUNDATION: Walls—concrete. Cellar floor—4 in. concrete. Waterproofing—Anti-Hydro Waterproofing Co.
STRUCTURE: Exterior walls—24 in. Royal shingles, Douglas fir frame, Truscon metal lath, Best Brothers' Keene's Cement Co. plaster.
ROOF: Wood shingles on shingle lath, 18 in. Perfection.
SHEET METAL WORK: Flashing, gutters and leaders—copper.
INSULATION: Roof—rock wool, U. S. Gypsum Co.
WINDOWS: Sash—double hung, wood. Glass—American Window Glass Co.
WOODWORK: *Trim and* cabinets and doors—Curtis Companies and Morgan Co. Garage doors—Curtis stock.
HARDWARE: Yale & Towne Mfg. Co.
PAINTING: Exterior: Walls—brush stained. Trim and sash—priming and finish coat. All paint materials by Sherwin-Williams Paint Co.
ELECTRICAL INSTALLATION: Wiring system—BX. Switches—Bryant Electric Co.
PLUMBING: All fixtures by Standard Sanitary Mfg. Co.
HEATING: Oil burner, Petroleum Heat and Power Co. Boiler and radiators—American Radiator Co.

HOUSE FOR JACOB J. DAITCH, BROOKLINE, MASS.





SECOND FLOOR



FIRST FLOOR

George H. Davis Photos

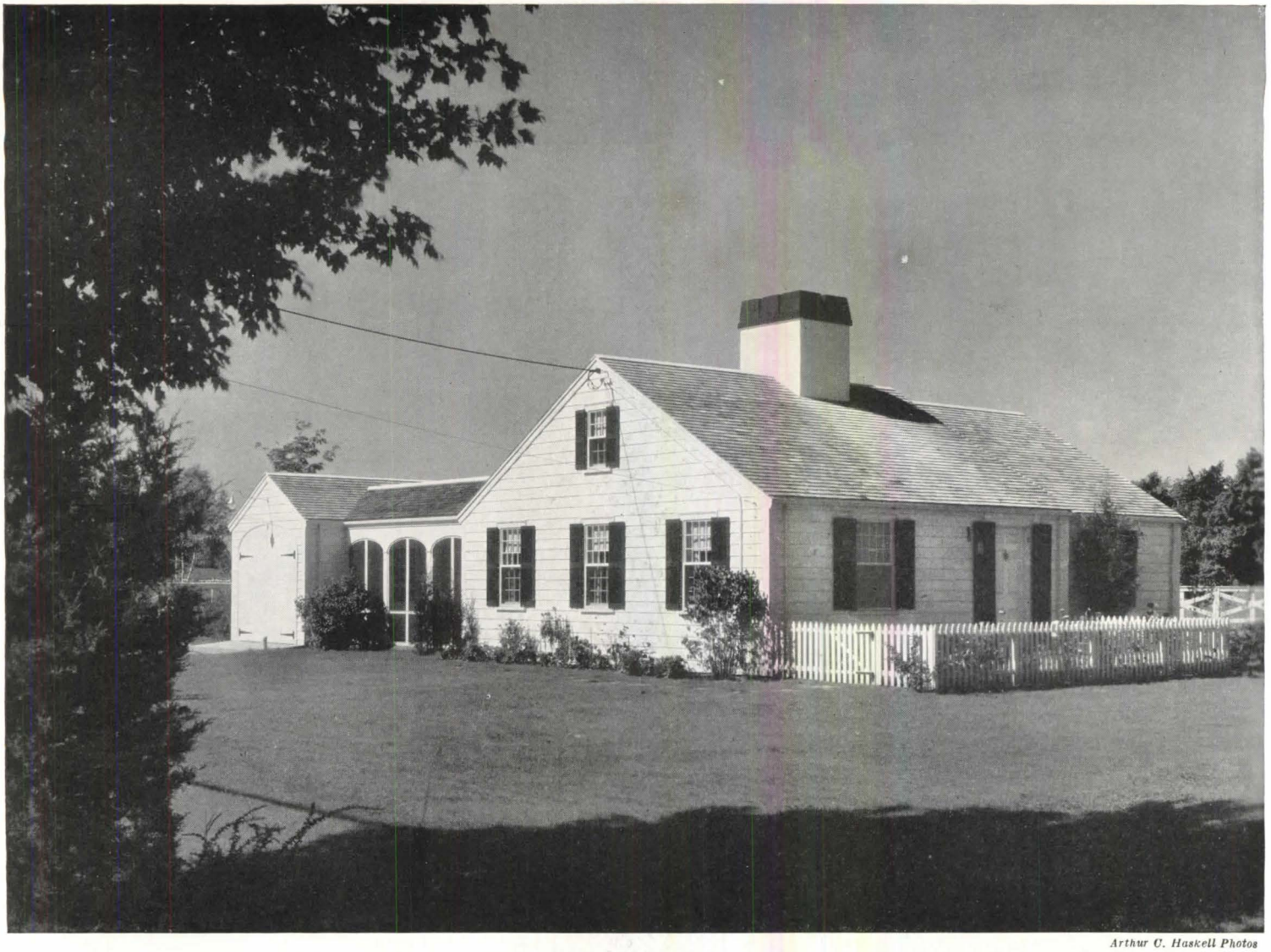
SAMUEL GLASER, ARCHITECT

A comparison of the two illustrations above brings out a most interesting point in connection with small house design. The large photograph shows an effective combination of rough stone with white wood trim: its simplicity is admirable. When seen as a whole in the smaller picture, the house loses somewhat due to the introduction of wood on the side and wing. The plan is compact, again displays the living-dining room combination, has a study well located for privacy, and a lavatory easily accessible from the living rooms. Cost: $8,400.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—frame construction, 7/8 in. boarding, Sisalkraft paper, air space, and field stone. Interior partitions—wood studs, U. S. Gypsum rock lath and plaster.
ROOF: Asphalt shingles, Bird & Son, Inc.
CHIMNEY: Tile flue lining. Living room fireplace—Bennett Fireplace Corp. damper; incinerator, Kerner Incinerator Co.
SHEET METAL WORK: Flashing and leaders—copper. Gutters—wood.
INSULATION: Outside walls and attic floor—U. S. Gypsum rock wool.
WINDOWS: Sash — wood, double hung, weather-stripped. Glass—double thick, quality A, Libbey-Owens-Ford Glass Co.
FLOORS: All rooms select oak; kitchen—oak, covered with linoleum.
WALL COVERINGS: Living room and bedrooms—wallpaper. Kitchen and bathrooms—paint.
HARDWARE: Interior and exterior—Schlage Lock Co.
KITCHEN EQUIPMENT: Stove and refrigerator—electric. Sink—enamel iron, acid resisting.
PLUMBING: All fixtures by Kohler Co. Pipes—cast iron.
HEATING AND AIR CONDITIONING: Forced air, filtering and humidifying and cooling. Boiler—Wintermaster, with oil burner. Thermostat—Minneapolis-Honeywell Regulator Co.

HOUSE FOR FRED A. BEALS, EGYPT, MASS.

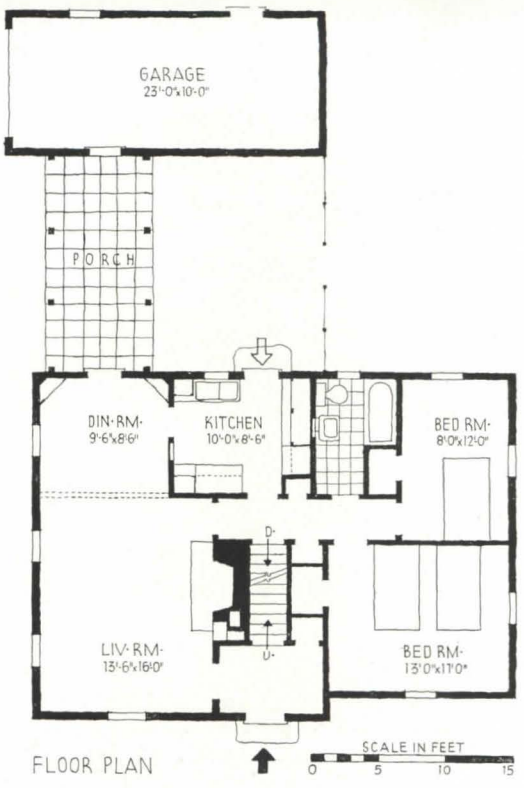


Arthur C. Haskell Photos

The essence of the successful small house is informality, close relation to its surroundings, and small scale. The example here exhibits all three characteristics. Note that the house is essentially a square, symmetrical box with central chimney and stair, and that it is the picket fence and the extension to the garage which produce the rambling, informal appearance which is so typical of earlier houses in this manner. The romantic quality of the exterior does not extend to the plan, which is a completely realistic solution of the problem. Living room and dining room are one, giving a maximum of space, kitchen and bathroom are back to back, and the bedrooms are well related in size to the total space. The cost, $6,500 at about 40 cents per cubic foot, was somewhat higher than it would have been in another location. One item which increased the cost was waterproofing for the entire basement.

LIVING ROOM

ENTRANCE



FLOOR PLAN

CONSTRUCTION OUTLINE

FOUNDATION
Walls—poured concrete, continuous. Cellar floor—cinder concrete. All walls waterproofed, Western Waterproofing Co.

STRUCTURE
Exterior walls—clapboards and shingles, paper, boarding, studs, Celotex lath and plaster. Interior—plaster on rock lath, U. S. Gypsum Co. Floor construction—pine. Ceiling—plaster.

ROOF
Rafters, 2 x 6 in., boarding and cedar shingles.

SHEET METAL WORK
Flashing—copper. Gutters—wood. Leaders and downspouts—Toncan metal, 2 in. round.

INSULATION
Outside walls and attic floor—Celotex lath.

WINDOWS
Sash—No. 1 pine, double hung. Glass—single strength, quality A.

FLOORS
Living room, bedrooms and halls—wide soft pine. Kitchen and bathrooms—slash fir, covered with linoleum, Armstrong Cork Products Co.

WALL COVERINGS
All rooms except kitchen and bath covered with wallpaper, Strahan.

WOODWORK
Trim and cabinets—pine. All doors—white pine.

HARDWARE
Interior—some wrought iron hinges, latches, etc. Exterior—stock, P. & F. Corbin.

PAINTING
Interior: Ceilings—calcimine. Floors—3 coats spattered. Trim and sash—3 coats ivory enamel. Exterior—Cabot's double white. Sash—Old Process lead and oil.

KITCHEN EQUIPMENT
Stove—electric, General Electric Co. Refrigerator—Kelvinator Corp.

BATHROOM EQUIPMENT
Douglas fixtures.

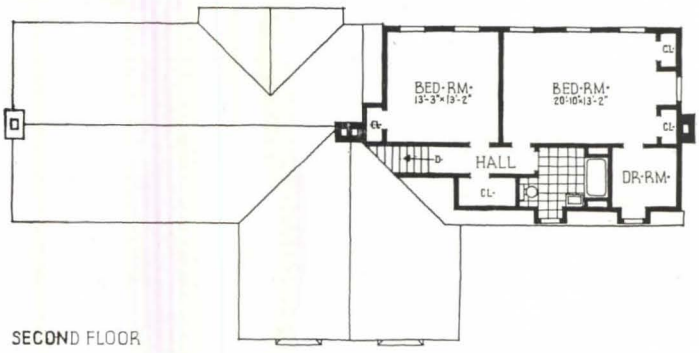
PLUMBING
Soil pipes—cast iron. Water supply—copper.

HEATING
Boiler—jacketed sectional, Burnham Boiler Corp. Fuel—oil, Petro-Nokol, Petroleum Heat & Power Co. Radiators—Burnham narrow type, Hoffman valves. Hot water heater—built-in, indirect, galvanized tank, 30 gal.

HOUSE FOR G. H. BOWEN, TULSA, OKLA.

Miller Studio

FIRST FLOOR



SECOND FLOOR

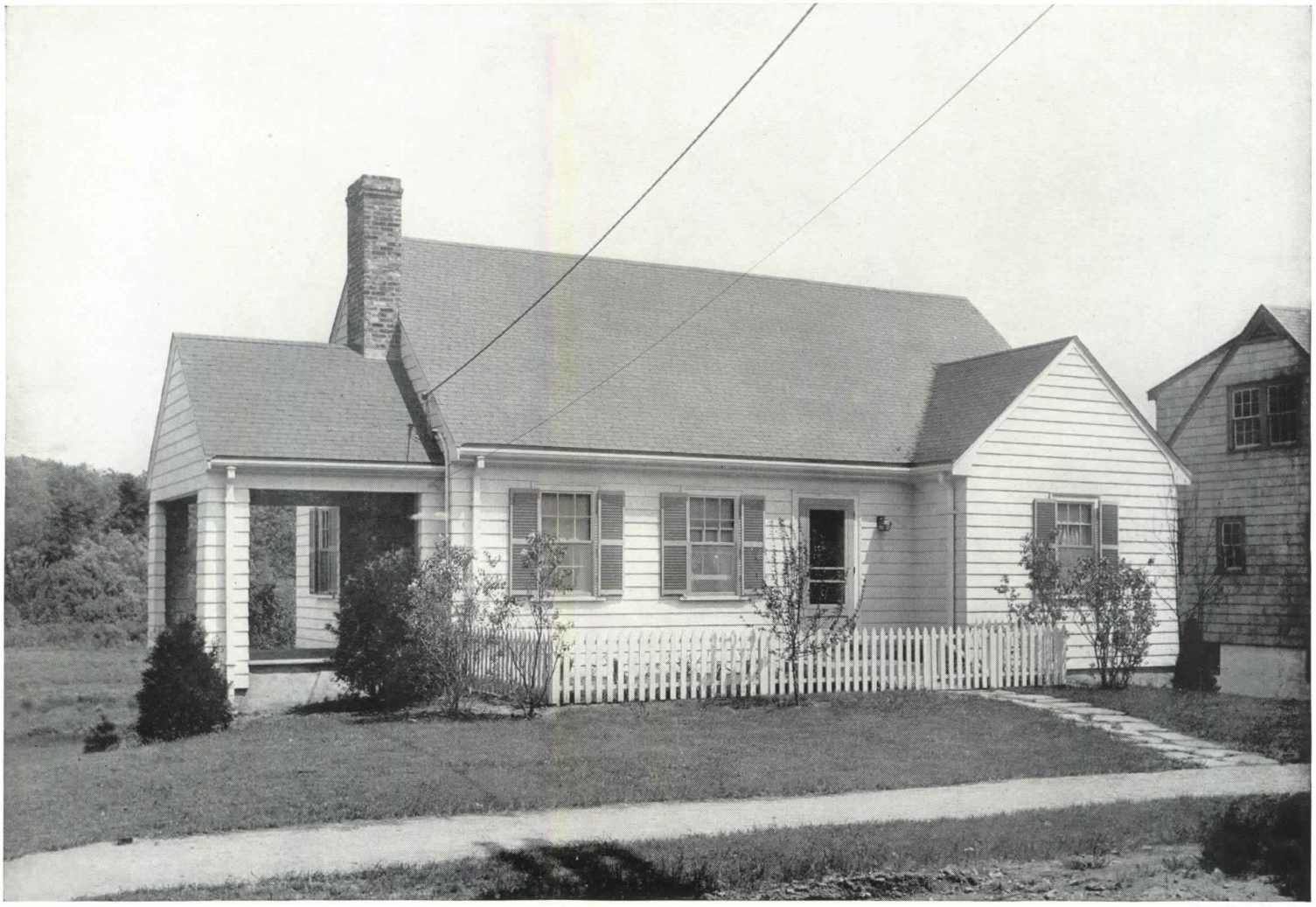
E. PALMER POTTER, DESIGNER

A change in ground level permitted the placing of two bedrooms and a bath over the garage without substantially altering the low roof line of the house. The main rooms are all on the ground floor level. The plan is of interest chiefly for the unusual amount of space that has been given to the service elements: the laundry alone is as large as the usual kitchen plus laundry, and the kitchen also is generous in size. By comparison the living room appears cramped, although its dimensions are by no means uncommonly small. A great convenience in the plan is the location of the service entrance next to the garage doors, providing easy access for guests in bad weather. Cost $10,930 at about 40 cents per cubic foot.

CONSTRUCTION OUTLINE

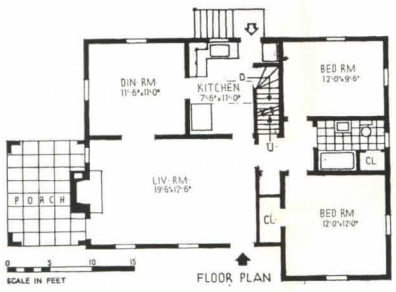
STRUCTURE: Exterior walls—brick veneer, 20 lb. asphalt felt, 1 x 6 in. matched boxing, 2 x 4 in. studs, U. S. Gypsum rock lath and plaster.
ROOF: Cedar shingles, 16 in.
SHEET METAL WORK: Flashing, gutters and leaders —26 gauge galvanized iron.
INSULATION: Attic floor—Johns-Manville rock wool.
WINDOWS: Sash — double hung, wood, weather-stripped. Glass—double strength, Libbey-Owens-Ford Glass Co.
FLOORS: Living room—wood, random width Tavern plank, E. L. Bruce Co. Bedrooms—1½ x 13/16 in. clear red oak. Kitchen—linoleum, Armstrong Cork Products Co. Bathrooms—tile.
WALL COVERINGS: Living and dining room—Texolite, U. S. Gypsum Co. Bedrooms and halls—wallpaper. Kitchen—washable wallpaper. Bathrooms—tile.
PAINTING: *Interior: Floors*—filler, color developer Murphy Varnish Co., wax. Trim and sash—semi-gloss paint, Cook Paint & Varnish Co. Exterior: Walls and sash—outside white. Roof—green shingle stain.
ELECTRICAL INSTALLATION: Wiring system—conduit. Switches—Pass & Seymour.
PLUMBING: All fixtures by Standard Sanitary Mfg. Co. Soil pipes—cast iron. Water pipes—galvanized iron.
HEATING AND AIR CONDITIONING: Pennsylvania gas fired furnace, fan, filters, humidifier, 2-zone control, thermostat controlled.

HOUSE IN NEWTON HIGHLANDS, MASS.



Russell B. Harding

EARL C. DAVIS, ARCHITECT



This speculatively built house is one of a number recently built and sold in a small residential community. The houses are far superior to the usual efforts of this kind, are simple and solid in appearance, and are attractively designed. Here the living room is entered directly from the outdoors, a rather questionable way of saving space where winters are not mild. Bedrooms are small but adequate. The house was sold for $7,250 including land, electric refrigerator, and electric stove.

