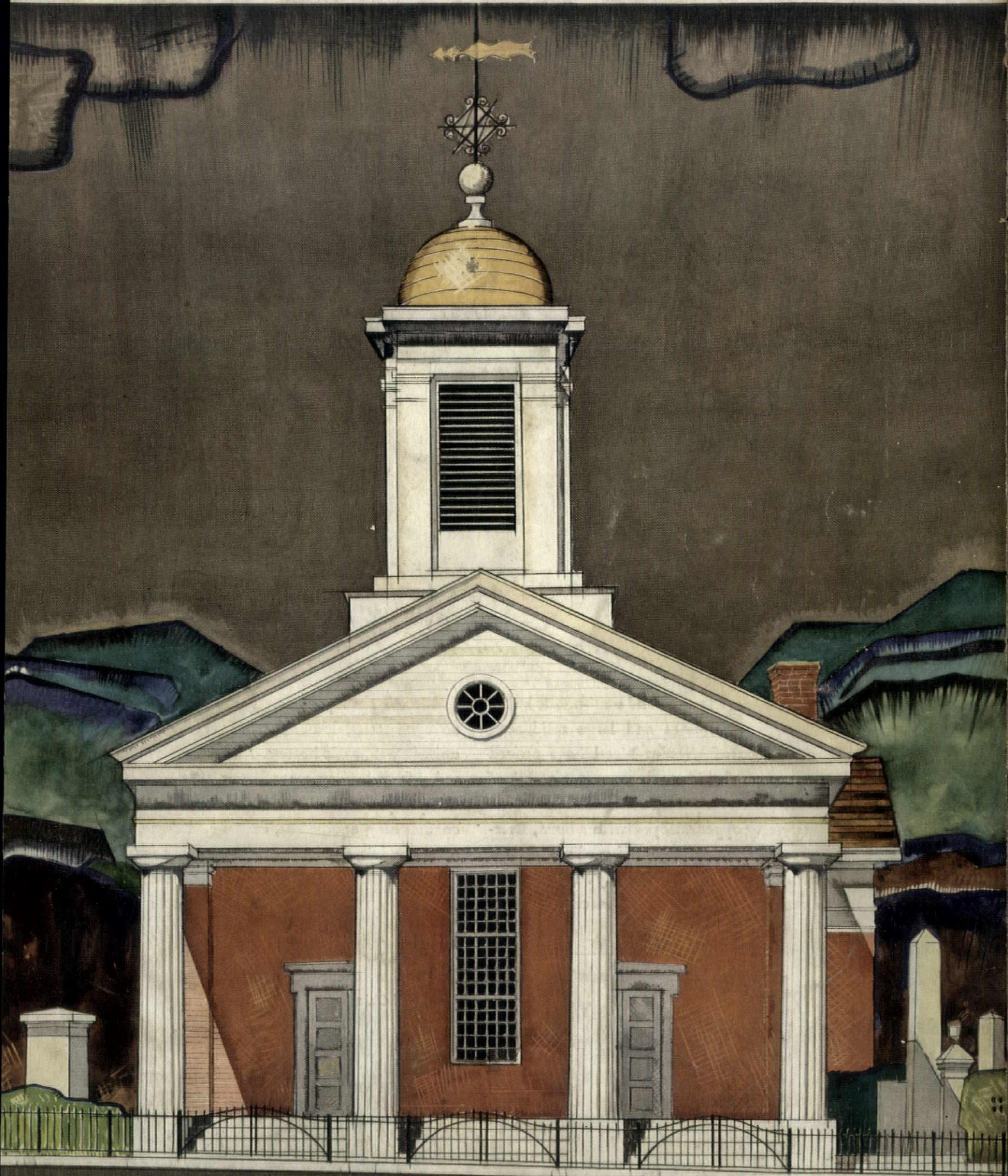
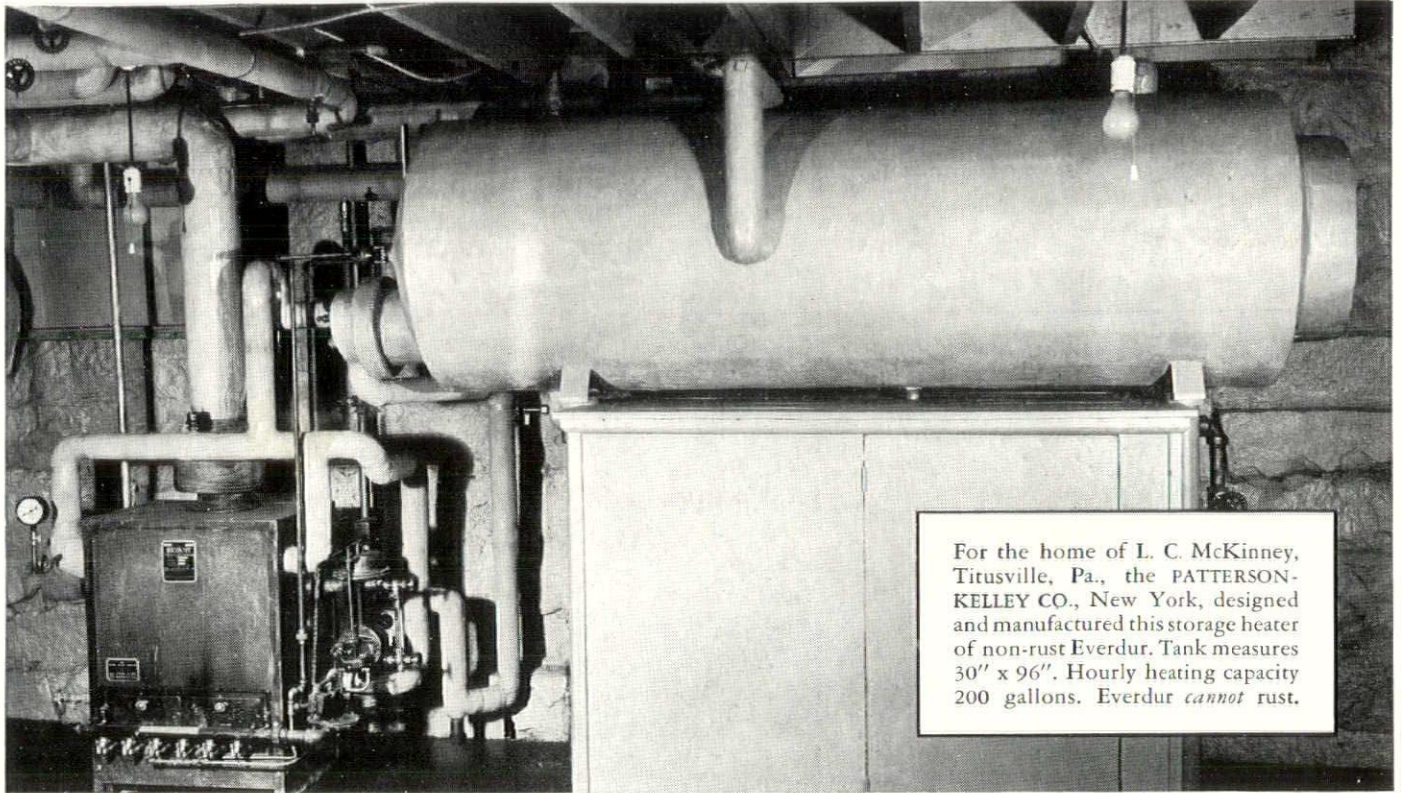


# AMERICAN ARCHITECT



MARCH 1936 • LE CORBUSIER • MEXICO • CHURCHES • PAINT



For the home of L. C. McKinney, Titusville, Pa., the PATTERSON-KELLEY CO., New York, designed and manufactured this storage heater of non-rust Everdur. Tank measures 30" x 96". Hourly heating capacity 200 gallons. Everdur *cannot* rust.

*In the Home, too...*

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# EVERDUR METAL *for* TANKS

# AMERICAN ARCHITECT

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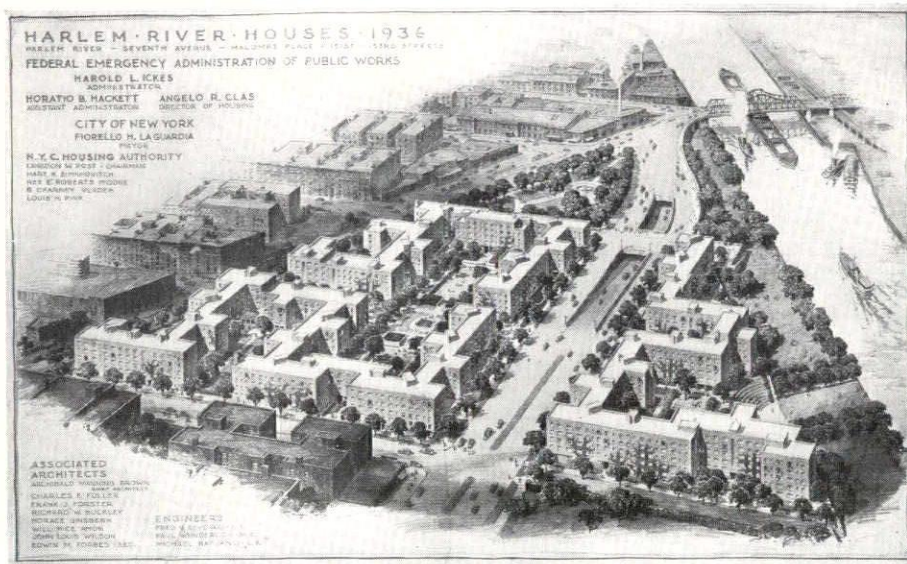
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Another of PWA's New York low-rent housing projects will cost \$4,700,000 and have 574 apartments. Harlem River Houses, at 153rd Street and the Harlem River, will bring bright airy rooms and wide lawns to the city's most densely populated area

## PARADE OF HOUSING PASSES

• Just one month ago housing occupied the center of the political stage. Press reports glibly spoke of \$300,000,000 subsidy as being almost a certainty. The names of Senator Robert F. Wagner, Allie S. Freed, Chairman of the Committee for Economic Recovery, Peter S. Grimm, Housing Co-ordinator, Secretary Ickes, and Harry L. Hopkins were front page features. Everything, supposedly, was set for the biggest housing program ever attempted—a program that would dwarf the efforts of FHA, HOLC, and other alphabetical agencies.

But talk of and plans for housing have gradually dwindled during the last thirty days. Legislators have realized that to appropriate any considerable sum for a housing subsidy at the present time would strain an already burdened treasury, and would be, therefore, poor political strategy. Housing, from its center stage position, has momentarily been relegated to a place in the "wings," and it seems likely that for this session of Congress it will remain just another off-stage voice.

Further indication that subsidy of housing has been postponed can be seen in Stewart McDonald's announcement that an agreement has been reached between FHA and the RFC Mortgage Company whereby RFC will furnish the facilities of a mortgage discount bank to purchase mortgages given for new construction and insured by the

Federal Housing Administration. Intended to stimulate further the flow of capital into the mortgage field by putting RFC's resources behind FHA's insured mortgages, this measure undoubtedly is designed to meet the anticipated upward trend in new home construction.

## RFC BUYING TERMS

• In an announcement to the 10,000 financial institutions qualified to use this new mortgage service, RFC laid down its terms for mortgage buying:

1. That RFC will purchase FHA's insured mortgages from original mortgagees for the unpaid principal amount less one-half of one per cent, plus accrued interest, where the mortgagee agrees to continue servicing them, and will allow the mortgagee to retain the service charge plus one-half of one per cent of the unpaid principal balance outstanding at the time interest payments are made;

2. That only mortgages that will yield RFC 4½ per cent interest will be bought;

3. That insured mortgages purchased by RFC will be available for sale to approved mortgagees desiring to acquire them for their portfolios.

Thus, with this additional source of liquidity, FHA and RFC hope to meet the need for sound financing of home construction. Even the most optimistic observer, however, could not see in this action the financial machinery necessary

for low-cost housing that might have been provided by Senator Wagner's subsidy bill.

## RECOVERY COMMITTEE REPORTS

• While plans for huge Federal appropriations languished, another housing panacea was examined and found wanting. From Washington, therefore, came the announcement that an unidentified New Deal agency would soon issue a confidential report sharply criticizing the findings and recommendations of the Committee for Economic Recovery.

Acting only in an advisory capacity to the government, Allie S. Freed and his Recovery Committee have gone to great lengths to point out the housing problem and to call upon the initiative of private enterprise. The reports have been called "dramatic, concise, and forceful." They have repeatedly urged lower financing costs, but, says the New Deal, "they have failed to point out how this objective can be attained."

The preliminary criticism states: "The program is based entirely on speculative or operative building for sale. The provision of housing facilities for rent is almost entirely neglected. These facilities must be provided in any comprehensive program.

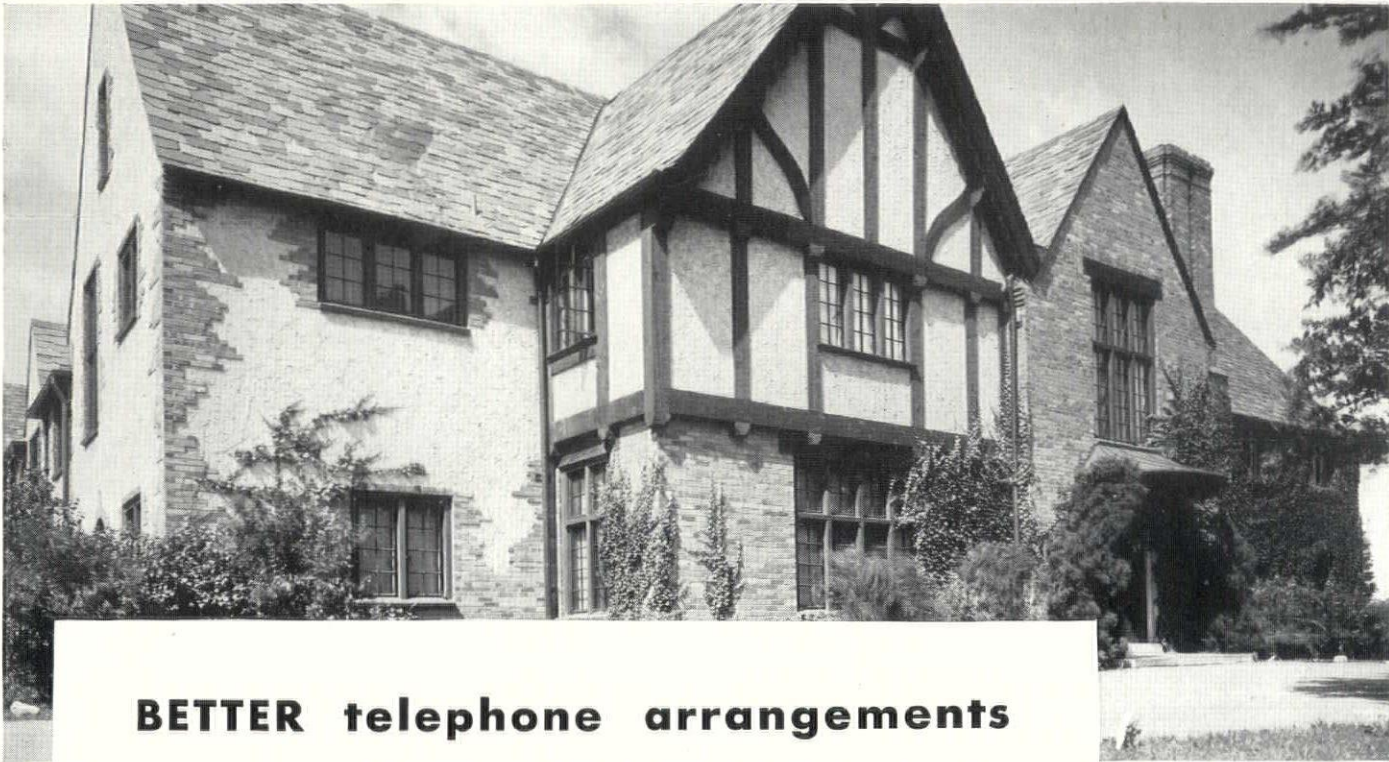
"In a program of building for sale provision must be made for the prevention of exploitation through shoddy building, concealed financing charges, high pressure salesmanship and overpricing. The proposals of the Committee neglect these problems."

## A. F. of L. PROGRAM

• Even while the Administration was showing willingness to postpone talk of spending large sums for cheap housing—plans, reports, ideas, demands and pleas continued to pour into Washington. From the American Federation of Labor came a two-year program for housing asking for \$500,000,000. From Mrs. Mary K. Simkhovitch, president of the National Public Housing Conference, came an appeal to the President asking him to use the powers of his office to push through Congress legislation for low-rental public housing. Besides, there was the report of the U. S. Chamber of Commerce.

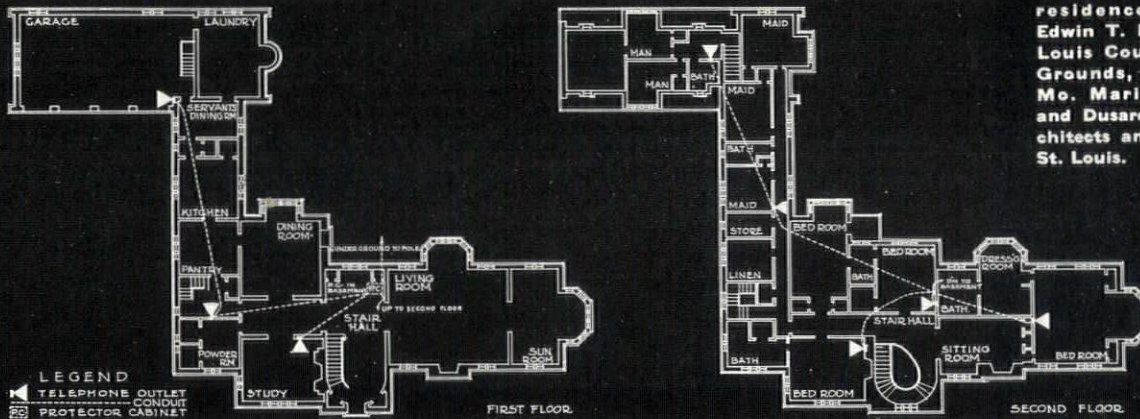
Substantially similar to the Wagner Bill and other low-cost housing schemes, the A. F. of L. program calls for the creation of a new National Public Housing Authority and the establishment of local authorities which may be

(Continued on page 4)



**BETTER telephone arrangements  
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Built-in conduit, connecting 8 outlets, provides for telephone convenience in the residence of Mrs. Edwin T. Nugent, St. Louis Country Club Grounds, St. Louis, Mo. Maritz, Young and Dusard, Inc., Architects and Builders, St. Louis.



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American Architect, published monthly by Hearst Magazines Inc., 572 Madison Avenue, New York, N. Y. \$3.00 per year; Canada, \$4.00; Foreign, \$5.00. Entered as second class matter April 5th, 1926, at the Post Office at New York, N. Y., under the act of March 3rd, 1879. Issue 2643, dated March, 1936.

financed, advised, and otherwise assisted by the Federal body. This new Housing Authority would be organized to provide dwellings for families with incomes of \$1500 or less a year, and would operate on the theory that the Federal government must furnish nearly all of the subsidy needed to make up the difference between "economic rent" and what low income workers can pay. In its report A. F. of L. included the demand that contemplated housing be built by union labor at standard wages. Despite the urgent necessity of tackling the slum problem, and despite President Roosevelt's obvious sympathies with housing plans, it seems hardly possible that the money necessary will be forthcoming now. 1936 is election year.

## ANOTHER REPORT

• The third "book of the month" forwarded to Washington was the Committee Report of the U. S. Chamber of Commerce. Mainly a revision of already publicized housing data, the report contents itself with recommending that various New Deal agencies be liquidated before becoming "permanent and competitive agencies of government in the private investment field."

## DOLEFUL DOLLARS

• "It is reasonably certain that the total expenditure for work relief during the fiscal year 1937 will be far less than during the current year." Those are the words that President Roosevelt used in his annual message to Congress to predict a reduction in relief appropriations in next year's budget. But despite this optimistic note about curbing expenditures, almost everyone connected with the administration is convinced that a considerable relief burden must be borne for many years to come.

Of the \$4,400,000,000 appropriated for the current fiscal year, part went to PWA for heavy construction and low-cost housing; part to Rexford Tugwell's resettlement administration; part to CCC, the Army Engineer Corps, and to a long line of other agencies. If the President, as he says, plans to slash the relief appropriation, which of these agencies will be omitted? The government plans to provide for 3,000,000 unemployed in 1937. Secretary of the Treasury Morgenthau has remarked that the Federal relief outlay probably will not exceed \$2,000,000,000—less than half of this year's appropriation. How will this reduction be made?

Most likely solution at the moment appears to be that the entire relief pro-



PHOTO: HARRIS & EWING

Mrs. Roosevelt inspects one of Washington, D. C.'s 200 notorious alleys with the result that \$500,000 goes to infant Alley Dwelling Administration. ADA promptly appropriates \$140,000 to clear O'Brien's Court and still has 199 more to go

gram will be carried by WPA, and that PWA and the other relief entities will be switched from the emergency classification into regular departmental appropriation bills. Were this the means of decreasing relief expenditures, the reduction would be only a technical one—in that it would merely nominate emergency organizations for regular governmental berths.

Whatever disposition of the relief problem is made, two facts are apparent; first, that President Roosevelt will never switch back to the dole; second, that the 1937 appropriation will be a tidy sum—although probably not \$12,000,000 a day.

WPA struck a new political note when it appropriated \$80,000 for renovating Convention Hall in Cleveland, site of the Republican National Convention. (The Democrats got only \$10,000 for Independence Hall in Philadelphia.)

## PWA PLANS

• Object of PWA Administrator Ickes always has been to build a record of performance that will become a testimonial for continuation of non-Federal public works construction. Chief obstacle to the achievement of this aim

is the ever-present threat that President Roosevelt, in order to reduce relief appropriations, will reallocate to WPA funds originally granted PWA.

Last month, in an effort to push his program beyond the stage where allotments can be recalled, Administrator Ickes called his lieutenants to Washington for conferences on ways and means of expediting the public works program. Cold weather has been a handicap, but it does not explain why southern projects generally, with the advantage of warm weather, should be lagging behind the northern program.

PWA now, therefore, has become involved in an inter-agency sprint to keep its identity. All of PWA's funds have been, or soon will have been, allocated. Bids have been called or contracts let for practically all of the 4,000 projects in the program. PWA has disposed of its \$735,000,000 and any attempt by the administration to withdraw funds at this late date undoubtedly would be met by court action instituted by the sponsors of approved projects. One question remains. What will be done with the money made available by the possible failure of execution of some of the projects?

No matter what President Roosevelt's attitude may be, Administrator Ickes is bent on having available enough projects to take care of any shortage.

## CHEAP MONEY MYTH

• Despite all that has been written and said about "cheaper money" for building in general and low-cost housing in particular, it is apparent, from a survey completed recently by the National Association of Real Estate Boards, that mortgage-money costs are only about 1 per cent lower than a year ago, and that they still show some variation with distance from the money centers. The 6 per cent rate continues to be the most general on which first mortgage loans are made. No city has reported a rate under 4½ per cent and none over 8.

Based on a survey conducted by the association, in which 346 replies were received from 267 cities, the tabulation shows that 164 indicated 6 per cent as the most common rate, 56, 5½ per cent; 48, 5 per cent; 37, 7 per cent; and 29, 6½ per cent.

Similar inquiries into the trend of rents in the same 267 cities showed that in 36 cities rents have advanced 5 per cent; 109 cities reported a rise of approximately 10 per cent; 22, of 15 per cent; 34, of 20 per cent; and 11 of 25 per cent or more. Only seven cities reported lower rentals.



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"Air" and "Earth" by C. P. Jennewein flank the entrance between two galleries at the 50th N. Y. Architectural League Show. A panel of James Michael Newell's gold medal mural is seen behind Gaetano Cecere's honorably-mentioned figure of Lincoln

## 50th LEAGUE SHOW

• As far back as 1886 the Architectural League opened doors on its first exhibition of drawings and illustrations of architecture. Consequently, when aspiring exhibitors placed 900 exhibits in Manhattan's Fine Arts Building last month, the League was not only celebrating its fiftieth anniversary, but also was picturing the transitions of fifty years in architecture and design.

Better to show the marked changes which have taken place since the 1886 show, the League was joined in the exhibition, for the first time, by the American Institute of Decorators. Two rooms—one a typical drawing room of 1886, the other a modern room—showed the trend in decorative technique and the Decorator's part in the complete architectural conception.

Always of broad scope, the League show probably never before has presented quite so inclusive an exhibition. Paintings, sculpture, decorative painting, landscape architecture, crafts, photographs, drawings, and renderings, pictures and models of architectural design—all were represented. In addition, there were drawings and photographs of Federal housing developments, the plans for the International Exposition of Paris 1937, and the usual abundant displays of Federal buildings.

To Edgar I. Williams, Chairman of the League's Annual Exhibition Committee, must go major credit for running off the show without a hitch. Particularly in the exhibit of domestic architecture, where wall space was scarce, there was a problem in display. Carrying

out the contrast between architecture in 1886 and today, the first panel in this exhibit was devoted to the functional designs of William Lescaze, Harold Sterner, and other examples of the modern, and to a number of highly colored pages of the quaint conceptions of good house design taken from *The Scientific American* of that period.

Principal disappointment of the show, if disappointment it can be called, was that no gold medals for architecture were awarded, since, as Mr. Williams explained, "nothing produced during the last year, which was sent to the exhibition, quite agreed to the standard

set by the League for these awards." The silver medals awarded James O'Connor, and Morris Sanders, both of New York, and the honorable mention given Roland E. Coate of Los Angeles were, therefore, the only awards in domestic architecture. In making the three awards, the jury's citations were: "Silver Medal in domestic architecture to Morris Sanders for the architectural treatment of a narrow city residence." This was cited for its "fresh and modern use of glazed brick and glass, and for its harmonious color scheme throughout."

"Silver Medal in domestic architecture to James O'Connor for the excellence and charming livable quality of his country houses, as exemplified in the exhibition by the treatment of the facade of an indoor tennis court."

Other awards and citations follow: Gold medal in decorative painting—To James Michael Newell, of New York, for the "excellence of his mural decorations" developing the subject of "Evolution of Western Civilization," at the Library of Evander Childs High School, the Bronx.

Gold medal for industrial art—To Karl Schmeig, New York designer, for his enlargeable circular dining table in crotch mahogany, involving a new principle of construction.

Henry O. Avery Prize for sculpture—to Waylande Gregory, for his terracotta "Mother and Child," a relief.

Birch Burdette Long Memorial Prize for architectural rendering—To Miss Elizabeth Hoopes, for her water colors of interiors.

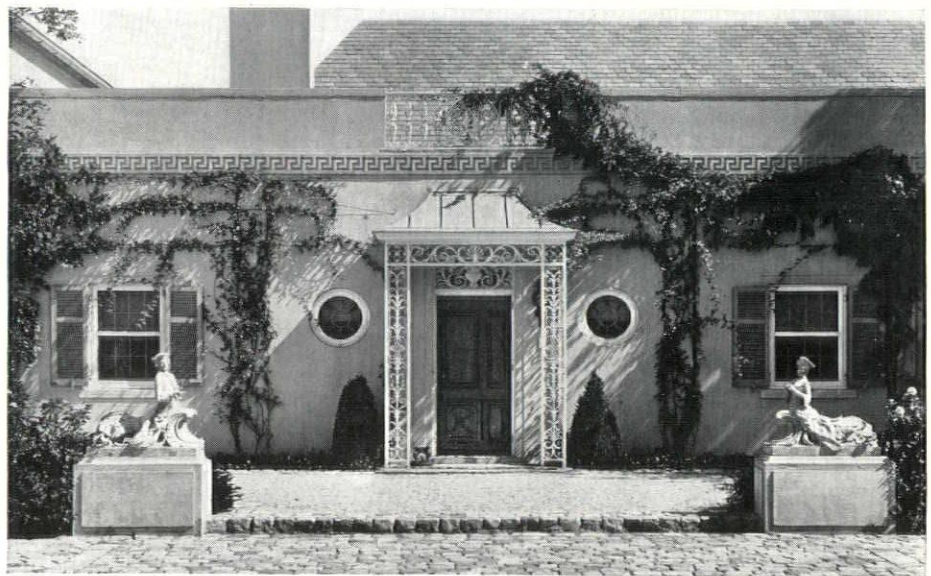
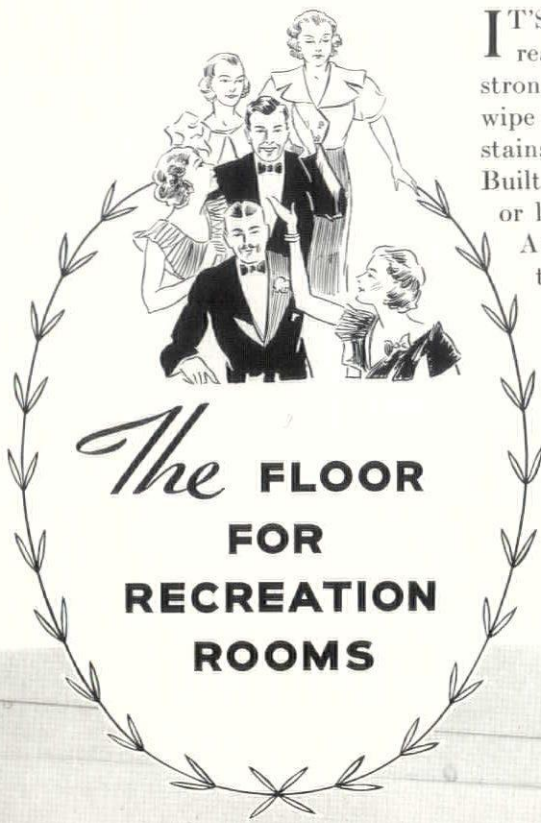


PHOTO: SAMUEL H. GOTTSCHO

His tennis court on Long Island won for James W. O'Connor the League's silver medal in Architecture





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FOR  
RECREATION  
ROOMS**

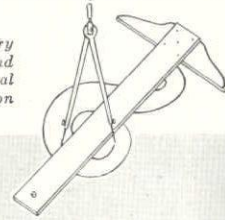
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# TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENT



PHOTO: COURTESY BAKELITE CORPORATION

Shining black modern news stands are the latest note in the PWA civic beautification scheme for New York. Built of Formica with brass trim, they are a sample of what is in store for shabby police booths, bootblack and refreshment stands

## BOOM IN THE VALLEY

• To the average man, TVA spells primarily electric power. That is the issue over which the court controversy was fought. But to an overwhelming majority of the population of the Tennessee Valley, and to TVA's directors, the generation and sale of power—important as it is to the project as a whole—is only one phase of the program. The directors of TVA have taken President Roosevelt's vision of an entire region converted by power and by planning into one of the garden spots of the world seriously. Consequently, even while Chattanooga, Knoxville, Memphis, and Cincinnati are negotiating for TVA power, other and possibly more far-reaching forces for prosperity, stimulated by the Supreme Court decision, are at work.

In Chattanooga, the valley's unofficial capital, there is already ample evidence of the bullish influence provided by the construction of the \$32,000,000 Chickamauga Dam. Property owners, generally, are regarding real estate as the investment most likely to appreciate. Home owners on the verge of selling their properties are struggling to hang on, and investment and trust companies are paying fancy prices to add real estate to their portfolios in unusually vast quantities. Rents, also, are increasing.

Similar stimulation is being felt by other branches of business. Hotels are packed for the first time in five years. Mercantile establishments, some of them drawn here by TVA created prospects, have taken all of the available space along the principal business thoroughfares. Banks, with millions awaiting investment, expect TVA to open up new fields for loans. These are the visible ways in which private enterprise will cash in on the project. There is also the government plan for the Valley.

Besides TVA's series of six dams along the Tennessee River, which will generate more than 400,000 horsepower of electric energy, a comprehensive program to help the farmer is already under way. Soil erosion control by reforestation, the proper planting of crops, the possibilities of new crops, new methods of processing farm crops—all are being studied with an eye to improving the economic level of the farmer so that he can become a better market for electric power.

And, at the present time, it seems apparent that there will be widespread new home construction, private- and government-sponsored. Chattanooga, particularly, anticipates a home shortage, but major incentive to building undoubtedly will come from additional TVA directed projects. More construction camps for work on new

dams will make developments similar to TVA-created Norris, Tennessee, imperative. And, after the success enjoyed with the 231 houses erected in Norris, it seems certain that TVA directors will not be long in preparing similar projects.

## MORTGAGE MONEY

• Four years ago the urban mortgage indebtedness in the United States reached the staggering total of \$21,810,000,000. Since 1932, because of the wholesale foreclosure operations of private lenders, 500,000 home owners have lost their properties, wiping out \$1,500,000,000 of this debt. The reduction of interest rates on distressed mortgages to 5 per cent by the Home Owners' Loan Corporation has resulted in the retirement of approximately \$3,000,000,000 more. Every factor included, the aggregate of non-farm home mortgages has decreased 20 per cent to a total today of \$17,500,000,000, according to the Federal Home Loan Bank Board.