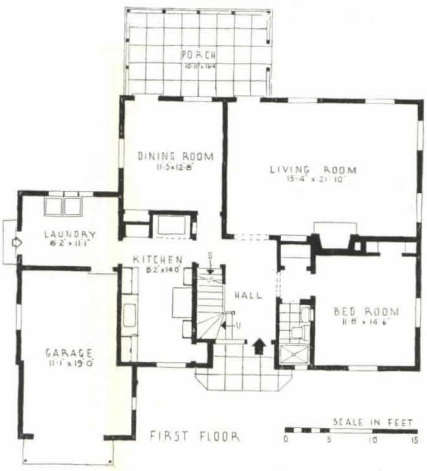
CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—18 in. cedar shingles, asphalt felt, hemlock studs, ⅞ in. sheathing, rock lath and plaster.
ROOF: Asphalt shingles.
SHEET METAL WORK: Flashing and gutters—copper. Leaders—Toncan iron, Republic Steel Corp.
INSULATION: Outside walls—4 in. rock wool, U. S. Gypsum Co. Space between first floor and garage ceiling insulated with rock wool. Attic floor—6 in. rock wool.
WINDOWS: Sash—double hung, pine.
FLOORS: Living room, bedrooms and halls—oak. Kitchen—oak covered with linoleum. Bathrooms—tile.
WALL COVERINGS: Living room—paneled with native pine. Bedrooms—wallpaper, Richard E. Thibaut, Inc.
WOODWORK: Trim—pine, painted. Doors, interior—veneer 6-panel pine.
HARDWARE: Interior and exterior—Russell & Erwin Mfg. Co.
PAINTING: Floors—filler, 2 coats white shellac and wax. Trim and sash—3 coats paint. Exterior: Walls and sash—2 coats outside white.
KITCHEN EQUIPMENT: Stove—Hot Point and refrigerator—Edison General Electric Appliance Co. Sink and cabinet—Kitchen Maid Corp.
PLUMBING: All fixtures by Standard Sanitary Mfg. Co. Water pipes—copper.
HEATING: Steam. Boiler—American Radiator Co. Radiators—concealed throughout. Valves—Vent Rite, Anderson Mfg. Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—copper, 40 gal., Taco Heaters, Inc.

HOUSE FOR LEWIS K. URQUHART, MUNSEY PARK, LONG ISLAND, N. Y.

Murray M. Peters Photos

An unusually free use of traditional motives characterizes this small residence. A reversed salt-box in effect, it has one story on the front and two in the rear, and relieves the low line of the front elevation with the mass of the garage. A pleasant atmosphere of intimacy is given by the sheltered entrance, an informal combination of door and window. The planting, particularly the large trees, is well disposed. A large screened porch, frankly expressed as an appendage, furnishes outdoor living space on both first and second floors. Interiors are simple. Cost about 29 cents per cubic foot.



REAR ELEVATION

LIVING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—continuous concrete. Cellar floor—cement finish on concrete over cinder fill. Waterproofing—integral.
STRUCTURE
Exterior walls—24 in. Creo-Dipt shingles, Creo-Dipt Co., Inc., over heavy building paper over diagonal sheathing, 2 x 4 in. studs, 16 in. o.c., plaster on wood lath.
FLOOR CONSTRUCTION
Fir joists with rough flooring and finished oak flooring. Ceilings—white plaster on wood lath.
ROOF
Perfection shingles over shingle strips on wood rafters. Deck—covered with canvas.
CHIMNEY
Terra cotta flue linings. Damper—H. W. Covert Co.
SHEET METAL WORK
Flashing and leaders—copper. Gutters—wood.
INSULATION
Roof—4 in. rock wool. Weatherstripping—zinc.
WINDOWS
Sash—wood, double hung. Glass—double strength, quality B. Screens—copper mesh in wood frames.
STAIRS
Treads—oak. Risers and stringers—Idaho knotty pine.
FLOORS
Kitchen and bathrooms—linoleum over wood.
WALL COVERINGS
All rooms—wallpaper.
WOODWORK
Trim, cabinets and doors—white pine.
HARDWARE
Interior and exterior—brass.
PAINTING
Interior: Ceilings — calcimine. Floors — stained and waxed. Exterior: Walls—stained. Sash—painted white.
ELECTRICAL INSTALLATION
Wiring system—BX cable. Switches—toggle.
KITCHEN EQUIPMENT
Stove—gas, Chambers Mfg. Co. Refrigerator—General Electric Co. Sink—Monel metal, International Nickel Co., Inc.
LAUNDRY EQUIPMENT
Two enameled iron laundry trays.
PLUMBING
Soil pipes—cast iron. Water supply pipes—red brass.
HEATING AND AIR CONDITIONING
Winter air conditioning. Boiler—Delco oil fired, Delco Appliance Corp. Hot water heater—gas.

HOUSE FOR DR. J. M. ELLZEY, JR., PHILADELPHIA, PA.

C. V. D. Hubbard

EDMUND KRIMMEL, ARCHITECT

The problem of incorporating a doctor's office with his living quarters presents no great difficulties as a rule. Here a straightforward solution places the patients' entrance on the side of the house, conveniently close to the driveway, and concentrates the required services into two rooms. There is access to the private office from the main stair hall, and a secondary entrance from the servants' quarters. To obtain the largest possible space for living room, dining room, and hall the clients agreed to reduce bedrooms to a minimum. The arrangement which places closets and entrance on one side of each bedroom is an excellent way of reducing circulation and minimizing the inconvenience of small size. Cost $14,000 at about 29 cents per cubic foot.

CONSTRUCTION OUTLINE

FOUNDATION WALLS: Stone, 3 ft. clear space under joists, only one-third fully excavated for basement.
EXTERIOR WALLS: Second hand brick with 2 coats of whitewash. Walls furred, ⅜ in. finished plaster on ⅜ in. rock lath with aluminum foil on exterior face.
INSULATION: In addition to aluminum insulation of garage ceiling, the roof of room over garage and second floor ceilings have 4 in. of rock wool.
ROOF: Non-fading green slate. Flat roofs—tin, painted with aluminum.

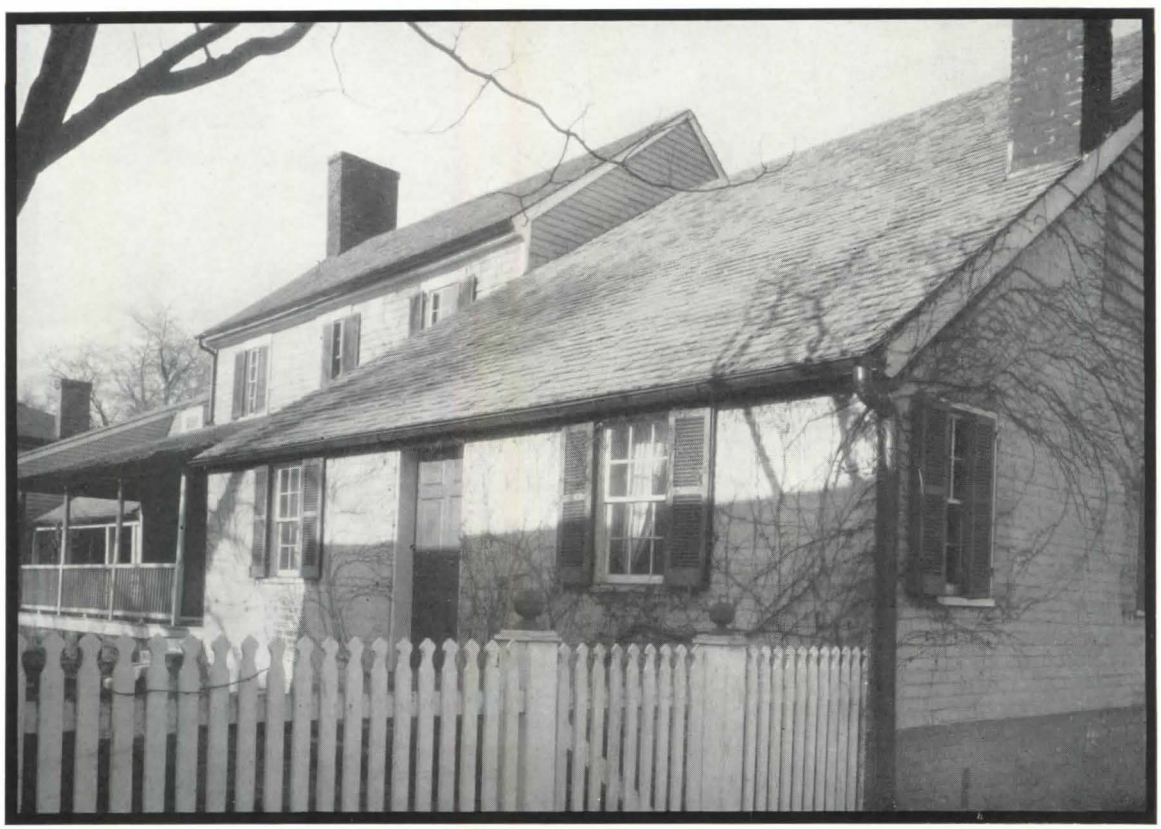
HISTORIC AMERICAN BUILDINGS

HISTORIC AMERICAN BUILDINGS SURVEY

U. S. DEPARTMENT OF THE INTERIOR, OFFICE OF NATIONAL PARKS
BUILDINGS AND RESERVATIONS, BRANCH OF PLANS AND DESIGNS

NUMBER 9

THREE HOUSES IN VIRGINIA



MARY WASHINGTON HOUSE FREDERICKSBURG, VA.

The Mary Washington House is located on one of the two lots bought by George Washington from Michael Robinson in 1772. The original transaction is recorded at Spotsylvania Courthouse, Deed Book "H," page 224, September 18, 1772.

As the deed specifically mentions "buildings" when the lots were purchased by George Washington, it is evident that there was more than one building on the property at that time. In 1929-1930 this property was restored by Philip N. Stern, architect. From the physical evidences obtained by him during this work, it was definitely determined that the two one-story-and-a-half wings on Charles Street were the oldest buildings. The two-story central portion was built between these two cottages, and the brick dining room on Lewis Street was the last addition to the group.

There are also evidences remaining in the cellar of three different sets of steps leading down from various outside entrances that have now disappeared. That the first floor of the central portion had, originally, solid paneled outside shutters was discovered when it was found that the pantry cupboard doors fitted the window openings perfectly. These have now been re-hung. The original porch columns were also found, concealed in the walls of a room that had been added to the west of the drawing room. Its removal has opened up the old porch again.

The woodwork has been painted the familiar gray green of the Colonial period. Formerly the second floor was painted a gray blue.

All roofs are covered with the Williamsburg type of asbestos shingles. Under the tin roof that was removed to permit laying the asbestos shingles were found the old wooden shingles, whose rounded butts gave the appearance of fish scales.

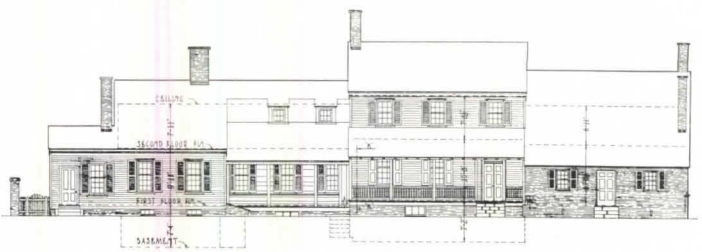
Mrs. Mary Washington lived in this house from 1775 until her death in 1789. It is stated that she died in the corner room on the first floor. The bedroom on the second floor of the central building is known as the George Washington room.

MARY WASHINGTON HOUSE

STREET ELEVATION

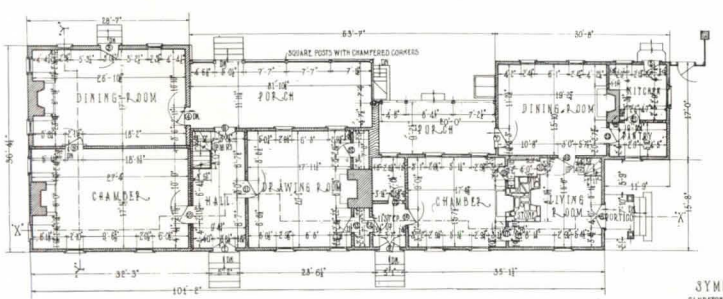
GARDEN ELEVATION

EAST (FRONT) ELEVATION
SCALE 1/8"-1'-0"

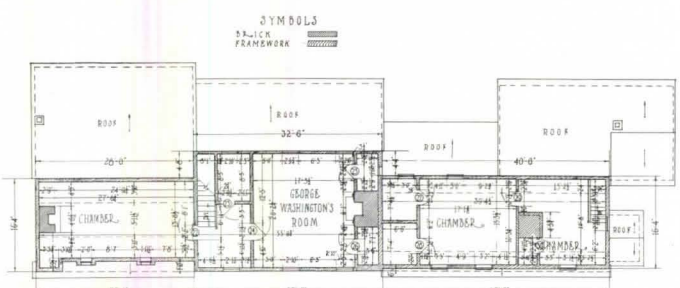


WEST ELEVATION
SCALE 1/8"-1'-0"

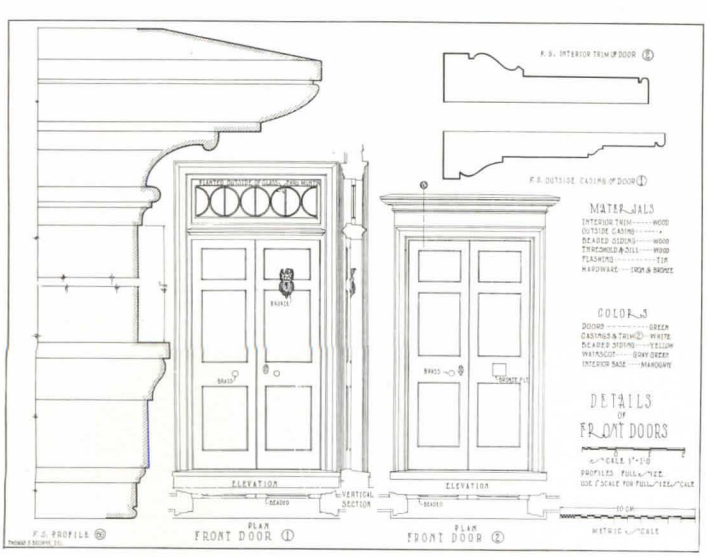
SCALE 1/2"-1'-0"
METRIC SCALE



FIRST FLOOR PLAN
SCALE 1/8"-1'-0"

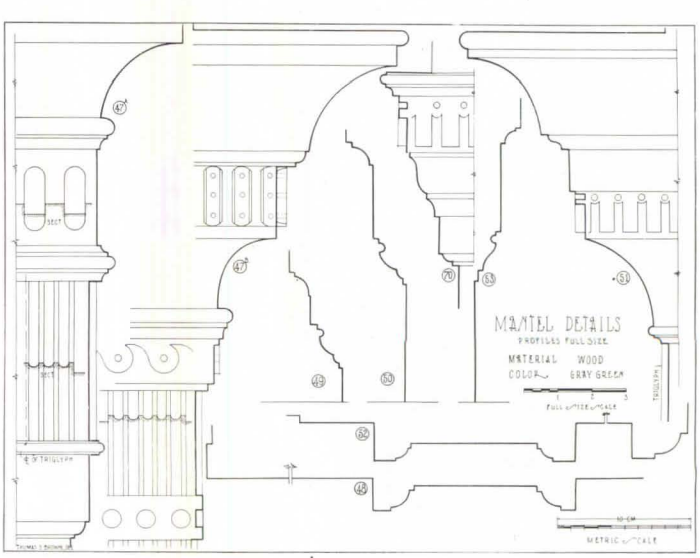


SECOND FLOOR PLAN
SCALE 1/8"-1'-0"



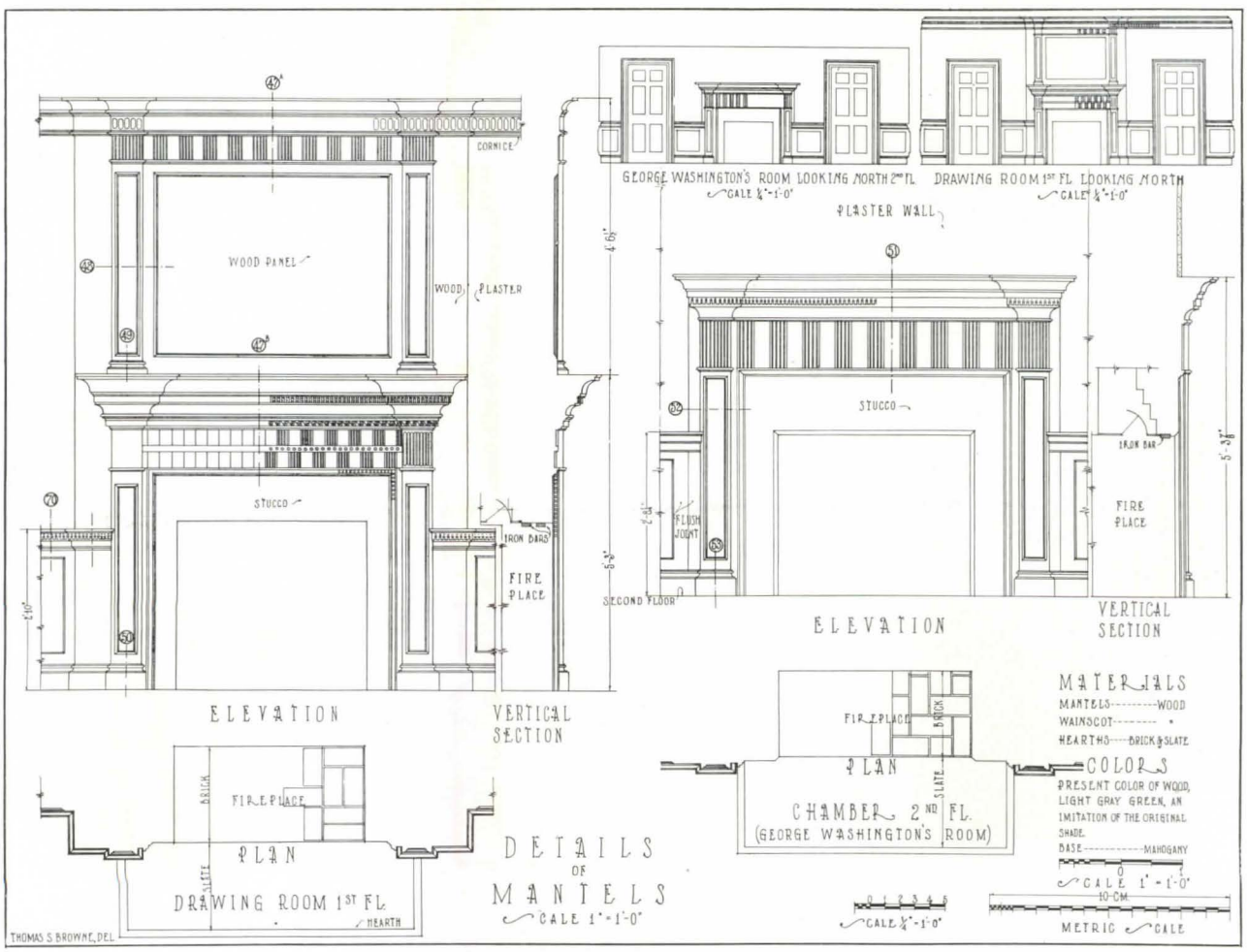
FRONT DOOR ①

FRONT DOOR ②



MANTEL DETAILS

DRAWING ROOM, FIRST FLOOR

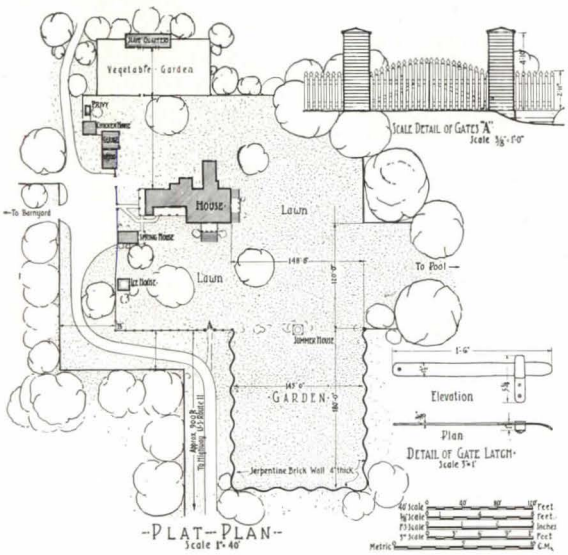


"FOLLY FARMS"