Other than for the fact that HOLC has come into the picture as one of the largest holders of home mortgage loans, the ranking of the different classes of private home financing institutions is the same in 1936 as it was in 1932. Savings and Loan associations hold the largest volume of mortgages, with about 23 per cent of the 17½ billion dollar volume; individual lenders control 20 per cent of the total; HOLC holds 17 per cent; mortgage companies have 13 per cent; savings banks 12 per cent; life insurance companies 8 per cent; and commercial banks only 7 per cent.

## CONSTITUTIONAL INTENTION

• Bankers, as a class, have resented the financial activities of the New Deal. But if there is any one group that has been more critical, more outspoken than the others, it has been the Mortgage Bankers. The announcement that the 23rd convention of the Mortgage Bankers Association would demand withdrawal of the federal government from every phase of business not strictly governmental was, therefore, to be expected.

In making his announcement of the convention site L. A. McLean said: "Last year we concentrated on bending every effort to promote private lending as against government lending. This year we are going the whole way and do our best to stop further government encroachment upon private business. We feel that American public opinion will not tolerate much farther government entry into fields that the framers of the constitution intended should remain in private hands."

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UNION CARBIDE

ESTIMATES OF CONSTRUCTION VOLUME (37 Eastern States)				
	Year 1935	Year 1936 Conservative	Year 1936 Possible	Estimated Increases
Commercial Buildings ...	\$ 163,000,000	\$ 225,000,000	\$ 250,000,000	38% to 53%
Factories .....	106,000,000	150,000,000	175,000,000	41% to 63%
Public and Institutional Buildings .....	329,000,000	475,000,000	500,000,000	44% to 52%
All Non-Residential Build- ings .....	\$ 598,000,000	\$ 850,000,000	\$ 925,000,000	42% to 54%
Apartments and Hotels..	\$ 107,000,000	\$ 175,000,000	\$ 200,000,000	63% to 87%
1- and 2-Family Houses*.	360,000,000	630,000,000	720,000,000	75% to 100%
All Residential Buildings.	\$ 467,000,000	\$ 805,000,000	\$ 920,000,000	72% to 97%
TOTAL BUILDING .....	\$1,065,000,000	\$1,655,000,000	\$1,845,000,000	55% to 73%
Public Works and Utilities	675,000,000	650,000,000	700,000,000	-3.7% to +5%
TOTAL CONSTRUCTION	\$1,740,000,000	\$2,305,000,000	\$2,545,000,000	32% to 46%
* Estimated new family dwelling units in entire United States .....	70,000	120,000	140,000	71% to 100%

COURTESY F. W. DODGE CORPORATION

## BUILDING UPS AND DOWNS

• Construction volume for January was up or down, depending upon your interpretation of the statistics gathered by the F. W. Dodge Corporation for the 37 states east of the Rocky Mountains. For, while the \$204,792,800 reported for January was roughly twice the January, 1935 volume of \$99,773,900, the total was about 22 per cent behind the \$264,136,500 reported in December 1935.

Residential building alone, during January this year, reached a total of \$37,439,500 as against only \$22,410,200 for January, 1935, and \$45,140,100 for December 1935. Non-residential building showed similar tendencies, with the \$90,479,800 reported this year being almost three times the total for the same month last year, but considerably short of the December total. The January 1936 volume of heavy public works and utilities construction amounted to \$76,873,500, as contrasted to \$44,403,300 for January 1935, and \$94,490,400 for December, 1935.

Largest relative gains were recorded in the Middle Atlantic States, the Chicago territory and southern Michigan.

### Prophecy

• After looking over its reports of the last six months, all of which indicate increases in construction, the F. W. Dodge Corporation momentarily deserted its role of reporter and attempted to predict the volume of construction for 1936. Despite the abundant evidence that building will continue its comeback

during this year, forecasting the 1936 totals is still pretty largely guesswork. These statistics, therefore, indicate only the probable trend in building.

## COMPARATIVE CONSTRUCTION COSTS

• In February, American Architect began publication of the costs of building the same, typical house in 100 major cities. Last month this survey, compiled by the Federal Home Loan Bank Board, revealed that costs in the 27 reporting cities ranged from a low of \$4,337, or 18 cents a cubic foot, in Columbia, S. C., to a high of \$6,422, or 26.8 cents a cubic foot, in Providence. This month's index shows similar widespread variations between different areas of the United States.

While no one city reported construction costs low enough to challenge Columbia's \$4,337, the dubious honor of being the "most expensive city" was transferred from Providence to Great Falls, Montana where the "standard house" cost \$6,779 or 28.2 cents a cubic foot. The western states Idaho, Montana, and Wyoming also had the highest average cost for any one district. Surprisingly, Detroit, where increases in automobile production supposedly have brought boom times, returned the lowest cost of the month, \$5,032 or 21 cents per cubic foot.

The "standard" house is a detached home of 24,000 cubic feet volume, of good design, containing a living room, lavatory, dining room, and kitchen on the first floor, and three bedrooms and bath on the second. There is an open

attic that may be used for storage or finished into one or two usable rooms. There is a basement without partitions, housing the heating plant and laundry.

The exterior treatment is assumed to be a combination of wideboard siding, with brick and stucco as features of design. A one-car garage is included. FHLB estimates that the home might be placed in the \$6,000 class.

Costs of construction are gathered by the corps of trained investigators that FHLB recruited from the Home Owners' Loan Corporation. Each investigator obtains the current delivered prices on all materials used in the house from leading local dealers. Likewise, the prevailing local hourly labor rate for each of the principal trades involved in the construction is reported. These determine the index of construction costs in any particular city.

The statistical analysis for February of four FHLB districts, divided by sections and cities, follows:

Federal Home Loan Bank Districts, States and Cities	Total Cost	Cost per Cubic Foot
<b>No. 2—New York:</b>		
<b>NEW JERSEY:</b>		
Atlantic City .....	\$5,922	\$0.247
Camden .....	5,082	.212
Newark .....	5,709	.238
<b>NEW YORK:</b>		
Albany .....	5,340	.223
Binghamton .....	5,370	.224
Buffalo .....	5,490	.229
Syracuse .....	5,500	.229
White Plains .....	5,143	.214
District average .....	\$5,444	\$ .227
<b>No. 6—Indianapolis:</b>		
<b>INDIANA:</b>		
Indianapolis .....	\$5,889	\$ .245
South Bend .....	5,787	.241
<b>MICHIGAN:</b>		
Detroit .....	5,032	.210
District average .....	\$5,569	\$ .232
<b>No. 8—Des Moines:</b>		
<b>IOWA:</b>		
Des Moines .....	\$5,874	\$ .245
<b>MINNESOTA:</b>		
St. Paul .....	5,330	.222
<b>MISSOURI:</b>		
Kansas City .....	5,328	.222
Springfield .....	5,808	.242
St. Louis .....	6,342	.264
<b>NORTH DAKOTA:</b>		
Fargo .....	5,606	.234
Minot .....	5,914	.246
<b>SOUTH DAKOTA:</b>		
Sioux Falls .....	5,751	.240
District average .....	\$5,719	\$ .238
<b>No. 11—Portland:</b>		
<b>IDAHO:</b>		
Boise .....	\$6,777	\$ .282
<b>MONTANA:</b>		
Great Falls .....	6,779	.282
<b>OREGON:</b>		
Portland .....	5,267	.219
<b>UTAH:</b>		
Salt Lake City .....	5,980	.249
<b>WASHINGTON:</b>		
Seattle .....	5,315	.221
<b>WYOMING:</b>		
Cheyenne .....	6,506	.271
District average .....	\$6,104	\$ .254

On the job **7** years in Burnett Court Apartments

# ELECTROLUX PROVES

## LOW MAINTENANCE AND LOW OPERATING COST



Mr. Burnett's maintenance cost for 103 Electrolux which are seven years old is only two hundred and six dollars, or two dollars apiece, a year.

Consolidated Gas Co;  
4 Irving Place,  
New York, N.Y.

Gentlemen:

I am pleased to enclose herewith my check for Two Hundred Six (\$206.) Dollars representing payment in full for maintenance of Electrolux refrigerators for the coming year. Inasmuch as this is the entire fixed charge for 103 refrigerators, you can believe me when I say that I have the highest praise for the Gas Refrigerator. As you may remember, the 103 Electrolux refrigerators were installed in Burnett Court, which incidentally is one of the largest and most completely equipped apartment houses in Flushing, seven years ago; and they still continue to be as efficient and economical as the day they were installed.

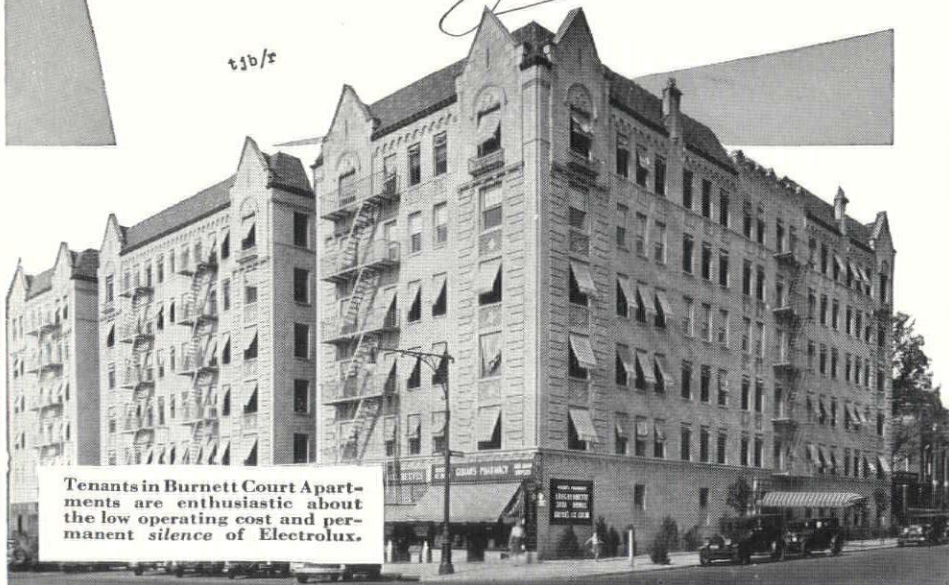
Originally Electrolux was chosen because of its simpler operation (no moving parts) and gas company service, promised more in lasting satisfactory service and low maintenance cost. This promise has certainly been fulfilled. I have already mentioned the remarkable performance of every one of our refrigerators, and I feel that it is only right to thank you and congratulate you for your company's service during these seven years. It has always been prompt and efficient and rendered in a very courteous manner by its employees.

Today I am more convinced than ever that Electrolux is the most practical refrigerator for any building owner or operator to install. I might add that from a tenant's viewpoint as well, Electrolux is preferable because of its silence and extremely low operating cost.

Very truly yours,

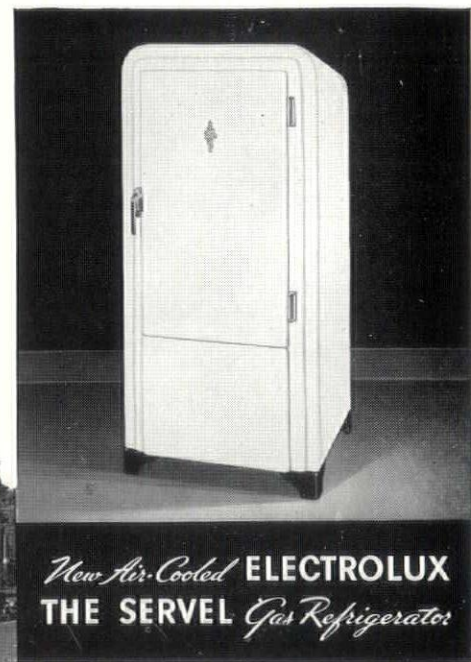
*T. J. Burnett*  
T. J. Burnett, Owner  
Burnett Court

tjb/r



Tenants in Burnett Court Apartments are enthusiastic about the low operating cost and permanent silence of Electrolux.

WHETHER you're choosing refrigerators as original equipment or to replace old equipment, the experience of Mr. Burnett, of 136-05 Sanford Ave., Flushing, is important to you. *First*, because it answers the vital question every refrigerator buyer wants to know: "How can I make sure that the refrigerator I install today will be just as efficient and economical in 1943?" *Second*, because it is typical of the experience of Electrolux owners the country over. For consider this—the total maintenance cost for the 103 Electrolux that were installed in 1929 is today only two hundred and six dollars, or two dollars apiece, a year. You'll find that the economy and dependable gas company service which Electrolux offers are advantages no other refrigerator, at any price, can match. See your local gas company for complete information about Electrolux. Servel, Inc., Electrolux Refrigerator Sales Division, Evansville, Indiana.



New Air-Cooled ELECTROLUX  
THE SERVEL Gas Refrigerator

## DON'T BE AWED BY A REPUTATION

### Mr. Loofborough wanted to build a \$10,000 house.

Straightway, he went to Architect A—a brilliant artist whose towering talent lifted him head and shoulders above his competitors. Mr. Loofborough got an exquisite house that looked far more expensive than a modest \$10,000. He paid his architect 8% which amounted to \$800.

### Mr. Moffet wanted to build a \$10,000 house.

Naturally, he had heard of the great Architect A. But his very greatness frightened Mr. Moffet away. He was awestruck and diffident about engaging a mighty talent for his modest project. He went to an indifferent architect, got an undistinguished house, paid 8% which amounted to \$800.

So seldom do architects receive lay recognition that when Saks Fifth Avenue published this advertisement it became newsworthy. The copy neglects the fact that much significant work is being done by young, comparatively unknown architects and that it is often well for a client to have a mind of his own about choosing his architect

### "BI-WAYS" FOR HIGHWAYS

• The moving sidewalk has long been the plaything of inventors. At the Chicago World's Fair of 1893 (the Columbian Exposition) the first of the moving sidewalks, running at a speed of six miles per hour, appeared to startle the customers. Less than a mile long, it proved so popular that others like it were installed at the Berlin Industrial Exposition in 1896, and at the Paris International Exposition of 1900.

Norman W. Storer, a Westinghouse engineer, is the most recent advocate of this method of transportation. The "bi-way," Storer's name for the moving sidewalk, has the usual two platforms which move at different speeds in a continuous loop. Entrances to the local or slow platform are placed at intervals of 100 yards, and to the fast or express platform every mile or so. With an average speed of fifteen miles an hour, the express platform varies in speed between 16.5 and 12.5 miles an hour. The local platform starts from rest (to enable passengers to get on and off), accelerates to 12.5 miles an hour, reaches that speed at the same time as the express, runs at approximately the same speed for ten seconds (permitting transfers between local and express), and then slows down to a standstill while the express accelerates to its maximum speed. This cycle is repeated, Storer says, every forty-two seconds. No one ever waits for a train longer

than about half a minute. While the local stops eighty-five times an hour, the express platform never stops.

Each car is twelve feet long, and has only one pair of wheels, near one end. The other end rests on the front of the next car. No noise. No brakes. No loose parts to rattle. Describing the mechanics of the "bi-way," Mr. Storer says: "The stationary driving motors beneath the tracks at intervals of about 1,000 feet stop and start automatically. Error is impossible. If the system is to be stopped for any reason a control button is pushed or a control switch thrown. Since both trains and the stationary platforms are continuous, it is impossible for a passenger to fall under the wheels. Car floors cover the entire track space."

Summing up the advantages of his bi-way, Mr. Storer says: "The stationary platform is lined with brightly illuminated shops, each with its entrance to the bi-way. Shops, buildings and streets are marked conspicuously. Get off at any point, make purchases and return to the bi-way without extra charge. You can do a day's shopping, buy practically anything you want, and return home all for one fare."

### TOWNSEND AND REAL ESTATE

• Just about a year ago the first press reports about the Townsend Plan began to filter out of the West. Little attention was at first given this dramatic

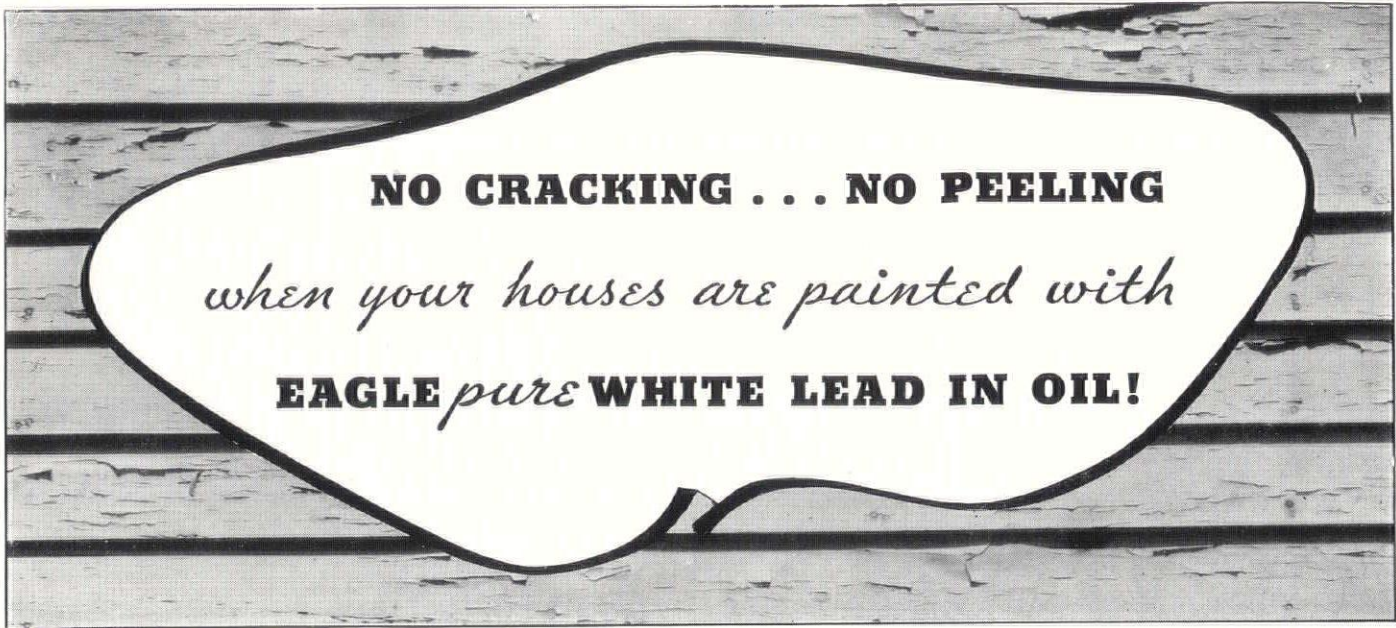
scheme for ending unemployment. The Plan was allowed to grow, to flourish, and, in some sections (such as Michigan), to become a vital factor in political affairs. Until a month ago this plan was scoffed at but tolerated.

Suddenly, for no apparent reason, editors tired of their tolerance and began to bombard Townsend's promises; Congress considered an inquiry of campaign policies; many private research organizations studied the provisions of the Plan's 2 per cent gross transactions tax and its probable effects. All agreed that the Townsend Plan was another of the magnificent Utopian bubbles that sooner or later must be punctured. And all set about being the first to do the puncturing.

One of the research groups analyzing the Plan was the National Industrial Conference Board, and what the Board reported would fill a medium-sized text book. First of all, it is stated, "the taxes required under the Townsend Plan amount to nearly half the total national income, more than half of all wages and salaries, eight times as much as all dividends, and more than three times the gross cash income of all farms."

Of principal interest here, however, is what effect the Townsend Plan would have on real estate. The 2 per cent gross transactions tax, imposed to support old age pensions, would apply equally to all types of property, including the gross rents of houses. This 2 per cent would be taken before any of the expenses of maintaining the property—repair, insurance, taxes, etc.—were deducted. Since, in 1929, the gross income of all real estate and realty holding companies and corporations was \$2,456,000,000, the 2 per cent tax would have amounted to \$49,000,000. On the other hand, the net income of these corporations was only \$146,000,000. The tax, therefore, would have absorbed more than one-third of the profits of these companies. Furthermore, out of 88,524 corporations in the real estate field, 46,897 had no net income in 1929.

These corporations operating without net income or at a loss, the Board's study points out, would have to shift the tax or get out of business. "The shifting of the tax, however," says the report, "would be an extremely difficult task, first because the outstanding leases could not be changed, and second, because the tenants would be unable to pay higher rents. The result would be wholesale bankruptcies of real estate concerns and destruction of capital on which depends the security of real estate mortgages."



**Let a Paint Expert tell you how chemically active pigment  
STOPS PAINT FAILURES**



“Eagle white lead is a chemically active pigment. See how pigment particles look when greatly magnified. The irregular, uneven shape of pigment particles is one reason why a film of Eagle Pure White Lead in Oil wears so long!”

“When these white lead particles are mixed with linseed oil, a chemical reaction begins. Particles ‘bloom out’, making an interlocking mass of pigment and linseed oil. Inert pigments found in many paints do not bloom out.”

“The ‘blooming out’ process completed. This homogeneous film of white lead particles and oil seeps into the surface it is applied to . . . sticks on like glue. It stays tough and pliable . . . does not crack when surface stretches or shrinks.”

THE EAGLE-PICHER LEAD COMPANY, CINCINNATI, OHIO

In competitive tests Eagle Pure White Lead in Oil has won out over other paints time after time. Write today for more information.

Choice of  
good painters  
since 1843

Eagle

pure WHITE LEAD

## THE HOME CLINIC PLAN

The majority of home builders think of architects as expensive and unapproachable artists. They do not realize the value of the architect's *service*, inspection and supervision—protection against unscrupulous builders. On the other hand, it would be economic suicide for most architects to depend entirely on a practice devoted to individually designed small homes. The A.I.A. sponsored Architects Small House Service Bureau sold plans developed by architects. Objections from members that this was unsound competition with their own services led to the death of the Bureau as such. Plan selling is not architecture. The service of the architect begins with advice on suitability of plans to client's needs, and follows through the entire building process. To provide a limited small home architectural service at a fee which would seem reasonable to the average home-builder, architects have developed a co-operative "clinic" idea.

Last year in Baltimore and Buffalo, groups of architects banded together to get some of this work. By means of lower fees for specifically limited service, clever publicity and intelligent sales and display methods the scheme has proved successful enough to be taken up all over the country. Even the A.I.A. traditional antipathy toward fee cutting was softened by the limited service feature of the plan. Called the Home Clinic Plan the idea, developed by HOLC, nurtured by the FHA, is being sponsored by the Home Loan Bank Board and approved by the American Institute of Architects. The Institute's approval is largely due to the efforts of Chairman Richmond H. Shreve and his Committee on Housing.

A member of the firm of Shreve, Lamb and Harmon, Mr. Shreve has long been known as a man who not only sees but does something about the ills of his profession. It is not unusual then that one of the first of several new local clinics is Small House Associates of New York. It is patterned largely after the pioneer Buffalo clinic where architects furnished the client with blueprints and specifications, prepared contracts after receiving four bids, allowed three office calls and six visits to the site for an average approximate fee of 2 per cent.

The New York Clinic's membership is not yet complete, but an executive committee consisting of Harrison Gill, Geoffrey Platt and Frederick Woodbridge, and Harvey Stevenson, Gerald A. Holmes and Edgar I. Williams has already been formed. Alfred Easton

Poor is treasurer, and Mr. Shreve consultant.

The following facts about Small House Associates have been taken from their recently issued prospectus:

"The nature of architectural service has never been fully understood, nor has its value been fully appreciated. The layman is inclined to think that the architect's activities in his behalf start and end with the preparation of plans and specifications. Nothing is further from the truth.

Real architectural service consists of, first, the thorough understanding by the architect of the client's needs and desires. Second, the painstaking interpretation into drawings that meet the specific requirements of the individual family and the site. Third, the letting of contracts based on individual specifications, and fourth, the actual supervision of the construction, to insure the successful completion of the house. Most important of all, he is the man who can see that the owner gets what he is entitled to; without him there is no one to protect the Owner's interest.

Such a process requires much time both in and out of the office of the architect. The proper fee for such service is usually more than equalled by the added attractiveness and the added sales value of the house. The architect can frequently see how savings greater than the amount of his fee can be made in the details of the plan and construction. That too is part of his job. However, some owners feel that they are not able to undertake even this proper charge for individual service.

The following is an effort to provide the essentials of this architectural service at the lowest possible cost:

### A LIMITED ARCHITECTURAL SERVICE:

Facilities are offered for the selection of a design from sketches, already prepared by members of the group, of houses for private owners, ranging in cost from \$3,500 to \$8,000; conferences with the architect selected; preparation of working drawings adapted to individual needs, based on the chosen design; securing bids, awarding contracts and supervision while construction is in progress.

### TERRITORY:

Within thirty-five miles of 101 Park Avenue. If a house is undertaken at a greater distance, but reasonably accessible to New York City, a charge proportionate to the added distance will be made.

### SUPERVISION:

This is an essential part of the service. The Small House Associates will not undertake work without it.

### LARGER HOUSES:

Houses costing more than \$8,000 will be undertaken by any of the individual firms at regular architectural fees. A special collection of photographs of executed work of member firms is maintained to simplify the problem of selecting an architect. Houses under \$8,000 requiring special individual solution may be handled by an architect selected in the same manner.

### PROCEDURE:

Fill out the preliminary questionnaire. Look over the portfolio of small houses in the office and select the one that most nearly fits your needs and budget. A member of the staff will discuss your particular problems and

advise you as to the selection of a design. No charge is made for this preliminary interview.

If you desire to proceed, a conference will be arranged for you with the architect of the design you select.

If you wish to take your chosen design from the office for further study, a deposit of \$10.00 is required and you are given a receipt for the drawings, which are copyrighted and may not be used except in connection with the services of the Small House Associates. If you return the drawings within three days, the \$10.00 will be refunded, or, if you proceed, it will be credited against the charge for service.

At the first conference with your architect, you sign a contract for architectural service and pay 10 per cent of the fee. The architect will discuss your requirements in detail, outline the changes that must be made in your plan, help you fill out a complete checking list which you are to sign.

When the working drawings are in their preliminary stage, you have another conference with the architect, and check the drawings and applicable portions of standard specifications. At this conference you pay an additional 10 per cent of the fee.

When the working drawings and specifications are completed, you have a third conference with your architect and sign the final drawings, details, lists and specifications. At this time you pay an additional 40 per cent.

The Small House Associates now take bids and prepare contracts which you execute with the successful contractor.

A qualified superintendent will inspect the job when the foundation work is begun, when the house is ready for lathing, when the plastering is complete and interior woodwork is being installed, and when the painting work is in progress and at the completion of the job.

The remaining 40 per cent of the architectural fee is payable from time to time simultaneously with payments to the contractor.

The careful cost estimates procured in advance by the Small House Associates make it possible to foretell within reasonable limits the cost of any plan you select. The Small House Associates do not guarantee the cost of any house, but if the low bid of a contractor acceptable to the Small House Associates is more than 10 per cent above the preliminary estimate, taking into account any changes made in the drawings and approved by you, the owner, all payments made on account of the fee will be refunded if you drop the project.

If, of your own accord, you drop the work or fail to secure a mortgage due to site or personal credit, no payments are refundable, and the architect shall be paid proportionately for the work performed in accordance with the schedule of charges.

### SCHEDULE OF CHARGES:

The charges are as follows and include supervision as defined above.

Cost of House	Total Fee
\$3,500 to \$4,000	\$150
4,000 to 5,000	165
5,000 to 5,500	185
5,500 to 6,000	200
6,000 to 6,500	215
6,500 to 7,000	230
7,000 to 7,500	245
7,500 to 8,000	260

Extra charges due to changes made by you after working drawings have been started—\$2.50 per hour.

Extra conferences with architect, if required by you—\$5.00 per hour or fraction thereof.

Preliminary inspection of site or special visits to job, other than called for above, may be had at your request for \$10.00 per visit.



*For perfect execution of the  
Store Fronts you design . . .*

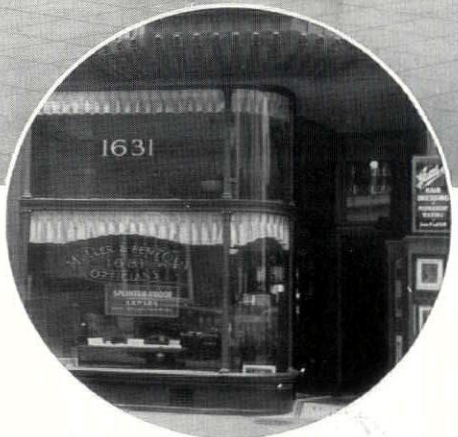


**PITTCO  
STORE FRONTS  
PRODUCTS**

**Y**OU will make certain that the store fronts you design will look as well in reality as they do on paper if you use Pittco Store Front Products to execute them. These products . . . glass, metal and paint . . . are of the best quality obtainable. They help you transform an old front into a modern, sales-building, revenue-producing front. They allow you full scope for original and effective treatments. And they assure client satisfaction of the highest order.

The new Pittsburgh Time Payment Plan, which makes it easy for merchant or property owner to finance the purchase of a new Pittco Store Front, also includes provision for an architect's fee. So many prospects in your community will be remodeling their stores . . . and calling you in to help. When they do, tell them the advantages of Pittco Store Front Products. And meanwhile, we invite you to clip the coupon below and have your name entered on our architect's list to receive our "Design of the Month" service. Each month, our staff of store front experts, maintained to cooperate with architects on problems of construction and product application, prepare a style suggestion on some type of front. We would like to send these "Designs of the Month" to you.

*An opticians' shop in Philadelphia, Pa., before and after Architect Warden H. Fenton of New York City remodeled it with a new Pittco Store Front. Mr. Muller, the optician, writes: "We are very much*



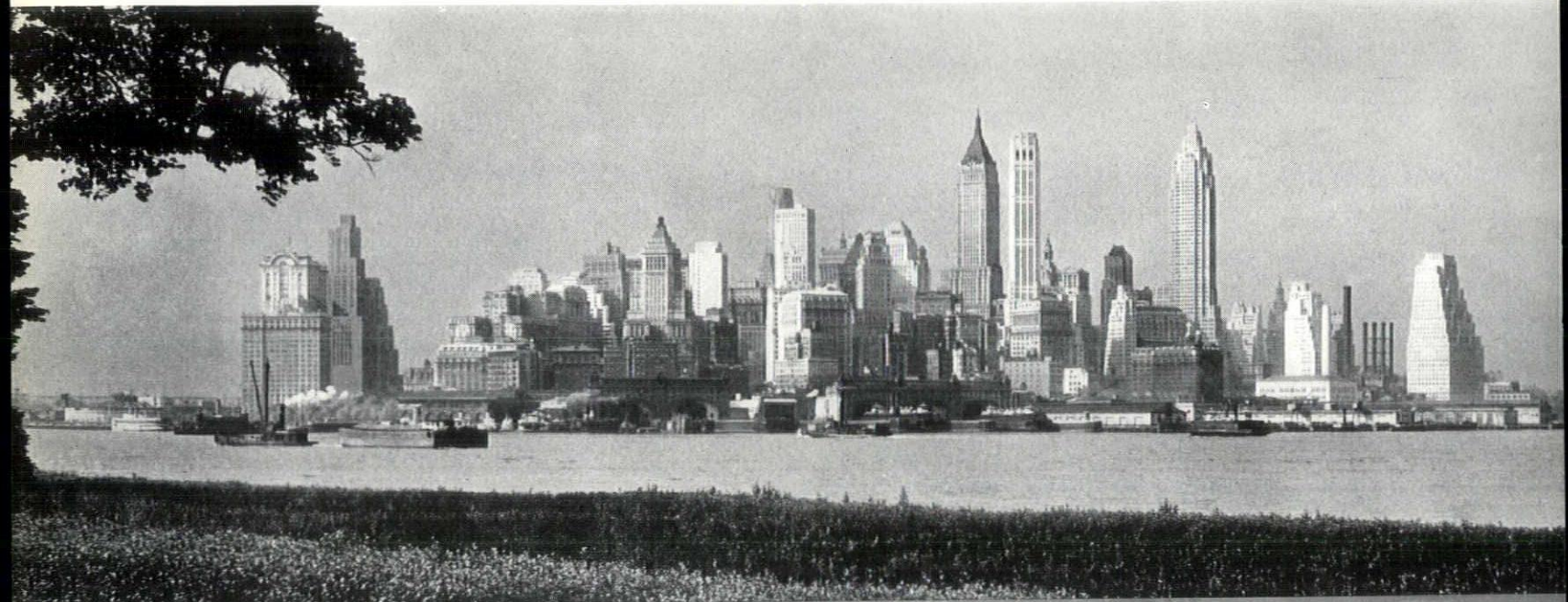
*pleased with the new store front . . . many people have complimented us on our beautiful new store and we feel sure it will be quite productive of increased business."*

*Listen to the Music You Love, superbly rendered by the Pittsburgh Symphony Orchestra and distinguished guest artists every Thursday at 8:00 P. M., E. S. T., over NBC Blue Network and associated stations.*

CARRARA STRUCTURAL GLASS	<b>PITTCO</b>	PITTSBURGH PAINT PRODUCTS
PITTCO STORE FRONT METAL		POLISHED PLATE GLASS
PITTSBURGH MIRRORS	STORE FRONTS	TAPESTRY GLASS
	<i>glass...metal...paint</i>	
	PRODUCTS OF	
<i>Paint</i>	<b>PITTSBURGH</b>	<i>Glass</i>
	PLATE GLASS COMPANY	

Pittsburgh Plate Glass Company,  
2397A Grant Building, Pittsburgh, Pa.  
Please enter my name on your list of architects who will receive your store front "Design of the Month" suggestion regularly each month during 1936.

Name \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_



TOP PHOTO: SAMUEL H. GOTTSCHO



PHOTO: MCLAUGHLIN AERIAL SURVEYS

# WHAT IS AMERICA'S PROBLEM?

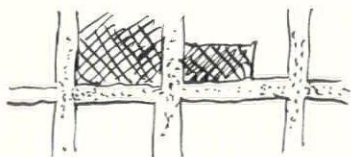
BY LE CORBUSIER



PHOTO: ANDRÉ STEINER

*une divagation romantique*

1. A romantic divagation



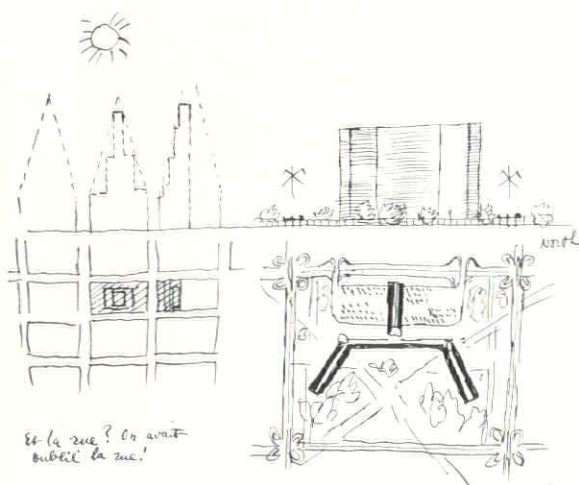
Translator's Note: The difficulties of Le Corbusier's style are excessive with its sudden drifts from the rhetorical to the vernacular. There is, therefore, very considerable freedom in the rendering of words, phrases and even whole sentences. The reference throughout to "La Ville Radieuse" is implicit but rather essential to full comprehension of the thought. But the "message" is an exhortation, a call to action, not a detailed program. The author's enthusiasm and power of imagination should be sufficiently evident even in the inadequate English version.

HENRY - RUSSELL HITCHCOCK, JR.  
Wesleyan University                      January, 1936

THIS is the way I put it speaking over the radio three days after my arrival. From Quarantine, New York appeared through the morning mist like the Heavenly City of the Promised Land—distant, azure and pearly, with its spires rising toward the sky. There was the Land of New Times and its fantastic and mystical city; the Temple of the New World! Then the boat passed Wall Street and finally touched the dock. "What brutality, what savagery!" I cried. But so much force exploding in the stern geometry of piled-up prisms was not really displeasing. Coming from France in that depressing moment of late 1935, I gained confidence from such a sight.

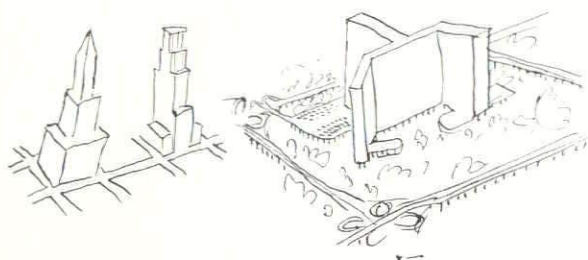
For I saw the skyscrapers, that spectacle which Americans have ceased to consider, and to which I, like everyone else, grew quite passively accustomed after six weeks. A height of three hundred meters is an architectural event; it is, among psycho-physiological sensations, something really important. It "gets" you in the neck and in the stomach. Height is a thing beautiful in itself.

Nevertheless the reason soon comes to be troubled. I said, "The Skyscrapers of New York are too small," and the *Herald Tribune* made a headline of it. The skyscrapers of New York are romantic: a gesture of pride, but of real value as a gesture. They are also a proof that one can erect buildings three hundred meters high and arrange admirably for the circulation of crowds up to the very top. But the skyscrapers have killed the street and made the city a crazy thing. They are unreasonable from bottom to top and the fault lies in building regulations which are an astonishing piece of nonsense. It is disturbing that the city authorities should accept the postulates they do and make their building laws accordingly. (Fig. 1) In the last skyscraper, however, some attempt was made to avoid the primary error and thus Rockefeller

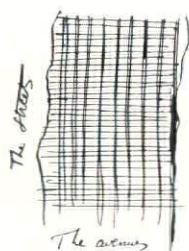


2. And the street?  
The street was forgotten

*une biologie intérieure  
un être raisonnable* south  
A complete biology, a  
reasonable existence

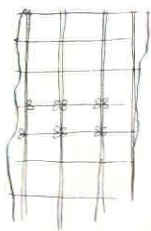


*re-formation cellulaire de la ville*  
Cellular reorganization of the city



*The streets*  
au temps du cheval

3. For the horse age



au temps de l'auto  
(re-formation cellulaire)

For the automobile age  
(cellular reorganization)

Center's group foreshadows the skyscraper of the future, the rational skyscraper. So we need no longer be worried as we contemplate the new phenomenon of architecture, for we shall make use of it to achieve in New York—order, reason and splendor. (Fig. 2)

Yet the city is in disruption. Let us recognize, however, first, and remember the lesson, that the principle upon which the streets are laid out is clear, useful, simple, true, human and excellent. It is easy to find one's way in New York and Manhattan has been well divided up—for horse transportation! But the automobile has come with tragic consequence; circulation now is impossible in New York. (Fig. 3)

I would never have imagined a distribution so violent, so decisive and so simple, or one which would change so radically the significant ground values of a city. The eight or nine longitudinal avenues divide up the usefulness of the land into an accelerated scale from the atrocious to the sumptuous. Manhattan—great unfilleted sole spread out on a rock—is no good except along the back bone; the edges are slums.

On foot, twenty minutes take you across this spectacle of contrast. But how can the reason accept such a situation? The edges along the East River and the Hudson are inaccessible. The ocean is inaccessible, invisible. Looking at a map of New York or an air view, one thinks: "It is certainly the best organized city in the world." Yet all that ocean and those great rivers are invisible, and the advantages of their beauty, their space, their movement, and their lovely light under the sun, all that belongs to no one. New York, the immense ocean port is for its inhabitants as inland as Moscow! And those splendid sites along the river, destined, it would seem, to receive immense apartment houses with windows opening on space, those sites are desolating—for they are slums. By a well-advised municipal development, it would be easy to rehabilitate these districts and the profit would be sufficient to permit going ahead with rehabilitation of the center of the city now all violence and anarchy. What stupefies a foreigner is to be told that Manhattan, bristling with skyscrapers has buildings of an average height of 4½ stories. You hear? 4½ stories! That is the imperative and revealing statistic which allows us to have every hope for a plan of urban reconstruction which will bring order into the city. (Fig. 4)

The skyscraper in New York has now only a negative effect: It fills the street and the city, it destroys the possibility of circulation, worse still it is a cannibal; it draws the blood of life from whole quarters around it; it empties them and ruins them. Here again we sight the appearance of salvation: solution lies in the urbanization of the city. The skyscraper today is too small and it destroys everything else. Make it larger, make it honest and useful—thus an enormous ground area will be recovered: ruined properties will be restored and the city will have green open spaces and no traffic problems. All the ground area of the city will be available as parks for pedestrians; automobiles will circulate up in the air on elevated highways, a very few elevated highways for one way traffic with a speed limit of 150 Km. an hour and going very directly from one skyscraper to another. In order to do that it is necessary to take some group action—without it there can be no salvation. Some day it will be absolutely necessary to come to such action by the organization of co-operatives and real estate syndicates, or as a governmental measure—a measure which is strong and paternal (with all the energy of a father who knows exactly what his children should do). (Fig. 5)

Between the existing skyscrapers are crowded apartments and houses large and small—above all, quantities of small houses. What are all these tiny houses doing in dramatic Manhattan? I cannot understand at all for it is outside the bounds of reason. It is a fact; that is all, like the confused ruins after an earthquake or a bombardment.

Central Park offers another lesson. Notice how the big hotels and apartment houses have come to it naturally, spontaneously, so that their windows receive the advantage of open space. But Central Park is too large and yet only a hole in the midst of the houses. That is its lesson. One crosses Central Park as if it were a "no man's land." The green and above all the open space

of Central Park ought to be spread out and multiplied over all Manhattan.

New York today has an average height of 4½ stories. With a rise in this average to only sixteen stories, New York could regain three-fourths of her ground area. Central Park would then be available to all in the form of parks surrounding every building, and playgrounds at every door—and the new houses would be in the city and not in Connecticut! But that is another story!

It is the story of the New Yorker in mad pursuit of imaginary paradises.

It is the great American historical pattern, and it is worth consideration. For what I have to say concerns not only New York and Chicago, but all the towns, small and large, which are exploding everywhere out over the land according to the same formula and in the same disorder. Some day, who knows, they will also be New Yorks and Chicagos.

In order to present this fairly, let us recognize that Chicago possesses a lake shore, and parkways, splendid with expensive apartments facing the lake and the parks; that New York has fine apartments here and there, and delightful houses in far-off and almost inaccessible suburbs.

These apartments and private houses are inhabited by those "who have a voice in affairs." These people—by and large—being well-fixed as regards themselves and their families, find that the world is not running so badly. But I, personally, think more often of the crowds riding in the subways, going home in the evening to joyless flats. For there are millions of human beings tied to a life without hope or rest, for whom there is no sight of the sky, or the sun, or good green trees.

In the name of these crowds, I can say that the world is not running at all! But these crowds, just now, have no voice in the matter. For how long?

Behind the Drives of Chicago there are slums, *immediately* behind them—without transition. And what immense slums! Like another universe.

Let us try to cut through the "suburban illusion" of American cities.

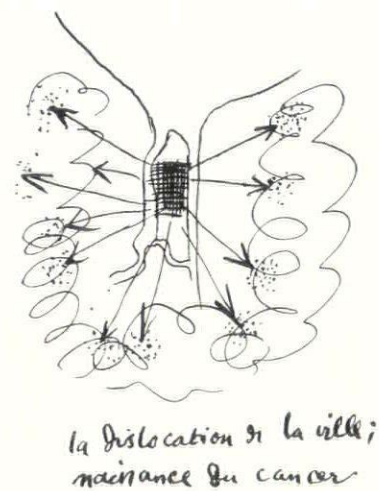
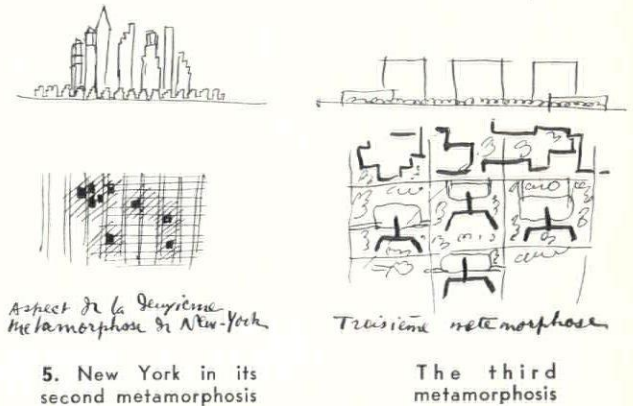
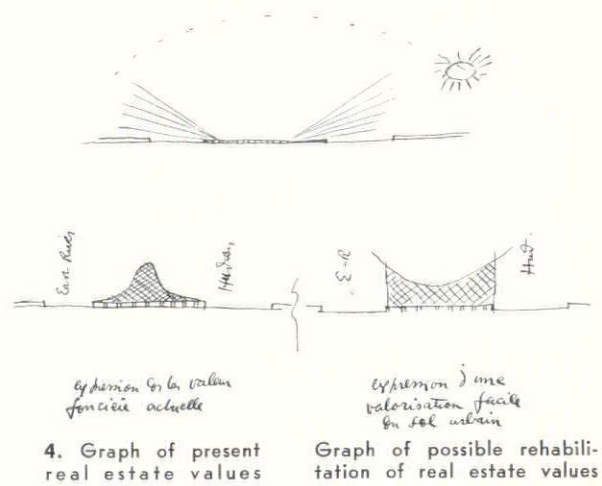
Manhattan is a city so hostile to the most fundamental needs of the human spirit that the dream of escape takes root in every heart. To get away! Not to have to waste one's life and the life of one's family in this implacable rigidity. To open one's eyes on a bit of sky, to live close to a tree, on the edge of a lawn. And to flee forever the noise, the tumult of the city.

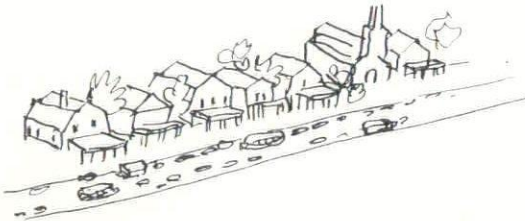
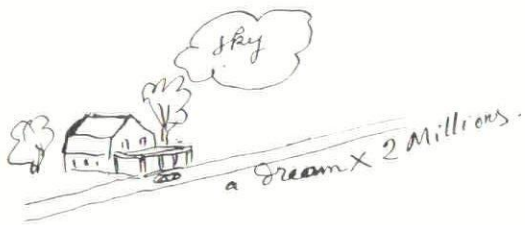
#### AMERICA'S SUBURBAN ILLUSION

This dream of the masses has found expression. Millions of inhabitants have gone off into the country—the country of which they dreamed. And in so doing, in settling down there, they have killed the country. The result is the suburb, that immense and widely extended region about the city. And there is nothing left but the dream, the desperate dream, of being free—at least, of being master of one's own destiny. (Fig. 6)

This represents hours daily on the subway, the bus, or the train, and the loss of the collective life—the very stuff of which nations are made. And it is no more than a feeble sort of liberty, door to door with one's neighbor, window against window, the street in front of the door, the sky shut off by the surrounding roofs, and the few trees that are left, after the real estate development is complete. (I am still speaking here of those who have not been able to get away from the daily round; of the masses, those numberless masses who make up the great body of New Yorkers and Chicagoans.) (Fig. 7)

In my lectures in the U. S. A., I tried to make it clear that this was the mortal American inefficiency, paid for by a new and unconscious slavery. The hours lost in getting to and from the innumerable points of dispersion are nothing to the hours lost daily by each individual, over and above truly productive work, to pay for this mistake! For the gigantic suburbs, house after house, absorb the unbelievably complicated network of railways, roads, water and pipes, gas, electrical and telephone wires. Who pays for that, I ask you? We, you, everyone—and every day—by the tribute of three or four hours of unproductive labor given to pay for these futilities, given by each one of you just "to get better air."

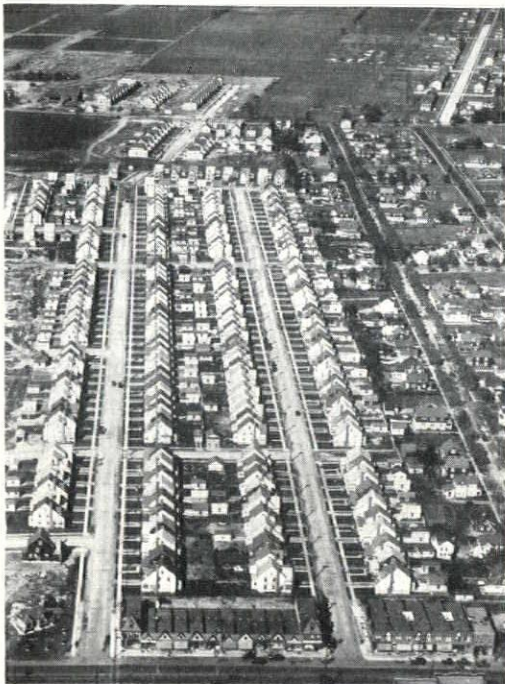




*un petit aspect de deux millions de rêves : ceci est baptisé : la liberté individuelle.*

7. A little glimpse of two million dreams: It has been christened individual liberty

PHOTO: CURTISS FLYING SERVICE, INC.



"To get better air," to find an occasional tree, a small patch of the sky on the edge of a road swarming with automobiles. Yet you can have plenty of trees, a great deal of sky, an immensity of space, and no automobiles if you are willing to go back into the city, into Manhattan itself, on the sole condition that you make of Manhattan—an immense and quite sufficient territory—a "radiant city"; that is to say, a city devoted to the necessary and sufficient human joys.

For Manhattan is large enough to accommodate millions of inhabitants, both business men and workers under splendid conditions if it is put in order.

Real order may be introduced into Manhattan by the general utilization of the land; that is to say that New York can be made the most harmonious city in the world, with financial profit for those who undertake wise reconstructive measures and with every kind of profit for those who now pursue in the slavery of sterile hours of labor the fatal illusion of the "Garden City" in the suburbs.

Americans have proved by significant achievements that they are capable of undertaking anything when the financial machine is running. I ask that the thinking machine be set to work; that is, that the acute and fatal disease of New York and Chicago and the rest be pondered until the basic evil is clearly recognized so that the true remedy may at last be found. You Americans have made the Holland Tunnel and the Pulaski Skyway, spanning all the complexities of an industrial region—factories, railways, rivers, roads, etc. You have built the George Washington Bridge over the Hudson, in all its harmonious and serene splendor. You have laid out the County Parkways (forecasting the city of the future); you are now constructing the elevated drive along the docks by the Hudson.

In addition you have made your elevators work, something which we can't do yet in Europe. You have built great blocks of apartments, so well-organized that they house in carefully chosen localities those who lead a life of luxury.

#### VISUALIZING MANHATTAN'S FUTURE

Let us see then:

What is Manhattan? A peninsula entirely surrounded by water and space with a healthful and vigorous climate, approximately 16 kilometers long by 4 wide, that is 64 square kilometers or 6,400 hectares. I know from my detailed studies—diverse, multiple, precise studies—that it is possible to provide extraordinary conditions of comfort and joy for 1,000 inhabitants per French hectare. (Under the conditions of the "Radiant City" 12 per cent of the area would be built up; 88 per cent would remain for parks, walks and sports; there would be absolute separation of pedestrians and automobiles; 100 per cent of the area freely accessible to the former; playing fields all around the houses—daily sport for everyone—immense spaces—600 to 1,200 feet—before each window; and each window receiving direct sunlight, etc.) I know that it is possible to lodge upon Manhattan six million inhabitants! That is a certainty.

When all six million inhabitants are settled in Manhattan, you will be free from the slavery of your automobiles and your money-losing railways; you will work three or four hours less each day because you will no longer have to pay for the waste of utilities in the "Garden Cities" of Connecticut and New Jersey.

Your automobile will move at 100 or 150 miles an hour across such an organized city, and from two to five minutes will bring the delights of a really open countryside, with trees and fields and sky stretching out everywhere. The roads will be freed from the obsession of traffic lights which today negate the very principle of the auto, which is to move rapidly; at last the roads will be free!

In order to reform American cities, and especially Manhattan, one must first know that there is room enough for a real reconstruction. But Manhattan is large enough to hold six million inhabitants.

One must know whether existing conditions are good enough for the realization of the dream of individual liberty and of the benefits of nature which are necessary to the spirit of man: sky, sun, space, trees. Manhattan possesses the most extraordinary preliminary conditions for materializing such dreams: long empty river banks (yes, empty, or nearly so); an immense central section, empty or sterile, and therefore at our disposal or at least accessible for purchase, between the skyscrapers of Wall Street and 34th Street: a huge space at the heart of the city, a space admirably suited for a residential section which ought to occupy the center of the city. For there in the center are the bridges and the subways. (Fig. 8)

It will be necessary to regroup the streets in larger units: the present network is much too tight. The existing small scale gridiron layout prohibits—I cannot too strongly repeat—any solution to the automobile traffic problem. It could be changed, and it is easy to do if one knows absolutely it *must* be done.

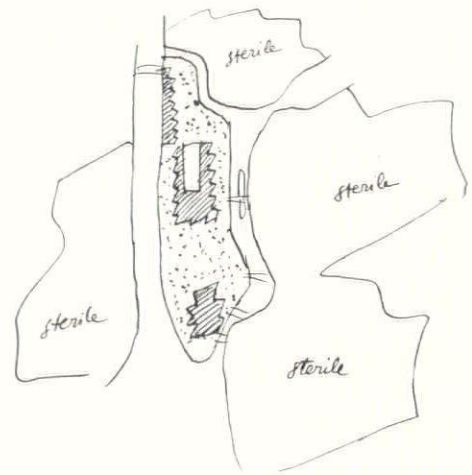
And the means of getting such things done? Why they are in the city itself, they are the very life of the city. Manhattan is covered with buildings whose average height is  $4\frac{1}{2}$  stories. You must see that that is the key to the situation. If you put on the soil of Manhattan, 1,000 inhabitants to the hectare, you will double, triple or quadruple the value of Manhattan's soil. With the profit from this increase in value you will pay the expenses of building special roads for pedestrians and express automobile highways. The means are in the very life of the city: the Empire State Building might suck the life blood from the surrounding quarters; it might ruin a multitude of people. The Rockefeller Center might do the same, and ruin in turn the Empire State Building. This money you require, the money you are searching for is in the active forces of the city, in the city's need to live better and better every day. If you permit disorder in carrying out this operation for the salvation of the New York region, ruin will be the savage reward of the masses; and profit, the diabolical reward of the few. If the measure is developed as a public utility—more than that: a necessity of general well-being—government authority can take charge of the metamorphosis creating welfare and riches for all, on the basis of a sound plan. But a sound plan is necessary, a symphonic totalitarian plan, corresponding to collective needs and assuring individual happiness: the cellular reconstruction of the American city. Here is the all-powerful and beneficent role of the government: its paternal role.

This remains to be stated: that the home is the essential product for general consumption—urgently needed, almost limitless in its market—in the U. S. A., and in the entire world.

## "METAMORPHOSIS"

New York is only a temporary city in a large part of its immense whole. A city which will be supplanted by another city. But everything must be carried out according to the inner laws and the proper scale of a metamorphosis conforming to the needs of the period. *Metamorphosis*. That is the word that has impressed itself upon my mind in the U. S. A. Growth has been relatively regular, though very rapid, even precipitous. People have been satisfied with *blocks*, units of grouping suitable to the epoch of the horse, and of small urban agglomerations. New York and Chicago at their present dimensions are out of proportion, out of touch with the daily realities imposed on us by the cosmic law of the sun: the 24-hour day. American cities (and Paris, London, Berlin, Moscow) must be brought back to a form of organization which takes account of the time-limit imposed on all our activities, our business, our labors: the time which elapses between the rising and the setting of the sun. (If you prefer between awakening and sleeping.)

But if the home is the consumers' product par excellence in the U. S. A., we must open our eyes at last to the actualities and the potentialities of mechanism. In the U. S. A. the relation of the current selling price of automobiles to that of pre-war years is -50. That is because production has been organized

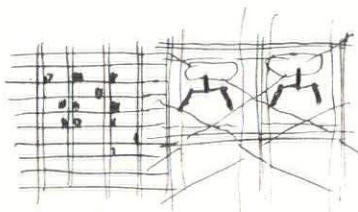


*Vies en terrain libre ... dans Manhattan*

8. Here are free areas—right in Manhattan

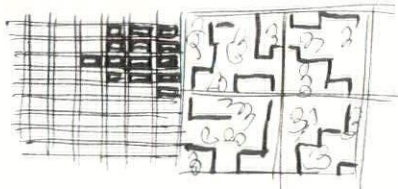
PHOTO: MCLAUGHLIN AERIAL SURVEYS





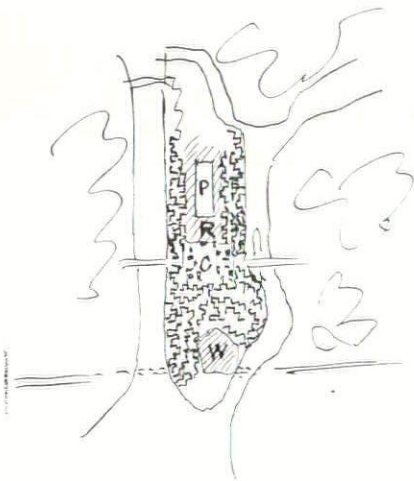
re-formation cellulaire:  
le gratte-ciel

9. Cellular reorganization,  
skyscrapers



re-formation cellulaire:  
le logis

Cellular reorganization,  
apartment buildings



une nouvelle ville efficace sur Manhattan:  
six million d'habitants

10. An efficient new city for  
Manhattan—six million inhabitants

and full use has been made of the miracle of machines. The relation of the current selling price in the field of building to that of the pre-war years is +210. That is because into this gigantic and essential industry the advantages of methods reducing the cost of expensive hand labor have yet to be introduced.

Modern techniques prove to us that large-scale industry can take over building. Let me repeat the obvious. That the home may be, and must be made in the factory—by industries at present idle because their only purpose is the manufacture of products whose consumption has ceased—of products which are superfluous.

Houses are indispensable to everyone.

Let us then make them in the factories.

Let us reform the cellular structure of cities so the new housing industry may have the scale to avail itself of mass production of the machine. (Fig. 9).

Force industry to discover that its real market is in the field of housing.

Stop the frightful waste of real estate developments spreading like some dramatic fatality over the countryside and the city. Let the government, above all, realize what its great task should be: urban legislation for the U. S. A. in order to produce a market for industry and to bring the essential joys of the human body and the human spirit.



And notice the consequences: 3 or 4 hours less of work for everyone every day. Unemployment? None at all! Freedom from a totally sterile participation in the upkeep of wasteful inefficiency—the immense waste of present American city-planning. These 3 or 4 hours brought nothing to anyone. They paid only for foolishness—for so much wind.

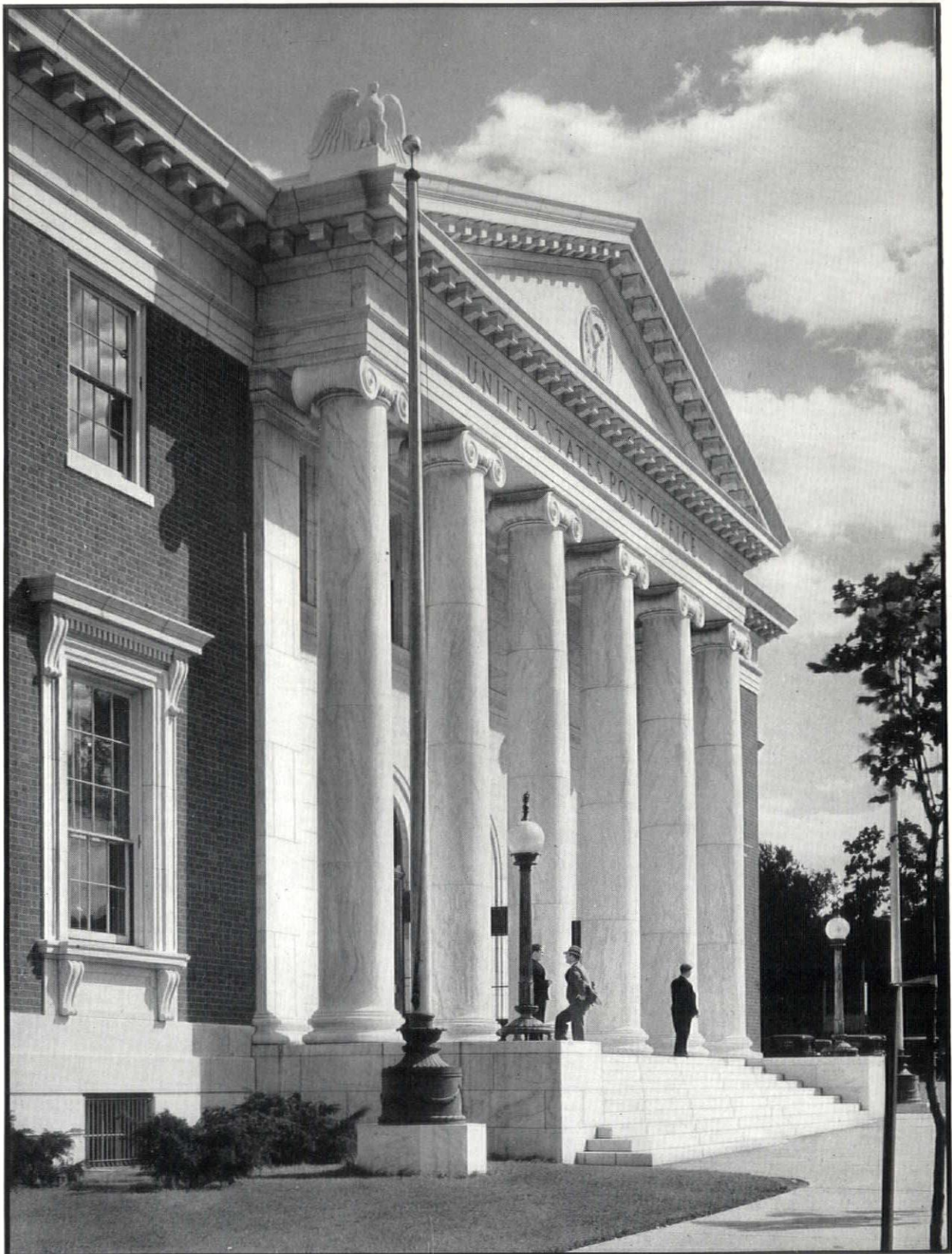
And then there will be new leisures. With machines, four hours of productive labor are enough. We will need cities—building and open spaces—to take care of these new leisures, so that they will not rise up in a new convulsion of mechanized society. We must plan our cities, and prepare by education for these new hours of leisure which will be available for the development of body and the culture of the mind. (Fig. 10.)

I see the machines of the U. S. A. and the prodigious organization of American industry. I see the Plan that can fix the program of essential production. I see the cessation of American slavery—in the subways, in the buses, in the trains, and on the roads—the daily hours lost *doing nothing*. I see the end of these daily hours of drudgery spent for things outside the range of legitimate consumption: shoes, clothing, bread, games and amusements—the mad expenditure for over-extensive cities. I see an aggressive education open to all minds, leading men to form opinions, awakening desires, creating a will. And I see the government at last justly, radically, profoundly, exactly informed of the possibilities of the present time (its techniques and its needs), at last considering the necessity of undertaking large scale reconstruction in the cities. Legislate for that; impose upon the stubborn egoists the urgent necessity of the public good; coördinate the forces of life, draw from the very vitality of the cities the power of usefulness and lead it where it ought to go: to the service of man.

Man of the machine age, in control of his machines, using them, making them produce, and realizing the imperious necessities of the new machine age: the human home, the radiant home, filled with all the gifts of progress, or organization, and of a plan which simply serves the profoundest needs of human nature: sun, sky, space and trees—joys that are essential.