HOME

OF JOSEPH S. COCHRAN

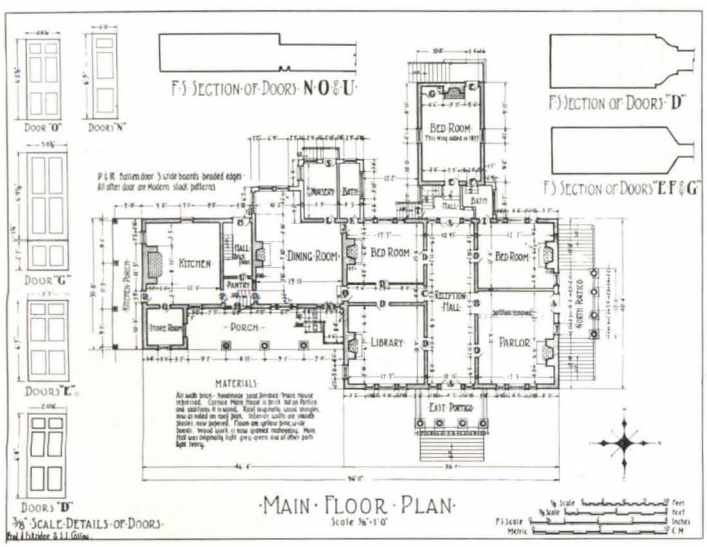
FOLLY MILLS, VA.

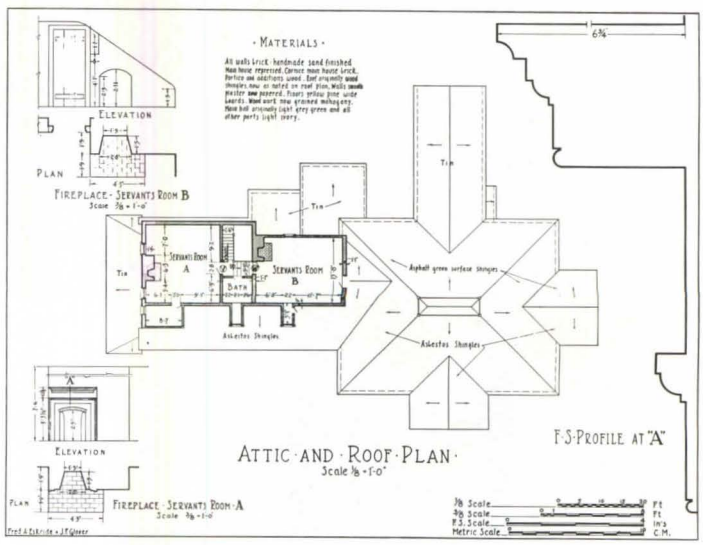


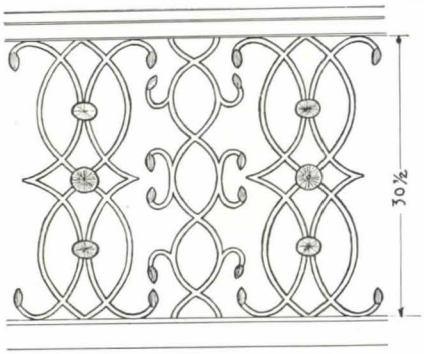
Joseph Smith, who built "Folly Farms" in 1818, served in the Virginia Legislature with Thomas Jefferson. Papers indicating a friendship between the two men, and the fact that the design shows characteristics of Jefferson's work would seem to support the owners' contention that the house was designed by Jefferson.

The house is still occupied by the descendants of the original builder.

The garden is surrounded on three sides by a brick serpentine wall, which is said to have been built prior to 1818. The wall, therefore, is two years older than those built at the University of Virginia by Thomas Jefferson.

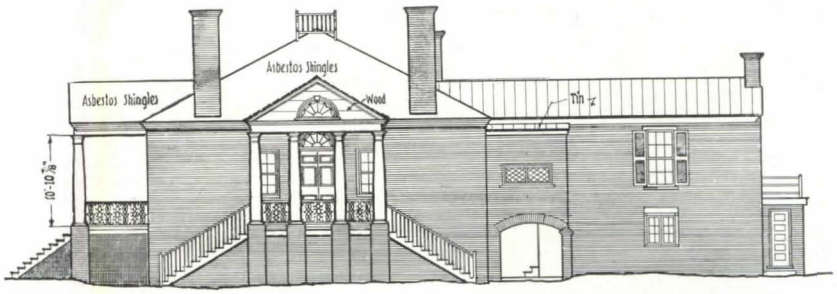






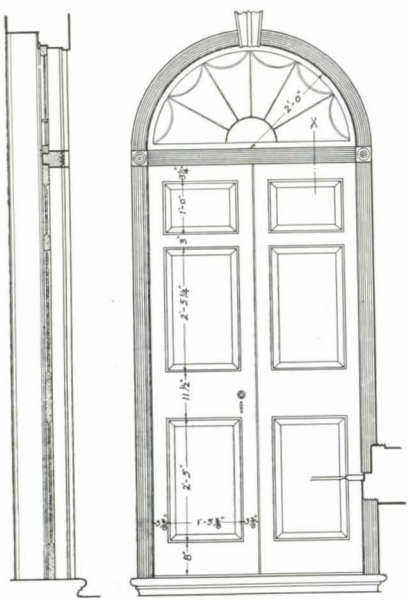
Scale Detail · Portico · Railings ·

0 1 2 Feet



·· NORTH · FRONT · ELEVATION ··

Scale ⅛" = 1'-0"



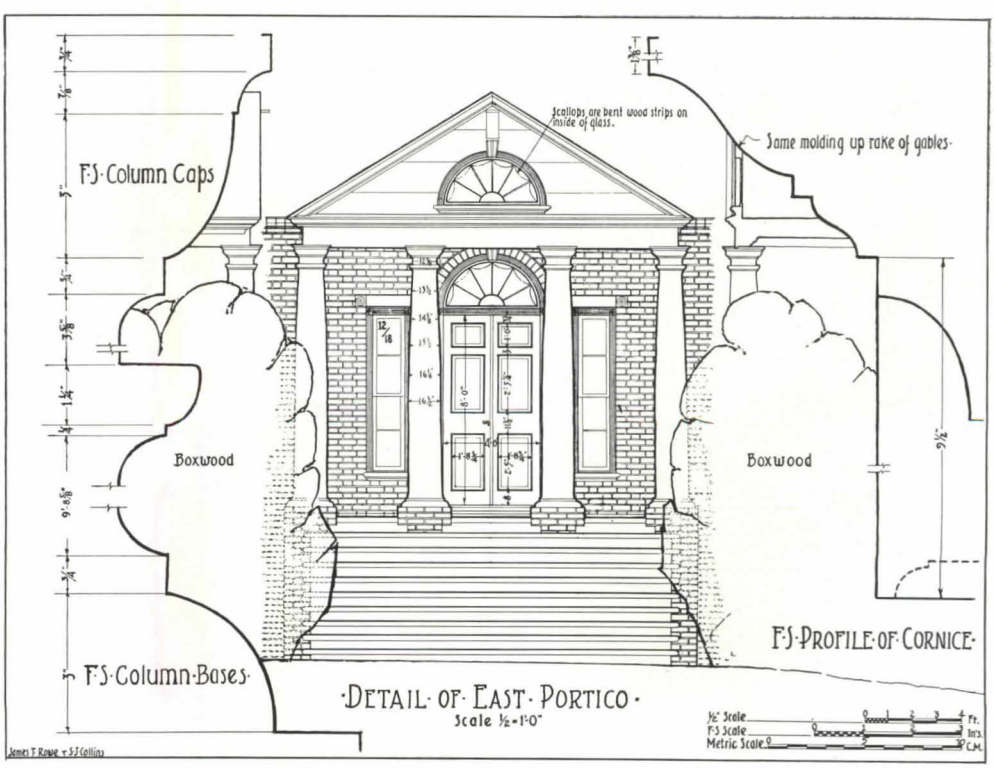
SECTION ELEVATION

DETAIL OF ENTRANCES · A

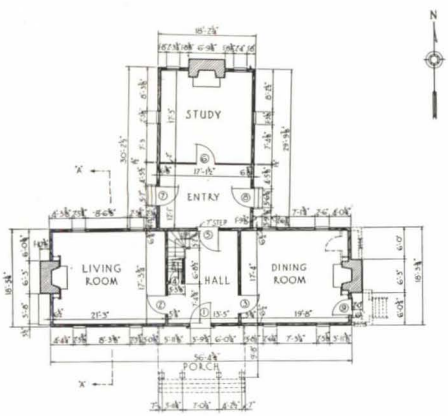
· EAST · FRONT · ELEVATION ·

Scale ⅛" = 1'-0"

⅛ Scale 0 5 10 15 20 Feet

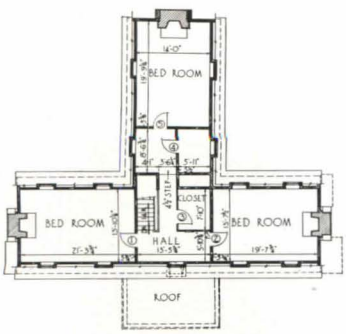


GREENWAY, CHARLES CITY COUNTY, VA.



FIRST FLOOR PLAN

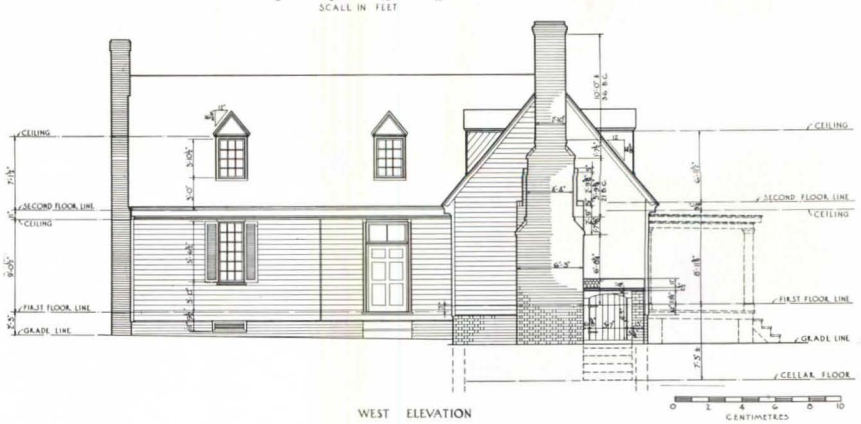
SCALE IN FEET



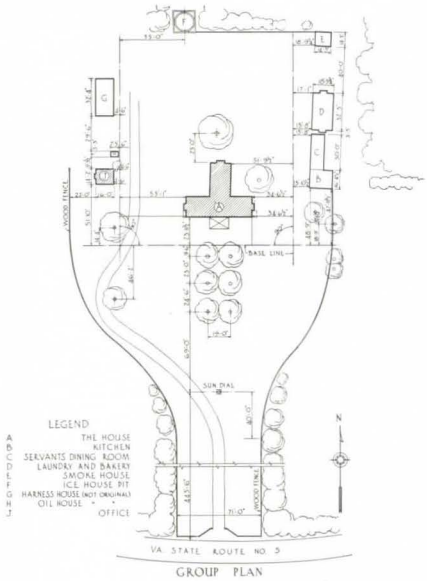
SECOND FLOOR PLAN

SOUTH ELEVATION

SCALE IN FEET

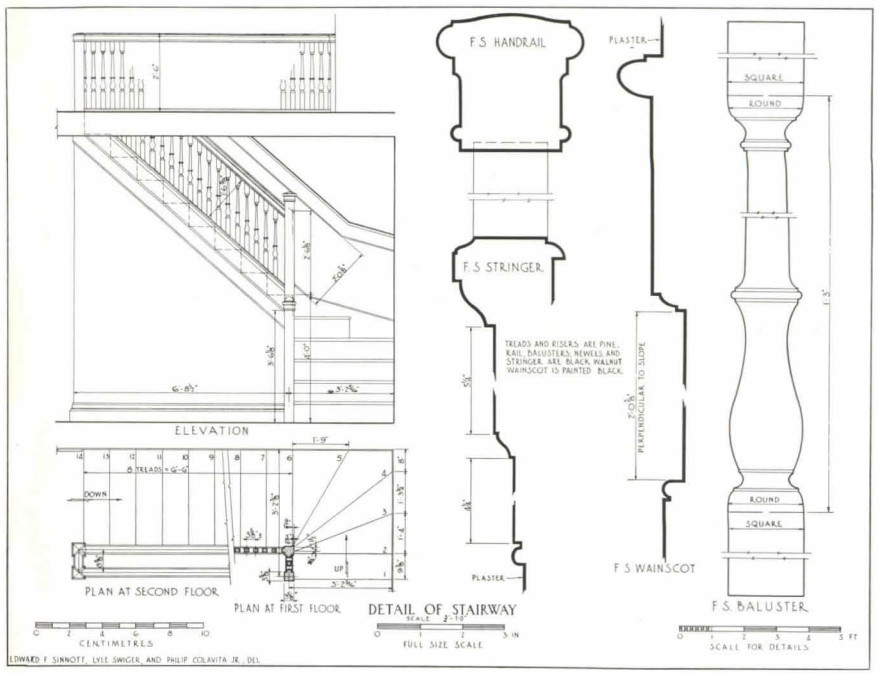


WEST ELEVATION

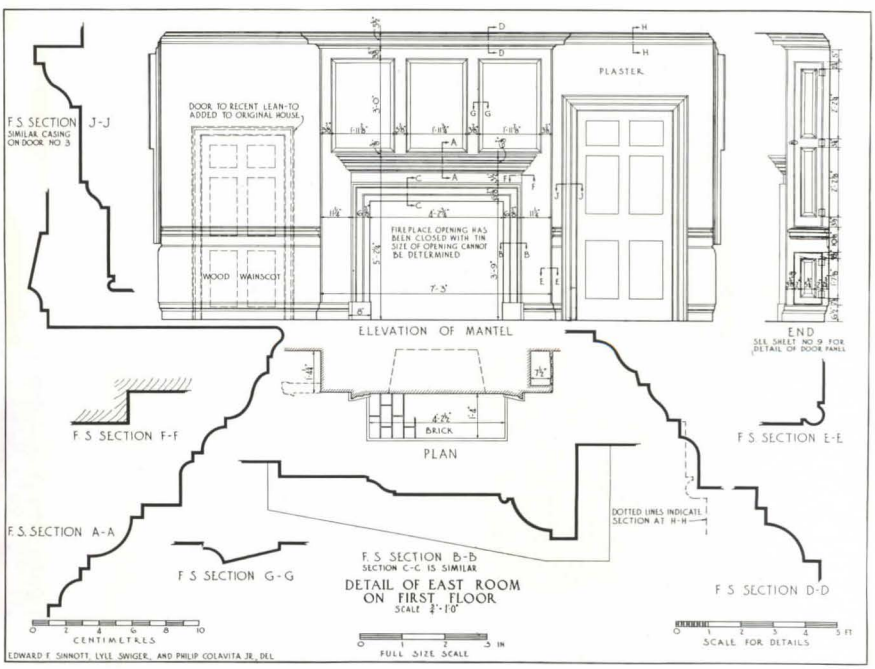


GROUP PLAN

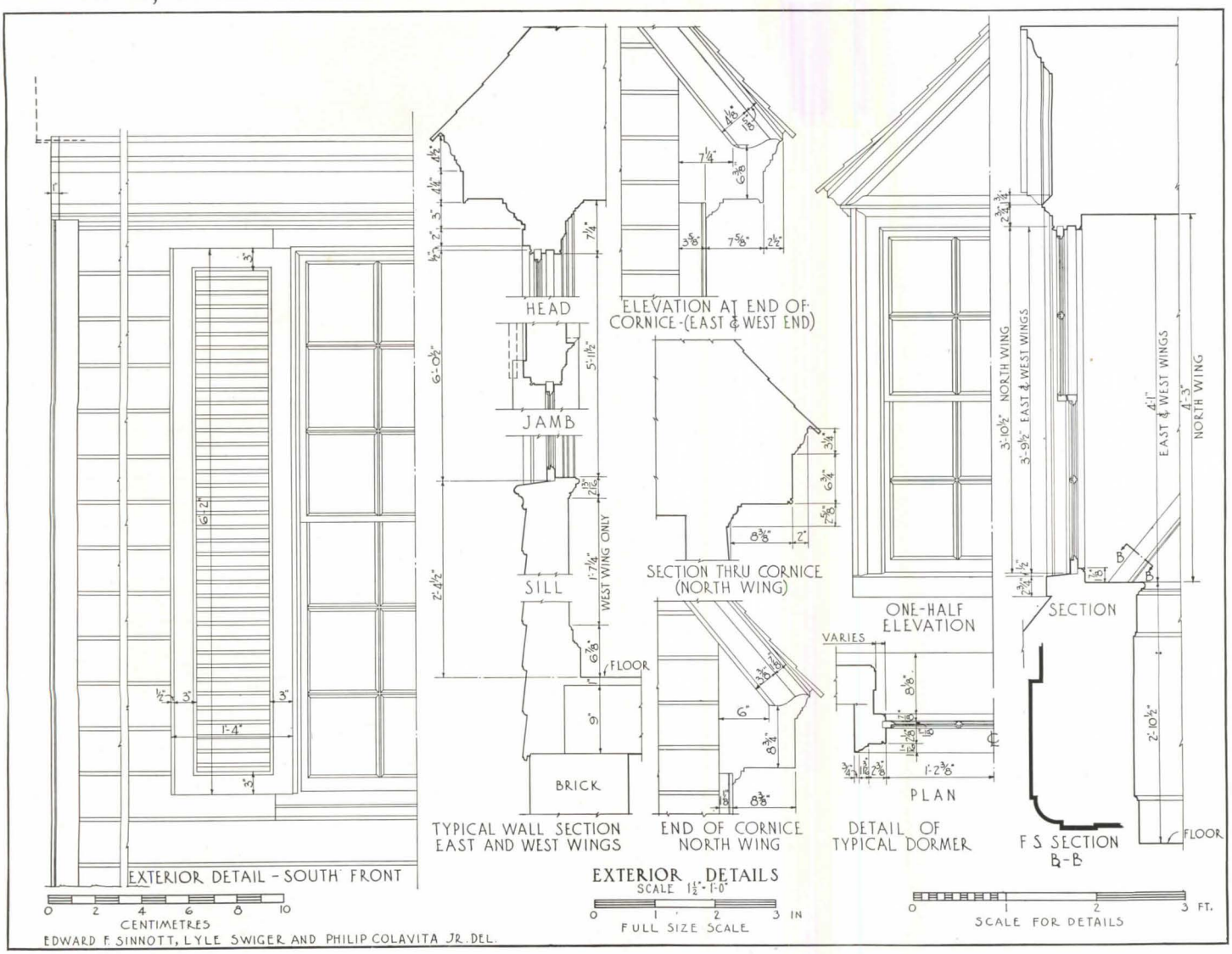
SECTION A-A
SCALE $\frac{1}{4}$"-1'0"