LE CORBUSIER  
S.S. La Fayette





PHOTOS: SAMUEL H. GOTTSCHO

**FLUSHING POST OFFICE, FLUSHING, NEW YORK**  
**DWIGHT JAMES BAUM, ARCHITECT**  
**WILLIAM W. KNOWLES, ASSOCIATE ARCHITECT**

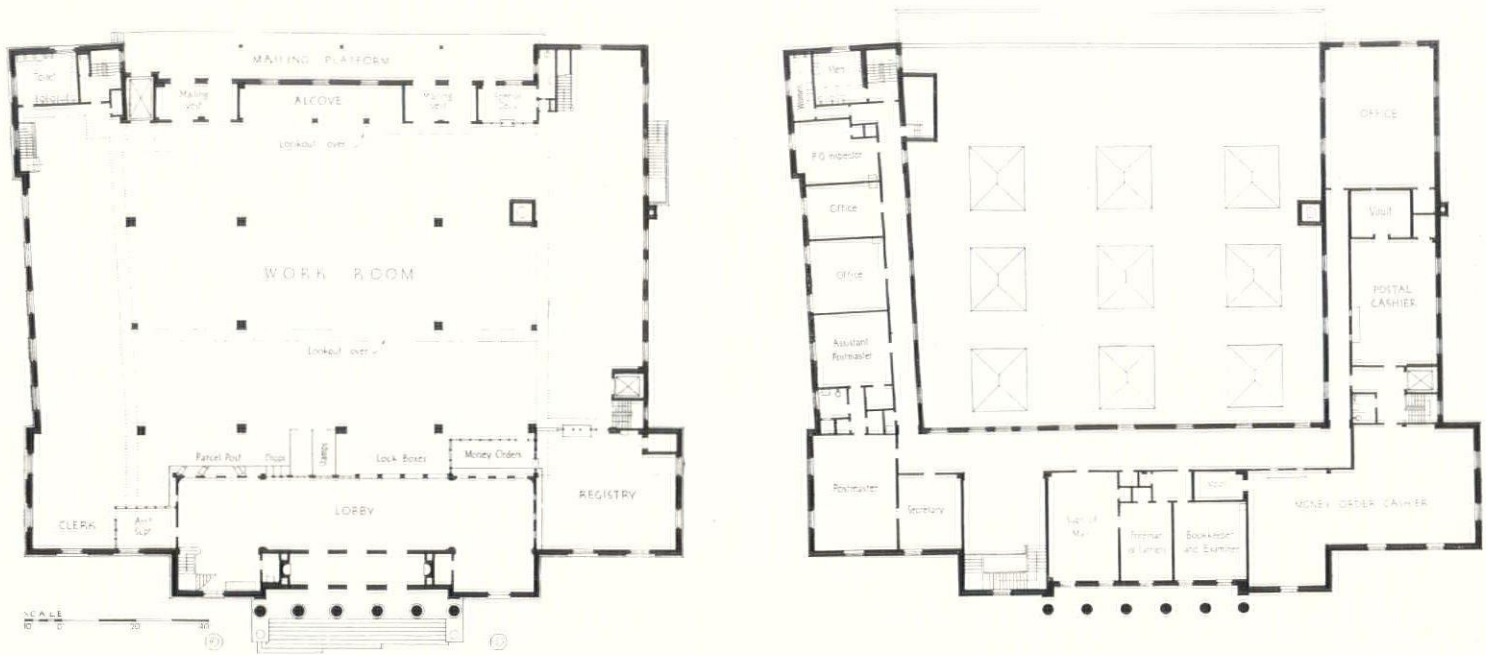


## **FLUSHING POST OFFICE, FLUSHING, NEW YORK**

**DWIGHT JAMES BAUM, ARCHITECT**

**WILLIAM W. KNOWLES, ASSOCIATE ARCHITECT**

This is one of four buildings selected by the Procurement Division of the Treasury Department for a traveling photographic show of recent government work. Others are the Hartford Post Office by Adams and Prentice (*American Architect*, July, 1935), the Albany Post Office by Electus D. Litchfield associated with Gander, Gander and Gander, and John Russell Pope's Archives Building. The contrast between the warm tones of handmade Jeffersonian-sized brick and the Vermont White Marble is in the traditional Georgian character. A feature of the main lobby (opposite page) is a 220 square foot mural painting recording the history of Long Island and the Flushing area, by Vincent Adriente. Ceiling is a soft green with mouldings picked out in gold. Walls of Golden Saint Genevieve Marble. Floor of Vermont Verde Antique and Alabama Cream Marble. The trim is bronze. The plan is standardized by government requirements



Lookout platforms overlooking work rooms, indicated by the dotted lines on the first floor plan of the Flushing Post Office, are a standard government specification





1

PHOTOS: CARL WAITE

## FARM AND STABLE GROUP

ESTATE OF ELLSWORTH H. AUGUSTUS, WAITE HILLS VILLAGE, OHIO

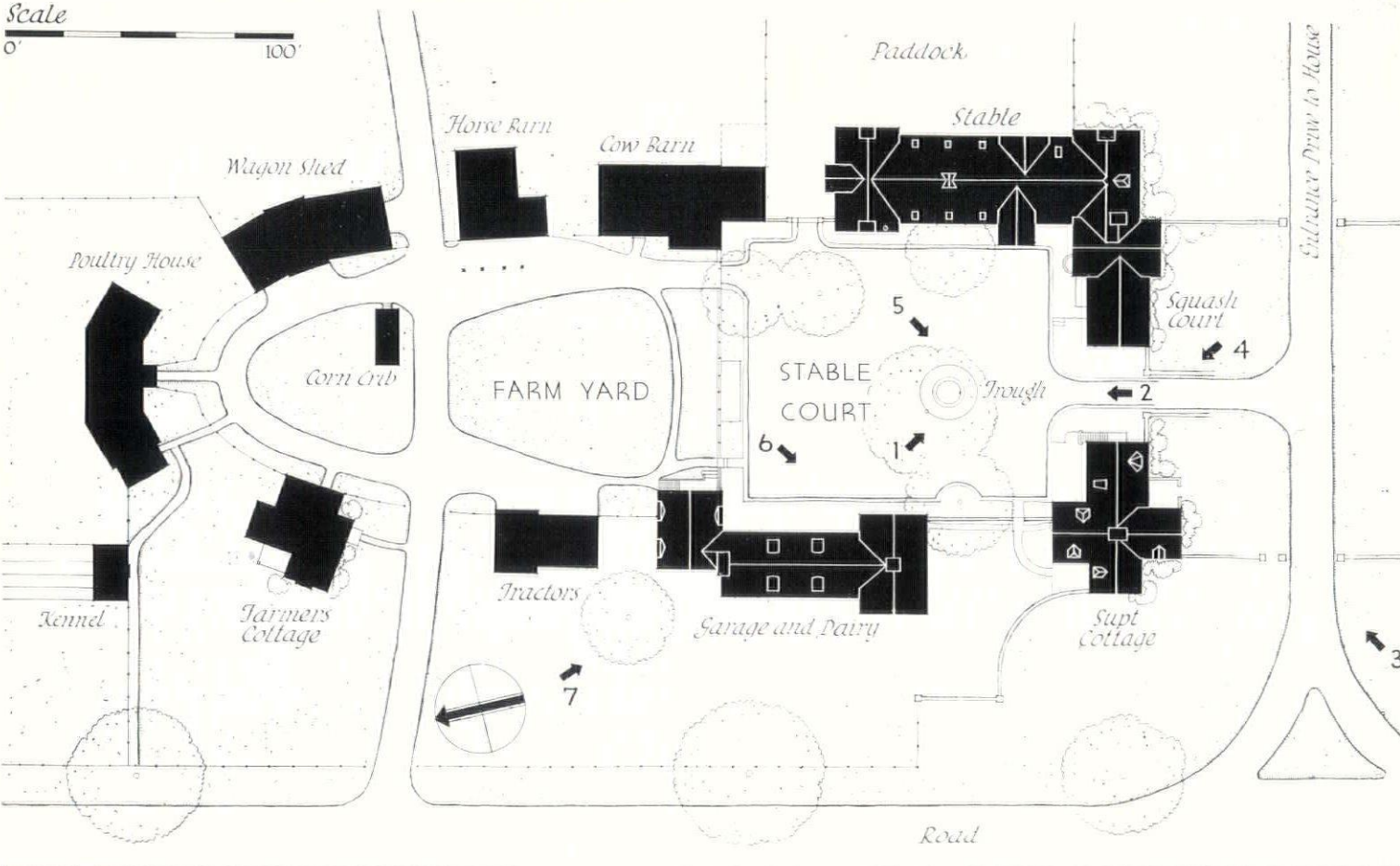
MUNROE WALKER COPPER, JR., ARCHITECT

Although the group was primarily designed for a variety of agricultural activities, parts of the new buildings are devoted to the personal sport interests of both the owner and his wife. Therefore, the main planning problem was to place the various service buildings in proper relation to the combination squash court and stable for blooded hunters, for convenience and for efficiency of operation. By grouping these new buildings around a second courtyard, which is in reality a fenced-off continuation of the farm yard, not only was this problem solved, but the result is one of picturesque informality.



2

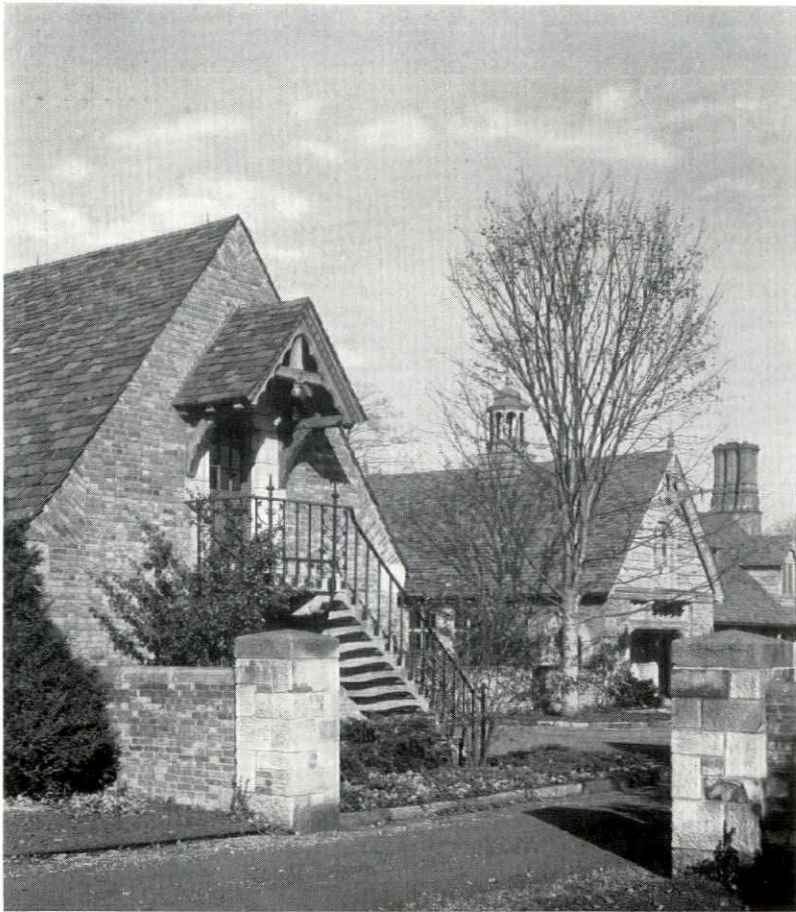
Scale



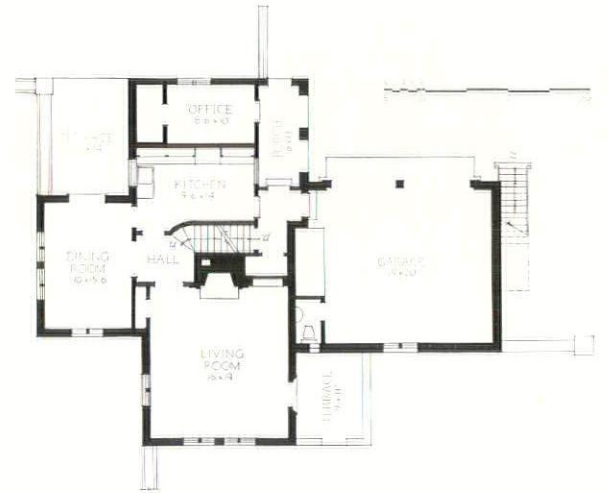
The numbered arrows on the plan indicate the location and direction of the camera for the photographs correspondingly numbered



3



4



Pastel-colored, reclaimed brick and variegated sandstone taken from old farm buildings contribute an air of antiquity to the entire group. The note of age is repeated in such details as the main entrance gate (above) of hand-axed timber treated with a weathered gray acid stain and the hand-wrought iron railing of the superintendent's cottage seen from the entrance to the court

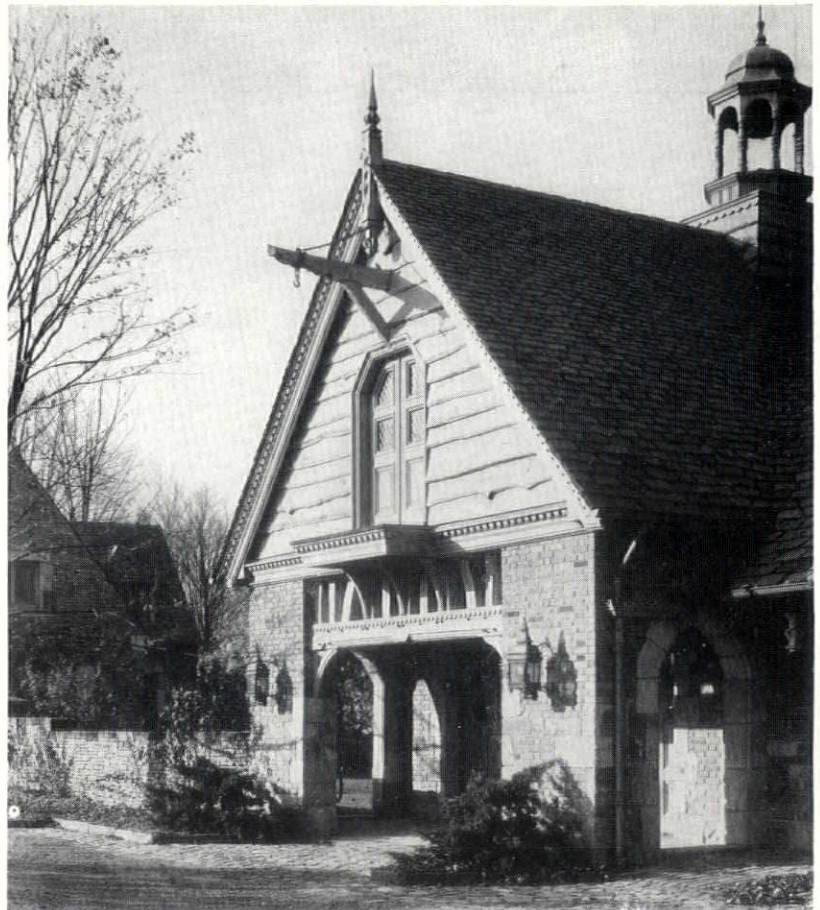
ESTATE OF ELLSWORTH H. AUGUSTUS, WAITE HILLS VILLAGE, OHIO



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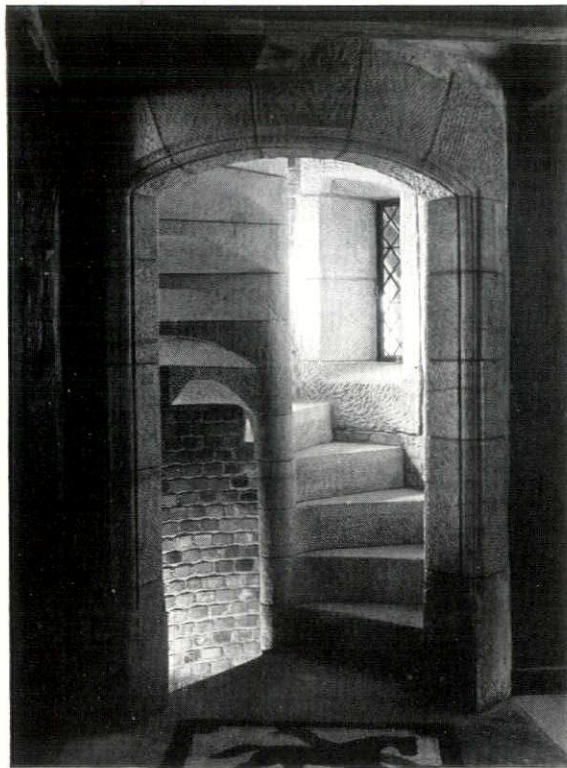
Structural half-timber work, not appliqué. Roofs are black and dark mottled-gray, Vermont slate in varied thicknesses. Casement windows are painted aquamarine blue in the superintendent's cottage (above) which is seen from behind the watering trough which was carved from a massive 50-ton solid stone at the site. (Right) Courtyard entrance to the main garage and dairy



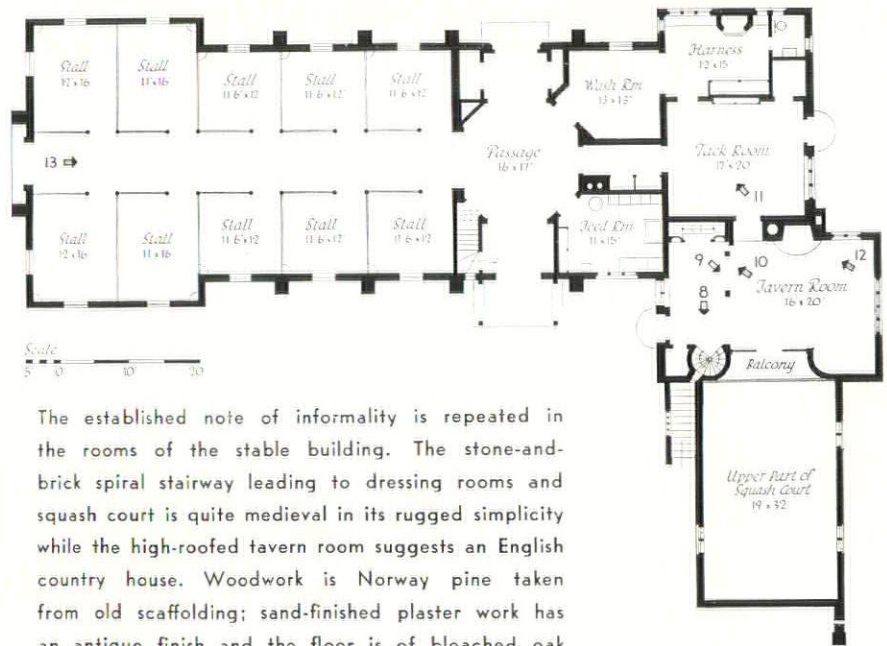
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MUNROE WALKER COPPER, JR., ARCHITECT

7



8

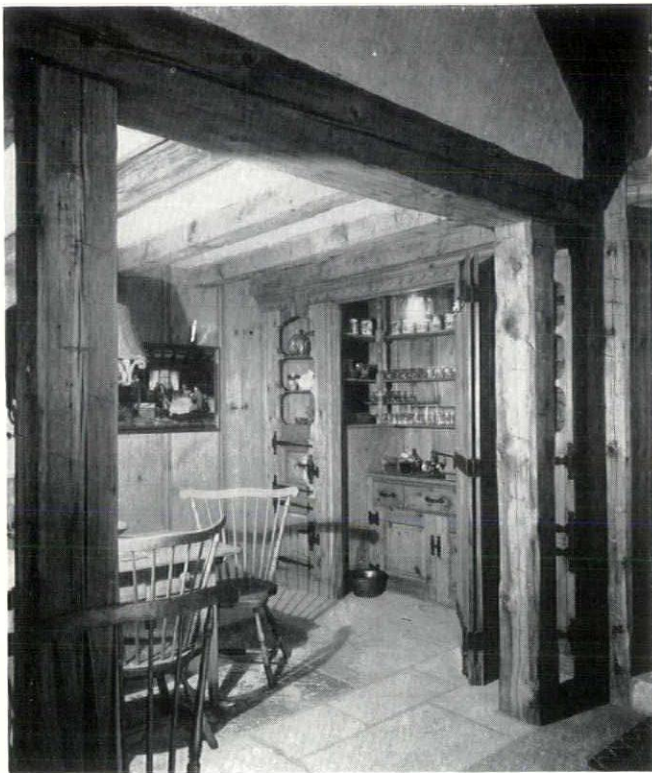


The established note of informality is repeated in the rooms of the stable building. The stone-and-brick spiral stairway leading to dressing rooms and squash court is quite medieval in its rugged simplicity while the high-roofed tavern room suggests an English country house. Woodwork is Norway pine taken from old scaffolding; sand-finished plaster work has an antique finish and the floor is of bleached oak planks. The doorway to the right in the illustration on the facing page, leads to a spectators gallery overlooking the squash court. The exterior view of the garage and dairy building (above) is from the main highway

Numbers on plan indicate where photographs were taken







Both bar (left) and tack room (below) have walls of wide, hand-plowed pine boards, hand-wrought iron hardware and ceiling beams of Norway pine, hewed by a Swedish-trained carpenter. Floors are Crab Orchard stone from Tennessee

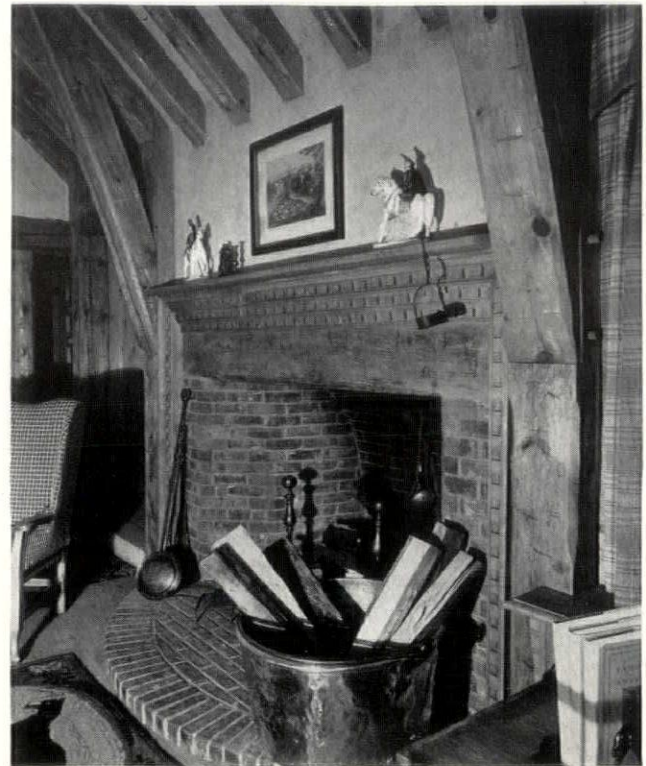
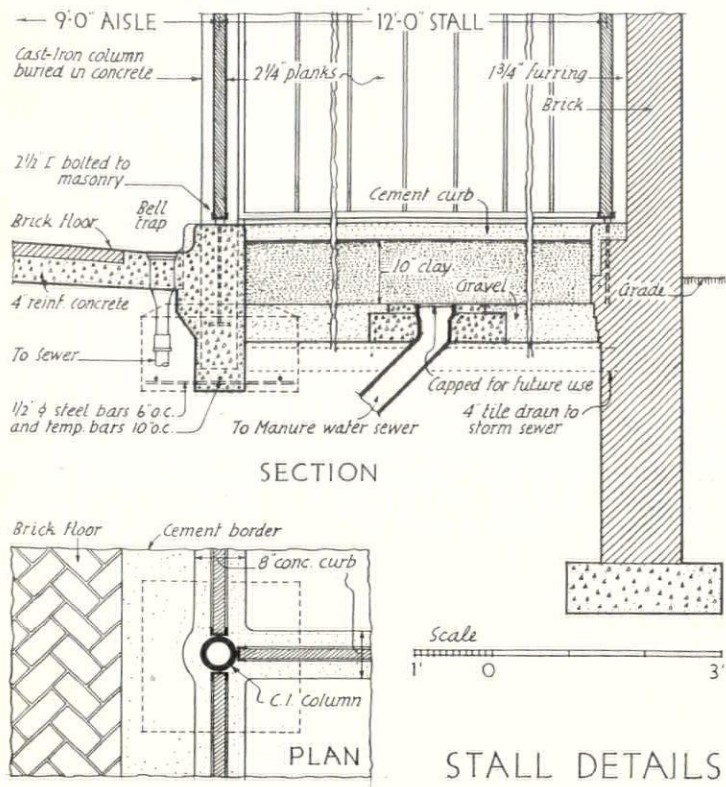
Opposite page: Bricks for the fireplace in the tavern room were originally brought from England for the old homestead of the late Marcus A. Hanna. Oak box stalls, for the exclusive use of thoroughbred hunters, are stained a light warm gray and the iron work is painted blue. Stall floors are of clay, while the aisle is paved with a rough-textured non-skid brick

ESTATE OF ELLSWORTH H. AUGUSTUS  
WAITE HILLS VILLAGE, OHIO  
MUNROE WALKER COPPER, JR., ARCHITECT

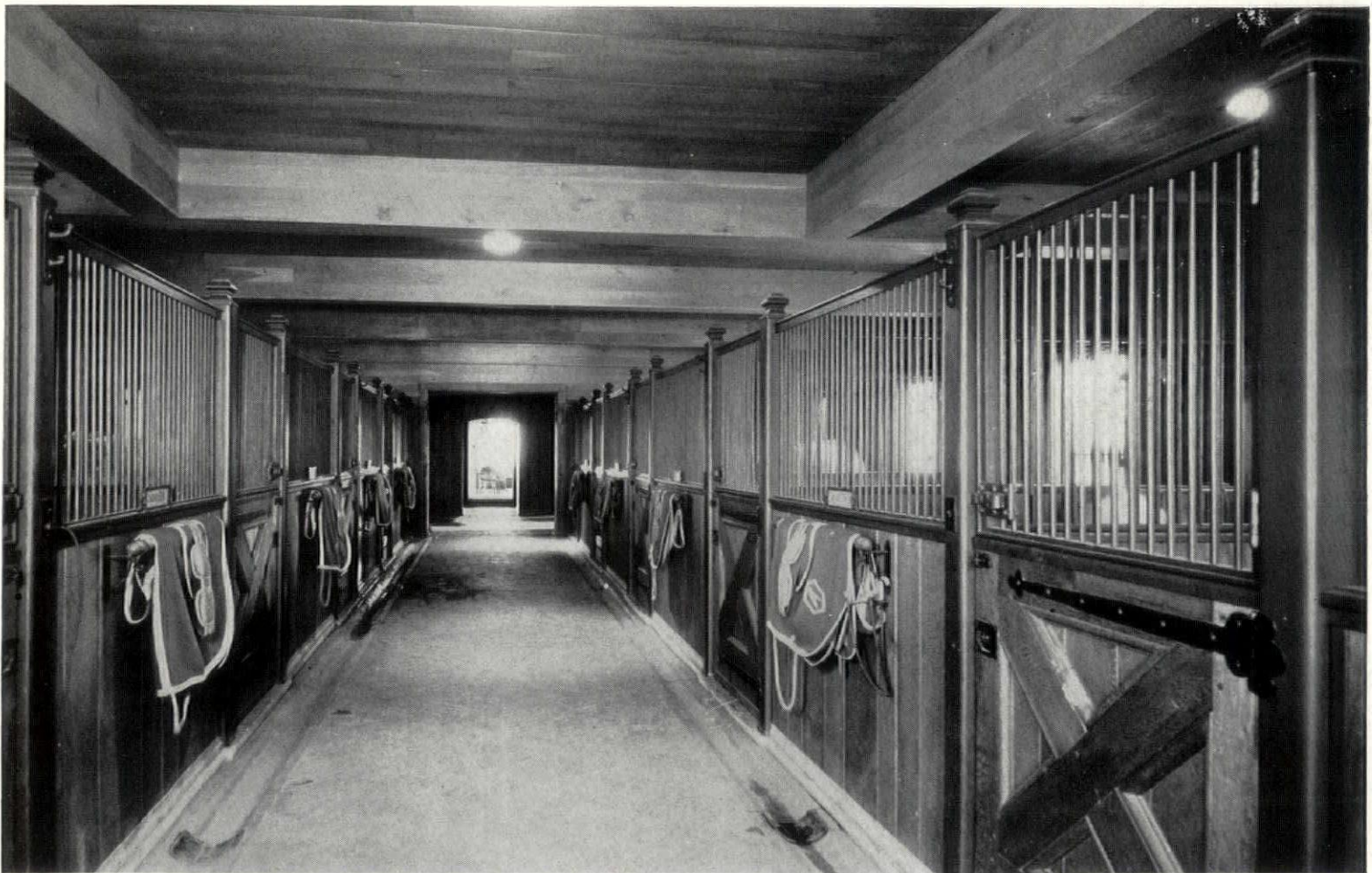
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11



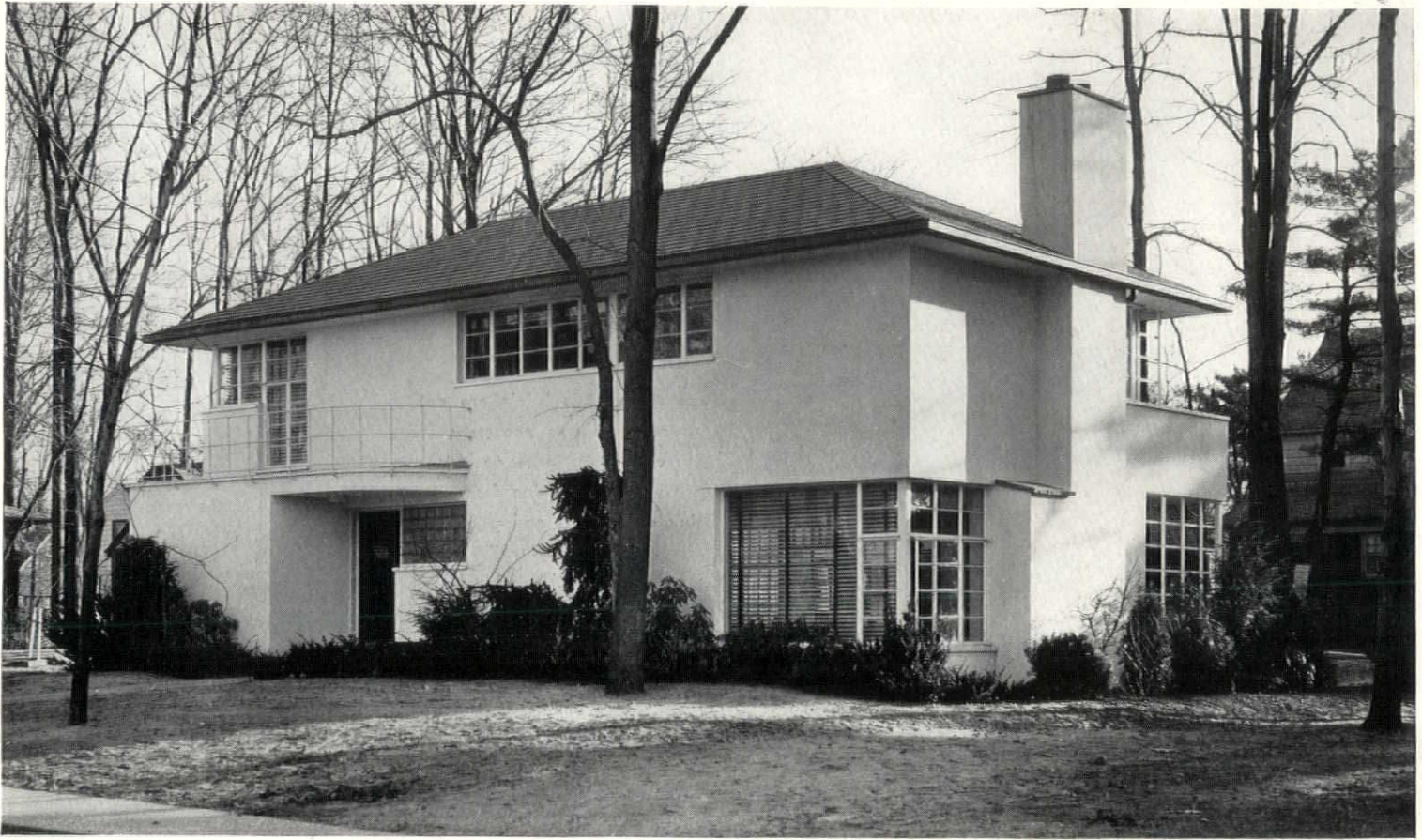
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13

HOUSE OF EMMETT A. JOHNSTON, TEANECK, NEW JERSEY  
ERIK KAEYER, ARCHITECT

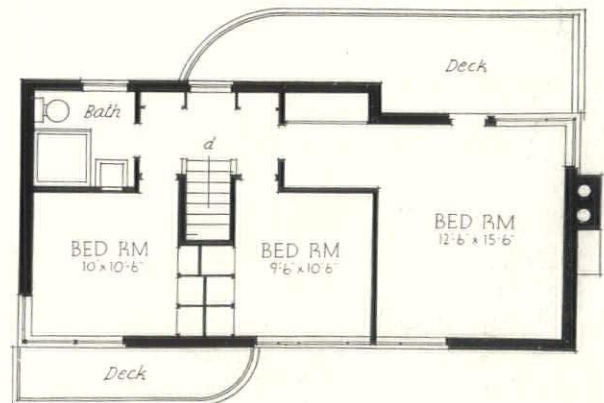


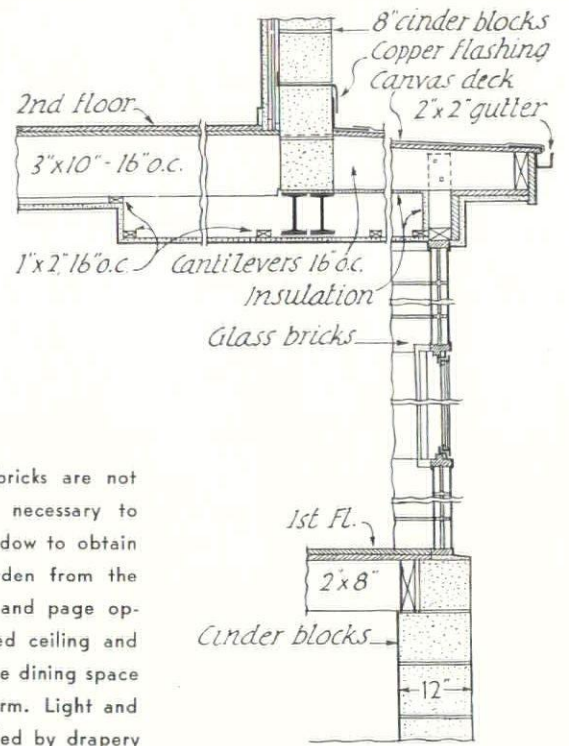
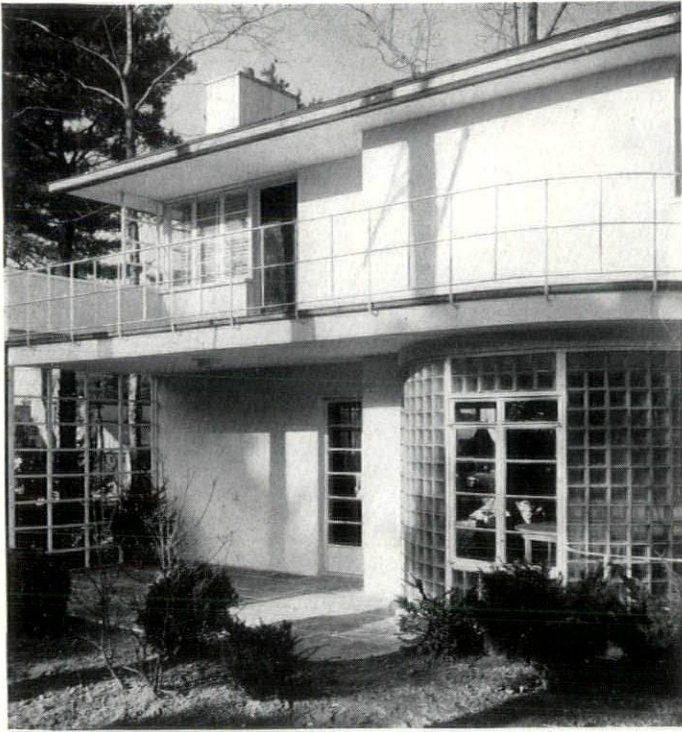


PHOTOS: JOHN GASS

Maximum space-use in plan makes this a house-of-the-present despite the "traditional" pitched roof. (Flat roofs are just as traditional.) Fenestration studied from interior relationships, the healthful sun decks and the use of simple forms are all modern. So are concrete block construction, pipe railing for the decks and Insulux structural glass bricks for light-plus-privacy. Other niceties of detail are chromium finished interior trim, a walnut Flexwood wall and built-in plate glass bookcases. . . The plan, too, is ingenious and

economical in its functional arrangement. The relationship of the living room to the cheerful glass-walled dining circle provides the owner with a spacious multi-use room. The same openness of plan occurs between the stair hall and the living room. There is a minimum, though adequate, hall on the second floor; closets are generous and convenient; the bath is served by the plumbing stack from the kitchen below. Sun decks, convenient to the bedrooms, serve the additional purpose of protecting the porch and main entrance.