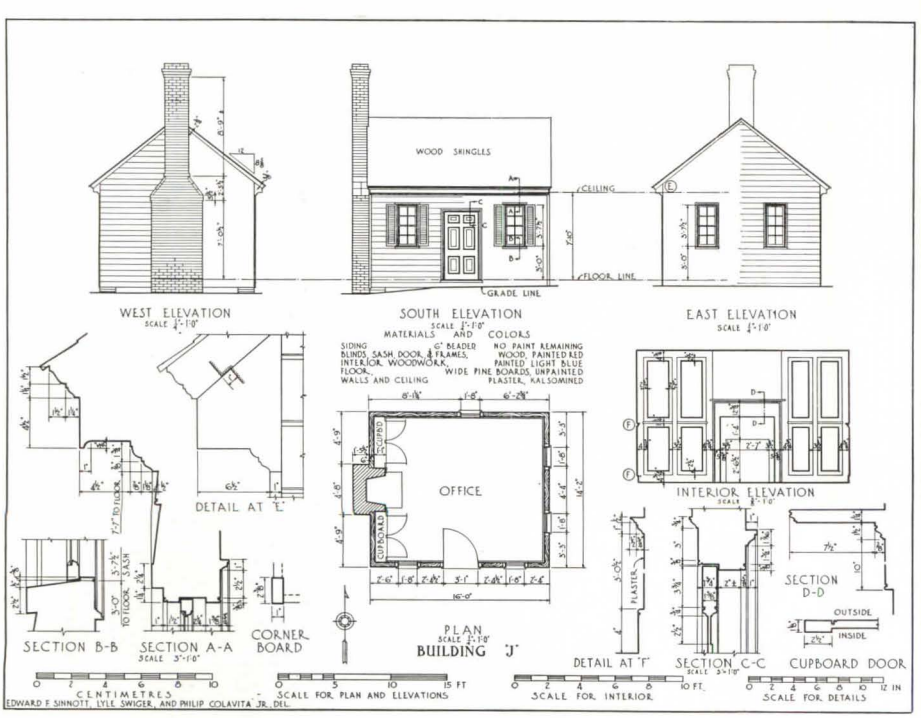


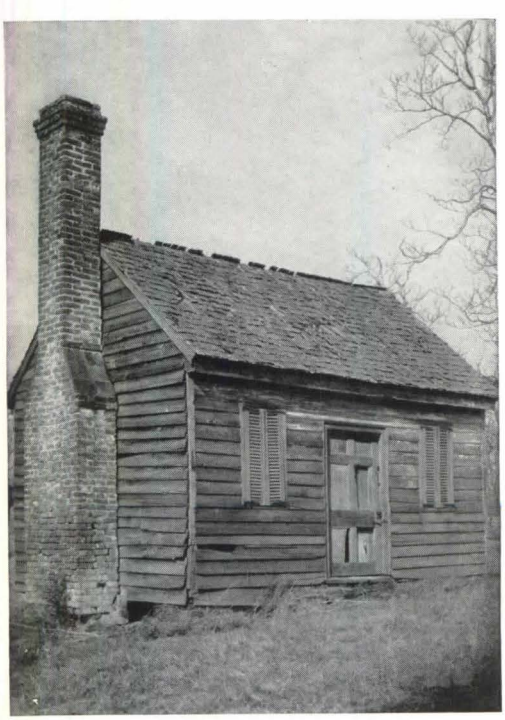
EAST ROOM, FIRST FLOOR



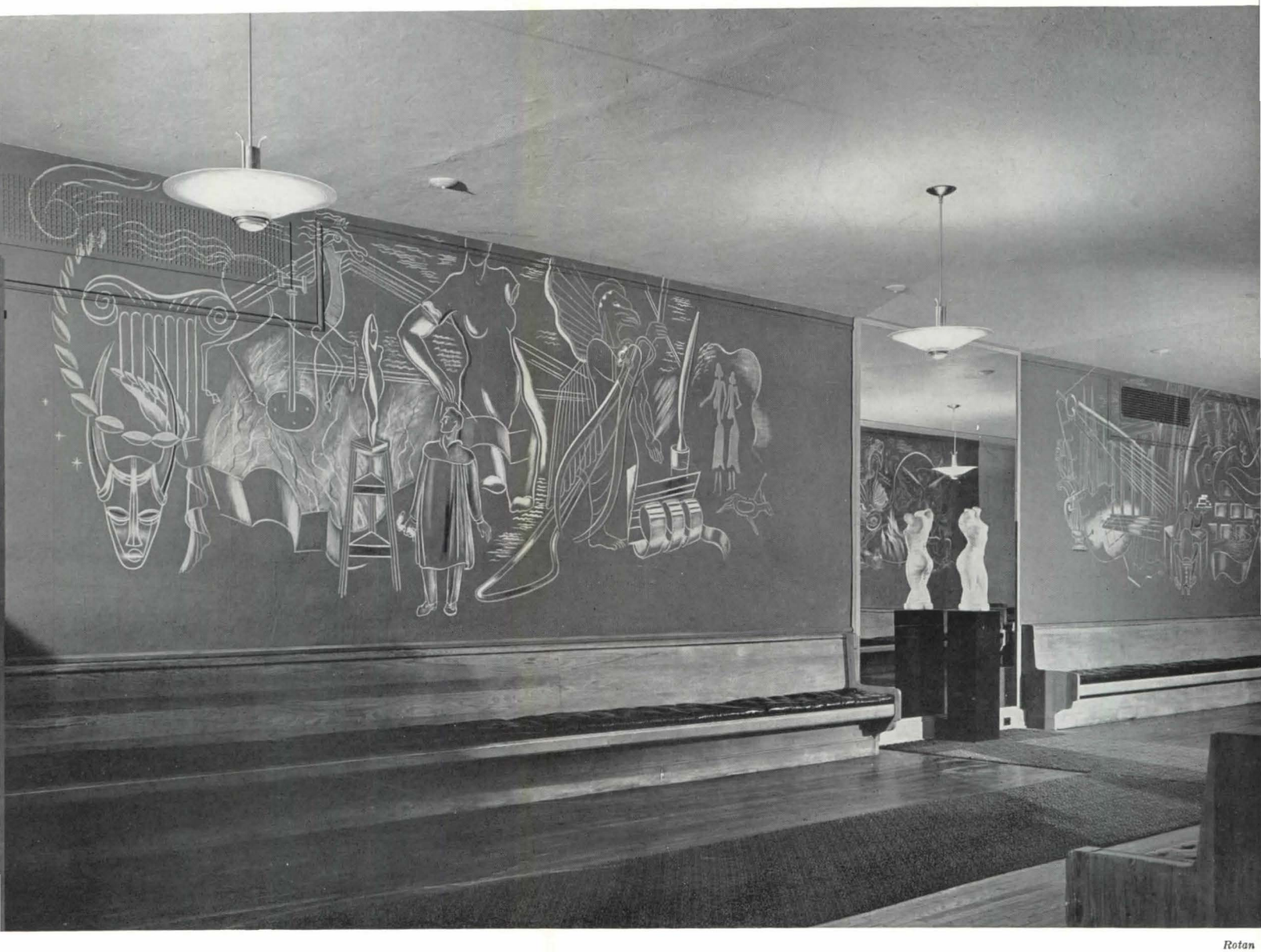
GREENWAY, OFFICE BUILDING







ARCHITECTURAL LEAGUE MURALS, NEW YORK

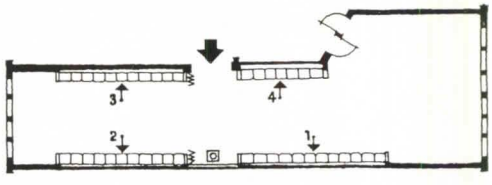


Rotan

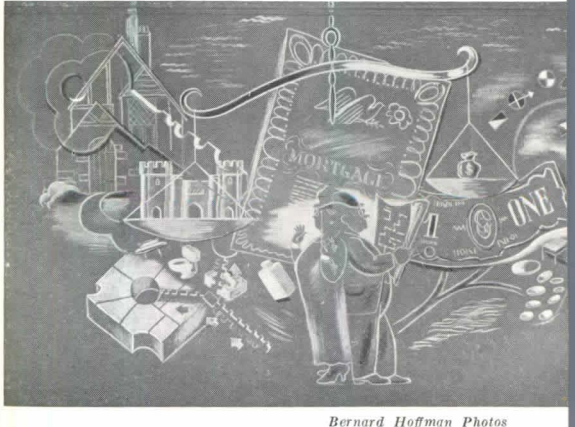
MADELAINE KROLL THATCHER, CHARLES B. GILBERT, STUART E. ELDREDGE

Four large mural paintings, new lighting fixtures, and refinished furniture effected a complete transformation of the dining room of the Architectural League of New York. The interior had been a haphazard, cluttered affair, rather consciously "olde worlde" in its appointments. The murals, a demonstration of sympathetic collaboration, give the room an entirely new scale and character. Painted in grisaille on a terra cotta ground, the walls amusingly depict painter, sculptor, architect, and client in characteristic attitudes and activities, and the casual manner of drawing leaves the wall surfaces flat and undisturbed. Furniture was gone over to remove the dark finish, with a marked improvement in its appearance. Mrs. Eleanor S. McMillen of New York was the decorator.

MURAL 2.

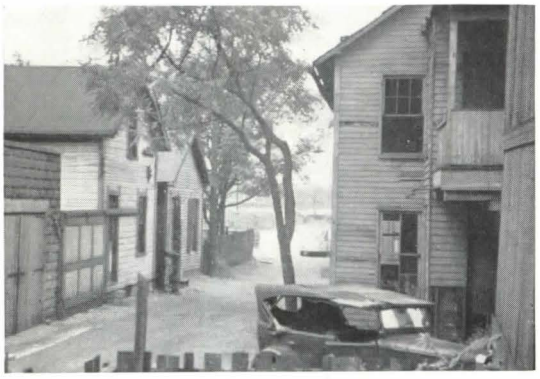


MURAL 3.



Bernard Hoffman Photos

MURAL 4.



SLUM

7:00 A. M.

INDIANAPOLIS MINIMUM HOUSE

THE *INCENTIVE* Indianapolis slums: 27,700 dwelling units without private indoor toilets; 14,500 without running water. Some blocks with twenty families using one privy and drawing their water from a nearby shallow well. Ten per cent of the population because of its bad housing getting 26 per cent of the city's police, fire, health and sanitation budget.

THE PROBLEM A housing structure which could be placed on lots now occupied by unfit dwellings, which would have a low enough cost to enable it to be rented at a profit at present rentals, which could be easily disassembled and would have a high salvage value in case the land on which it stood should be wanted for another purpose.

A POSSIBLE ANSWER Frankly an experiment, the Housing Department of Purdue University designed and with the help of the staff of the State Planning Board of Indiana and the WPA constructed and erected this two-family house in one of the Indianapolis slum areas. Cost: $1,239 for the two-family unit or $620 per family—overhead and profit not included. Erected in a day, from the foundations up, can be demolished in less and reerected with practically no loss in value to the shell or plumbing fixtures.

PLAN Minimum requirements for each family: two bedrooms, a combination living room and kitchen having cross ventilation; running water (cold only) in toilet, shower, and kitchen sink; stove (coal burning) for both cooking and heat; a tight, well-insulated shell to conserve heat.

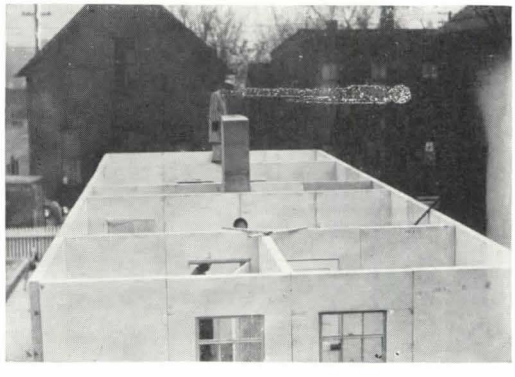
CONSTRUCTION SYSTEM Phenol-resin glued, fir plywood, glued and nailed to both sides of wood framing members forming "stressed covering" panels built up near the site. Phenol-resin glue is water resistant and verminproof.

Three-eighths inch thick three-ply plywood was used for walls, ½ in. five-ply for roof, ¼ in. three-ply for ceiling, 2 x 4's for wall framing, 2 x 6's for roof framing. Panels were filled with rock wool for insulation and primed with aluminum paint. Such panels are fire resistant. Panels were held together by ⅜ in. steel rods threaded on ends run laterally through tops and bottoms of wall panels and at four equidistant points through roof panels, drawn up tightly with nuts.

Foundations: Concrete walls 8 in. wide and 3 ft. deep and a concrete slab floor,* with 2 x 6 sills fastened down with countersunk bolts. Sill and roof are connected to walls by angle irons and screws. Chimney: concrete, cast in place before erection of house. Roof finish: mastic.

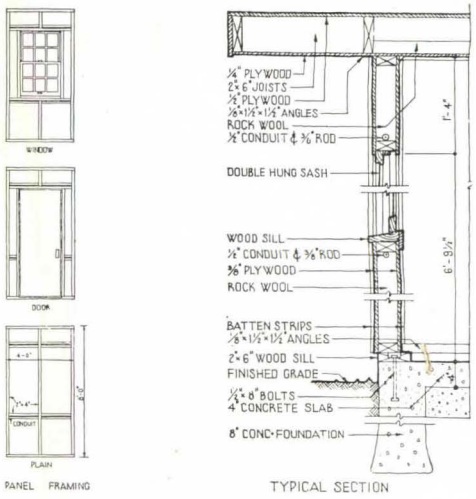
*Floor panels, like those of the roof, could replace the concrete slab floor. They would be more comfortable and have a much higher salvage value.

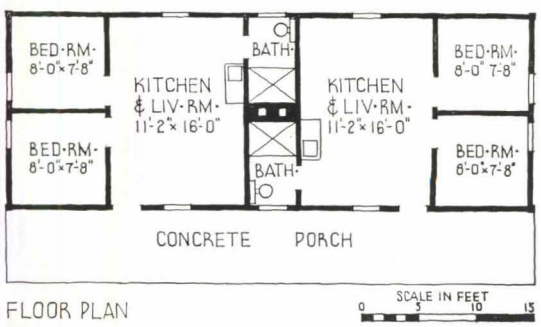
7:35 A. M.



10:50 A. M.

12:45 P. M.





FLOOR PLAN

THE RESULT

A house that can be washed out with a hose, is verminproof, fire resistant, well ventilated, will have low heating and maintenance costs. A rent of $7 per month per family, less than $2.50 a room per month will permit its erection at a profit and pay a 1 per cent per month return on the cost, more than enough for maintenance, taxes and amortizing the cost in fourteen years. Quantity building should reduce the cost.

COST BREAKDOWN—2 FAMILY UNIT

FOUNDATION AND FLOOR SLAB		
21 c.y. @ $8.35		$175.35
CONCRETE CHIMNEY		24.50
PLUMBING		
2 w.c.'s @ 14.50	29.00	
2 sinks @ 7.00	14.00	
2 showers @ 2.85	5.70	
Roughing materials	28.30	
Labor: 24 hrs. @ 1.00		
24 hrs. @ .60	38.40	115.40
WALL PANELS		
2880 s.f. ⅜ in. plywd. @ .09	259.20	
1350 f.b.m. 2 x 4s @ 42.00	56.70	
1500 lb. loose rock wool @ .025	37.50	
Misc. glue, nails, paint	33.50	
Labor: 100 hrs. @ .50	50.00	436.90
ROOF PANELS		
1152 s.f. ½ in. plywd. @ .12	138.24	
1152 s.f. ¼ in. plywd. @ .07	80.64	
1152 f.b.m. 2 x 6s @ .045	46.08	
665 s.f. 2 in. rock wool bolts @ .05	33.25	
Misc. glue, nails, paint	18.35	
Labor: 103 hrs. @ .50	51.50	368.06

RODS AND ANGLES		$27.50
MILLWORK AND HARDWARE		
8 doors @ 2.56	20.48	
10 prs. sash @ 1.28	12.80	
Hardware	7.13	
Misc.	13.75	54.16
ERECTION: 64 hrs. @ .50		32.00
ROOFING		
Material	50.00	
Labor: 12 hrs. @ .50	6.00	56.00
PAINTING		
Material	37.10	
Labor: 24 hrs. @ .50	12.00	49.10
TOTAL COST		**$1,338.97**

Note: This cost does not include overhead or profit. Certain costs involved in experimenting and correcting mistakes would not be involved in duplication. The elimination of these would reduce the cost approximately $100.

MODERN MOVING STAIRWAYS

Although there are moving stairways which have been in continuous use since 1901, almost 30 per cent of present installations were made in the last three years. Basic reason for this increased demand has been a growing appreciation of their unique quality of providing continuous vertical transportation for large numbers of people. They have continuity of motion with low power cost, require no human operators or attendants, and for equal capacity occupy only a small fraction of the space required by elevators.

When served by moving stairways, restaurants, chain stores and banks have found second floor space desirable. Railroad and rapid transit stations, steamship piers, theaters, auditoriums, schools, even night clubs are installing moving stairways. Large office buildings find electric stairway service to large lower floors well worthwhile.

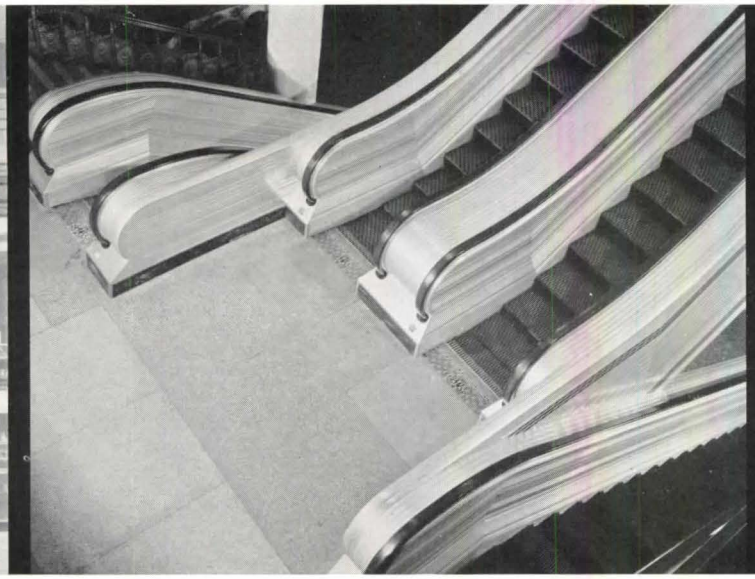
Benefits derived from moving stairways are nowhere more important than in department stores and nowhere have they been more valued as a commercial investment. Department store merchants are faced with the problem of distributing to other merchandising space large numbers of people who enter the ground floor. They have long made use of moving stairway service to basement stores. Now in many department stores well-planned combinations of moving stairways and elevators, providing up and down service to as many as six or seven floors, have materially increased the income from upper floor space formerly served by elevators alone. The electric moving stairway eliminates the annoyances of waiting for elevators, of congestion and crowding, provides instead fast and comfortable transportation from floor to floor, always immediately available, and with a good view of merchandising space. The saving in shoppers' time and energy, immediately reflected in their dispositions, is translated into goodwill for the store.

Not the first, but certainly one of the most striking installations of moving stairways in an office building is this one in the lobby of the International Building, Rockefeller Center. Where access to the basement is important, as in this instance, moving stairways make elevator service unnecessary, greatly simplifying operation. Escalators by Otis Elevator Co.

Moving stairways installed in an addition to an Indianapolis department store cut operating costs per passenger 71 per cent, increased customer transportation capacity six-fold, area occupied by equipment only 27 per cent. Data collected from a large number of stores show that in stores with both moving stairways and elevators there were more than double the number of shoppers on the floors above and below the first floor, as compared with entrance traffic, than in stores of comparable size using elevators only.

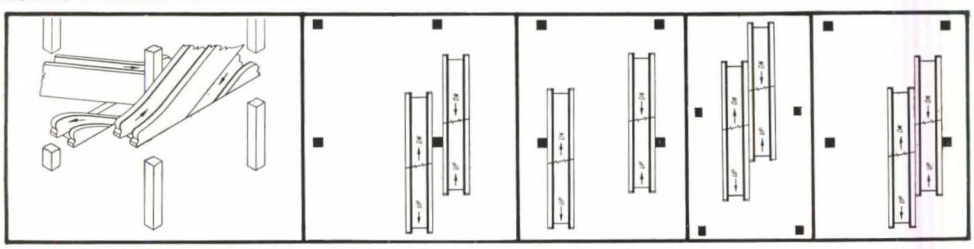
COMPARATIVE COST: SYSTEMS OF EQUAL CAPACITY FOR 6 STORY STORE BUILDING

	10 Moving Stairways 5 Elevators	25 Elevators	Additional Cost of System Using Elevators Alone Dollars	% Additional
CAPITAL INVESTMENT	$450,000	$750,000	$300,000	67%
FLOOR SPACE REQUIRED (sq. ft.)	9,350	33,850	24,500	162%
INDIRECT EXPENSE PER YEAR	$ 46,140	$ 76,900	$ 30,760	66%
OPERATING EXPENSE PER YEAR	23,920	77,850	53,930	225%
FLOOR SPACE EXPENSE PER YEAR	18,750	77,500	58,750	313%
TOTAL EXPENSE PER YEAR	$ 88,810	$232,250	$143,440	162%

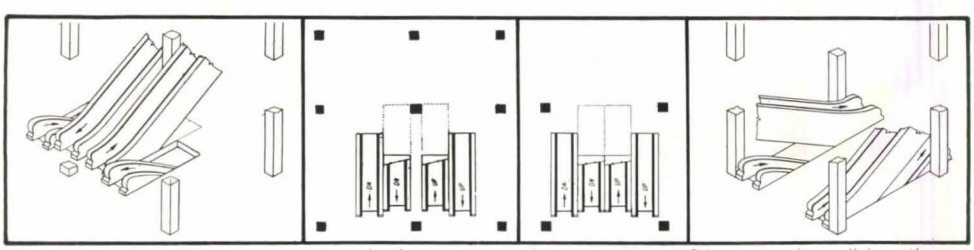


Golden Oak to Chromium—Otis Elevator built the first moving stairway (above, at left) for the Paris Exhibition of 1900. Afterwards, the stairway was installed in Gimbel Bros. Philadelphia department store. Followed, in rapid succession, installations in Macy's New York store, R. H. White Co., Boston, the Boston Store, Chicago, Stix, Baer and Fuller, St. Louis, the Interborough Subway in New York City and American Woolen Mills. Most of these veterans are still in daily use. Mechanically, the latest product of the Otis Elevator Company differs in few important respects from the original model built at the turn of the century. Middle picture: Otis Escalators, Sears, Roebuck and Company, Chicago. At the right: Westinghouse Electric Stairway, Marshall Field, Chicago.

MOVING STAIRWAY ARRANGEMENT



Crisscross | Around columns | Alongside columns | At center of bay | At side of bay



Parallel-continuous | Around columns | At center of bay | Crisscross and parallel-continuous

CRISSCROSS ARRANGEMENT

ADVANTAGES:

1. Continuity of traffic-flow from floor to floor.
2. Distinct separation of up and down traffic.
3. Space beneath stairways is efficiently utilized.
4. (Stores) Distribution of shoppers to both ends of stair creates larger sales area.

DISADVANTAGES:

1. Visibility of stairways poor.
2. Passenger vision restricted.
3. Side and end views less attractive.

PARALLEL-CONTINUOUS ARRANGEMENT

ADVANTAGES:

1. Same as crisscross.
2. Same as crisscross.
3. From central point passenger may choose either up or down stairway.
4. End and side views better looking.
5. Visibility of stairways is greater.
6. Passenger vision unobstructed.
7. Less walking between stairs in continuous travel.
8. (Stores) Shoppers face opposite directions going up and down, thus see entire store.
9. Served by one cross aisle.

DISADVANTAGES:

1. Vacates more floor space.
2. Increases cost for building preparation.

Crisscross and parallel-continuous arrangement is used only on the street floor. Reason for this variation is that both "down" traffic from second floor and "up" traffic from the basement is generally exit traffic; "up" traffic to second floor and "down" traffic to basement, incoming—a condition which occurs only at street level. With this arrangement exit traffic comes off one end of the stairway group; entrance traffic boards the stairs at the other. Disadvantage of this arrangement is the loss of continuity of traffic from basement to second floor.

PLACING OF STAIRWAYS (In relation to bays).

	ADVANTAGES:	DISADVANTAGES:
Around columns:	Shorter walking distance.	Breaks into two bays, whole load on two columns.
Alongside columns:	Only one bay disturbed. Load distributed on more columns.	Longer walking distance, possible conflict of aisle and stairway traffic.
At center of bay:	Shorter walking distance. Disturbs only one bay.	Requires wide bays, possible congestion at landings.
At side of bay:	Same as for center of bay.	Eccentric load on one row of columns, possible congestion.

Parallel-continuous stairways may also be separated by a bay or bays, or placed on opposite sides of adjoining bays. The advantages of this placement are that it provides a main aisle between the stairways and distributes the load over more columns. Principal disadvantages are that more bays are disturbed, more space vacated.

CAPACITY

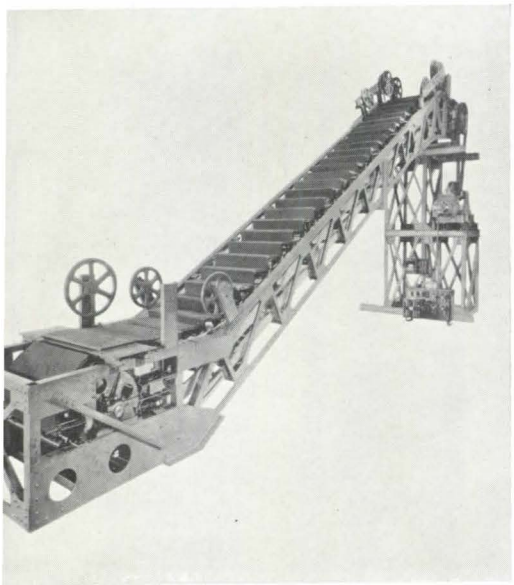
Most important fact to remember about moving stairways is their tremendous capacity. Capacity of electric stairways is rated according to their standard two-foot, three-foot and four-foot widths, at 4,000, 6,000 and 8,000 person per hour, respectively. Thus the capacity of a "double riser" (up and down) three-foot stairway, is equal to that of twenty 3,500 pound capacity elevators.

Moving stairway capacity is usually stated in terms of the "density ratio." This term refers to the number of square feet of floor area served per person moved per hour. Thus a density ratio of 1:5 means five square feet of floor area per person moved per hour. This is the ratio commonly used for bargain basements in large stores. At this ratio a pair of standard 3-foot moving stairways is adequate for a bargain basement of 30,000 square feet area or a space 150 x 200 feet. For upstairs space density ratios of 1:15 to 1:25 are usually desirable. In stores having elevators only, a lower density is the rule. Where moving stairways provide the major means of vertical transportation ratios of less than 1:20 obtain. One store using all moving stairways, no elevators, has a density ratio of 1:10.

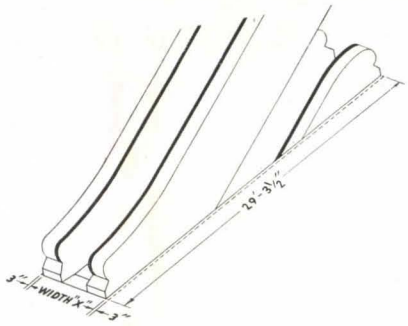
COSTS

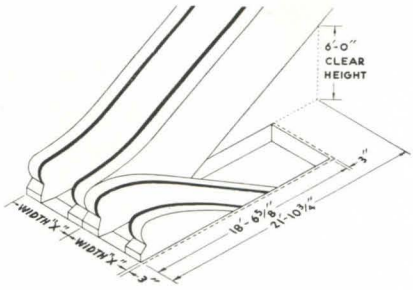
Power consumption of moving stairways is about 7,200 kilowatt hours per year per flight. Capital cost falls between $25,000 and $30,000 per flight.

Interest on the investment, power and maintenance total $8 to $9 per day per flight. Eighteen moving stairways (nine up, nine down) for a ten story building show a yearly saving over the twenty elevators required to provide equal transportation capacity of over $30,000 for operators and starters, and about $3,400 for power.



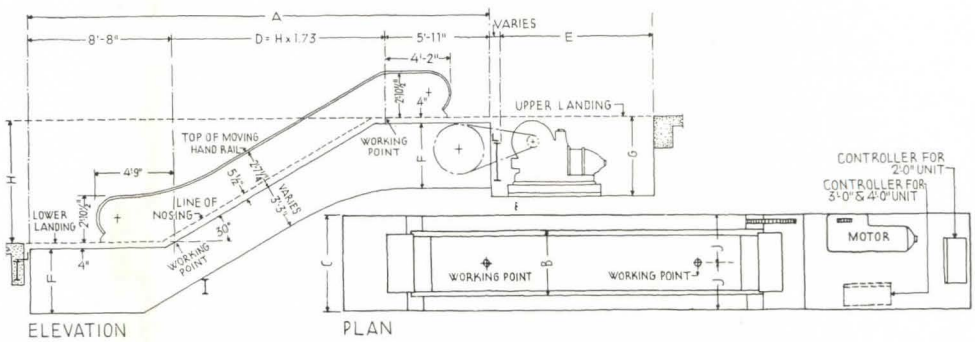
The Works: The modern moving stairway is a completely integrated unit, requires support only at the ends. The machine room must be placed at the top of the stairs, may be placed either at end, alongside or beneath the truss.





OTIS Escalator	Width "X" including Deck Covers	Two Escalators, one above the other		Two Escalators, adjacent			
				Up escalator		Down escalator	
		Width*	Floor Area*	Floor Area Occupied	Floor Area Beneath	Width*	Floor Area*
4 ft. escalator.....	6 ft. 5 in.	6 ft. 11 in.	202.6 s.f.	73.7 s.f.	64.0 s.f.	6 ft. 8 in.	124.8 s.f.
3 ft. escalator.....	5 ft. 5 in.	5 ft. 11 in.	173.3 s.f.	62.2 s.f.	53.6 s.f.	5 ft. 8 in.	106.3 s.f.
2 ft. escalator.....	4 ft. 5 in.	4 ft. 11 in.	144.0 s.f.	50.7 s.f.	43.2 s.f.	4 ft. 8 in.	87.7 s.f.

*Including wellway rails



WESTINGHOUSE Electric Stairway	B	C	E	F	G	J	Weight evenly distributed when fully loaded
4 ft. stairway...	4 ft.	6 ft.	8 ft.	4 ft. 1 in.	4 ft. 6 in.	3 ft.	= A in ft. x 1,000#
3 ft. stairway...	3 ft.	5 ft.	8 ft.	4 ft. 1 in.	4 ft. 6 in.	2 ft. 6 in.	= A in ft. x 900#
2 ft. stairway...	2 ft.	4 ft.	9 ft. 6 in.	4 ft. 1 in.	4 ft. 6 in.	2 ft.	= A in ft. x 800#

SPACE

Area occupied by a pair of four foot electric stairways—capacity 8,000 people per hour, up and down—is 225 sq. ft. Space required for a pair of elevators—having only one-tenth this capacity per hour for a ten floor run—together with necessary landing aisle space—is 305 sq. ft. or 80 sq. ft. more per floor. Elevators also require pit space below lowest floor, clearance above and space for operating machinery, not required by moving stairways.

LOCATION—IN STORE

Moving stairways should be between principally used entrance and elevators so that they will be first choice of traffic since they are expected to perform the greater portion of the transportation service.

They should be in direct line with the heaviest traffic so as to be easily accessible and easily observed from the principal entrances yet not too close to them as incoming traffic is carried some distance into store by its own momentum before becoming oriented.

The distance to be traveled from the discharge end on other floors should be taken into consideration.

Downstairs or Basement Stores

"DOWN" Stairways:

Near the entrances in the busy section so as to draw off the "Downstairs" shoppers.

"UP" Stairways:

In relation to "Down" so as to separate outgoing and incoming traffic, thus avoiding congestion. Hence not typical "crisscross" arrangement.

Away from "Down" so as to draw shoppers through merchandising area and deliver to less busy part of first floor, preferably not near entrances so that they must traverse first floor merchandising area also.

Upstairs or Multi-Floor Stores

"UP" Stairways:

In addition to the entrance considerations consider location of upper floor stairways in relation to merchandising space.

"DOWN" Stairways:

So as to discharge traffic toward a dead merchandising section on first floor and keep incoming and outgoing traffic separated to avoid congestion. Avoid having both "Up" and "Down" Stairways side by side in a "Crisscross" arrangement against a side wall, thus pocketing landings. Where a Stairway must go against a side wall separate "Up" and "Down" so that traffic is drawn across the store.

Stairways for Bargain Basements should provide transportation for approximately one person per hour per 5 sq. ft. of shopping area. By providing adequate up and down stairways, elevator service to basement can be eliminated, improving the elevator service to the upper floors. For department store space above first floor, vertical transportation—elevators or moving stairways or both—should make possible a density ratio of between 1:15 and 1:25.

ARRANGEMENT

Moving stairway arrangement differs from the arrangement of stationary stairs because of the fact that moving stairs are a one-way proposition, whereas stationary stairs are generally thought of as working both ways. Four flights of moving stairs are therefore required on a typical floor; an "up" stairway *to* the floor above, a "down" stairway *from* the floor above, a "down" stairway *to* the floor below and an "up" stairway *from* the floor below. (Since moving stairways are reversible, two flights suffice if "up" and "down" traffic is confined to definite, separated periods.) Just as in stationary stairways, an effort is usually made to place stairways to the floor below underneath stairways to the floor above in order to save space. With moving stairways it is necessary to preserve at the same time the continuity of "up" and "down" traffic.

1. STAINLESS STEEL AWNING FRAME

A specially fabricated, welded stainless steel awning frame recently installed on the terrace of a Long Island residence demonstrates the advantage of this material and method of fabrication. Composed of 2-inch, satin-finished stainless steel tubing, with connections, pins and anchor bolts of the same material the frame will neither rust nor tarnish and requires no painting. And since stainless steel has three times the strength of ordinary steel, thin walled tubing has been used which results in extremely light weight, easily assembled sections. The welded construction gives assurance that the frame will remain in place during storms. The frame is assembled by simply sliding the member running parallel to the wall and the member connecting the stanchions through the wall brackets, and the strap fittings attached to heads of stanchions and ends of "rafters," locking all joints with pins. James W. O'Connor, Architect.

2. ALL STEEL DISPLAY FURNITURE

Illustrated are three new merchandise display tables, product of the Universal Equipment Company, 3500 Arthington Street, Chicago, Ill. The tables are built entirely of steel and composed of identical die-pressed parts. Eighteen gauge steel is used at all stress points, twenty gauge for panels. Corners are rounded and there are no visible bolts. Finish is synthetic baked-on enamel in two-tone effects.