Since these glass bricks are not transparent it was necessary to use a casement window to obtain a view of the garden from the dining space (left and page opposite). The lowered ceiling and the red carpet in the dining space recall its circular form. Light and privacy are controlled by drapery

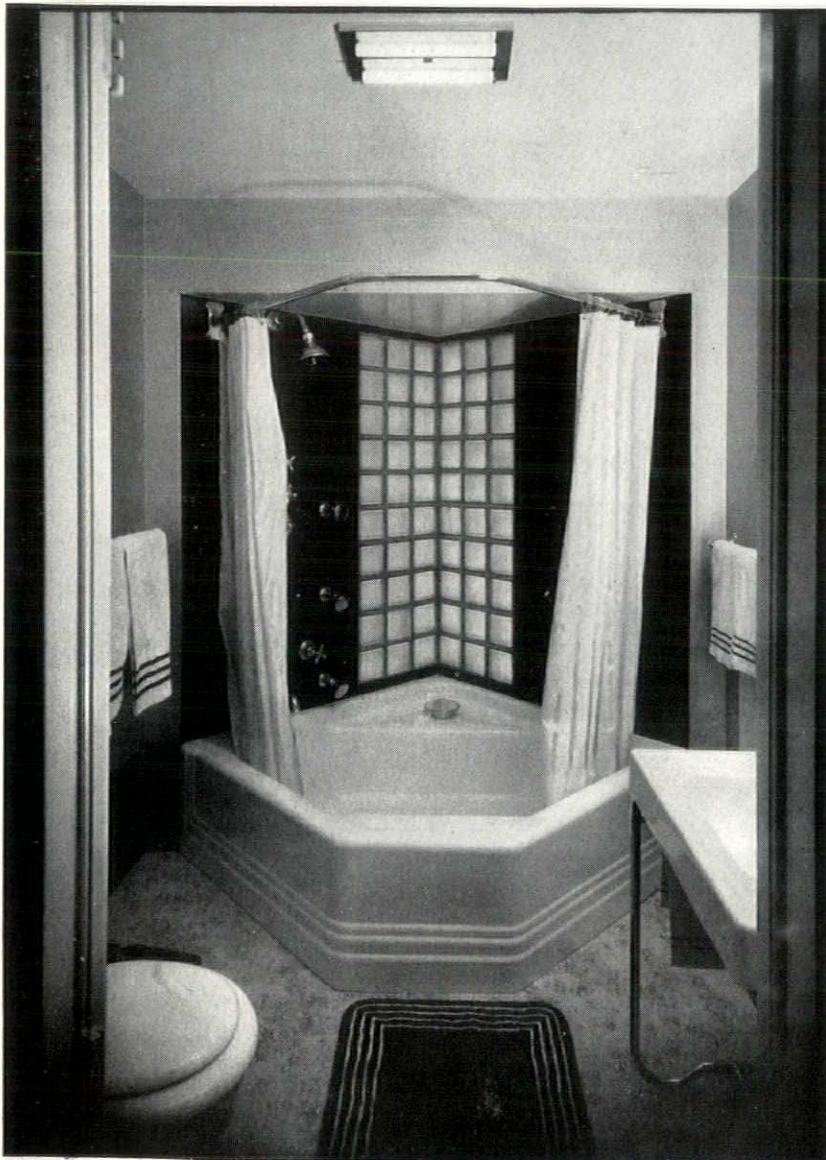


Chromium trim, light beige walls and a white ceiling are in pleasant contrast with the walnut Flexwood wall and brown carpet



HOUSE OF EMMETT A. JOHNSTON

ERIK KAEYER, ARCHITECT



## HOUSE OF EMMETT A. JOHNSTON

TEANECK, NEW JERSEY

ERIK KAEYER, ARCHITECT

### OUTLINE SPECIFICATIONS

**FOOTINGS:** Stone concrete, 8" thick with 6" projection beyond each side wall.

**WALLS:** Foundation and outside cellar walls, 12" thick concrete units. First and second story walls, 8" x 8" x 16" cinder concrete units laid with flush blocks, corner, window and door jamb blocks. Outside walls finished with white portland cement. Interior walls, white plaster on metal lath. Front wall of living room, walnut Flexwood panel 14' x 8' high.

**FLOORS:** Basement of 4" cinders, well tamped, 2" of 1-2-3 stone concrete, finished with 1" cement coat, 1-2 mix, troweled smooth. Living porch and entrance floors, 1/4" bluestone (broken) flagging, random sizes and colors, laid in cement on a 4" bed of cinder concrete. First and second story floors, flat-grained white oak, with building paper laid between floors. Second story balcony and deck floors, 1 1/8" x 3" fir, covered with heavy canvas laid in white lead. Linoleum floors in kitchen, bathroom, and powder room.

**FRAMING:** First and second floor construction, 2" x 10"-16" O.C. wood beams, with 1" x 3" cross bridging, 7' apart. Second story ceiling beams, 2" x 8"-16" O.C. with 3" x 8" plate anchored to walls. Roof framing, 2" x 6"-16" O.C., rafters with 2" x 8" ridge and hips. Matched spruce underflooring, 7/8" x 6" over first and second story, main and entrance roof. Inside of all exterior walls of first and second stories, except garage, furred with 2" x 2" strips 16" O.C. and lined with Bird insulation board.

**DOORS:** All exterior and interior doors of stock, flush-panel, birch veneer; outside doors 1 3/4" thick; inside doors, 1 3/8" thick; wardrobe and linen closet doors, 1 1/8" thick. Frames of pine. Trim 3/4" half-round chromium moulding.

**STAIR:** Constructed with 1 1/8" oak treads, 7/8" pine risers and 1 1/4" stringers. Chromium stock hand rail.

**ROOF:** Blue slate, 3/16" thick laid on roofing felt; gutters, leaders, flashings, 16 oz. copper.

**WINDOWS:** Crittall steel casement windows, with bronze screens.

**DINING ROOM:** Circular walls from floor to ceiling are constructed of Owens-Illinois Insulux glass building blocks. Ceiling lowered to complete curve in living room and has circular chromium track for draw curtains to control light and privacy.

**BATHROOM:** White Neo-Angle tub. Vitreous china lavatory with chromium legs. One piece W. C. Hoegger chromium accessories. Walls of Owens-Illinois Insulux glass building blocks. Black Micarta, shower and dado, with silver Sanitas walls. Lumilite lighting fixtures.

**LAVATORY:** Colored fixtures.

**PLUMBING:** Drain pipes of cast-iron; waste and vent pipes, galvanized steel. All water pipes, fitting and connections of brass.

**HEATING:** Richardson and Boynton air conditioning system with automatic controls and oil burner.

**PAINTING:** Lead and oil, with interior frames, base and cabinets, shellacked and given two coats of paint and finished in eggshell enamel. Doors stained to match furniture of individual rooms.

**WIRING:** ABC steel armored cable.



# FROM HACIENDAS TO HOUSING

Vast estates taken over by the government since 1910 are sites for Mexico's first housing experiments. Result—new architecture plus the problem of selling a new style of life to the poor

BY ROBERT C. WEINBERG

NOT until 1932 had the Mexican Government, hampered by an almost continual threat of revolution, made any attempt to solve their ever-pressing housing problems. Even today, when only 313 families out of a population of 615,637 have been provided for in public housing, Mexico's contribution, like our own, is little more than a drop in the bucket.

The first of these projects at Colonia Balbuena and San Jacinto near Mexico City, described herewith, show how Mexico is attempting solution of her problem by means of houses, constructed under government auspices, to be amortized in ten years. The government also contributed 25 per cent of the cost of each house, from its own budget, in favor of the purchaser.

Unlike other metropolitan areas in America, Mexico City has nothing comparable to the suburban or semi-suburban sections, whether flourishing or "blighted," that are so characteristic of New York, Boston, and Chicago. The transition in Mexico City from the intensely built-up urban areas to the open country is sudden and abrupt. Consequently, the city dweller and his country cousin for generations have been accustomed to sharply contrasted living conditions. Even the idea of living in so-called suburban communities was new. The Mexican problem, therefore, was not only to provide the worker-occupant with new housing, but with a new manner of living as well. This, since the completion of the project in 1934, has proved even more difficult than anticipated. For the country people, who, before moving to the city, had lived in one-room primitive "jacals" (Indian huts), the transition was difficult. For city dwellers the change was, perhaps, just as trying. In both cases, however, the shift in environment was far different from that involving American slum occupants. With few exceptions, sunlight and air have not been lacking in even the oldest and most squalid tenements in Mexico City. But, since most of these old courtyard "apartments" consist of nothing but a single room with a single opening to the public balcony or court, serving every purpose of door, window, and refuse exit, new housing was imperative. These are proletarian homes as they have existed for millennia, and probably differ little from the living quarters of the people in ancient Rome. Although lacking



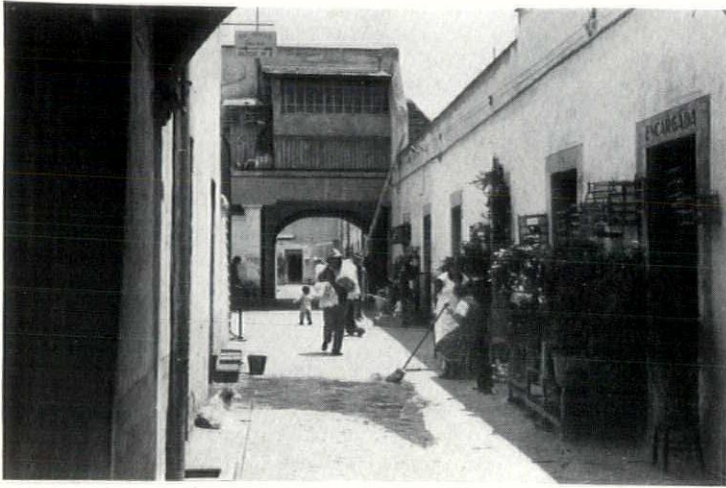
PHOTOS: ROBERT C. WEINBERG

Courtyards, a universal feature of Mexican architecture, still flourish but the picturesque balconies and niches for patron saints will be superseded, according to present plans, by sanitation

the barest conveniences provided in even the worst tenements and blighted districts of our own cities, the slum dwellers in Mexico City have been accustomed to homes that have a certain picturesque attractiveness. But the crowding is horrible and the Administration is to be commended for tackling the problem, even though the emergency requirement is not so much to replace slums as it is to take care of an increased industrial population. Now, after one year's experience in management, the Administration is considering new and additional experiments that would provide an intermediate type of dwelling between the (jacal) and the present type of housing.

This, however, is Mexico's peculiar sociological problem.

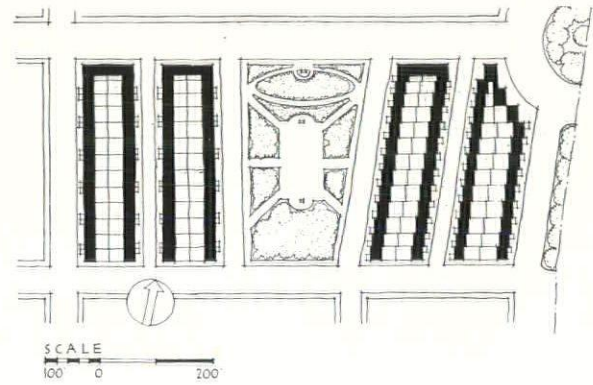
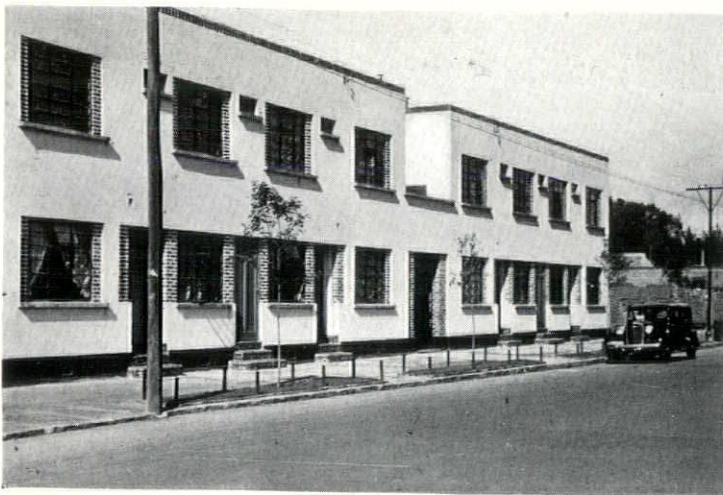
The "Employes' and Workmen's Housing Projects" at Colonia Balbuena and at San Jacinto, conducted under the auspices of the Federal District of Mexico, a governmental unit comparable to our District of Columbia, were completed in 1934 as part of the Six-Year Plan for national housing initiated by President Rodriguez, predecessor of President Cárdenas. Historically, the lands used, which are located in open country only a short distance outside the built-up section of Mexico City, were originally parts of the great haciendas appropriated by the government after the revolution of 1910, and used for various public purposes by the Department of Agriculture.



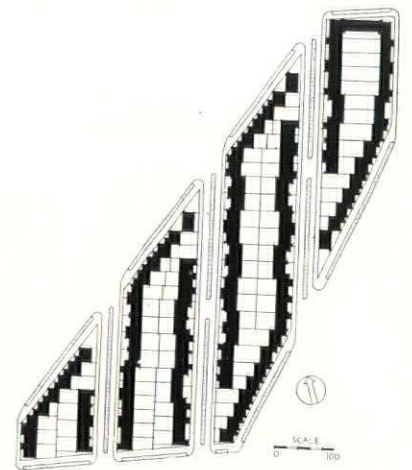
Both projects, which are of the row-house type, one and two stories high, create the general impression, in regard to character and density, of Sunnyside, in Queens, New York City. Fully equipped recreational parks and self-sufficient water and sewage disposal systems, when completed, will be closely tied up with housing at both Balbuena and San Jacinto. Unfortunately, the location of these projects in relation to the development of the Mexico City plan as a whole does not seem to have been clearly worked out. But, while the street systems to which the projects conform are of no great merit from an urbanistic standpoint, the adaptation of the housing units to the established property lines gives a certain amount of variety to the blocks of houses as seen from outside and provides ample private garden spaces on the interior.

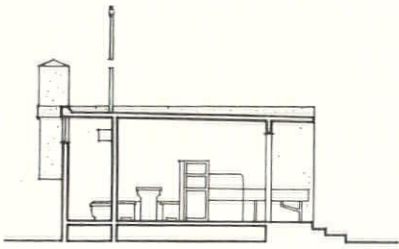
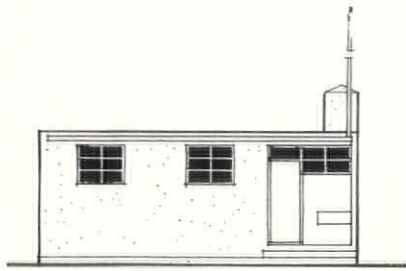
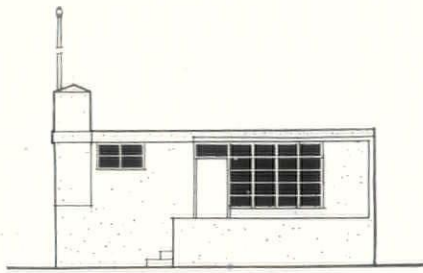


The design of the houses and the selection of the architect in the Colonia Balbuena project were determined by competition, and it is particularly interesting that not only was the prize given to designs which are distinctly functional and forward looking, but also that the competition drawings were very closely followed in the executed work. In reference to the flexibility of the sleeping quarters, the plan of the houses is exceptionally ingenious. The frank acceptance of the water tanks and venting apparatus, and the undisguised utilization of them as elements in the exterior design have been accentuated by painting these tanks in various bright colors, enlivening the whole row and helping the worker identify his house. All of the construction is simple and substantial and has, I am told, met with no serious deterioration with the exception of the exterior stucco which has worn

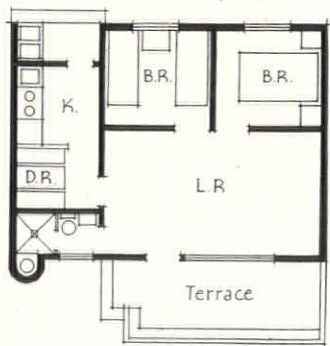


Private landlords still house the majority of workers. Sunshine and air are usually provided; the traditional one or two-story dwellings are taken for granted (above). One room apartments of the old style rely on a single door for all purposes (center). Current builders substitute a neatly planned apartment of about the same room area, but add a window, an entry, a bath and a kitchen (below). Street front of apartment court shown in center picture (right). Where land cost is high, two stories have always been the rule. Plot plans show that Colonia Balbuena has its own park and streets paralleling the main highways while San Jacinto has a traffic problem in streets connecting two highways

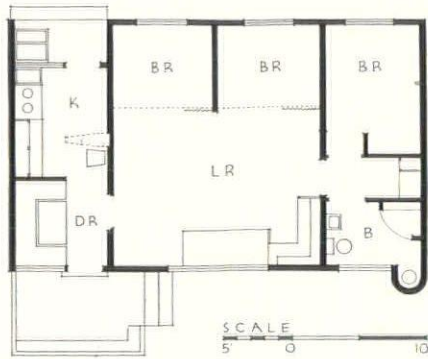




SCALE  
5' 0 10'



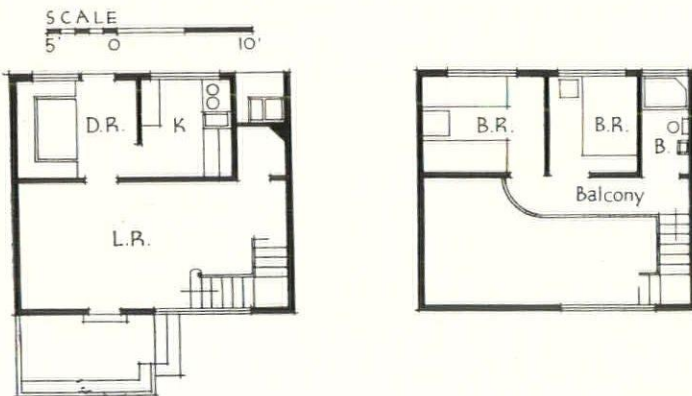
In the government project at Colonia Balbuena, the architecture follows the established current of functionalism. The price spent for the seemingly needless expanse of heat reflecting pavement (bottom) might well have been used for better stucco work (center); the project's central park (top) will, in time, offer delightful shade



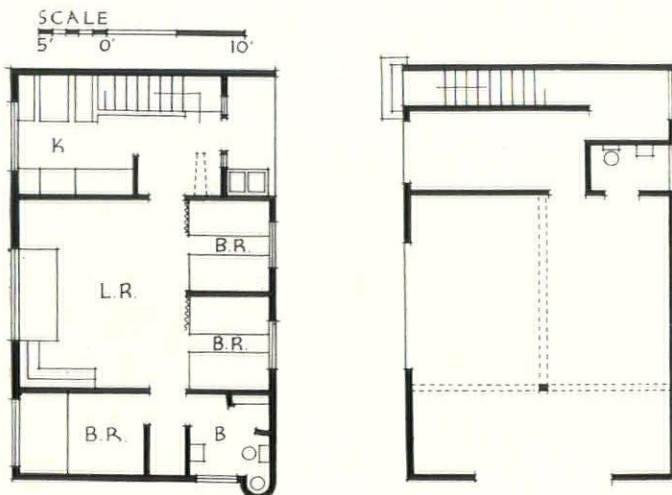
Typical government plan of a one-story house.



Plan of a two-story house with three bedrooms.



Plan of a two-story house with two bedrooms.



Typical plan of an apartment over a store (right).

very badly indeed. The method of applying this to the outside of concrete block, however, was somewhat experimental in the Mexican climate and doubtless will be improved upon when the next houses are built.

### FINANCIAL MECHANICS

In some respects these projects are analogous to PWA ventures conducted by the United States Government. For, although sponsored by the Federal District of Mexico, the construction was financed by an issue of municipal bonds of Mexico City. But, where the financing is handled through the municipality, the sale of the homes is a direct transaction between the Federal District and the purchaser. Just as soon as the first lot of houses was completed at Colonia Balbuena in the middle of September 1934, the Federal District published an announcement in all of the important newspapers for thirty days, stating the type and location of houses it had for sale. Application for ownership was allowed anyone between the ages of 18 and 45 who was a laborer, employe or head of a family, who was of Mexican origin, and who earned a minimum salary of 75 pesos per month. Similar announcements were run when the second lot of 205 houses was ready for occupancy at San Jacinto.

Every effort was made by the government to assure the inhabitant permanent possession of the house. In case of illness or involuntary interruption of work, the purchaser is allowed one grace period of three months, and, in case of inability to carry out the contract, he is allowed ninety days to transfer his title to a new purchaser. Through compulsory insurance on the life of the breadwinner, which costs about 1.09 pesos per thousand at the age of 35, the government is attempting to decrease losses of ownership due to death. To stimulate ownership of these homes, the buyer is given a rebate of fifty per cent of the real estate tax for ten years, even when the principal sum is amortized in advance of this term.

Taking as an example the cheapest house in the project, the individual costs would be:

Land .....	184.54 pesos
Construction .....	1,942.25 "
Utilities .....	53.75 "
Share of Sts.....	233.33 "
	2,413.87 "

The real net cost, after the government's deduction of 25 per cent, would be only slightly more than 1,810 pesos. A peso has about the same buying power in Mexico City as the dollar in New York, although its foreign exchange rate is about 27 cents. All fractions of the pesos are figured in centavos of which there are 100 to the peso. This is amortized in ten years. No interest is charged on the capital sum.

The Colonia Balbuena and San Jacinto projects, therefore, are significant as settlements or communities that may well be the forerunners of an entire ring or belt of semi-suburban developments surrounding the city and forming a part of its natural growth. Such a growth, if it continues to be directed and controlled by government agencies, will avoid many of



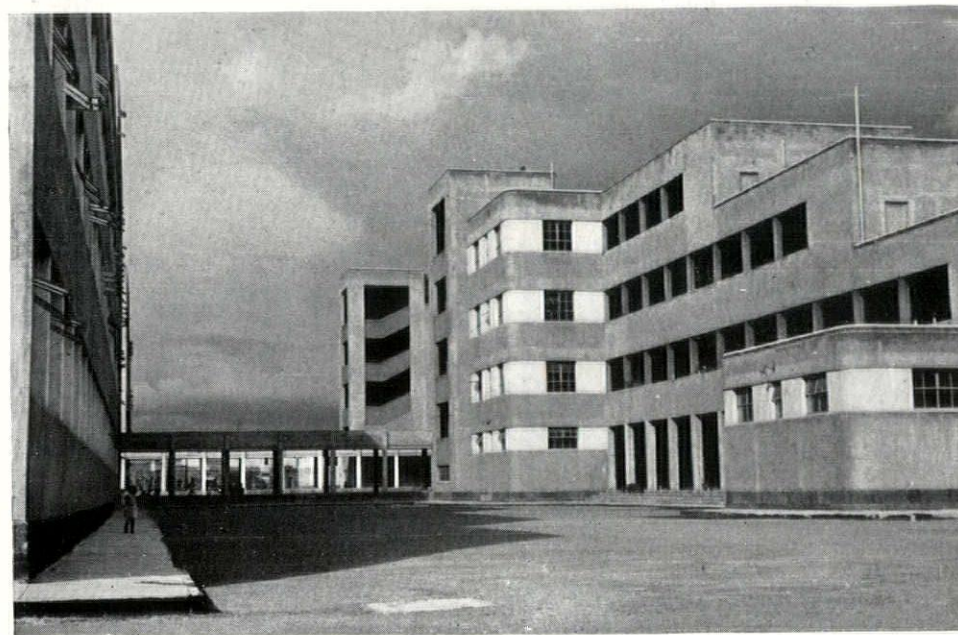
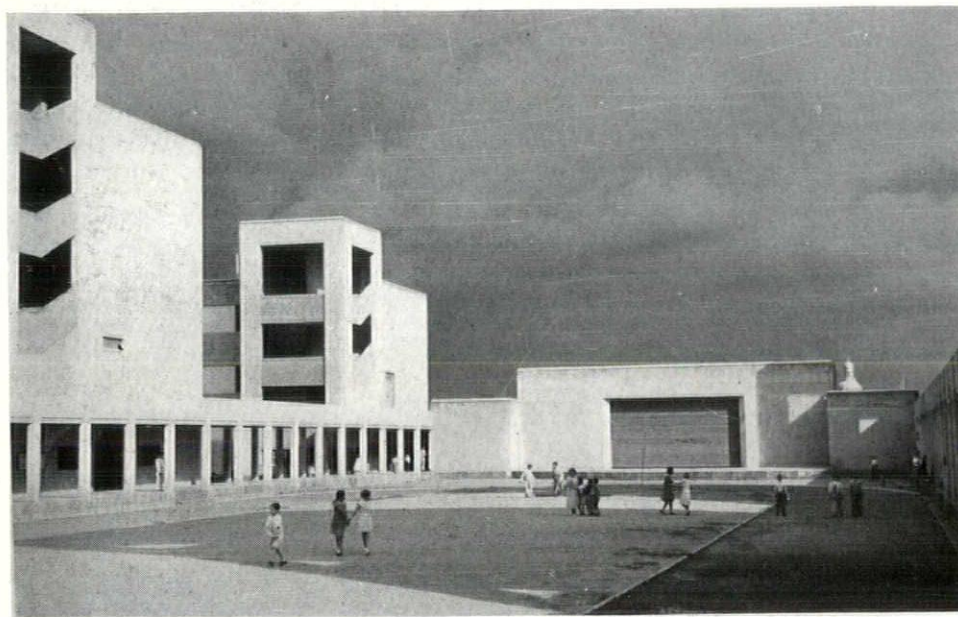
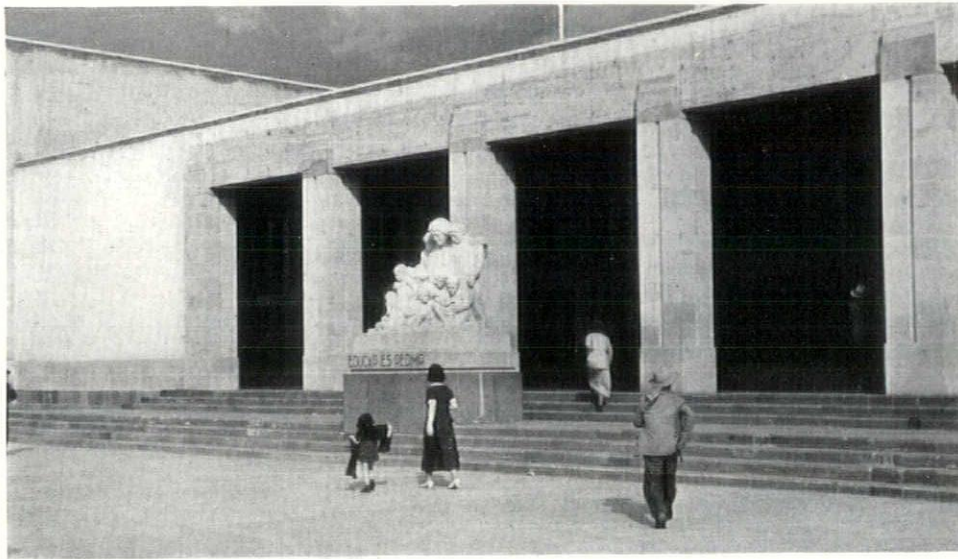
Adequate fenestration, while typical of all the government projects, is particularly noteworthy in the popular two-storied three-bedroom houses for large families (above). Immediately adjacent to Colonia Balbuena is a medium-sized private home, a maternity health station and a nursery school (center). Private enterprise has had less aesthetic success than the government in similar developments (below).

the architectural evils that have resulted from the uncontrolled growth around our own American cities.

Even Balbuena and San Jacinto do not seem to the city planner as part of any integral scheme for the whole city, they are certainly part of a well thought out project for improving the condition of the working man by the present Mexican administration. The Six-Year Plan aims at providing the working man of Mexico with a large number of benefits, of which housing is only one. The projects illustrated are closely connected with parallel developments in the fields of education, recreation and health. The school building program going on in Mexico is phenomenal. Recreation facilities for workers in the form of field and forest preserves, and the construction of play facilities of various types accessible to congested areas, are progressing side by side.

On the other hand, it is an interesting sidelight that where private initiative has replaced old structures in Mexico City, the new buildings, although modern conveniences are supplied, show improvement neither in general planning nor in architecture.