Each of the designs is available with or without paneling as shown. A is a general utility table, two feet wide, four feet long and 31 inches high. B is a four-drawer table with drawers mounted on roller bearing slides. C is a double-deck table particularly adaptable for the display of "hard" lines in department stores or specialty retail establishments. Because of volume production of the die-pressed basic units, prices are claimed to be in every case comparable with cost of wood equipment, in some cases cheaper.

3. WOOD SURFACED WALLBOARD

Known as C-X Texboard, a new product which duplicates the effect of fine wood paneling at much lower cost has been introduced by the Celotex Corporation, 919 North Michigan Avenue, Chicago, Ill. Texboard is made by applying genuine wood veneers of walnut, mahogany and Avodire to a Celotex base. It is ¼ in. thick and comes in planks 6 and 9 inches wide, 8 and 10 feet long. Texboard planks have beveled edge shiplapped joints, and are secured to the wall with nails along one edge, a special adhesive along the other, thus producing a nail-free surface in grooved plank form.

Because the overall thickness of the finished wall covering is only ¼ in., it is particularly adapted to modernization work, since it does not require the removal of baseboards, moldings and casings at doors and windows. Texboard is intended only for application over continuous wall surfaces, and may not be applied directly to framing or furring strips. In new construction, a plywood backing may be substituted for plaster to receive the Texboard finish.

4. PREFINISHED FLOORING

Also adapted to modernization work as well as to new construction, a new prefabricated prefinished hardwood flooring known as Parkay is now on the market. Manufactured by the Wood-Mosaic Company, Inc., of Louisville, Kentucky, Parkay comes in corrugated cardboard cartons in pieces 2 x 6 ft., is marketed through department stores. The new flooring is made up of individual hardwood blocks, 5/16 inch thick, assembled in basket-weave pattern and embedded in a semi-pliable grill; is held in place by a special adhesive; laid over a layer of felt. Ready for use as soon as laid, the flooring is installed in the average room in a period of four or five hours. Light and dark oak, walnut and East India teak are available.

5. PLASTIC WALL FINISH

A new plastic water paint known as Polytect, which has been available for some time abroad, has recently been introduced into this country by the American Polytect Corporation, 84 University Place, New York City. Polytect is similar to other plastic water paints, except for certain unique properties which permit a wider variety of decorative treatment. First of these properties is the drying characteristic of the material: Polytect hardens with rounded rather than sharp edges in the marking; always retains a degree of elasticity which helps to prevent cracking resulting from movement of the base.

Second is the fact that Polytect, unlike other plastic paints, may be polished after application; applied smooth and polished the material may be given a tile-like appearance; raised portions of brushed or tooled surfaces may be rubbed smooth so as to contrast with the indentations.

Third is the rather remarkable fact that Polytect may be metallized, and at the same time polished, by simply burnishing the surface with a piece of the metal whose appearance is to be simulated. Thus by rubbing the material with aluminum, an aluminum surface is produced; with bronze, a bronze surface. Any metal, even steel, may be used in this way.

Polytect is shipped in dry powder form in containers of ten, twenty-five or fifty pounds; mixed only with water and dry color on the job. It may be applied to any surface to which paint will adhere by all ordinary methods.

BUILDING MONEY

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

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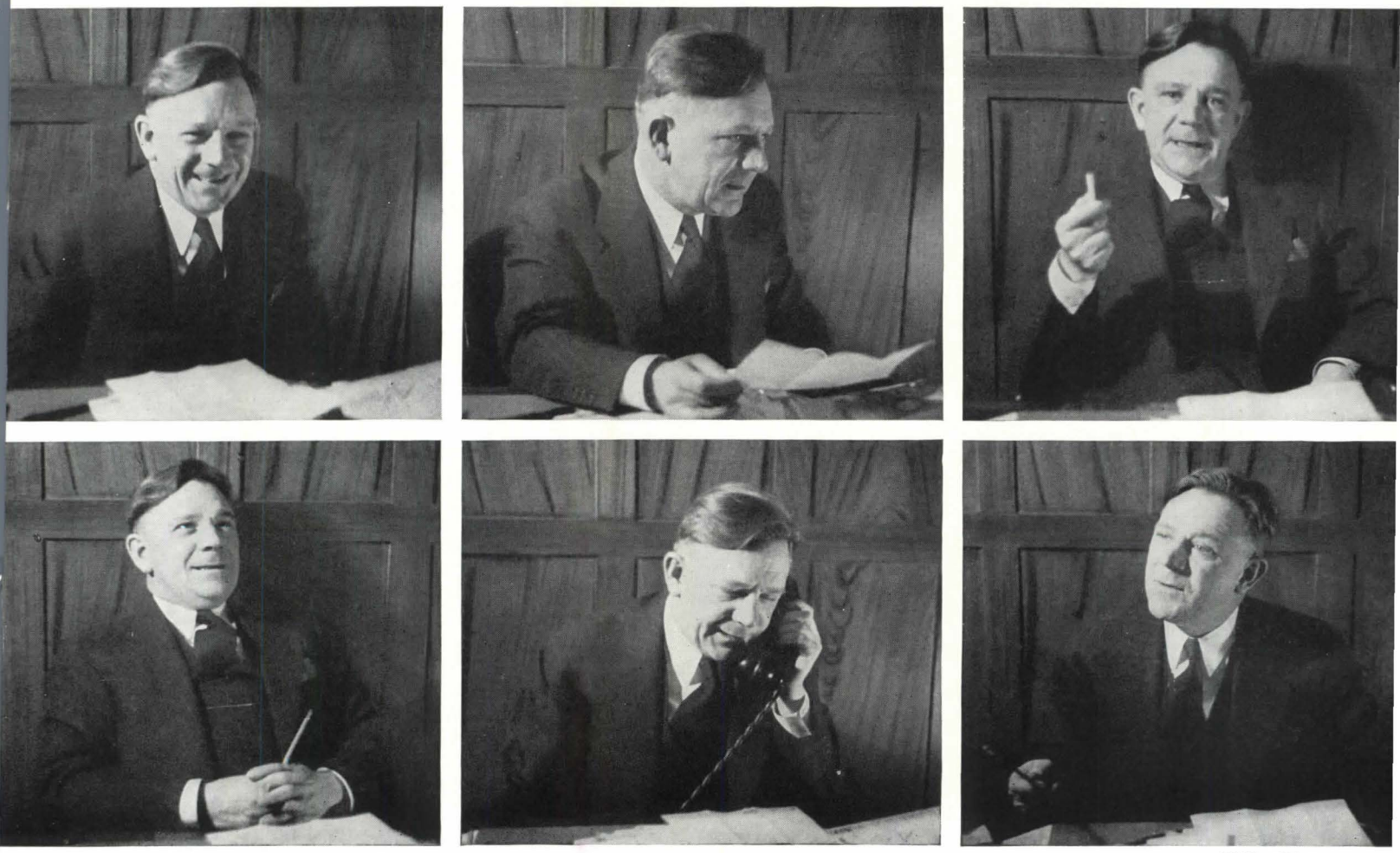


William Nelson

HARRY D. BURCHELL (see Page 70)

$2,500 FOR HOUSE AND LAND

becomes a fact, significant because construction and design are both sound. A look at the Buyer and the Profit.

ONE morning last April on Long Island Frank Fox, the canny and bleak president of Realty Associates, Inc., stepped out of his house, settled himself in his car, and was driven by his wife to the Huntington station. There he bought a copy of the New York *Herald Tribune,* waved goodbye to his wife, and climbed aboard his train. For two cents he had bought an idea worth tens of thousands of dollars. The Federal Housing Administration had that day announced its plans and specifications for low-cost houses. (ARCH. FORUM, May, 1936, p. 432.)

Losing no time, President Fox called to his office his Vice President Harry D. Burchell and his Assistant Secretary, the forthright, shrewd William J. McGowan. To them he broached this proposition: to develop a speculative house of sound design and construction to sell for $2,500 with land in a restricted neighborhood. First step was New York's FHA Director Thomas Grace, who referred them directly to Washington, which with some trepidation, made commitment for 624 houses. Next step was proof. Ground for the first house in Hillside Heights was broken on rich farmland near Mineola about May 1. By last month Realty Associates, Inc. had completed its sixth month of serious selling, and 116 houses had been sold. Ninety-five have been completed, with 55 more under construction.

The Product. The $2,500 house has duly made its appearance among the 150 erected at Hillside Heights. It cost Realty Associates just a trifle more than $2,500 to produce this house, but the price was sufficiently dramatic to bring thousands of New Yorkers flocking out to Long Island. Which was exactly what President Fox had intended, for to these pilgrims his salesmen proceeded to sell houses priced with lot all the way up to $4,000. Of the $2,500 houses they have to date sold exactly five.

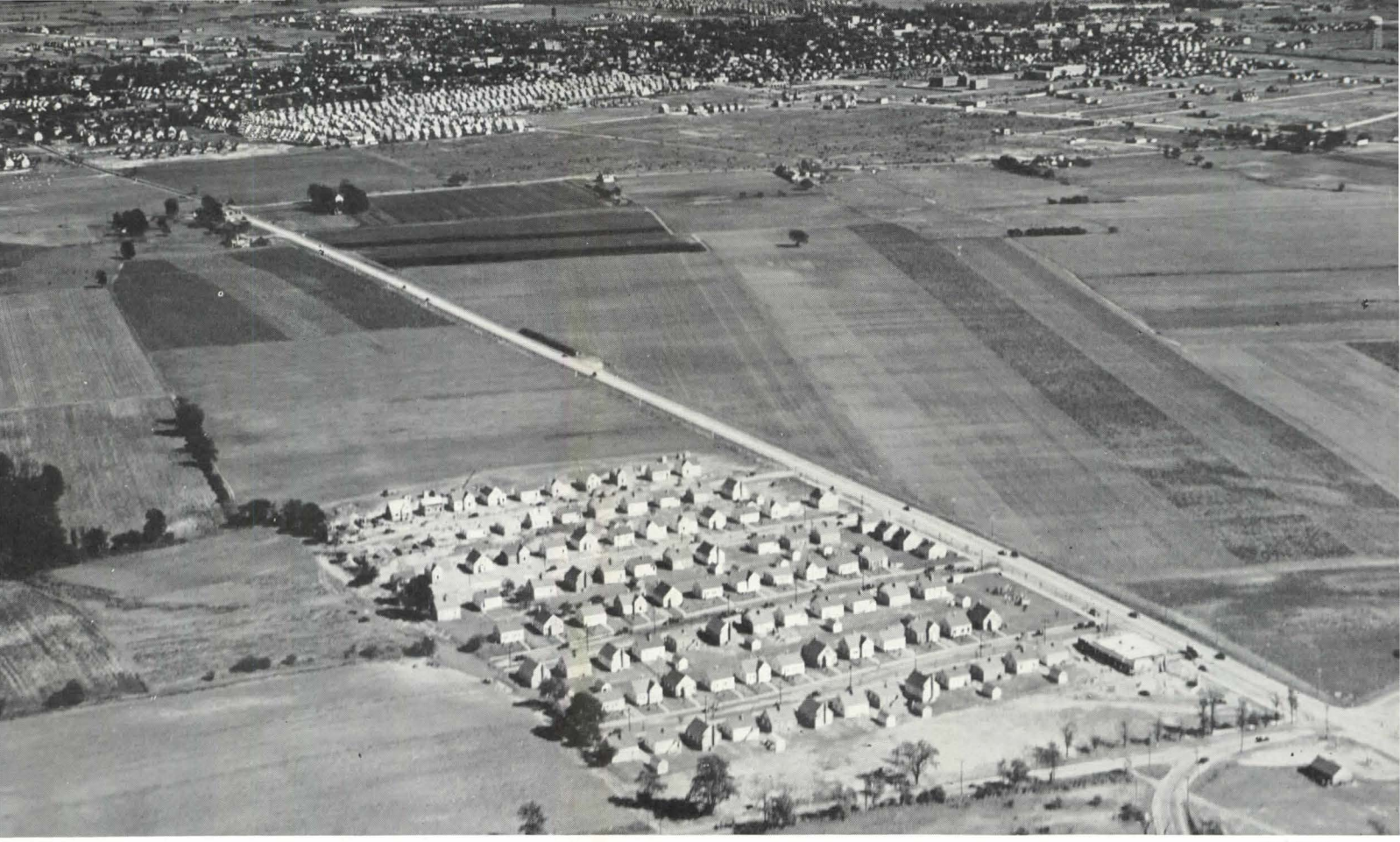
So as to live up to the elaborate brochure on Hillside Heights, which bears the chaste inscription, "Inspired by the Federal Housing Administration," plans for the houses were based on the FHA specifications. Harry Burchell, however, felt that the New York market would not take a house which combined kitchen, dining room, and living room. So one room has been made two, the others enlarged.

Houses in the $2,500 class are on a plot 40 x 100 ft. They are without cellar or garage, have a living room-dining room, two bedrooms, a kitchen, a bath, three closets (see picture and plan below). They have hot water heat which is almost too effective. The larger ones are very comfortably heated by a circulating heating plant, a system which renders the upper story warm even when the connecting door is shut.

The houses in Hillside Heights are as well constructed as any small houses in the metropolitan area. Take a running jump on the living room floor of any of these houses: only the furniture rattles. When Howard Leland Smith, the FHA's Chief Architect, was taken around Hillside Heights, he reported himself "amazed." This is chiefly because the FHA district office in Jamaica, in the person of smart, young Donald K. Vanneman (whose resignation in favor of mortgage financing became a fact last month), brooded over Hillside, leaned over Harry Burchell's shoulder to recommend improvements. The early houses in Hillside Heights were inspected by his office, which made certain suggestions to Director Vanneman, who in turn retailed

Charles E. Knell

$2,500 is the price on this neat, compact little house (Type A), with a plot 40 x 100 ft., but without basement or garage. Monthly payment amounts to $22. Its builders do not expect it to make a profit. Five of this model are included in the total of 116 houses sold, none of which brings more than $4,000. Architect: Benjamin Driesler, Jr.



Carl Evers

Here is the Subdivision, 1936 model. In the background, see the 1926 model. Staggered house lines, more space, diversity in roof angles make Hillside Heights as pleasant as the cramped terrain permits. The development will reach out along the road, swing over to the left in an L.

them to Vice President Burchell. All suggestions were incorporated. In the first sample house window and door openings were single-studded, sheathing was horizontal, there were no fire-stops in the basement, the attic was no more than a cat-walk. Now the openings are double-studded, diagonal sheathing* is employed on lower floors, fire-stops are included, copper flashing is provided, and the attics are all but finished off.

To Benjamin Driesler, a shy, serious, dark man, goes credit for the design of these houses. Architect Driesler is not hired exclusively for Realty Associates' work, but does the large per cent of their designing. His offices are across the street, but his working day is bound up with Hillside Heights. The style he chose for the development is Early American. Chief virtues are the simplicity in their lines, the compact room arrangements, the addition of space by pushing the cellar stairs to the rear of the kitchen. There are but three basic types: the one-story, the one-and-a-half story, and the one-and-a-half story with a gable arrangement. But the variations on these types give all that can be desired to end deadly uniformity. In plan Hillside Heights displays a certain monotony which is dictated by the terrain. To make the best of it, Realty Associates have staggered building lines so that the facing rows of houses arch out from each other in bowlegged fashion. Sole considerable eyesore in the Hillside Heights layout is the arrangement of the electric wire posts, which have been sunk in the front lawns along the street. Messrs. Burchell and McGowan might well have considered allowing for a 2 ft. easement in the backyards, thereby permitting services to be brought in from the rear. Cost was the factor here considered. To serve the daily needs of the community, a square of buildings has been provided for stores, but no communal facilities have been arranged.

The Profit. The land in Hillside Heights is an L-shaped plat, on a high rolling terrain. Consisting of 93.95 acres, it cost Realty Associates $1,000 an acre. Originally they had planned to carve this land into 650 plots, but individual desire for larger yards has pushed the size of the average plot to 48 x 100 ft. On the basis of the first hundred houses and plots sold, the land and development of an average property in Hillside Heights costs the client $670, of which $110 is land cost. The extent of the firm's profit here is $50 a plot, since the selling price for the first hundred plots developed was $72,000.

Profit on the houses has come, as previously inferred, through the higher-priced products. Already prices have been forced up to take care of rising material costs. This rise has affected all houses save the $2,500 dwelling, still regarded as a profitable loss. At present the average house and plot in Hillside Heights sells for $3,218.80, this sales price being based on the first 100 units sold. Assistant Secretary Bill McGowan estimates the building cost on the average house to have been $2,345. Taking land costs into consideration, Realty Associates have netted an average of $203.80 per house, a total of $20,380.

In common with most builders, Realty Associates are cagy with their cost ledgers. Bill McGowan and Harry Burchell are doubly secretive, for within the last month certain acquaintances have come to their offices with the news that they are starting a development in the same price class nearer the city line, and would Realty Associates mind if they borrow Architect Driesler to draw up their plans? The request is of course not encouraged. However, by now Realty Associates is sure enough of its ground, confident enough of its future, to release the following breakdown of its construction costs, the figures being culled for an average of the first 100 houses:

Excavation and masonry	$365
Carpentry and flooring	270
Plastering	200
Roofing and sheet metal	140

*The FHA brought widespread use of diagonal sheathing to Long Island, and brought it to a group of builders so bungling that some (not Realty Associates) are currently allowing their carpenters to apply it without its meeting at the house's corners in a V, less sturdy a treatment than horizontal sheathing.

Charles E. Knell

Basic type C has a basement, attic space for two future rooms. On a plot 45 x 100 ft., this house costs $3,400, requires monthly payments of about $30.00, FHA plan. Architect: Benjamin Driesler, Jr.

Plumbing and heating	285
Lumber and trim	525
Hardware, rough and finish	50
Electric wiring and fixtures	70
Painting and decorating	125
Clothes dryer, range, linoleum, shades, medicine cabinet, landscape work, permits, surveys, architect's fees, water and gas services	215
Overhead and supervision	100
Total	$2,345

Consumer. In a year when a bearish forecaster picks a total of 375,000 new one-family dwellings for 1937, the most important factor in the equation of land to buyer is the buyer. THE FORUM has prepared a table of 100 such buyers: the same 100 whose houses and plots were examined above. At the moment, they are Hillside Heights. There might have been more, but Realty Associates preferred to pick and choose, so, on those summer nights when the four model houses stayed open until 11:00 P. M., dozens were not encouraged to buy.

A graph of these 100 buyers by age runs curiously counter to expectation. Abstract theory seems to point to the man over 40 as the most likely buyer of a house so relatively low in the amenities; at that age he presumably entertains less hope of financial advancement, is therefore more prepared to adjust himself to a twenty-year obligation to live in relative simplicity.

Yet in Hillside Heights, a full 49 per cent are between 25 and 35 years old, illustrative of the majority's willingness to take these homes not for their declining years but for their most gainful two decades. Bill McGowan explains this phenomenon as a realistic appraisal by the public of a world in which nothing is certain, where outlook must be sensible. From a quartet of buyers in their early twenties, the charted line rises sharply to the largest category of 28 in their late twenties:

Age	*No. of Purchasers*
20 — 24	4
25 — 29	28
30 — 34	21
35 — 39	17
40 — 44	11
45 — 49	6
50 — 54	3
55 — 59	5
60 — up	5
	100

The same trend is discernible in the earning abilities of these men. Only twelve of them have annual incomes between $1,000 and $1,499. When the bracket is lifted by $500, it embraces the largest group of buyers, 41 per cent of the 100. It then, like the age scale, drops off gradually:

Income	*No. of Purchasers*
$1,000 — $1,499	12
1,500 — 1,999	41
2,000 — 2,499	20
2,500 — 2,999	18
3,000 — 3,499	6
3,500 — up	3
	100

Better to orient these figures, it should be remembered that the income figures are based in some cases only on one wage-earner's salary, do not take into consideration savings, interest from bonds, possible earnings by another member of the household.

The greatest benefit that these 100 derive from Hillside Heights is in the amount of money they save. Of the 100, only six are paying more money to amortize their mortgages than they were in their old apartments. Others have moved from homes that they probably did not own clear. Most of them save from $4 to $15 a month: one young engineer saves $30 a month. Fuel and transportation costs, sole new expenses incurred and not included in monthly payments, total between $40 and $50 a year. A company bus carries the families to the nearby railroad station.

The market is, in general, made up from the predictable groups: civil service employes, clerks, retired railroad men on pensions, mechanics, chauffeurs. Some testimonial to the calibre of workmanship is afforded in the fact that among the clients are four electricians, two carpenters, a plasterer, a painter. However, sales, like lightning, have struck in strange places. Many a subdivider has gone into a bar or a dogwagon without thinking of the man back of the counter as a potential customer. One from each such walk of life has bought a house in Hillside Heights, as have also a seaman, a filling station attendant, a gardener, a receptionist, a butcher, a revenue agent, a groom, a steward, a commercial artist, a chef. As might be further expected, almost without exception the buyers came from near Hillside Heights. One man came from northern New Jersey; otherwise all are from nearby Brooklyn, Queens, or Nassau County, with a scattered few from Manhattan.

Charles E. Knell

Background. Nets like those from Hillside Heights do not come to him who whistles. Realty Associates is able to clear a nice profit while still selling plenty of house for the dollar because of experience. Realty Associates was founded in 1901. In 1929 its scope was slightly limited. At present Realty Associates, Inc. is just one company in a complicated corporate set-up at the top of which is New York Investors, Inc. Last month this company, as well as some of the others in the family of Prudence Co., Inc., Prudence Bonds Corp., and Realty Associates Securities Corp., was still in a state of upheaval brought about by court orders for reorganization. Realty Associates, Inc., confining its field to real estate and building, had kept its course unambiguous.

This company was originally founded to buy up Long Island land and sell it in anticipation of the expected boom. Realty Associates joined the throng of builders during the early Twenties, when any house that was thrown up would sell. The company got into the low-cost field when it started building summer cottages for $4,000. People insisted on using them as year-round dwellings. Eighteen hundred such houses went up in two years, in what is now a depressing neighborhood of near-slums. Later, it was 1,500 more expensive homes in Brooklyn. A development in Garden City has reached a total of some 800 homes. Another 1,200 have been built under the company's auspices in Queens, East Rockaway, and Freeport, Long Island. Such protracted knowledge of and experience in the Long Island market has amply equipped Realty Associates for Hillside Heights.

Personnel. Coincidental with the rise of the firm has been the rise of its president, Frank Fox. Originally a company office boy, President Fox currently earns the reward for his decades of service behind two swinging leather doors, where he has the reputation of disposing of his visitors with machine-gun rapidity. These decades have been paralleled by the steady employment of the same gang of workmen, through Depression, Recovery, Prosperity. Frank Fox can attribute the resultant good workmanship and gratitude instead of strikes and problems to this forethought.

The large-scale construction department of Realty Associates is no older than Harry Burchell's term of office with the company. He formed it in 1921, so that the firm might take full advantage of the housing shortage, and the boom of the next few years. Having risen to the vice presidency, he retired to go into business for himself. On his own, he built a couple of hundred homes, at the crest of the market, then reaffiliated himself with Realty Associates in 1929. He has been there steadily since.

Vice President Burchell is soft-spoken, but nonetheless his words fall in place like paving-stones. His self-assurance and authority are subtly applied. Perhaps the only one in Realty Associates' Brooklyn office with whom he would enjoy settling down to a scrap is his son, Harry, who is now the firm's advertising, publicity, and promotion director. Because the father constantly overflows with nervous energy, must have his mind occupied, he will go to a moving picture any and every night he can find a companion. An insomniac, he gets to the office at 8:00 every morning.

Basic type B is one and one-half stories, with gable. Here also provision has been made for two future rooms in the attic. This costs slightly less: $3,350, with monthly payments amounting to $29.00. Architect: Benjamin Driesler, Jr.

CONSTRUCTION OUTLINE

FOUNDATION: Walls—poured concrete. Cellar floor—concrete.
STRUCTURE: Exterior walls—⅞ in. beveled siding or wood shingles, 2 x 4 in. studs, ⅞ in. diagonal sheathing, waterproof paper, wood lath and 3 coats plaster. Floor construction—2 x 8 in. fir joists, 16 in. o.c., ⅞ in. rough flooring, ⅞ in. T. & G. oak finished flooring.
ROOF: Construction—2 x 6 in. fir rafters, 20 in. o.c., covered with ⅞ in. roofing boards, tar felt and asphalt shingles.
CHIMNEY: Brick, Terra Cotta flue lining.
SHEET METAL WORK: Flashing—copper. Gutters and leaders—Toncan metal.
WINDOWS: Sash—wood, double hung. Glass—double strength.
FLOORS: All rooms ⅞ in. T. & G. oak except tile in bath and linoleum in kitchen.
WALL COVERINGS: All rooms—wallpaper, Richard E. Thibaut, Inc. Bathroom—Sanitas, Standard Textile Products Co.
WOODWORK: White pine throughout, except interior doors of fir.
HARDWARE: Interior and exterior—brass.
PAINTING: Interior—2 coats lead and oil. Floors—3 coats shellac. Exterior walls and sash—2 coats lead and oil.
ELECTRICAL INSTALLATION: BX flexible cable. Switches—tumbler, Harvey Hubble, Inc. Fixtures—Shapiro & Aronson, Inc.
PLUMBING: All fixtures by Standard Sanitary Manufacturing Co. Soil pipes—extra heavy cast iron. Water pipes—copper.
HEATING: Warm air or steam as alternate extra. Boiler—coal fired, The Thatcher Co. Radiators—American Radiator Co., Jenkins valves. Hot water heater—Boyton stove.

PURDUE'S HOUSE OF WOOD

affords the third of five cost analyses and costs 31 cents a cubic foot. Pointers on plywood.

In its promotional drive for wood in small house construction, the National Lumber Manufacturers Association has latterly sponsored a number of houses, three of them in Washington, following the small house specifications of the FHA (Arch. Forum, Aug. 1936, p. 157). Progressive, the NLMA has also put its oar into Purdue University's Housing Research Project. Last month on Purdue's campus the result of this cooperation appeared when the University's Housing Researchers released their detailed cost analysis of a newly built wooden house christened No. 5.

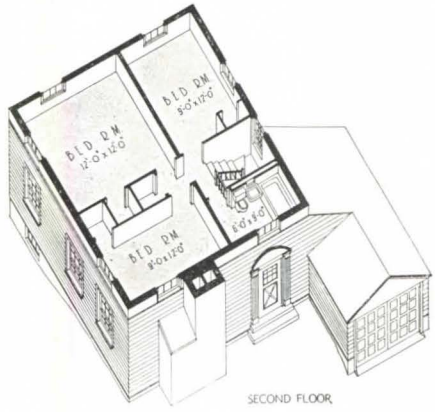
House No. 5, like No. 1 (wood frame and stucco) and No. 4 (steel) (Arch. Forum, Dec. 1936, p. 556), was erected to answer the special problem of housing two adults and two children of the opposite sex for less than $5,000, the price to include the cost of a garage. Its cost was $4,986, exclusive of the cost of land, grading, site development, and architect's fee. Like the others, it had the benefit of good planning, in this case by Chicago's McNally & Quinn. Sixty-eight working days were required substantially to complete it.

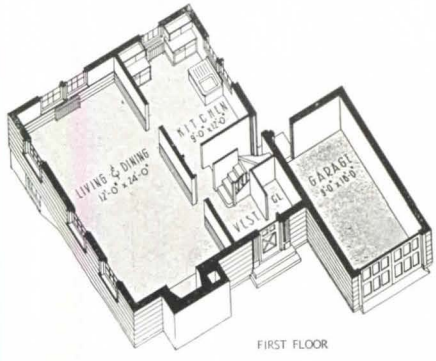
Technique in the use of the square foot and cubic foot costs of houses varies, and their application is only useful in the light of such other considerations as local conditions, wages, and costs, construction type, and equipment. But the Project gave a good comparison with Houses Nos. 1 and 4 by computing No. 5's area on the basis of the first and second floors, the garage, and half the basement. A contract cost of $4,986 and a gross area of 1,564 sq. ft., produced a cost of $3.18 per sq. ft. With a cube of 15,790 cu. ft., the cost per cubic foot was 31 cents.

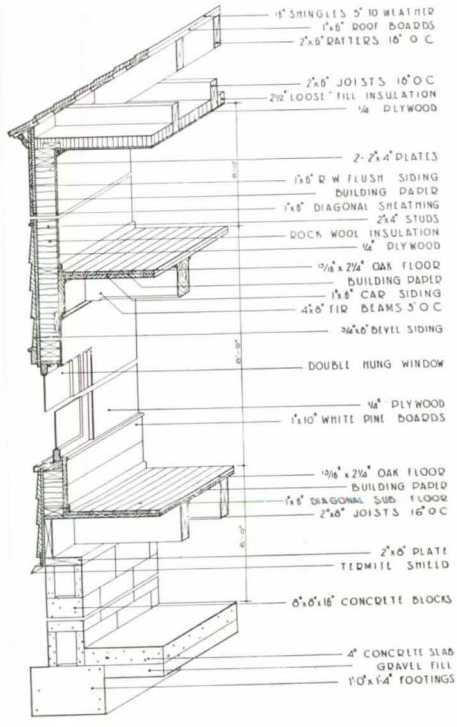
The construction cost summary (see next page) shows a total labor cost of $1,343.80. This is 26.9 per cent of the total. Materials cost $2,828.10, or 56.8 per cent, again disproving the classic plaint that excessive labor costs are a major restrictive influence in the industry. The balance of the total, $814.10 or 16.3 per cent, represents profits or overhead of general and subcontractors. Subcontracts totaled $1,136.60. Of this amount $806.85 was cost, $329.75 was profit or overhead. Thus, average profit or overhead was 40.8 per cent of cost, minimum profit being the plumber's 30 per cent, and maximum the painter's 57 per cent.

As with the other houses, House No. 5 has not stopped in its function as laboratory. Costs have been thoroughly explored by the Project's timekeepers, who recorded and checked labor time and material quantities. For the future, fuel and upkeep costs are to be tabulated. The house's occupants, Purdue University faculty members, find the house fairly efficient in plan. Chief sore spot seems to be the stairway: the stairwell is cramped, and the use of stair winders is feared as dangerous either for old people or children. The small entrance hall eliminates need for using any one room as a thoroughfare to others, however, and the occupants find the arrangement of the service and garage door convenient.

Chief difficulty encountered in construction came in the use of unselected plywood for the walls and ceilings; a wide variation in grains resulted. Specifications called for application of stain, shellac and wax. But to overcome the dissimilarity in the light and dark areas of the wood, it was necessary to stain it a much darker tone than would have been used on selected plywood. Upshot has been the effect of making the rooms look small and confining.







TYPICAL WALL AND FLOOR SECTION

J. C. Allen & Son

Five Rooms for $5,000

CONSTRUCTION COST SUMMARY: HOUSE NO. 5

GEN. HEADING OF WORK	SUB-HEADING OF WORK	SPECIFIC JOB	Labor	Material	Labor & Material	Profit & Overhead	Sub-Total	Total Cost	Percent of Cost
EXCAVATION			$ 48.40	$	$ 48.40	$	$	$ 48.40	1.0
FOUNDATIONS	FOOTINGS		8.80	37.80	46.60		46.60		
	WALLS		71.85	132.85	204.70		204.70		
	GIRDER & POST		2.70	8.20	10.90		10.90	262.20	5.2
CONCRETE FLOORS	FILL	BACKFILL	11.20	8.95	20.15		20.15		
	CONCRETE WORK	MIXING & POURING	18.25	57.30	75.55		75.55	95.70	1.9
ACCESSORIES	STEPS, ETC.		12.70	11.35	24.05			24.05	0.5
OUTSIDE WALLS	FRAMING		48.00	87.95	135.95		135.95		
	SHEATHING		41.70	84.10	125.80		125.80		
	SIDING	FLUSH & BEVEL	117.90	185.65	303.55		303.55		
	INSULATION		8.40	34.35	42.75		42.75		
	INTERIOR FINISH	PLYWOOD & BOARD	58.95	116.05	175.00		175.00	783.05	15.7
PARTITIONS	FRAMING		39.10	35.05	74.15		74.15		
	WALL FINISH	PLYWOOD & BOARD	76.95	135.20	212.15		212.15	286.30	5.8
1ST FLOOR	FRAMING	JOIST, SUB-FLOOR, ETC.	23.30	45.25	68.55		68.55		
	WOOD FLOORING		25.05	39.85	64.90		64.90		
	LINOLEUM	LINOLEUM & BASE	8.85	42.05	50.90	*	50.90	184.35	3.7
2ND FLOOR	FRAMING	JOIST, SUB-FLOOR, ETC.	34.30	74.80	109.10		109.10		
	CEILING FINISH	PLYWOOD & BOARD	7.20	16.25	23.45		23.45		
	WOOD FLOORING		29.95	50.20	80.15		80.15		
	LINOLEUM	LINOLEUM & BASE	2.25	13.90	16.15	*	16.15	228.85	4.6
ROOF	FRAMING	JOIST & RAFTERS	27.50	90.60	118.10		118.10		
	ROOFING	SHINGLES, FLASHING	24.75	58.60	83.35		83.35		
	CEILING FINISH	PLYWOOD	20.70	54.75	75.45		75.45		
	INSULATION		1.80	9.45	11.25		11.25	288.15	5.8
MILLWORK	DOORS	COMPLETE	54.90	229.75	284.65		284.65		
	SASH	COMPLETE	55.80	150.00	205.80		205.80		
	TRIM	MOLDS, SHELVING, ETC.	30.85	4.70	35.55		35.55		
	CABINETS	KITCHEN & BATH	8.10	76.00	84.10		84.10		
	SCREENS	COMPLETE	12.15	64.00	76.15		76.15		
	SHUTTERS	COMPLETE	8.55	56.85	65.40		65.40	751.65	15.0
STAIRS	1ST STORY	FRAME & FINISH	53.55	84.50	138.05		138.05		
	BASEMENT		7.20	30.45	37.65		37.65	175.70	3.5
HEATING	CHIMNEY†	BRICK WORK	28.25	39.50	67.75		67.75		
	FUEL BIN	FRAMING	4.95	11.65	16.60		16.60		
	ROUGH	STEAM PIPE, ETC.	28.15	25.45	53.60	18.90	72.50		
	FINISH	FURNACE & RADIATORS	21.40	220.80	242.20	85.30	327.50	484.35	9.7
FIREPLACE	CHIMNEY† MANTEL		33.20	75.45	108.65			108.65	2.2
PLUMBING	ROUGH		40.65	54.95	95.60	28.85	124.45		
	FINISH	FIXTURES & FITTINGS	17.55	110.00	127.55	38.60	166.15	290.60	5.8
ELECTRICAL	ROUGH		25.50	35.10	60.60	18.25	78.85		
	FINISH	PLATES, FIXTURES	6.00	51.60	57.60	17.20	74.80	153.65	3.1
PAINTING	EXTERIOR	3 COATS	45.00	38.55	83.55	48.10	131.65		
	SHUTTERS, SCREENS	3 COATS	21.00	9.10	30.10	17.10	47.20		
	INTERIOR	STAIN, SHELLAC, WAX	70.50	29.20	99.70	57.45	157.15	336.00	6.8
TOTALS			$1343.80	$2828.10	$4171.90	$ 329.75		$4501.65	
			General Contractor's Overhead and/or Profit					$ 484.35	9.7
GRAND TOTAL AND CONTRACT PRICE								$4986.00	100.0

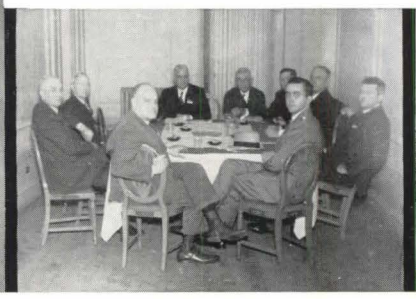
* Profit and overhead included in material cost.
† One-half chimney cost charged to heating and one-half to fireplace.

Genial Herbert U. Nelson, back from a hard-working summer's vacation in Europe, retailed his findings on foreign housing and methods of taxation.

Photos, Victor Harlow

A lean dark horse, Paul E. Stark loped home the winner in the election for 1937's president. His forte: taxation. His record: Madison's biggest home builder.

Florida's 1936 President Walter Rose assumed the role of boom's prophet, still later the role of Carnival's King.



The nominating committee. In the foreground, Philadelphia's famed Appraiser Philip W. Kniskern.

Despite three dances, the staff—even pretty Clerk Hazel Conroy—perforce was busy with 120-odd meetings. Right, an Herb between two Roses.

THE REALTORS' 29TH ANNUAL CONVENTION

J. C. Nichols (left), who made famous Kansas City's Country Club District, is the South Central Region's Vice President. Walter Schmidt (right), onetime NAREB president, sired and raised to lusty adolescence the new research program.

Another onetime president, Hugh Potter (left), is officially no longer active. Actually, fellow-realtors still listen to him with the deference they now accord Waverly Taylor (right), young but assured voice of the nation's builders.

For five and one-half days last month, 1,211 men, some carrying walking sticks made of sugar cane, some wearing badges saying "Welcome," all wearing badges showing their status as delegates to the 29th annual convention of the National Association of Real Estate Boards, trudged from room to room and from floor to floor of New Orleans' Roosevelt Hotel in an effort to miss as few as possible of the 120-odd meetings scheduled.