Education is another important part of the Mexican Government's program. The colonnaded main entrance (above) of a new urban grade school, for 5,000 pupils, is flanked by a library and administration offices. On the main axis is an open assembly court (center) with an enclosed stage at the far end. Six huge classroom wings, three on each side of the assembly court (below), have open air stairways, corridors and setbacks for outdoor classes. All the classrooms face southeast



PHOTOS: GEORGE HAIGHT

**HOUSE OF GAIL AND MARIE HOUSTON**

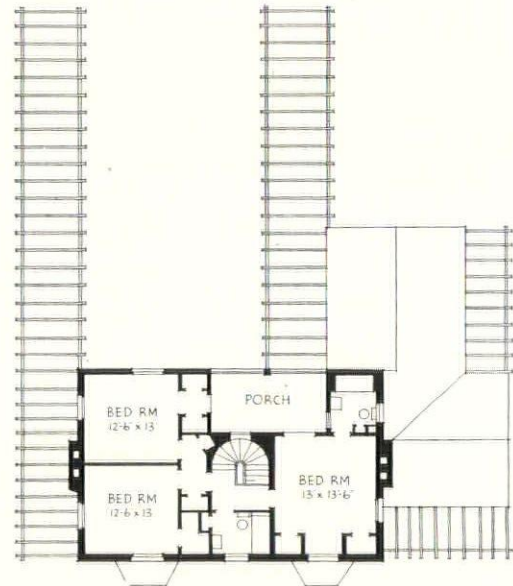
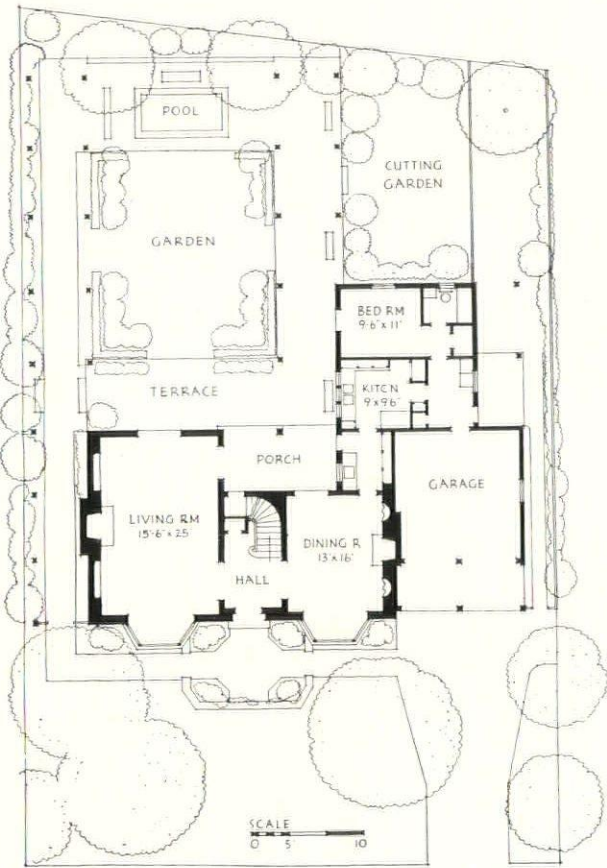
**LOS ANGELES, CALIFORNIA**

**H. ROY KELLEY, ARCHITECT**



**HOUSE OF GAIL AND MARIE HOUSTON, LOS ANGELES, CALIFORNIA**

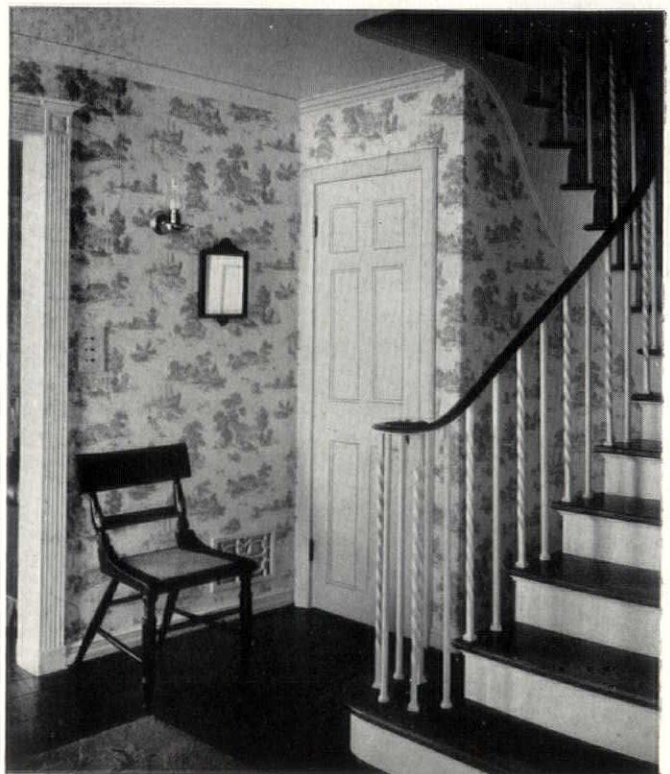
**H. ROY KELLEY, ARCHITECT**



Awarded first prize in the recent "House Beautiful" Small House Competition, for houses of eight rooms or less, because, as the jury expressed it, this home showed, "Balance, harmony and refinement achieved by skillful handling of fenestration and materials. A feeling of space in a small but formal house. Admirable simplicity of detail." . . . The exterior walls are white-washed brick on wood framing accented by red cedar shingles and green and white shutters. Other trim is white. Building cost was 38 cents a cubic foot



Interiors exemplify the same simplicity that distinguishes the exterior. All detail is fresh, clear-cut and refined. An early American wallpaper is used, with egg-shell white trim, throughout the first floor living quarters. Pegged white oak floors retain the spirit of an older time



# FAIR WORDS AND SILENCE



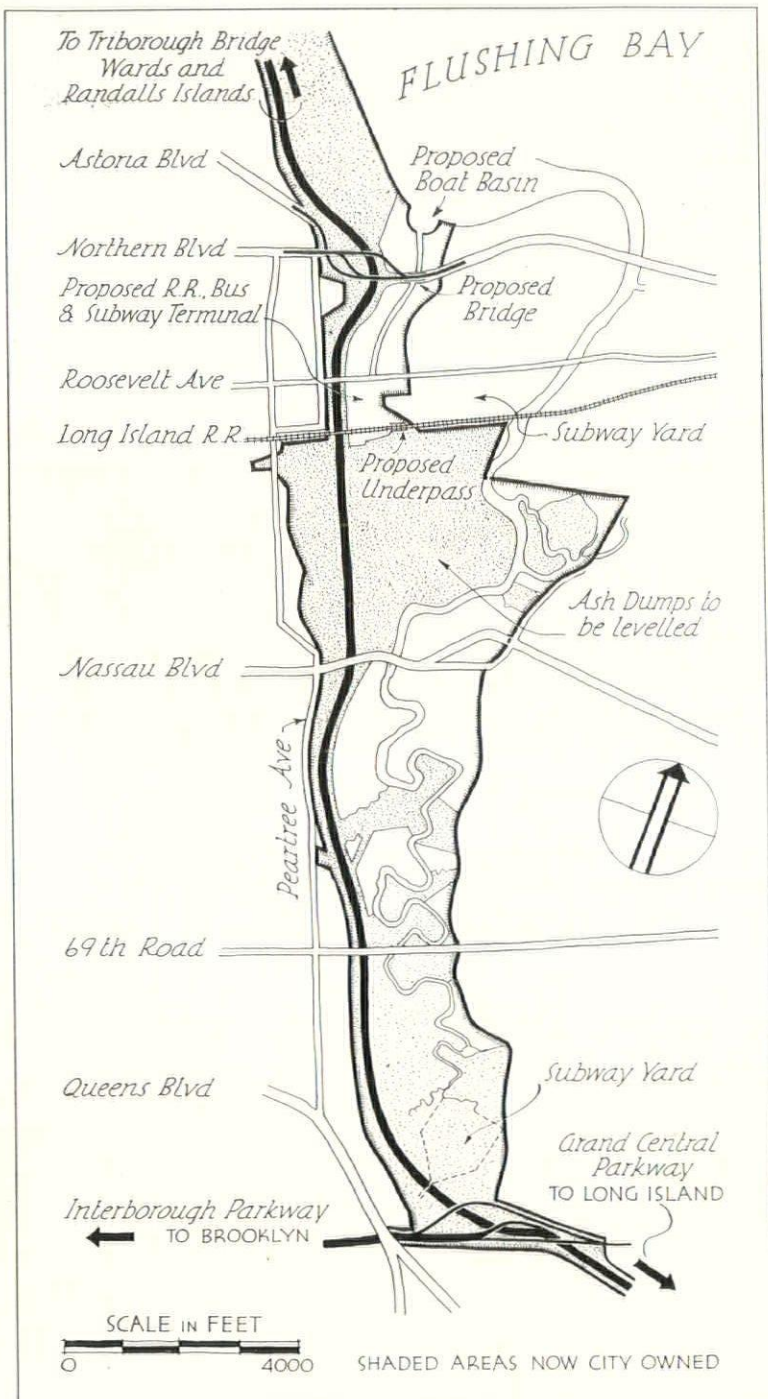
GEORGE McANENY, President  
New York World's Fair 1939, Inc.

mark the progress of New York's '39 World's Fair—fair words from factions urging "beauty" or "function," silence on factotum appointments

THE making of speeches is as necessary a part of the preliminaries to a world's fair as to a political election. Public interest is created and opportunities are offered to feel the public pulse. President McAneny inspires his audience with the high purposes and great expectations of New York's 1939 Fair. Silence, however, is discreetly preserved regarding the matters on which the architectural profession and allied artists seek light,—a silence which cannot be broken until city, state and national co-operation is made legal, financial and tangible. Deliberation of governmental legislative and executive bodies take time, but assurances are given that decisions will definitely favor the Fair and will shortly provide the background for definite announcements of Fair purposes, program, and personnel. In the meantime fair words are in order, and John Gregory, sculptor, has presented this paraphrase of Polonius' well-known advice:

There, our blessing with you!

And these few precepts for your memory.  
See thou *character*. Give bad taste no tongue,  
Nor any unproportion'd thought a chance.  
Be you fantastic, but by no means vulgar;  
The skill you have, and its exactness tried,  
Grapple it to your souls with hoops of steel;  
But do not dull your plans with entertainment  
Of each new-hatched, unfledged new fad. Beware  
Of entrance of a wild idea, but, being in,  
Control it so it may beware of you.  
Give every man your ear, but few a job;  
Take each man's censure, but reserve your language.  
Costly your buildings as New York can buy,  
Expressed in happy fancy; rich and gaudy;  
For the apparel oft proclaims the man,  
And they in France of the best rank and station  
Are most select and generous, chief in that.  
Neither a Classic nor a Modern be;  
For one oft puzzles both itself and friend,  
The other whets the edge of ribaldry.  
This above all: to your own selves be true  
And it must follow, as the night the day,  
Thou canst not then be dull to any man  
Farewell; my blessing season this in you.



# SEVEN OLD AMERICAN CHURCHES

*Church in Basking Ridge, New Jersey, built in 1839*

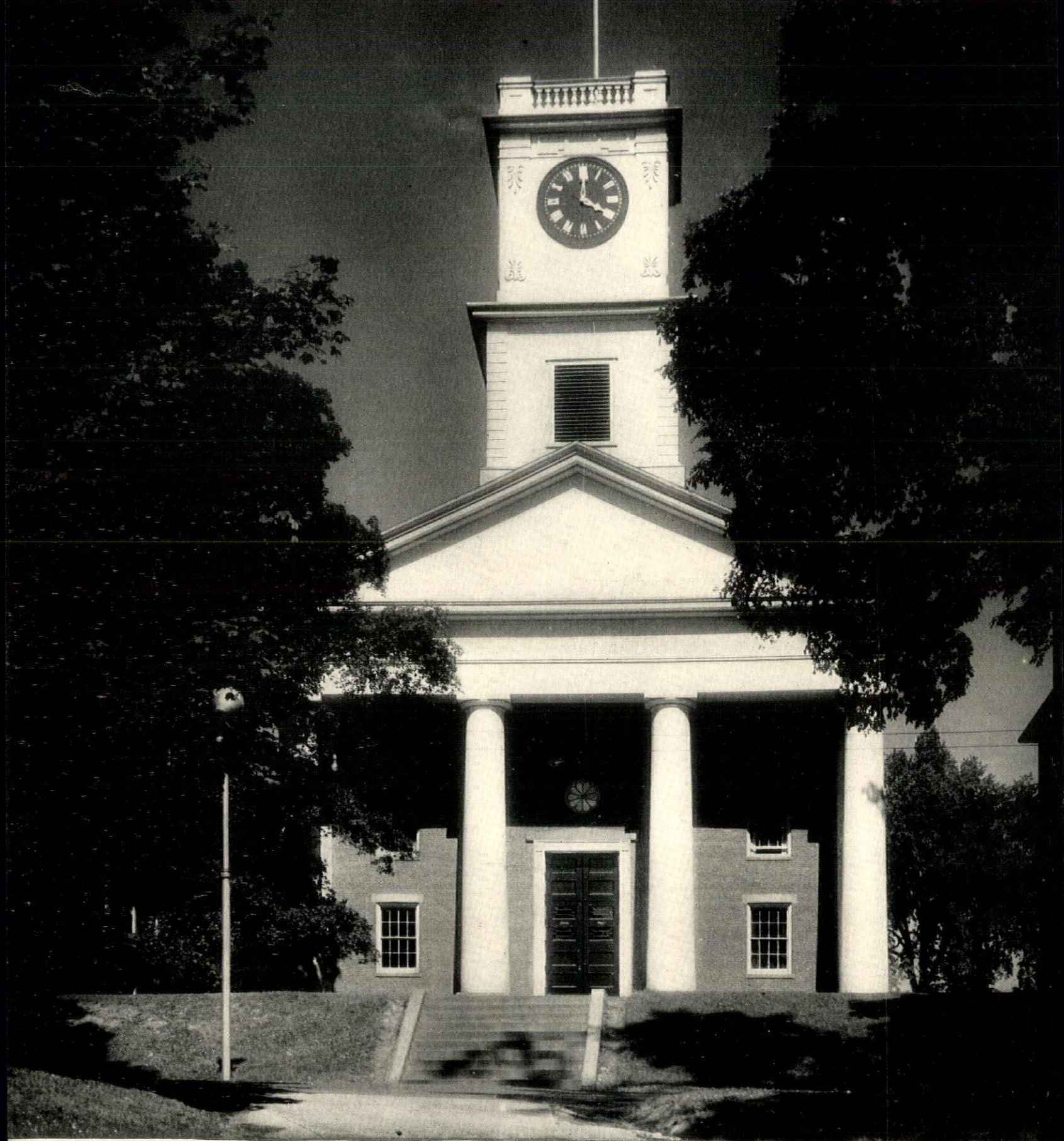
OS: R. W. TEBBS





*Gothic and Georgian Classicism combined in the design of the church built about 1780 in New Providence, New Jersey (above). In Springfield, New Jersey (opposite page) the treatment of the sunburst windows is unusual*



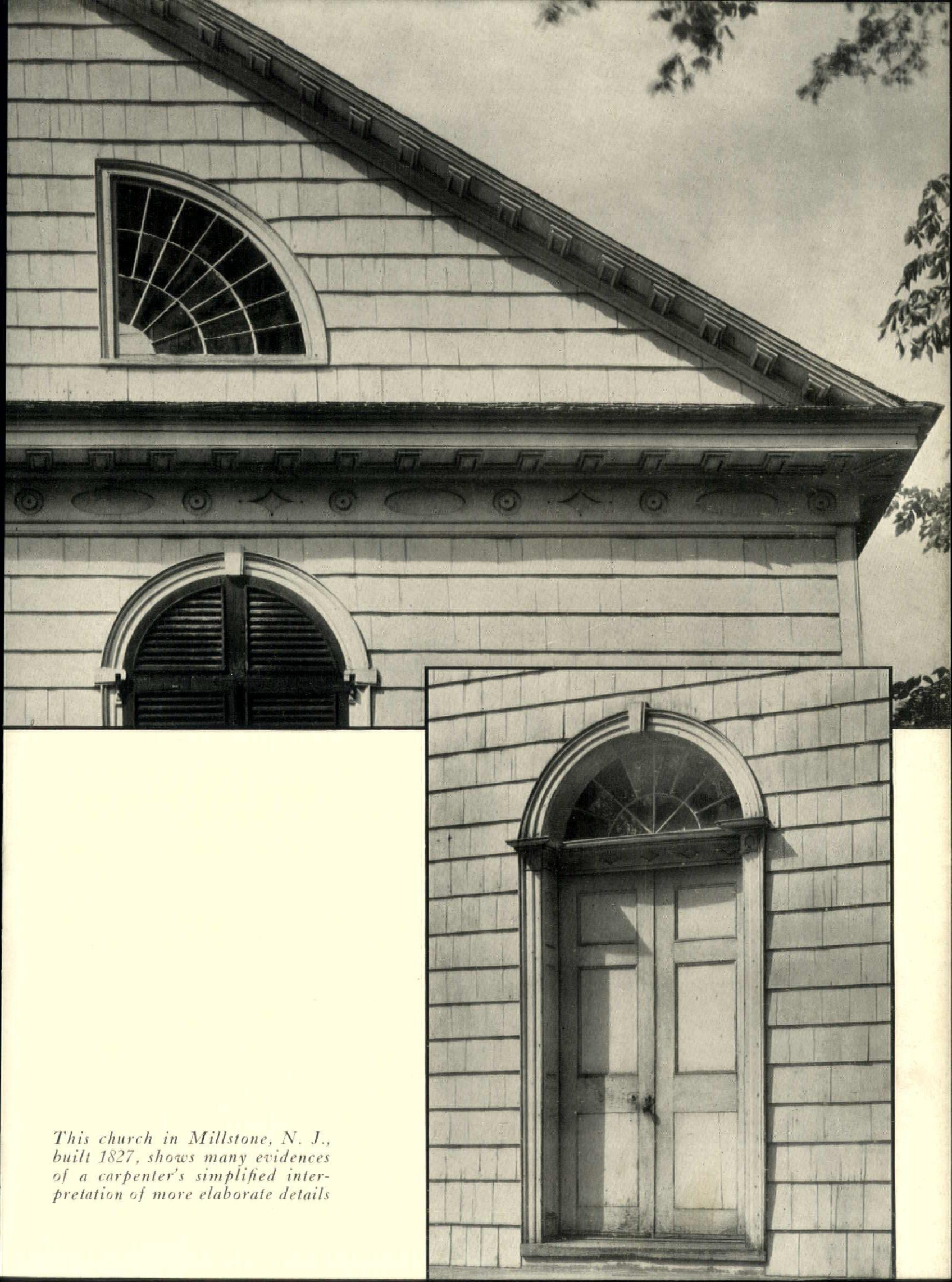


*Well-known Johnson Chapel, built in 1827, at Amherst College (above), an example of the Neo-classic style which is also used at Fincastle, Virginia (opposite page)*

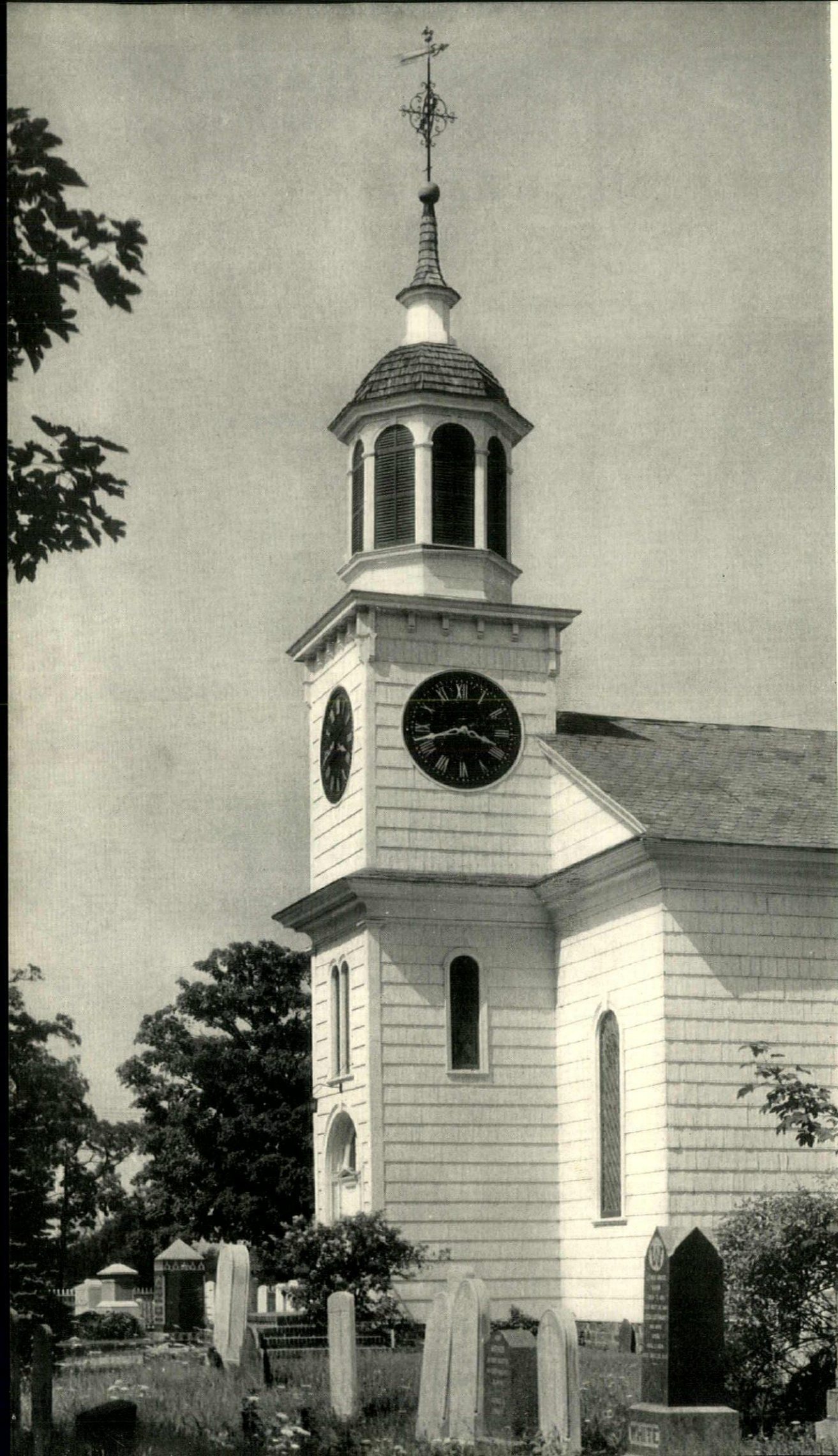








*This church in Millstone, N. J., built 1827, shows many evidences of a carpenter's simplified interpretation of more elaborate details*



*Queen Anne gave  
the crown which  
caps the weather-  
vane on this  
church, built  
in 1738, in  
Shrewsbury, N. J.*

## THE SHOEMAKER AND HIS LAST

THERE IS a growing tendency for business men to urge that "the shoemaker stick to his last," the professor stick to his classes, and the architect stick to his drafting board and pretty pictures. Such advice is undoubtedly due to the number of men who have deserted their original vocations to serve in government offices to show how the business of the country should be run to provide for a more abundant life, "To grasp this sorry Scheme of Things entire, . . . and then, Re-mould it nearer to the Heart's Desire!"

Even architects have been known to invade, in their thinking at least, the realms of building finance, real estate, city planning, and municipal government. Some architects have had time to study these fields and have had the temerity to voice their opinions as to what is wrong, stating their theories of the possible methods of correcting the conditions which have prevented the profession from gaining a living by practicing.

The fact that architects are taking an active interest in the forces and institutions that control all building, directly and indirectly, is good both for the architect and for those active in the "invaded" fields. Certainly the study of real estate practices, of financing methods, of legislation, of all the underlying factors which influence the potential and effective demands for building and for his services, is natural, proper and salutary;—especially when so little of his time has been demanded for the creation of new buildings.

Approaching these formerly-taken-for-granted fields with a pristine but perceptive and analytical mind, his conclusions may offer at best real contributions to constructive thought in those fields. At worst they may be no more "cock-eyed" than the thinking (or lack of it) which has brought us into this state of stagnation. Shall this shoemaker be sent back to his last? Just what is his last? Shall he not try to find out cause and effect in his own market? It is time that the architect, to change the metaphor, took apart the building industry clock to see what makes it tick,—or stop,—how strong its main spring is, who winds it, how its wheels within wheels mesh and grind or slip a cog.

True, the greatest contributions of an architect should be in the technological and aesthetic development of building, but, a better understanding of the factors which condition his work would enhance his effectiveness. That the architect is not neglecting his own last is evinced by the new interest in the small house, the less-than-\$5,000 house which constitutes 75 per cent of the dwelling market. The new experimental buildings in modern materials, straightforward in design, and the new housing developments show that advances are being made technically.

The architects who have understood the controlling factors in building, who have had a working knowledge of the existing "rules of the game," have been the busiest members of the profession. They have been the ones who have had the opportunities to put their technical knowledge and design talents to practical use. Those who keep informed of the changing rules and practices, and who even take a hand in formulating the new, will be in the most advantageous positions to obtain new commissions.

Architects must be credited, in part at least, for the advances made in home financing legislation and procedure,—architects who did not stick to their lasts. Only the fact that their expensive custom-shoe lasts have been so long idle is forcing architects to do "cobbling," and, to do some thinking. This is the reason why architects are examining causes and effects in the whole field of building needs and control. To find his market to create new lasts and styles, the shoemaker must leave his bench at times. We hope he does.

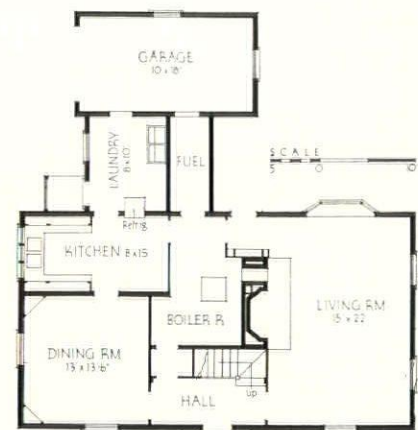


PHOTOS: K. C. GLAUBACH

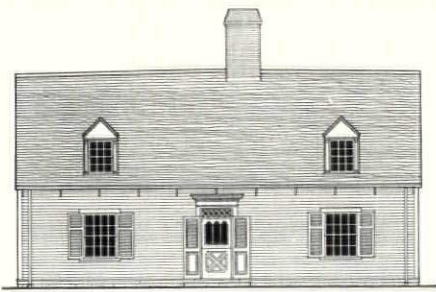
## HOUSE OF DR. C. A. STURDEVANT, MEADSVILLE, PA.

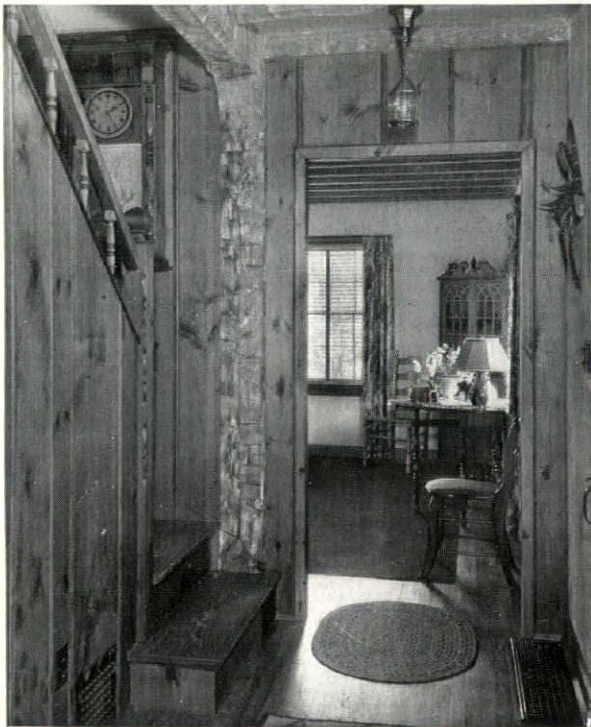
### E. A. & E. S. PHILLIPS, ARCHITECTS

Reminiscent of the compact Colonial cottages of Cape Cod and New England, this house was built in 1934, at a cost of \$5,700. The first floor is a concrete slab poured on the ground as there is no cellar. The wood floor is nailed to sleepers which are supported on individual brick spaced about 16" on centers resting on the concrete slab. The resulting air space insulates the floor and serves as a return duct for the air conditioning system. The majority of the partitions are non-bearing and consist of random width 1" pine boards placed vertically and finished on both sides. The house is insulated with two layers of aluminum foil. The heating plant is centrally located so that no warm air duct is more than six feet in length. The heating is by an oil burning furnace with air conditioning system attached. Including the garage the cubage is 23,200 feet.

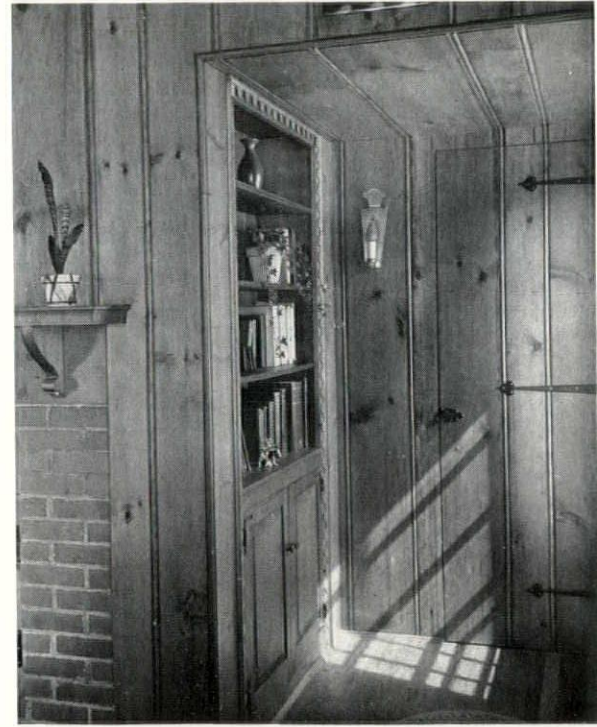


in keeping with the character of its early prototype, the entrance doorway is friendly and inviting. The shutters are in green; the hardware wrought iron; leaded glass above door. The step is a block of quarry stone. A serviceable arrangement is the location of garage, laundry and fuel room in the connecting unit at the rear of the house (lower right)





The living room is paneled in knotty pine. The beams are the second floor joists exposed and consist of 4" x 6" hand-hewn oak timbers. Over these is placed 1" Celotex which serves as a ceiling finish and sound deadener



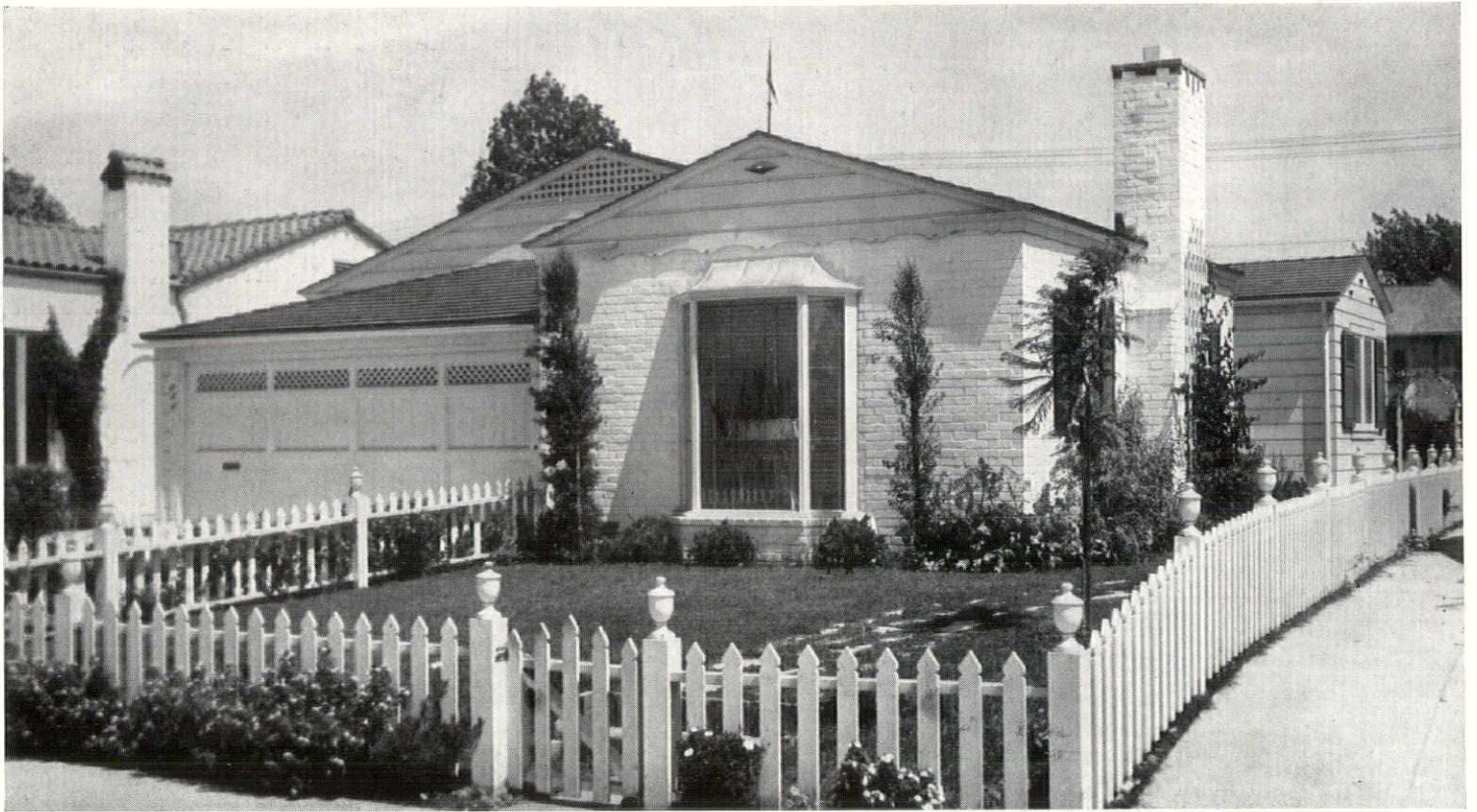


PHOTOS: LEOPOLD

**HOUSE IN BALTIMORE, MARYLAND**  
**T. WORTH JAMISON, ARCHITECT**

Solid masonry construction, special exterior trim. Cubic contents: 43,865 cubic feet. Cost, in 1932, \$9,750. This includes planting, screens, weatherstripping, fixtures, kitchen range and cabinets. Designed for Blenheim Realty Co.

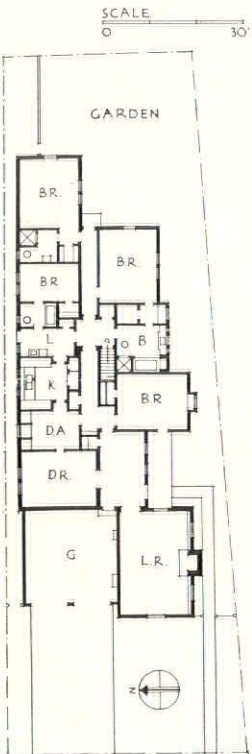




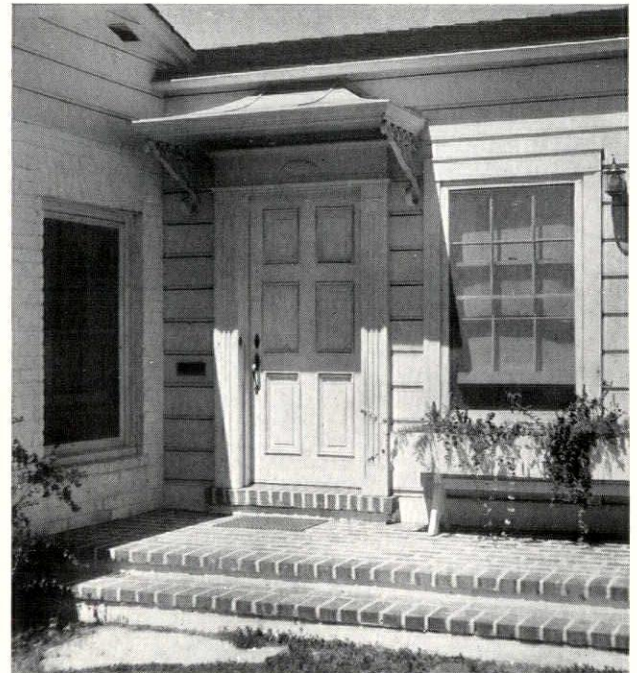
PHOTOS: MOTT STUDIOS

**HOUSE OF L. M. ROSE, BEVERLY HILLS, CALIFORNIA**

**ROBERT V. DERRAH, ARCHITECT**

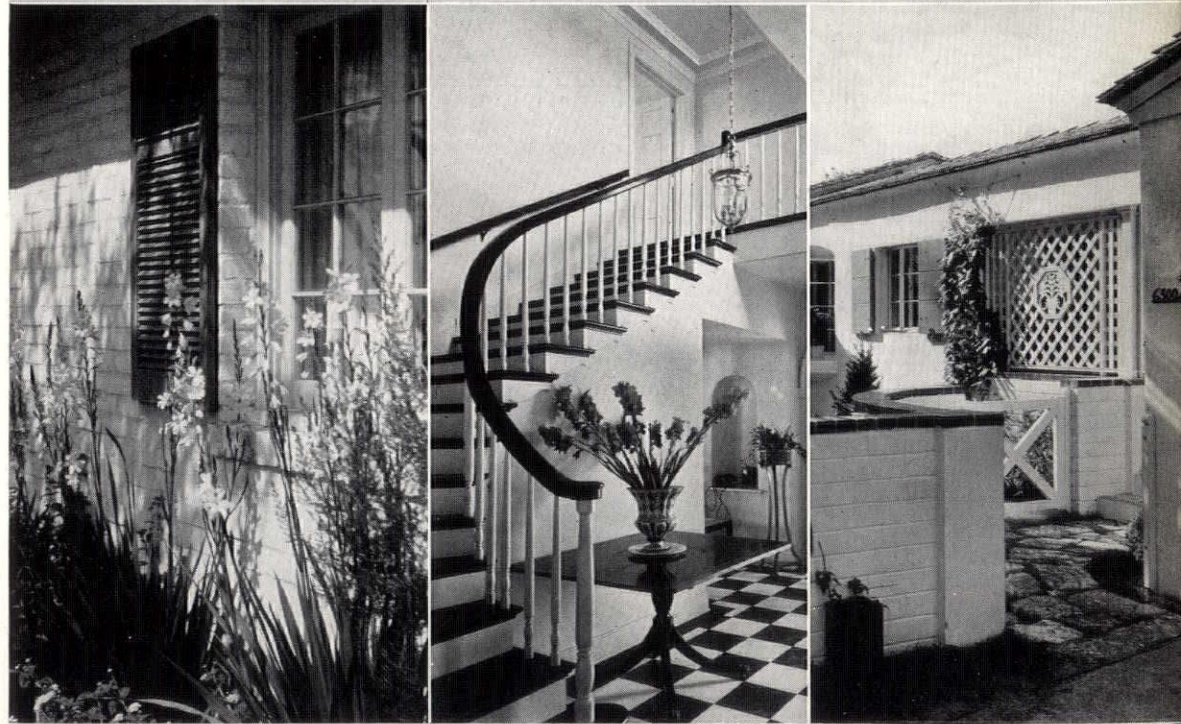
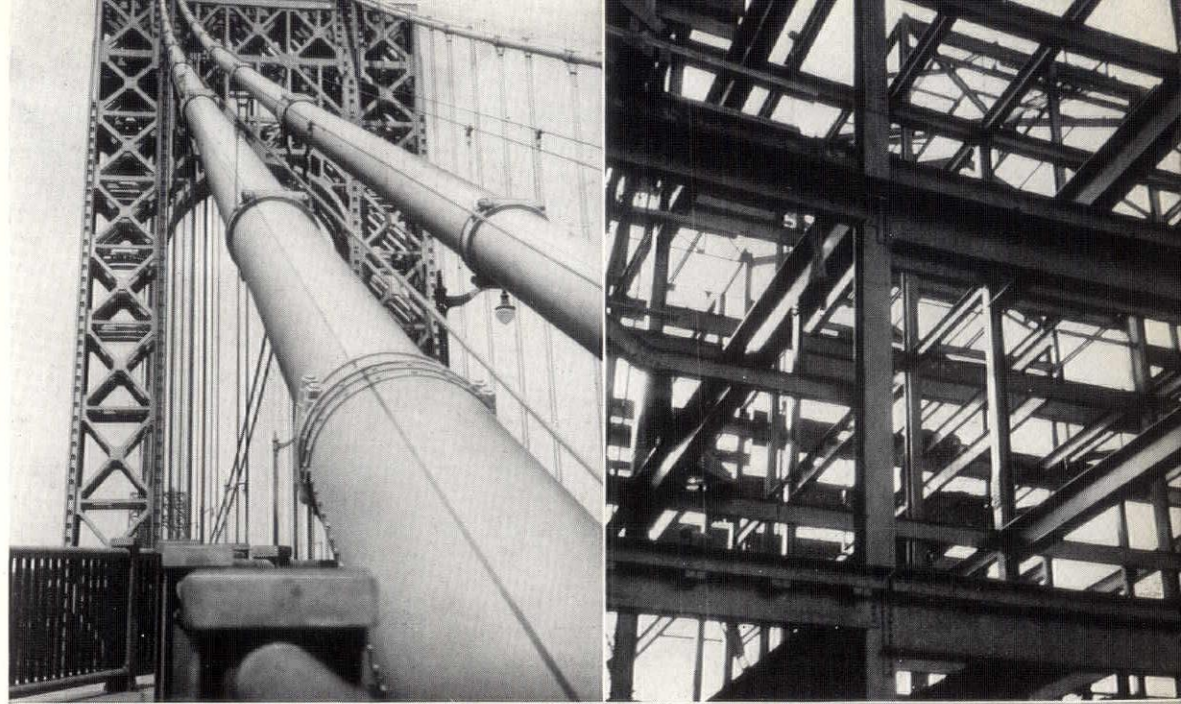


The plan and design of this small house were dictated by the limitations of the corner lot which is 50 feet wide in front, 40 feet wide at the rear, and 150 feet deep, with no alley. The owner's desire for a one-story house with four bedrooms and three baths, also made the problem difficult. The entrance was placed on the south side and was treated as a solarium with openings into the living room, dining room, and garage. The plan provides ample light and air for all rooms. The garage was located near the street to eliminate the necessity for a long cement driveway. The exterior is brick veneer, painted white, and the roof is shingles, natural color and oiled; blinds are light green, and window sills and chimney top, red brick. The floor area is approximately 2,400 square feet





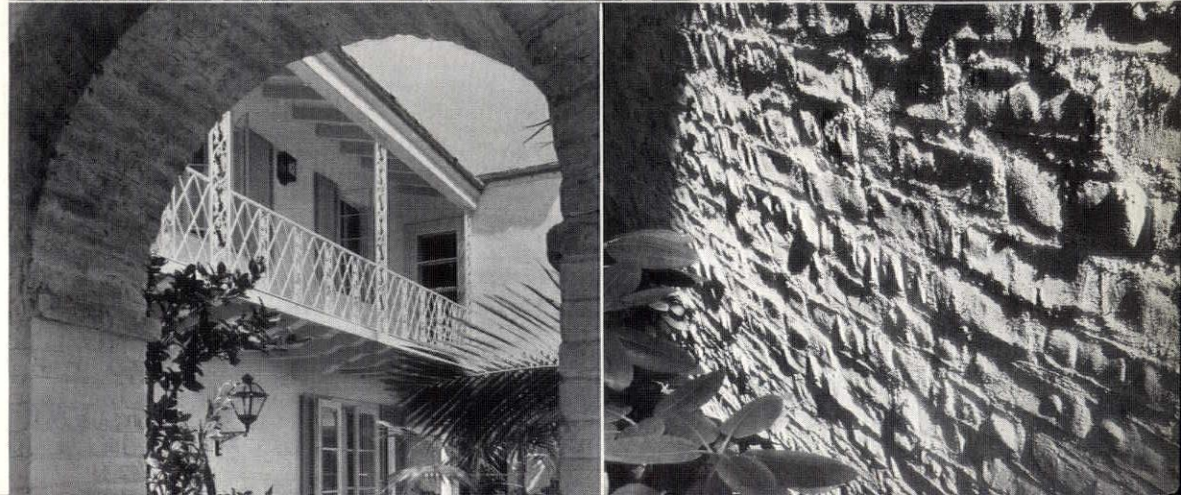
**OIL PAINTS  
AND  
PAINTING  
METHODS**



AMERICAN ARCHITECT

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# OIL PAINTS AND PAINTING METHODS

BY ROGER WADE SHERMAN

Technical Editor, American Architect

**S**ELECTION of the proper paint for any given surface is inevitably a matter of compromise. No paint formula exists which will fulfill every requirement at once or which will prove best for every purpose. The reason for this is that every painter's problem may involve a different set of conditions. Cost, type and condition of surface, the exposure characteristics of the locality, requirements of durability, the extent and purpose of a repainting program—all these are factors, which, singly or in combination influence the specification of paint and painting methods.

Furthermore, the successful execution of a painting specification will depend largely upon the painter himself. Even if it were possible to formulate a paint produce to satisfy every variable, a faulty method of surface preparation or inexperienced application might shortly prove a negation to the excellence of the product itself.

In recognition of the controlling importance of these variables, the paint industry has undertaken to formulate a series of products for special uses. But the reputable manufacturer who will—or who reasonably can—guarantee results is exceptional. All he can do is to warrant the purity of the materials in his paints and guarantee the composition of his formulas.

The paint industry has not thus far established any generally accepted standards of paint quality or serviceability. The formulation and use of paint is a science as it concerns the analyses of formulas and component materials. But the work of paint chemists has not yet led to an agreement on the best possible combination. The arts of the manufacturer and the master painter, however, have been perfected through a long series of practical experiments, tests, rejections and refinements of products and methods of use.

Thus, claims laid before the architect must be sifted carefully. The road to good painting practice is the more devious because of the virtually limitless variations in paints themselves and the many factors that may influence the results of their application. Absence of trade standards as to basic formulas is complicated by the fact that in only seventeen states\* is the sale of paint regulated in an attempt to protect the consumer against the unwarranted claims of those who manufacture inferior products.

\* Alabama, California, Colorado, Georgia, Iowa, Massachusetts, Minnesota, Mississippi, Nebraska, North Dakota, Ohio, Pennsylvania, South Dakota, Vermont, Virginia, Wisconsin and Wyoming. North Dakota's paint law, passed in 1906, served as the model for nine other so-called "formula laws."

But even legal restrictions requiring publication of formulas—mandatory in only ten states—are useful chiefly to prevent payment of a high price for a cheap paint or the price of a good paint for a poor paint. The consumer—or, in this case, the architect who specifies paint—is still the judge of comparative paint quality. Knowledge of paint and painting methods based upon experience rather than scientific determinants is still the basis upon which the material must be specified.

Fundamental to a properly developed specification is a realization that any kind of paint is at best only an impermanent means to an end. That end is the preservation of surface and appearance. This implies service over a period of time—the purpose of a maintenance program which begins when the surface is first covered and ends only when it is finally demolished.

It is evident that such a program involves a time factor and necessitates a periodic continuity of painting operations throughout the useful life of the structure. Thus, paint films are applied with the expectation that they will wear out and be renewed. They will wear well or poorly depending upon the combination of circumstances already mentioned. Choice of paint, therefore, must be made primarily upon the basis of material formulation. For any given surface there can be developed a paint formula which, when properly applied, will produce a film that will be relatively successful in withstanding, for a satisfactory period of time, the various influences tending toward its ultimate disintegration.

## FACTORS OF PAINT SPECIFICATION

**T**HE only constant against which the architect can check his specification is the suitability of paint materials and painting methods in meeting the requirements of a specific project. In every instance this requires a balancing of factors and an adjustment of relative values which may vary widely with every individual job. In the development of such an equation, such phrases as "high grade," "first quality" and "or equal" have little meaning.

That paint which is best suited as to cost and the exigencies of a maintenance program is a high grade product in that specific instance. Relatively speaking, it is "first quality." And if supplied by a reputable manufacturer, the architect can have confidence in the purity of its composition and can specify it definitely without exposing his professional

reputation, the performance of his painting contractor and the bankbook of his client to the jeopardy of an "or equal" clause.

Viewed thus, there appears to be no real conflict in the claims of reliable manufacturers within the paint industry. In certain cases the economy of mixing paints from basic materials on the job will be apparent to the architect. In others the convenience and availability of ready-mixed products may overshadow other considerations. Some jobs—such as the protection of metal surfaces or the exterior painting of fine residences—may require the most durable of pure pigments and a superlative type of oil vehicle. Special characteristics of others may cause durability to be less important than appearance. In such cases oil paints which contain certain quantities of "extender" pigments mixed with a composite vehicle may prove to be most satisfactory from the standpoint of ultimate economy. In still other cases, casien products—of which several types are available—may be used. Calimine often has definite value as economical coating, to fill satisfactorily the requirements of many types of maintenance programs.

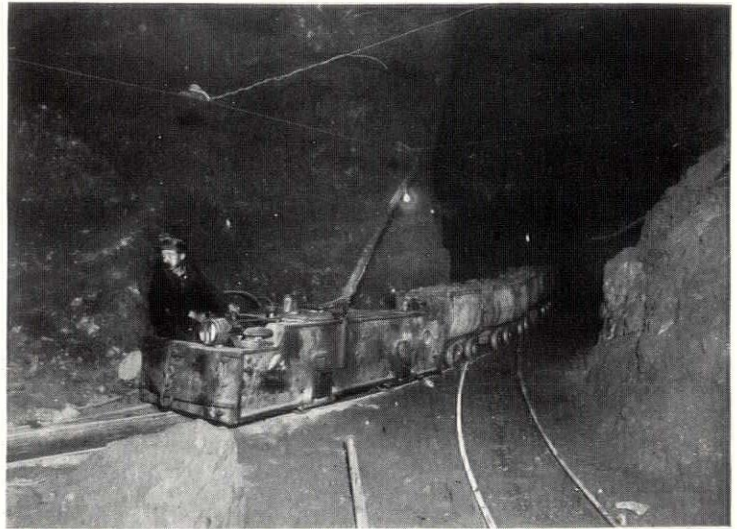
**Cost of paint** therefore becomes a matter of balanced judgment as it concerns the architect's specification. The cost of applying paints of averagely good spreading quality ranges from two to three times the cost of materials to almost five times the same cost in the case of elaborate decorative painting. Even a substantial variation in the cost of paint materials would affect the total cost by only a minor percentage that might easily be absorbed or extended depending upon the conditions and skill of application.

The program of repainting also has a bearing upon the cost of an original job. If repainting will be done only when the original film of paint has worn away from natural causes, the relatively high cost of labor in proportion to materials will make even the highest priced of durable paints considerably less expensive than any other paint with a shorter useful life. On the other hand it might prove wise not to require expensive durability for the interiors of a project in which frequent redecoration is a mandatory part of the maintenance program.

**Painting conditions** have an important bearing upon the specification of paint and painting methods. Labor is the major item of repainting cost. And if surface conditions require the removal of old paint before repainting can be attempted, the operation will be inordinately expensive.

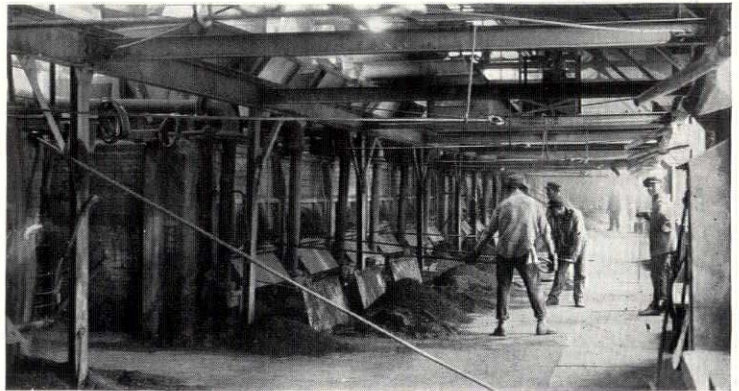
The most carefully prepared specification cannot always be an effective agent in eliminating this possibility. Failure of paints admirably suited to a given surface will be violent and premature under abnormal conditions of corrosion outlined in later paragraphs. A satisfactory repainting surface, however, results from a wearing process normal to oil paints. This is known generally as "chalking" and occurs when surface disintegration of the oil film exposes the dry pigment particles.

The rate at which paints chalk depends somewhat upon the type of pigment used and to a degree also upon the climatic conditions in which the paint film remains exposed. Single pigment paints made with basic lead carbonate (white lead) tend to chalk more rapidly when exposed in regions of comparatively high relative humidities and to intense



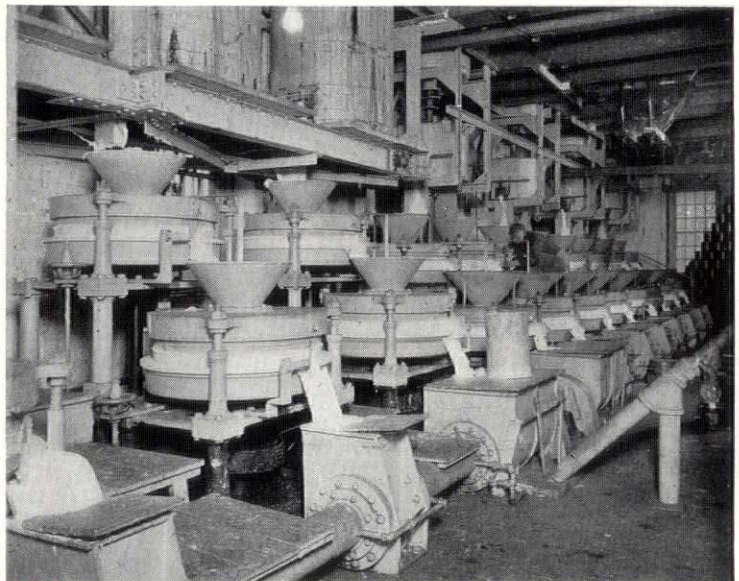
COURTESY NATIONAL LEAD CO.

From huge mines come many of the paint industry's raw materials. Here is one of several that furnishes black ore from which in time white lead is miraculously made



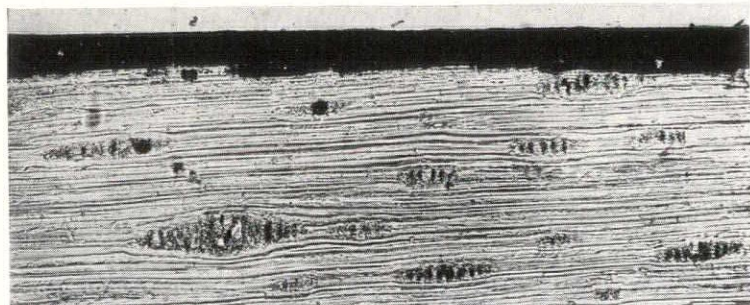
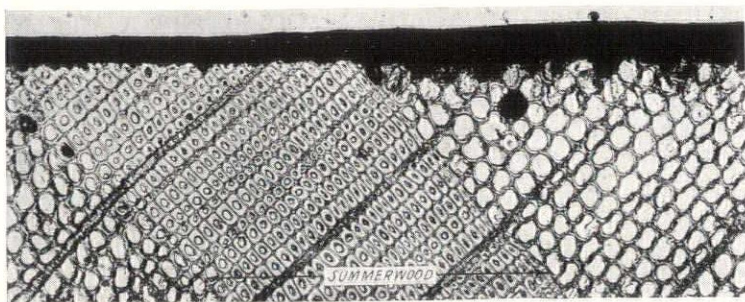
COURTESY NEW JERSEY ZINC CO.

... Through furnaces, great batteries of them, zinc ores are reduced and pigments trapped as billowing clouds of impalpably fine dust. This is part of a fume plant for the reduction of zinc oxide



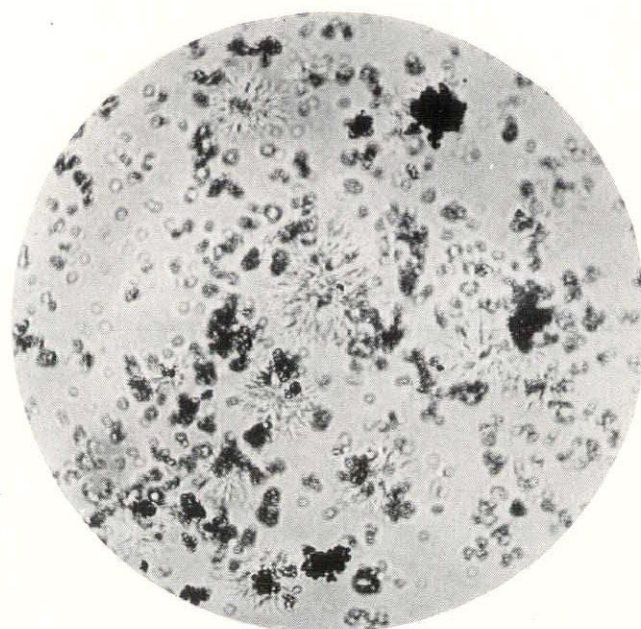
COURTESY NATIONAL LEAD CO.

... Into grinding mills are measured accurate proportions of dry pigment and linseed oil for a slow mixing that is so complete it seems interminable. From this battery of machines comes white lead-in-oil paste



COURTESY FOREST PRODUCTS LABORATORY

Paint retention on wood is influenced by cell structure. Micro-photograph of softwood sections. Black band is a paint film, penetrating springwood easily at top (end-grain), but repelled by fine cells of summerwood, top center and above (side-grain)



"Active pigments" are those which are most easily and completely wetted by linseed oil. These three microphotographs illustrate the physical and chemical mixture that takes place when white lead is ground in oil. (Above) Early stage of mixture

sunlight, although they remain elastic and are not subject to cracking. If a single pigment paint were made with zinc oxide, the film would tend to wear under similar conditions by cracking rather than chalking. For this reason many ready-mixed paints of good quality contain varying percentages of both white lead and zinc oxide to produce a finish film to withstand more uniformly the wearing effect of normal agents.

**Paint Formulas** can be useful as a basis for specifications for two reasons. First, they can serve the architect as a practical yardstick by which he can measure the relative value of proprietary claims. Second, knowledge of how a particular formula should be applied and the precautions necessary to insure a satisfactory painting result can constitute a comparative standard for supervision and for performance ratings.

In preparing his specifications, the architect has a choice of three general types of paint products. One includes a wide range of proprietary formulas, ready-mixed for use under specific conditions and under definite programs of application. These are variously packaged in containers characteristic of the manufacturer and are offered for use as they come to the job. The second type involves the use of the basic materials of paint formulation to produce, at the job, special mixtures deemed most suitable to the painting problem at hand. The third falls generally under the heading of "semi-paste paints." These are often special pigment mixtures ground at the factory with just sufficient vehicle to form a soft paste. They are offered as proprietary products for use in accordance with the manufacturer's directions to meet varying requirements of job conditions where a special pigmentation is desirable.

Each classification has strong supporters within the industry and in the ranks of the painting craft. The architect's selection should be based first upon his knowledge of the characteristics of paint materials, second, the technique of formulation, third the expediences of the job under which the advantages peculiar to one or the other would become operative.

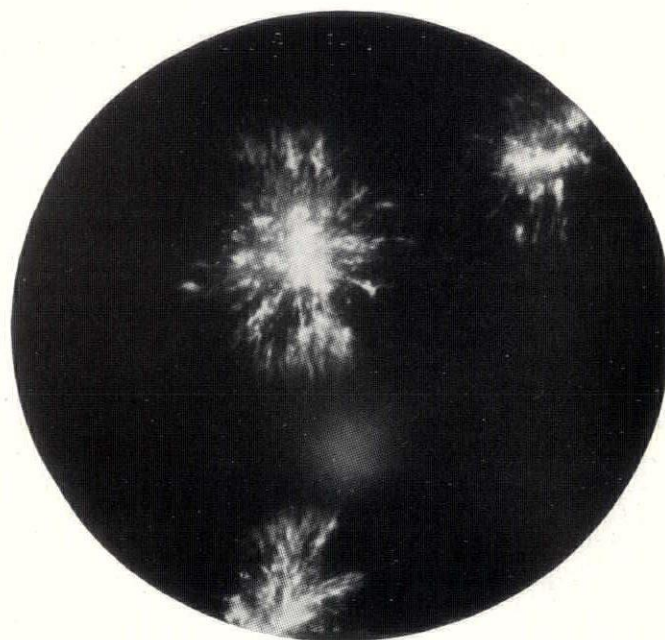
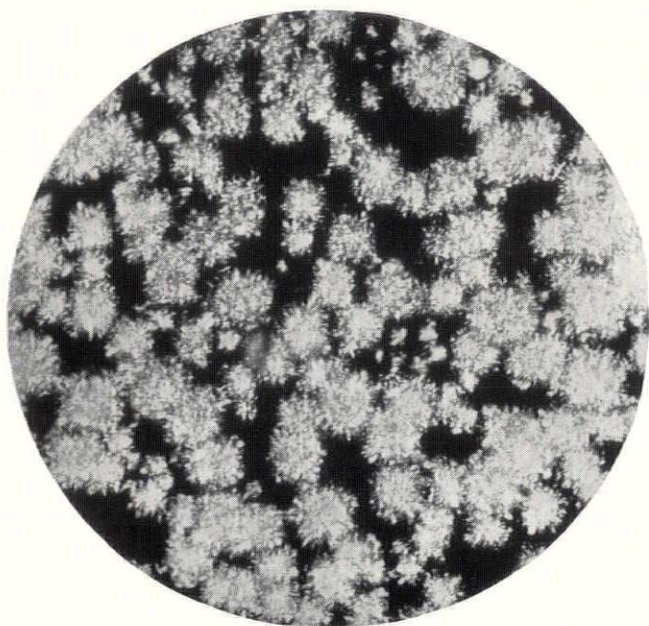
Advantages claimed for the use of basic materials for special job formulation include:

1. Quality of paint ingredients can be constantly controlled.
2. Proper formulation of different coats can be assured and formulas can easily be adjusted to conform to unforeseen conditions of surface and different climatic conditions.
3. Free exercise of the master painter's knowledge and experience is possible.
4. Economies may be developed through lesser material costs.

These claims, fully allowable in many instances, place responsibility directly upon the shoulders of both the architect and painting contractor for the quality and suitability of the various painted finishes. Upon the architect devolves the specification of formulas that will best fit conditions peculiar to the job. And this automatically implies the necessity of close supervision to see that formulation is correct and that the paint is applied in accordance with specified methods.

It is generally conceded that an honest and capable contractor can produce excellent results when paints are mixed on the job, for the opportunity is always present for adjustments whenever his judgment indicates the necessity.

On the other hand it is equally as simple for an unscrupulous painter to substitute materials, make unwarranted changes in formulation and "skin the job" from start to



MICROPHOTOGRAPHS: COURTESY EAGLE-PICHER LEAD CO.

Complete mixture involves a "blooming out" process when basic carbonate of lead is wet by oil, an expression indicating a smooth permanent blend of pigment and liquid. A similar type of action takes place when zinc oxide is ground in linseed oil

Pigment particle after it has "bloomed out" in linseed oil. The hydroxide of basic carbonate white lead produces a slight saponification which, in turn, is partially soluble in the oil. Note the almost complete dissolution of the pigment particle

finish. Such practices are extremely difficult to detect, since paint adulterants have many sensible characteristics of good pigments or vehicle components. Furthermore, even after a paint has been applied, skillful but dishonest adulteration rarely shows itself until the film has become thoroughly dry or until the factors of normal wear make evident the inferior quality of the adulterated formula. This may not be for several months after the painter has left the job.

Thus, the various claims for the superiority of ready-mixed paints are equally as compelling in certain cases. And in the case of paste paints many advantages common to the ready-mixed products are joined with those claimed for the use of basic materials. This is the more obvious when surface characteristics indicate the desirability of special pigmentation, but conditions make necessary at-the-job formulation as concerns relative proportions of pigment, drying oil, thinner and drier.

Responsibility for good painting results lies just as heavily on the painter, if paste or even ready-mixed paints are used. To the extent that specification excludes all but paint products that manufacturers can guarantee as pure, the architect must answer for the quality of the painting job. But adequate assurance of good results entails selection of a painting contractor on the basis of his expert knowledge as demonstrated by his record of experience rather than solely upon the basis of a bid which is apparently low.

## COMPOSITION OF PAINTS

ALL paint is a combination of pigment—finely divided metallic compounds, earths or metals—and a liquid vehicle of such proportions that the mixture can be spread

evenly onto a surface to form a hard-drying film. The vehicle carries the pigment in suspension and in drying serves as a binder causing the pigment to adhere to the surface. The pigment serves as a protective or decorative armor. The characteristics of a paint are largely dependent upon the types of pigments and the kind of vehicle it contains and the proportions in which they are combined.

**PIGMENTS.** These fall generally into two broad classifications: opaque and transparent, the terms denoting comparative hiding power when mixed with linseed oil. (See Time-Saver Standards Sheet No. 39, for full notations on pigments). Of the opaque white pigments commonly used in paint, white lead (both the basic carbonate and the basic sulphate) and zinc oxide have to a high degree the property of being completely wetted when mixed with oil. Thus, the pigment particles become inseparable from the liquid and are held in permanent suspension.

Also, some opaque pigments are chemically active with the fatty acids present in the non-volatile ingredients of vehicles. Slight saponification usually occurs on the surface of pigment particles. This thin film of soap is, in turn, partially soluble in oil. In the case of white lead saponification rarely goes beyond three per cent and the result is permanently plastic. In certain vehicles zinc oxide may saponify appreciably more.

**Transparent pigments** are variously used in combination with opaque pigments as "extenders" to give bulk, body or "tooth" to paint. Depending upon the proportion in which they are used and upon the kinds of opaque pigments and vehicles with which they are combined, small amounts of transparent pigments do not lessen materially the quality of good paint.

**VEHICLES.** The liquid part of any good paint is rarely composed of a single substance. Usually it involves at least three ingredients: a drying oil, a drier and volatile thinner. In many good paints there may exist some moisture incidental to manufacture, which has no detrimental effect upon the product provided it does not exceed one per cent of the vehicle.

The term "drying oil," refers to the quality possessed by several vegetable oils which, by absorbing oxygen, harden into elastic films. By far the most important is linseed oil, pressed from flaxseed and variously processed.

The function of volatile thinners is to form solutions with the vehicle to improve workability of the paint and, upon exposure, to evaporate almost completely without affecting the basic characteristic of the paint.

Above a percentage of one water is a dangerous adulterant of the vehicle. Added to paints, with caustic soda or chloride of lime or other water soluble agents, water emulsifies with the oil. The addition of these various emulsifying agents forms water-soluble soaps. The paint is not necessarily changed as to appearance or consistency, but the finish film is reduced in thickness and will disintegrate quickly and become porous as the soaps are leached out by the action of normal weather conditions.

**Proportion of Pigments and Vehicle** varies with the types of pigment used and depends to an appreciable extent also upon painting conditions and the type of surface to be covered. In general, the range should be from 25 to 40 per cent for the vehicle and 75 to 60 per cent for the pigment by weight calculated on the total paint ready for application.

There exists as well an optimum proportion of pigment and linseed oil in paint. Authorities are not in general agreement, but it is recognized as good average practice for the pigment volume—the percentage by volume of total pigment to total non-volatile ingredients—to range from 25 to 32 per cent in the *finish coat* paint. Below this range—too much oil—outside paints dry slowly, are soft and tend to become dirty, to chalk and to fade early. Above it—too little oil—paint films may lose gloss and may wear rapidly.

Amounts of volatile thinners should be only such as may be necessary to develop good brushing or spraying consistency, provided that the correct ratio of oil and pigment has been established. Exterior paints requiring unusually large amounts of thinner can be regarded as of questionable quality. They have "false body," caused by some sort of adulteration. This is not true, however, in the case of interior paints which are properly formulated with large percentages of volatile thinners to produce flat finishes.

**PROGRESSIVE WEAR.** Sunlight, oxygen and the presence of moisture are the three most active normal agents involved in the disintegration of a paint film. Normal wear is gradual and occurs in the following sequence:

1. The soiling stage. The film gradually becomes dirty, depending somewhat on pigment.
2. Flattening stage. Coatings lose gloss.
3. The chalking stage. Dirt may be shed more or less completely, but colors appear to fade.
4. The fissure stage. This is characterized by irregular cracks that may extend through the film. This is most

serious when films are hard and brittle. It is not to be confused with the minute checks that may appear on elastic films due to surface contraction and slippage.