First three days brought boom-talk from President Walter Rose and a message from President Roosevelt, tactfully asking private capital's cooperation for Government housing (Arch. Forum, Dec. 1936, p. 3). Far from following the lead of the mortgage bankers and the building and loaners who spent most of their convention time lambasting the FHA, the realtors endorsed it heartily, advocated its extension, cheered FHA administrator Stewart McDonald's speech outlining an enlarged scope.

But the NAREB's Housing Committee declared: "(We) reiterate opposition to housing projects built by the Federal government in our cities. (They) antagonize

local communities . . . We suggest the plan of developing limited dividend or public utility housing companies. If such companies cannot obtain their complete financing at normal interest rates from ordinary sources, we suggest that they receive credits or loans from the Federal government . . . The matter of eliminating slums (is) a separate problem. We recommend that the local government undertake demolition."

Only FHA item to be condemned was the large-scale housing program currently being pushed by Miles Colean. An interested bystander was the Mortgage Bankers' Secretary-Treasurer George H. Patterson who conducted a buttonhole attack against the FHA, decried loans on 80 per cent of appraised valuation as "too high" and "speculative."

A happy few heard witty Realtor H. C. Brady of Wichita, Kan., leaven the customary convention dough: "It is time to let the buyer in on the truth that a bargain is only a property in which the buyer has failed to discover the defect . . . It isn't difficult to build a better mouse trap, the trick is to sell it . . . People are still marrying, having children, and dying with a continual change in their housing requirements that creates a sales opportunity in houses already in being that is sufficient to keep a good broker busy if he never sold a new house."

By mid-convention the realtors had settled down to most of their familiar plaints, a few new and constructive moves. Most familiar jeremiad: a unanimous resolution against current taxation practices. Most constructive action: unanimous approval of the National Real Estate Foundation, created by Past President Walter S. Schmidt of Cincinnati, O. (Sage of the Queen City), to provide "a centralizing agency to disseminate technical education in real estate principles and methods to be carried on." Realtor Schmidt's ideas include a detailed study of slums and city planning, the preparation of practical textual material for use in the real estate courses currently offered at some 85 colleges and universities.

Delegates at play were kept busy. There were dances three nights, the Hawaiian delegation—which sought the 1937 convention—entertaining at one with leis, Hawaiian drinks, music, and grass-skirted dancing girls. Climax came in the Municipal Auditorium, with the Louisiana Purchase ("History's Largest Real Estate Transaction") being depicted in pageant at a costume ball.

Last sessions brought a struggle for 1937's presidency. When the realtors appoint a nominating committee, it means something, is more than a figurehead to stamp approval on the heir apparent. Pre-election rumors named J. C. Nichols (famed developer of Kansas City's Nichols land), E. A. MacDougall (colorful "boss of Jackson Heights"), Stanley C. Hanks of Springfield, Ill., but the nominating committee came up with a dark horse. Lank, bespectacled Paul E. Stark, of Madison, Wis., succeeded Walter Rose on the first of this month.

Tall (6 ft. 5 in.), spare, gracious, soft-spoken, President Stark is likewise president of the unincorporated company that bears his name. At Nebraska a champion shot-putter, he still finds time to play handball in the basement of his company's building, where also still work most of the fifteen employes who have been with him for two decades. His chief interests are in his real estate board, which he helped found, and in Madison's educational programs, which affect his five children. He is, like a good NAREB president, optimistic about real estate's future, and is justly considered an authority on the realtor's bitterest bone of contention, taxation.

A BOND ISSUE FOR BUILDING

appears in Arkansas, guaranteed by the U.S. It provides seven-figure money and 4½ per cent returns.

Last month while Wall Street was oversubscribing $700,000,000 of seventeen-year Treasury bonds bearing the all-time record low yield of 2½ per cent, three banks in Arkansas were congratulating themselves on the acquisition of $320,000 worth of bonds which were not only paying the currently unprecedented rate of 4½ per cent, but which in addition were guaranteed to yield at least 3 per cent until maturity by the U.S. Government itself. Such encumbrances are without precedent in financial circles.

These bonds are the obligation of the Crossett Housing Corporation, joint creation of a lumber company and a few far-sighted citizens of Crossett, Ark., and will be secured by the rentals from 199 one-story frame houses and two stores. Sold to the First National Bank of Eldorado ($250,000), the Union Bank and Trust Company of Monticello ($20,000), and the Bank of Crossett ($50,000), the proceeds have been augmented by those from a $120,000 stock issue for equity. The basic 3 per cent guarantee of the U.S. Government is secured in consideration of the participation of the Federal Housing Administration according to a formula first revealed in The Forum (November, 1935, p. 520). In brief the procedure is that already established by the FHA for its large-scale housing projects, with the significant addition of a bond issue. In practice, it works like this:

1. Plans for the proposed development are submitted to the Large-Scale Housing Division of the FHA for approval as to necessity, planning, market, and financial procedure. (Arch. Forum, Aug. 1936, p. 150.)

2. In the event of FHA approval, attorneys for the sponsor, the trustee, and the participating institutions draw up a trust indenture based on a standard form developed by the FHA. Upon this indenture is based a bond issue. In addition to the customary mortgage requirements, this indenture provides for the establishment of reserves, and of a schedule of amortization which will retire the debt through sinking fund operations over a period of 25 years.

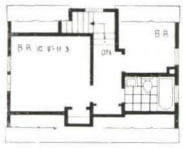
3. Also according to this indenture, the issuing corporation is required to make regular payments covering annual mortgage insurance premiums, bond interest, and amortization, and at the same time to manage the property involved according to regulations developed by the FHA.

4. Finally, and most significantly, the FHA—in the person of its Administrator—is issued a small block of first preferred stock which has minority voting rights including the right to elect one director until the issuing corporation violates one of its agreements as to rents, charges, capital structure, rate of return, or methods of operation. In the event of violation, the Administrator's stock immediately acquires the right to elect all but one director and majority voting rights. In other words, in the event of default the Administrator virtually becomes the receiver, and does so without the expenses and delays of the customary method. When the default in question is cured, the Administrator resumes his minority position; and when the obligation has been retired at the end of 25 years, he steps out of the picture entirely, resigning even his minority interests.

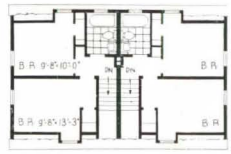
Largely the work of smart, young Executive Assistant Martin J. Roess, Jr., FHA legalite, the arrangement is ingenious in the extreme. The inspection and regulation of the project is in the hands of experts whose talents cannot be minimized. Such supervision plus the added attraction of insurance promises to attract capital on favorable terms. Furthermore, this type of indenture does away with the greatest fault hitherto inherent in this type of large-scale financing: the creation, in the event of default, of the bondholders protective committee. The trustee is under mandatory obligation to foreclose upon the occurrence of a default. Thus is obviated the necessity for rounding up scat-

(Continued on p. 80. A Portfolio of Large-Scale Housing is on pp. 78, 79)

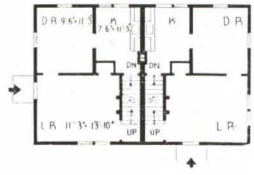
In 1935 in Meadville, Pa., a private corporation was formed to ease a shortage in industrial housing. The FHA agreed to insure a $800,000 thirty-year mortgage paying 4 per cent, and the financing was handled by the Pennsylvania State Workmen's Insurance Board. Land valued at $91,000 and a stock subscription of $121,000 comprised the equity. Seventy of the 202 homes so financed were opened last month. Three of the eight basic plans are reproduced below. Rentals average $7.50 a room. Notice that Meadville was NOT financed by a bond issue; but its duplicate could arrange to get one insured by the FHA. Above, the total result, named Hillcrest. Architects: E. A. and E. S. Phillips.

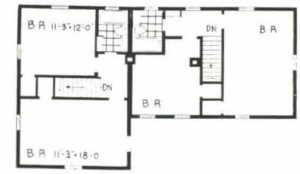


RENT: $30

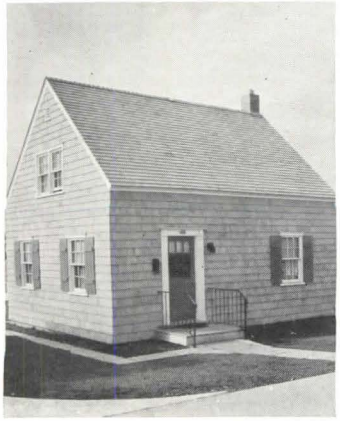


RENT: $36





RENT: $37.50



Stanton Studio

Commercial Photo C

Only project of the ten detailed below actually to issue bonds for housing is the Crossett Housing Corp. But the FHA would be glad to insure a bond issue on other projects like any of the ten. Reading down at the left are pictured the developments named Potomac Terrace Apartments, Falkland Properties, Inc., and Chester Crest. Of these only the first has not yet completed its financing. Their facades call to mind those apartments which in a less happy day were forced to resort to the notorious guaranteed mortgage for funds. In the table below the rental schedule and the equity requirements are particularly noteworthy.

LOCATION	Mt. Vernon N. Y.	Bronx N. Y. C.	Rye N. Y.	Arlington Co. Va.	Arlington Co. Va.	Meadville Penna.	Crossett Ark.	Silver Spgs. Md.	Arlington Co. Va.	Arlington Co. Va.
PROJECT	CHESTER CREST	EASTERN BOULEVARD GARDENS	FORD GARDENS	COLONIAL VILLAGE	COLONIAL VILLAGE EXTENSION	MEADVILLE HOUSING CORP.	CROSSETT HOUSING CORP.	FALKLAND PROPERTIES INC.	POTOMAC TERRACE	BUCKINGHAM
AMOUNT OF MORTGAGE	$1,150,000	$2,650,000	$500,000	$ 875,000	$1,480,000	$ 800,000	$320,000	$ 840,000	$1,925,000	$1,750,000
TERM OF MORTGAGE	26½ yrs.	26½ yrs.	26½ yrs.	15 yrs.	15 yrs.	26½ yrs.	26½ yrs.	26½ yrs.	31½ yrs.	26½ yrs.
TOTAL CAPITALIZATION	$1,602,340	$3,460,000	$685,000	$1,128,600	$1,785,390	$1,012,000	$440,124	$1,100,000	$2,412,475	$2,230,000
AMOUNT OF EQUITY	$ 452,340	$ 810,000	$185,000	$ 253,600	$ 380,810	$ 212,000	$120,124	$ 260,000	$ 487,475	$ 480,000
TOTAL BUILDING COST	$1,198,900	$2,677,824	$528,108	$1,101,100	$1,546,720	$ 699,940	$391,180	$ 810,000	$1,839,864	$1,757,180
NUMBER OF WHOLE ROOMS	934	2,500	450	1,026	1,563	1,072	710	795	1,649	1,700
NUMBER OF RENTAL ROOMS	1,068	2,875	501	1,026	1,598	1,072	710	826	1,699	1,700
NUMBER OF UNITS	279	750	126	276	462	202	199	178	462	456
AVERAGE RENTAL p.r.p.m.	$18.00	$14.00	$16.00	$12.76	$13.50	$7.28	$4.70	$14.50	$13.50	$13.00
AVERAGE RENTAL p.f.q.p.m.	$68.90	$53.67	$63.62	$47.45	$46.69	$38.61	$16.77	$67.29	$48.00	$48.46
MORTGAGE PER ROOM	$1,231	$1,060	$1,111	$833	$905	$728	$450	$1,132	$1,112	$1,030
SPONSOR	Anthony Morrell & Associates	Jacob Aisinberg	Bernard Trubin	Gustave Ring	Gustave Ring	Meadville Housing Corp. (Local Citizens)	Crossett Lumber Co.	Blair Mgr. Corp. (Blair Est.)	Simon & Sumner Engineering Co.	Allie Freed (Paramount Comm.)
LENDING AGENCY	Mfgs. Trust (Const.) RFC Mtg. Co.	RFC Mtg. Co.	RFC Mtg. Co.	N. Y. L. I. Co.	N. Y. L. I. Co.	Pa. State Wkmens. Ins. Bd.	Local Banks Bond Issue	RFC Mtg. Co.	Union Central Life Ins. Co.	Ins. Co.'s Bond Issue
STATUS	Under Construction	Ready for Closing	Ready for Closing	In Operation	In Operation	Complete	Under Construction	Under Construction	Ready for Closing	Ready for Closing

(*Continued from page 77*)

tered bondholders, obtaining the deposit of the bonds, pledging them to raise funds to finance the foreclosure. The indenture itself sets up reserves to cover the trustees' expense in foreclosure. Thus in the event of default, the trustee simply on its own motion institutes foreclosure proceedings, buys the property in, and transfers it to the FHAdministrator, who keeps it until the fault is adjusted.

In the event of foreclosure the bondholders receive debentures of the Mutual Mortgage Insurance Fund* guaranteed by the Government on all projects initiated before July, 1937, and paying 3 per cent interest. Theoretically, any project initiated after that date will become the obligation of the Mutual Fund but not of the Government. However, the FHA is now seeking, and seems to have assured for itself, legislation in the coming session which will continue the guarantee of the Government with respect to this fund.

New Money. During the Twenties the investment market absorbed about three billion dollars worth of securities based on large-scale apartment, hotel, and office buildings, and offered in the form of split, participating mortgages. With the Depression this market collapsed, and destroyed confidence in its investment—whether under the egis of companies like S. W. Straus or under the now notorious soubriquet of "guaranteed mortgage"—with the result that today it is virtually impossible to attract any considerable sums of public money into this field. In retrospect the main fault in this type of financing as then practiced appears to be that the properties were either poorly conceived or dishonestly administered. Subsidiary faults were the advancement of the pretext that any property could in effect guarantee itself, and that tremendous difficulties were encountered in attempting to salvage the properties by means of bondholders' committees in the event of default.

The result is that a market which in the past decade was three billion dollars big is today starving to death for want of public confidence. In the bond issue now being sponsored by the FHA each of the faults which occasioned the collapse of the old form of investment has been avoided. Conception and management are subject to the most rigorous and realistic type of scrutiny. The reorganizations which may occur have been simplified to the point where they operate automatically. And the guarantee for the funds resides not in the properties themselves but in the Government. Which is as good as any guarantee today can be.

At present the FHA-insured bonds have been used only for housing developments. These developments, incidentally, are not to be confused with those erected by the limited dividend corporations which operated with funds from the RFC early in the depression to erect such projects as Manhattan's Knickerbocker Village. The acceptability of a project for insurance by the large-scale division of the FHA is not based on social welfare, but simply on financial soundness. That the return is limited to 6 per cent during the period of 25 years required to retire the obligation is due simply to the technicalities of the laws under which the FHA was conceived. A glance at the projects pictured on page 79, together with their financial set-up, will reveal that they are conceived on established commercial lines. It is hoped in the near future that this type of bond issue financing will develop to the point where it will be used for office buildings, and even hotels.

Split? There remains one substantial difference—quality aside—between the old type of bond issue and that now being insured by the FHA. Whereas the old type of bond could be split up and sold to the public generally, large-scale housing bonds *under present policy* can be sold only to institutional investors at private sales. Thus far no public offering has been permitted. Institutional investors purchasing such bonds at private sales are not authorized under the current regulations in turn to issue to the general public any type of obligation based on ownership of these bonds. And although these bonds can be split into denominations smaller than $1,000 for purposes of participation by institutions, their resale to the public would be considered a circumvention of present policy. However, if these institutional investors purchase FHA-insured large-scale bonds at private sale with the intent to hold them, but later determine to sell them to the public, there is no restriction on their right to do so. In other words, the present policy prohibiting public offerings is only a policy, and *there exists nothing in the regulations to prevent bonds from later being sold in the open market.* Present indications are that the FHA will prefer to let this interpretation of the policy continue until market conditions make a public offering more feasible. Meanwhile the Securities and Exchange Commission is busy preparing a series of recommendations based on its report of last Summer, and it is understood that these recommendations will follow substantially the same line of reasoning taken by the FHA in its own efforts to rescue the large-scale building market. Certainly so realistic a plan will not languish for want of private encouragement.

* The assets of this fund are slightly over $15,000,000 and its income is approximately $500,000 a month. It is derived from appraisal fees at the rate of $3 per $1,000 (on the single but not on the large-scale mortgages), mortgage insurance premiums, and interest on the funds (which are invested in Government bonds). The outstanding liabilities of the fund currently are $12,677 in debentures, and interest at 3 per cent on the outstanding debentures.

A RAISE FOR LABOR

is prophesied by strikes, confirmed by wages.

¶ On June 28 in Idaho 2,500 loggers struck for higher wages and better working conditions. Governor C. Ben Ross declared martial law.

¶ On August 27, in New York 12,000 union painters, decorators, and paperhangers struck for enforcement of the union wage scale of $9 for a seven-hour day. Nine days of strike brought a partial victory.

¶ On October 25 the Federation of Flat Glass Workers called out 6,000 workers in six plants of the Pittsburgh Plate Glass Company in a demand for a 10 per cent wage increase. On November 9 the strike spread to the Libbey-Owens-Ford plant in Toledo where the "sit-down strike" was popularized.

¶ On November 26, in the face of a $100 bonus 1,200 employes of Midland Steel struck for a 10 per cent raise, got substantially what they wanted on December 4.

Such news all during 1936 has been the most visible harbinger of rising construction costs. That craft prices were also rising, though less ostensibly, was revealed last month with the release of the annual wage survey of the Builders Association of Chicago. Although no labor survey is able to take full account of the prevalence of sub-union wages paid to union workers, the bulletin of the Builders Association is more realistic than most:

City	1935	1936
BOSTON:		
Bricklayers	1.30	1.50
Carpenters	1.17½	1.25
Cement Finishers	1.25	1.35
Electricians	1.25	1.37½
Elevator Constructors	1.33	1.52½
Hoisting Engineers	1.17½	1.37½
Iron Workers	1.20	1.37½
Laborers	.70	.77
Marble Setters	1.30	1.50
Plasterers	1.37½	1.50
Plumbers	1.25	1.37½
Steamfitters	1.25	1.37½
CHICAGO:		
Carpenters	1.31¼	1.50
Cement Finishers	1.31¼	1.50
Glaziers	1.70	1.80
Hoisting Engineers	1.31¼	1.50
Laborers	.82½	.95
Ornamental Iron Workers	1.31¼	1.50
Painters	1.33 1/3	1.50
Structural Iron Workers	1.42½	1.50
SAN FRANCISCO:		
Asbestos Workers	.80	1.12½
Bricklayers	1.12½	1.50
Carpenters	.90	1.12½
Cement Finishers	.90	1.12½
Electricians	1.00	1.25
Hoisting Engineers	1.00	1.12½
Iron Workers	1.20	1.37½
Lathers	1.00	1.12½
Plumbers	1.00	1.25
Steamfitters	1.00	1.25