5. Disintegration by either scaling or flaking, after which the surface is more or less rapidly exposed, depending upon its character.

These stages of paint wear have been most accurately charted in the case of exterior paints over wood. But the behavior of paint films on all exterior surfaces generally follows a similar pattern.

Life of such paint films and, in consequence, adequate preservation of surface and appearance is a relative result of formulas applied to combat known conditions tending toward disintegration. Sunlight dries out the film, acting primarily on the oil, the ultra violet rays tending to promote polymerization and accelerate normal oxidation. The action is further hastened by moisture present in areas of high relative humidities.

For these reasons a poorly formulated paint may show a reasonable stage of wear on a surface continually in the shade and nearly complete disintegration on the same type of surface continually exposed to sunlight. Explained thus is the excessive chalking sometimes noted on east and south exposures of frame houses in the south and along the Atlantic seaboard.

It follows that the "best" paint—in this sense the most durable—must contain materials most resistive in combination to normal wear.

## EXTERIOR PAINTING

**R**ELATIVE durability furnishes the only basis upon which any reasonable discussion of exterior paint can rest. Beauty in paint and the preservation of appearance are personal issues that can be variously attained. But paint durability involves physical factors, variations of which can be evaluated for each particular job.

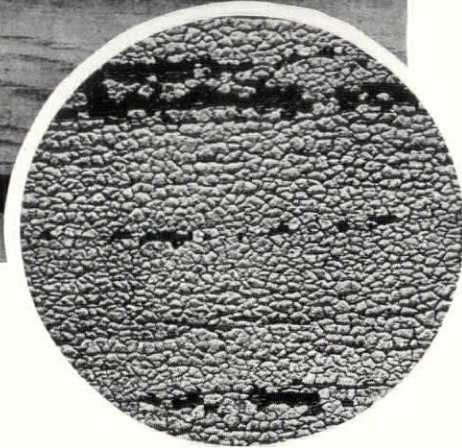
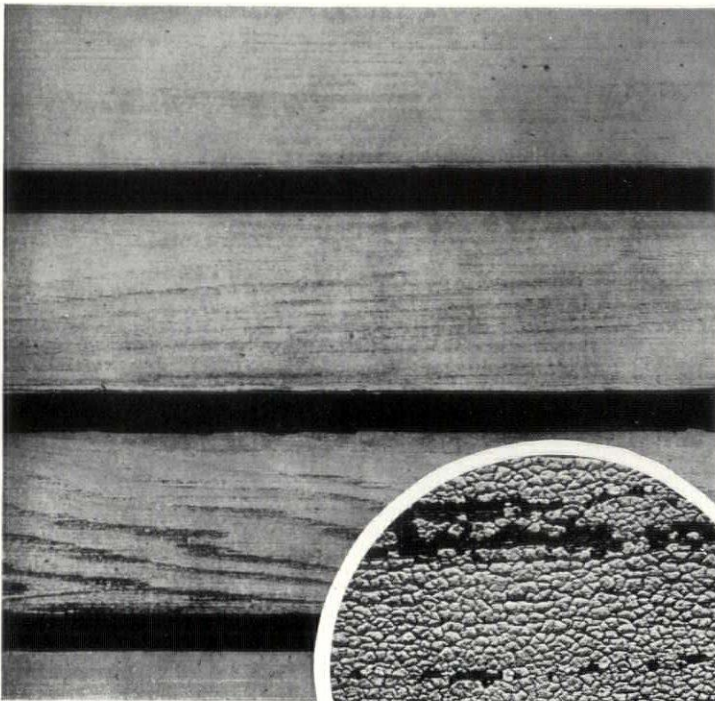
Wear resisting paints are, in general, those containing a high concentration of pigments. All pigments do not wear equally well, however, nor are wearing characteristics the same for all durable pigments. Furthermore, the type of vehicle and proportions of the formulation have much to do with durability of the finished film.

**Durable pigments** for exterior use include white lead, zinc oxide and the titanium pigments. Of these the first is the most widely used in both single and mixed-pigment paints, which are durable under a great variety of conditions.

Commercially manufactured basic carbonate white lead contains some lead hydroxide. If combined with a vehicle containing linseed oil of unusually high acidity, lead soap may be formed by action of the lead hydrate with the oil acids. This may improve the brushing qualities of the paint, and, according to many authorities, tends to increase the durability of the film. The basic carbonate changes to a black lead sulphide when exposed to hydrogen sulphide gas although this is of little practical importance in ordinary air. Further oxidation produces basic lead sulphate which is about as white as the original carbonate. Basic lead sulphate is sometimes substituted for the basic carbonate white lead in exterior paint. It is somewhat less expensive, but

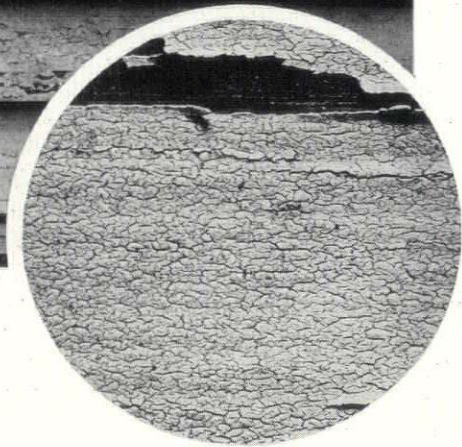
## NEGLECT SPELLS RUIN OF ANY EXTERIOR PAINT

Periodic repainting is an essential part of any maintenance program. If surface and appearance are to be preserved at a constant rate, repainting is required at intervals ranging from three to five years, depending upon local conditions of climate and the type of surface in question. Neglect of proper maintenance inevitably results in film disintegration to an extent which develops an unsatisfactory surface for repainting. This necessitates, in most cases, added labor of removing the remains of the original film. The paint film illustrated has been ruined by long neglect to repaint. Normal wear by chalking has progressed to disintegration by crumbling



WHITE LEAD PAINT

COURTESY FOREST PRODUCTS LABORATORY



LEAD AND ZINC PAINT

Durability of a paint film is the only basis upon which selection of exterior paint formulation can safely be made. In some localities—particularly in areas subject to high humidities and intense sunlight—mixed-pigment paints have proved more durable than those formulated with a single pigment. But mixed-pigment coatings are subject to more intense surface damage when failure to repaint at proper intervals has caused disintegration of the film, marked, as shown here, by cracking, curling and flaking. Repainting should not be attempted in a case such as this until the old paint has been burned from the surface

tends to chalk more than the carbonate and is generally less durable in a single-pigment film.

Zinc oxide is never used as a single pigment. Within a maximum proportion of forty per cent of the total pigment, zinc oxide is an excellent ingredient of mixed pigment paints. It reduces the damaging effect of sunlight and is often added to reduce the chalking of the white leads and the titanium pigments in very durable exterior paints. In all cases it should be mixed with pigments developing elasticity and toughness in the finish film.

Zinc sulphide pigments have been widely used in paints for exteriors where maximum durability was not an essential or in localities where climatic conditions were most favorable to paint films. They are somewhat less expensive than the oxide, but are regarded as less generally durable.

Of all pigments, titanium oxide is least affected by water, heat, acid, or sulphur fumes. It is most frequently combined in pigments containing either barium sulphate (blanc fixe) for exteriors or calcium sulphate for interiors. These pigments retain largely the durable characteristics of the pure oxide and have extremely good hiding power. They tend to chalk excessively, however, and are usually mixed with zinc oxide, or with both white lead and zinc oxide.

Certain types of rust-inhibiting pigments are used for painting metal and are among the most durable known. Thus, red lead, blue lead and lead and zinc chromates have few equals in the oil paint classification. All have extremely wide application as dependable protective coatings. They may be used advantageously alone or for priming coats on metal as a foundation for white lead body and finish coats.

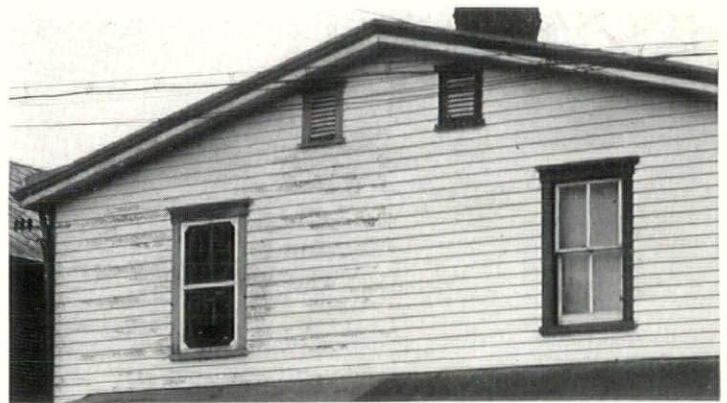
On the fringe of the oil paints is the so-called aluminum paint, now generally regarded as a product of good durability and high protective quality. Its efficiency, however, depends upon the quality of the vehicle employed. Aluminum as a pigment is completely inert. Therefore the vehicle should be a high grade long-oil spar varnish. This dries with a tough, elastic film, holds the aluminum well in suspension and produces "leafing" that results in an effective coating of metal.

Metallic zinc dust is used in special instances—particularly as a coating for galvanized metal—with an oil vehicle. Finally, powdered copper is another metallic pigment, but its use has been confined largely to marine painting.

**Durable Vehicles** are as important as pigments in resisting wear. Pure linseed oil is currently the basis of the vehicle in the most durable paints used on buildings. The relative quality of the oil is controlled by three factors: percentage of "foots," acid number and iodine number. Foots are impurities, the residue left from the manufacturing process of pressing the oil from flaxseed and straining it. Commercial standards set 2 per cent as the maximum volume of foots and 4 as the maximum acid number of raw linseed oil. The acid number for boiled linseed oil should not exceed 7.5.

As to iodine number, authorities are in disagreement. It is generally held, however, that oil with a high iodine number is a better drying oil than one from the same locality with a lower number. Iodine numbers range from about 188 to 175 and are an index of an oxidation characteristic.

Tung oil, or China-wood oil, withstands somewhat better than linseed oil the effects of moisture. It is never used in a



PHOTOS: COURTESY LEAD INDUSTRIES ASSOCIATION

Difference in wearing qualities of two paints applied under the same conditions and at the same time is strikingly illustrated. This two-family house was owned jointly and when painted became an excellent example of relative paint values. On the left side paint contained poor materials with a large percentage of extender pigment; paint on the other side was properly formulated and applied. Wear characteristics, and the relative values of the two coatings are compared in large detail on facing page

raw state and never used alone as a drying oil. But it is often employed as a heat-treated part of the vehicle of paints for exterior stucco, concrete or masonry surfaces, and, as a constituent of varnish, is the liquid used in most quick-drying durable exterior enamels.

Of increasing importance are a rapidly growing number of vehicles made from synthetic resins variously combined with natural oils and petroleum distillates. Development of these has been comparatively recent and, in many cases, is still subject to experiment. Some of them are used in paints formulated to resist special types of corrosion. They are worthy of the architect's consideration for specification where conditions require special treatment under abnormal circumstances.

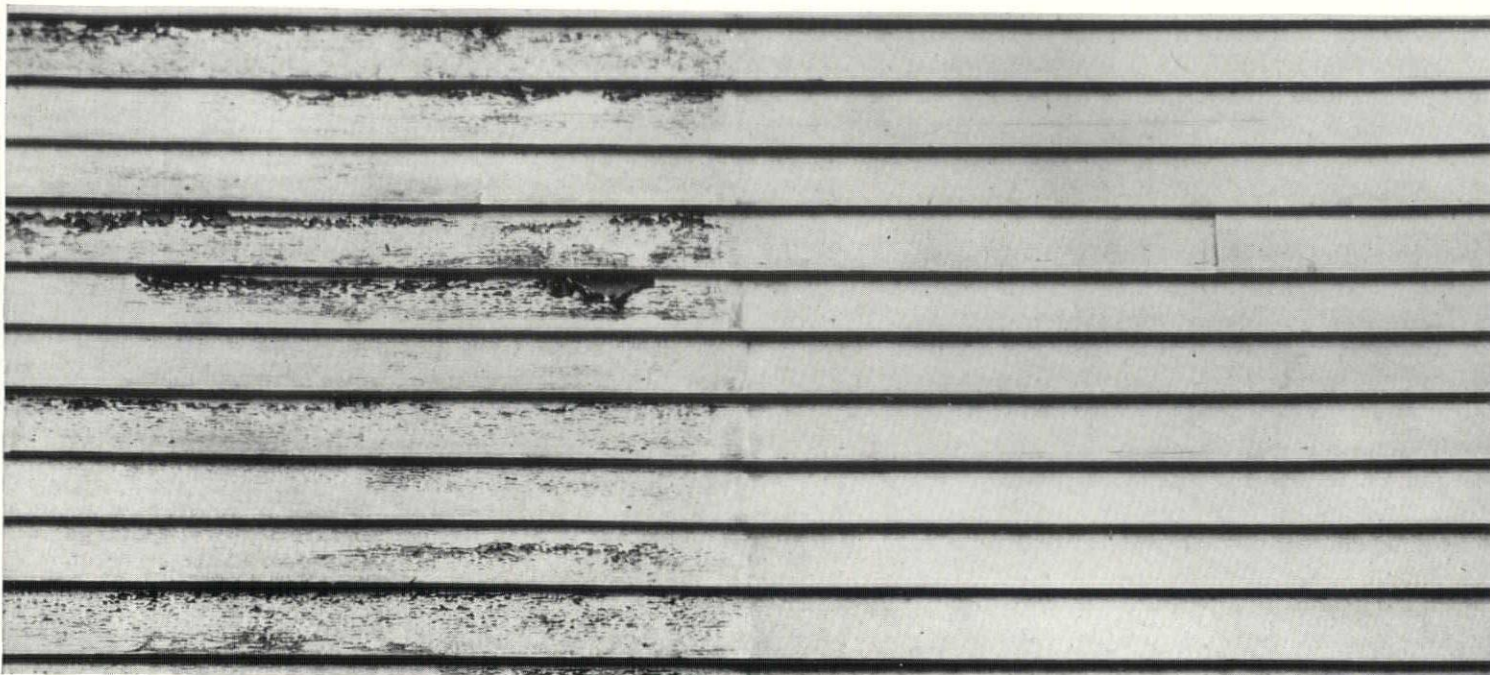
**MIXED PIGMENT PAINTS**—Many master painters hold that a white lead-linseed oil paint, if skillfully proportioned, can be made to serve adequately every ordinary painting requirement. However, experience has developed a number of mixed-pigment formulas which, when properly combined with a suitable vehicle, may in some cases prove superior to any single-pigment product in one or several relative categories that include opacity, covering power, initial cost and durability under certain conditions.

The following classification refers to paints suitable for the painting of exterior woodwork, since under this heading are included a majority of conditions that constitute painting problems. Percentages refer to maximum or minimum proportions of the total pigment.

A. *White or tinted pigments, linseed oil vehicle.*

1. White lead pigment entirely of basic carbonate white lead, except for minor proportions of colored pigments.
2. White lead and zinc oxide pigment. Not less than 60 per cent is white lead (basic carbonate, basic sulphate or a mixture). Such a proportion of zinc oxide as to make the sum of the white lead and zinc oxide not less than 90 per cent by weight of the total pigment. The remainder can be any extender pigment.





This formula conforms with the Federal Specification TT-P-36 for lead-zinc base paint in a ready-mixed or paste form. That following is based upon one now being considered for adoption as a Federal standard.

3. Titanium, white lead and zinc oxide pigment. Not less than 40 per cent by weight is white lead; not less than 20 per cent is zinc oxide; and not less than 7 per cent is titanium dioxide, either as such or as part of the composite titanium—barium pigment.

In addition, there exist widely used exterior paints containing zinc oxide and zinc sulphide pigments. As a class they usually contain not less than 25 per cent zinc oxide, the balance being zinc sulphide pigments (Lithopone) alone or in combination with leaded zinc. Durability of such paints is not equal to those indicated by other formulas, though they are usually much less expensive.

- B. *White or tinted paints with a vehicle containing material proportions of heat-treated drying oils, and natural or synthetic resins.*

1. Titanium and white lead paints. A new type of formulation in which the pigment is a mixture of basic carbonate white lead and titanium pigment without zinc oxide in substantially equal proportions with not more than 10 per cent extender. The non-volatile vehicle contains 5 to 10 per cent by weight resin, cooked to a varnish with part of the linseed oil.
2. Exterior enamels and "porch and deck" paints. Pigmentation may be roughly similar to the A- groupings. Vehicle is largely or wholly of heat-treated drying oils or varnish to provide resistance to mechanical wear.
3. Quick-drying paints. Vehicle must be largely heat-treated drying oils with or without resins to give quick drying characteristics. Such paints are relatively new developments and are not yet readily classifiable as to their pigmentation.

- C. *Colored pigment paints containing little or no opaque white pigment. The nature of the pigment is largely determined by the color desired.*

1. With a vehicle consisting largely of linseed oil a small proportion of varnish may be added to improve drying.
2. With a vehicle largely or wholly of heat-treated drying oils or varnish to produce resistance to mechanical wear.
3. With a vehicle largely or wholly of heat-treated drying oils or varnishes to develop quick drying characteristics.

**PAINTING EXTERIOR WOOD**—Within limits of about 10 to 12 per cent, the species of smoothly-planed wood has little or no effect upon the spreading rate of a priming paint. This spreading rate refers to the number of square feet covered by a gallon of properly mixed paint. It is controlled more by the skill of the individual painter than by any other factor. If the normal spreading rate is, say, 600 sq. ft. per gal. under the brush of a skilled painter, it could easily be stretched to 1000 or even 1200 sq. ft. per gal. because an unskilled hand applied it in too thin a coat. Also, though a few softwoods tend to absorb more paint than the average for a priming coat, some others tend to take less. And on subsequent coats the spreading rate does not vary with the species.

Woods that tend to take more paint are generally the lightweight species. Those taking less are heavy woods, containing a large percentage of summer wood. Roughness of surface, natural to the wood or caused by neglect to repaint, also tends to decrease the spreading rate to an extent that may, even in the hands of a skilled painter, cover only half the normal area per gallon.

**Paint retention** is only partially a function of the characteristics of a wood surface. After the paint film begins to fail, woods which weather most will retain paint less well than others. Lightweight and high grade woods hold paint relatively better than heavy woods or woods with many defects, because the proportion of summer wood and knots is less.

## GOOD PAINT— POOR SURFACE

Even the best paint will fail prematurely if water seeps through the structure from behind. Shown here is a typical result of this condition. The paint film has been irreparably damaged within a year after application because of moisture collected in the walls during the heat season. Moisture can gather from condensation or because of faulty construction which develops leaks. As long as such conditions exist, good results cannot be expected from repainting. Removal of the cause of moisture is the only cure for the damage conditions evidenced here



COURTESY FOREST PRODUCTS LABORATORY

The table classifying native softwoods in groups for relative paint retention qualities is based upon average behavior of commercial lumber, which may vary widely within any of the species.

### PAINT RETENTION OF SOFTWOODS

#### Group 1.

Alaska cedar  
Incense cedar  
Northern white cedar  
Southern white cedar  
Western red cedar  
Southern cypress  
Redwood

#### Group 3.

Commercial white fir  
Eastern hemlock  
Western hemlock  
Ponderosa pine  
Lodgepole pine  
Eastern spruce  
Engelmann spruce  
Sitka spruce

#### Group 2.

Northern white pine  
Western white pine  
Sugar pine

#### Group 4.

Douglas fir  
Western larch  
Norway pine  
Southern yellow pine  
Tamarack

1. Woods that hold paint longest and suffer least when protection against weathering becomes inadequate.
2. Woods that hold white-lead paint as long as those of Group 1, but do not hold mixed-pigment paints quite so long and suffer more than those of Group 1 if protection becomes inadequate.
3. Woods that do not hold either white-lead paint or mixed pigment paints so long as Group 1 and suffer more than woods of Group 1 if protection becomes inadequate.
4. Woods that do not hold paint coatings so long as woods of Group 3. (From "Wood Handbook," U. S. Dept. of Agriculture)

Paint adhesion under normal conditions of exposure can be assured if certain precautions are taken in applying paint, if the surface is properly prepared and if the priming coat has been formulated in view of climatic influences and the type of wood to be coated. Moisture in the wood is the greatest enemy of the paint film. No wood should be painted when damp; and painting should never be attempted immediately after even a slight rain or in moist or foggy weather. It is a good practice to delay painting until about

10 in the morning, or until after the sun has had an opportunity to dry any moisture that may have condensed during the night. Similarly, exterior painting is not recommended after sunset.

Exterior painting should not be attempted in weather colder than 40 degrees F. This is due partly to the possible presence of moisture on the surface and partly also to the fact that paint becomes too thick for good application at lower temperatures. Thus thinning is required and the benefits of proper formulation are impaired. In addition moisture may freeze at night weakening the film and giving it a dull, frosted appearance.

**Softwoods** that contain pitch, oil or resin do not take paint well unless these extractives are rendered inactive. Thorough seasoning of the wood is essential. In addition, all knots should be coated with shellac before any paint is applied. If very large and resinous, it is well to apply first a coating of solvent, as naphtha, and an extra coating of shellac. Otherwise piny resins may exude through the paint film, causing discoloration and possible encrustations.

Use of water-soluble preservatives does not necessarily damage paint films if the wood has been thoroughly dried before paint is applied. Nor is durability of the film materially affected. But no assurance of good results can be had from painting wood impregnated with creosote or other oil preservatives. Fair results have been obtained, however, by applying first a coating of shellac followed by high grade aluminum paint as a priming coat. In such cases three coats of paint are usually necessary to hide the aluminum properly.

**Painting New Work** involves two precautions on the job in addition to the general ones indicated above. First, the surface should be clean and smooth. It should be inspected before the priming coat is applied. Second, application should

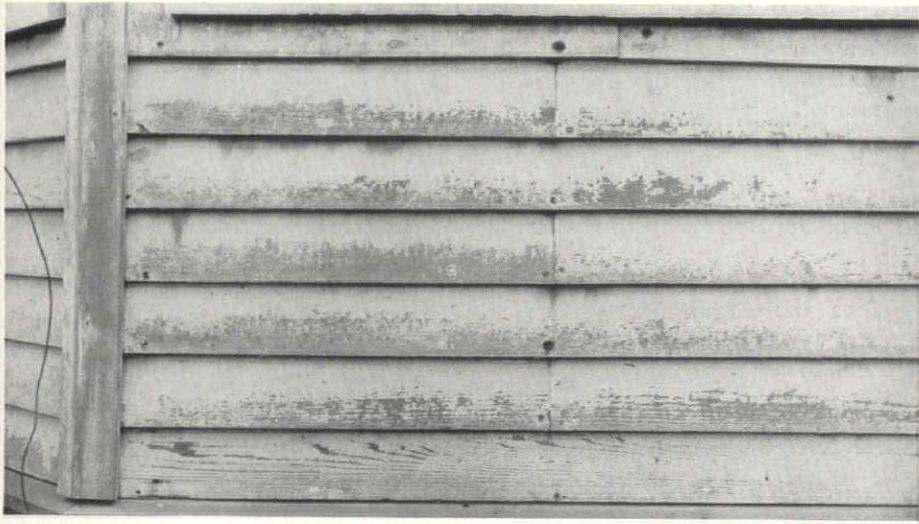


PHOTO: COURTESY LEAD INDUSTRIES ASSOCIATION

## POOR PAINT— GOOD SURFACE

Improper formulation of paint to minimize first cost is one of the most common causes for early paint failures. Surface conditions may be excellent, but costly repainting will be required at frequent intervals to maintain adequate protection of surface and appearance when poor paint is used. Illustrated here is a typical early failure of cheap paint, improperly formulated and inexpertly applied

attempt to balance all conditions. For example, if shadow or dampness is permanent on one or two exposures of the building, formulation can be adjusted so that sunny and shady surfaces will tend to wear at the same rates. Formulation may need adjustment also to assure an even hardness of the film in certain localities.

**Repainting** technique follows generally that for new work. Most important is the preparation of the surface. All loose paint must be removed by scraping, sanding, or by burning with a plumber's blow torch. The last is necessary where blistering and peeling are in evidence. In this case the surface should be treated with a priming coat and subsequent coats as for new work. Otherwise two coats are generally sufficient, the first being similar to the second, or body coat for new work.

Brushing over either old or new work should be with the grain of the wood, except in the case of enamels. Paints should not be flowed on, but brushed out to a smooth, even film with a full-arm stroke. This assures penetration, uniform coverage and tends to eliminate possibilities of laps or skips.

**Paint mixing** is normally subject to variation. But pigment volume of paint for three-coat new work should fall within the following limits, according to the recommendation of the U. S. Department of Agriculture in the section "Painting and Finishing Wood" of the Wood Handbook, recently issued. For priming coats the paint should have a pigment volume of 20 to 25 per cent; for second, or body coats, 35 to 40 per cent; and for finish coats, 25 to 32 per cent.

The recommended limits for the second coat are usually higher than can be obtained by using ready-mixed paints. Therefore, percentages for second and third coats are usually the same in the case of prepared paints. Semi-paste paints can usually be adjusted to recommended percentages. This

is the case, also, when repainting is done with two coats. Since the painter has, usually, little control over the pigment volume of ready-mixed paint, the desirability of specifying adequately formulated products of reputable manufacture is obvious.

The following table lists approximate amounts of linseed oil and turpentine to be added to one gallon of paste paint for coating new surfaces:

### AVERAGE FORMULATION, NEW EXTERIOR WORK

Reduction and spreading rate	For 3-coat initial painting			For 2-coat initial painting	
	First coat	Second coat	Third coat	First coat	Second coat
For soft paste (1) white-lead paint and other paste paints containing more than 50% pigment by volume:					
Raw linseed oil (2).....quarts	6	2	4	4	4
Turpentine .....quarts	1 1/2	1 2/3	0	1	0
Spreading rate (3) sq. ft. per gal.	575	600	600	450	500
For paste (1) paints containing 40 to 50% pigment by volume:					
Raw linseed oil (2).....quarts	5	1 1/2	3	3	3
Turpentine .....quarts	1	1	0	1	0
Spreading rate (3) sq. ft. per gal.	575	600	600	450	500
For paste (1) paints containing less than 40% pigment by volume:					
Raw linseed oil (2).....quarts	3 1/2	1	2	...	...
Turpentine .....quarts	1	1	1/2	...	...
Spreading rate (2) sq. ft. per gal.	550	575	575	...	...

(1) If the paste paint contains no drier about 1/3 pint of liquid paint drier should be added in each of the above mixtures.

(2) Boiled linseed oil should be used in place of raw linseed oil only if the manufacturer indicates that it is satisfactory to do so.

(3) If additional thinning is necessary to give good brushing consistency, thin further with turpentine, not with linseed oil, and apply the paint at correspondingly lower spreading rate. For congested urban districts where paint becomes very dirty or where mildew is troublesome, the amount of linseed oil added to finish coats may be reduced by about 1 pint and the amount of turpentine increased by about 3/4 pint.

(From "Wood Handbook," U. S. Dept. of Agriculture)

**PAINTING EXTERIOR MASONRY**—Oil paint should not be regarded as an efficient means of waterproofing exterior masonry walls. (See "Waterproofing and Dampproofing," American Architect Reference Data No. 17, April, 1935.) But it can be applied successfully in most cases as a fairly durable protective and decorative coating if the surface is completely dry and has been aged sufficiently to eliminate the corrosive effects of chemicals that attack paint films.

**Surface preparation** should not be attempted before the masonry has cured for at least six months. During that time moisture has largely left it and the alkalies have been, to a large degree, carbonated and dissolved. Moisture exerts a pressure behind any paint film that is applied, causing blistering and peeling. Also it renders very active caustic hydroxides, particularly in stucco and concrete, that react with vegetable oils and some gums present in paint vehicles.

All dirt, laitance, form-oil or efflorescent salts should be removed from the surface by vigorous wire-brushing or light sand-blasting. After this, on new structures, the alkalies should be neutralized before even a priming is attempted.

In general two chemical solutions have proved most effective. One, a solution of from 2 to 4 pounds of zinc sulphate in a gallon of water is the better known. It should be well-brushed into the surface pores. The other involves a coating with a magnesium fluosilicate solution. When the surface has dried thoroughly after this treatment it may be painted.

To test dryness, place a sheet of glass or linoleum against the masonry surface and observe the condensation of moisture after 24 hours.

The phenolphthalein test for free lime in brick mortars or in stucco surfaces is so sensitive that it usually becomes impractical if the neutralizing solutions have been applied.

**The priming coat** should consist of tung oil varnish pigmented to the desired color. This forms a good foundation for application of any durable kind of linseed oil paint. Varnish is used to seal the pores of the surface and thus prevent suction of the oil content of succeeding coats.

**Body and finish coats** can be of any formulation adaptable as a durable paint for exterior wood. Application presents no unusual problems. For flat finishes, however, the raw linseed oil content is commonly reduced. In its place are used bodied oils and volatile thinners in proportions that obviously vary widely with the type of surface.

## INTERIOR PAINTING

**F**ORMULATION of interior paints varies radically from that used on exteriors because surfaces and job conditions are not the same. Exterior paints are often used for interiors, but they are likely to change color as they age, for raw linseed oil yellows noticeably when used indoors. For this reason most good interior paints are formulated with a vehicle containing a relatively small percentage of non-volatile varnish or bodied drying oils and a high percentage of volatile thinners. This applies particularly to flat paints. Enamels may be regarded as special paints combining opaque pigments common to other paints with vehicles made largely

of various types of varnishes or quick-drying combinations of synthetic resins and drying oils. The latter type includes the so-called "four-hour enamels."

Pigmentation of interior paints logically includes many opaque pigments regarded as extenders if used in large proportions for exterior paint. Thus, various combinations of the zinc oxides and sulphides, titanium pigments and barium sulphate are much used to produce washable paints of good hiding power, economical formulation and long wear. Such paints are adaptable to both wood and plaster surfaces. White lead is also a part of many job-mixed formulas, made from "all-purpose pastes" that are well adapted to both exterior and interior work.

**PLASTER.** As with any other surface, the presence of moisture in plaster spells early failure of an oil paint film. In this case moisture danger is complicated by the possibility that alkalies in the form of free lime or caustic hydroxides may attack the film even after it has dried.

Time necessary for thorough drying cannot be definitely stated. As much as six months may be necessary in some cases and much less in others, particularly if heat is kept within the house during the drying stage. In any case, free air circulation is essential. Otherwise moisture may be driven from the surface into the construction, causing possible damage to exterior paint.

**In new plaster**, and sometimes even in old work, alkalies must be neutralized before paint can be applied. For this, brush on a solution of 2 to 4 pounds of zinc sulphate to a gallon of water. Allow at least two days for the wall to dry.

Corrosion of paint on plaster is caused less frequently by lime than by sodium and potassium salts mixed with the lime, which, in the presence of moisture, form alkali hydroxides, all of which are very destructive to paint. In this characteristic, plaster can be just as troublesome as an exterior masonry surface, for if moisture returns to a plaster wall once dried, alkalies may become active and paint corrosion will be the rapid result.

Lime and gypsum plasters are equally susceptible to the presence of such salts. These are usually present in sand, and when plaster is applied directly to masonry, may be absorbed in even larger quantities from the backing.

After neutralization, and when dry, plaster need only be cleaned of dirt and oil, and smoothed of surface imperfections before priming.

**Priming coat.** Formulation may vary with the type of paint to constitute a finish coat. If walls will be subject to continual redecoration, two coats of paint will be sufficient and the formulation can contain material proportions of inert pigments. Many ready-mixed paints of this type, which are relatively inexpensive and which give excellent results are available.

There are now available also a number of special primers formulated particularly for application within a week or two after plastering has been completed. They are largely tung oil varnishes, formulated to resist alkalies to the greatest possible degree. Such primers have but little penetration and depend upon adhesive properties to produce results. In many cases they can be used advantageously. Wherever damp plaster must be painted it is wise to leave a place for

moisture to escape, whenever possible. Baseboards, for example, should not be set until the last moment and a small strip of plaster behind them left unpainted.

The practice of glue-sizing plaster surfaces before priming is not recommended, for proper penetration and adhesion of the priming coat cannot then be attained. Defects which develop later may ruin the entire area, since the glue size is likely to peel off in large patches, with the entire film.

Prime the wall first. Allow from two to three days for drying. Alkali spots—characterized by a softening of the paint film—must be cleaned of paint touched again with the sulphate solution and reprimed. Flat areas should be reprimed and further sealed with glue size. This is made by mixing about one pound of the best gelatin glue with about a gallon of hot water to a consistency that feels slightly sticky between the fingers.

A priming coat on plaster must stop "suction" of porous plaster, seal the pores completely and develop a firm, opaque foundation for subsequent coats. To do this, ready-mixed or semi-paste paints are often applied according to a "system." This involves use of a special type of "undercoater" which, in effect, corresponds to the finish coat, to which varnish or a bodied drying oil has been added in amounts varying with the type of work. Porous plaster requires relatively more "sealer" of this kind than dense, dry plaster.

**Finish coats** of almost any kind will be safe to use over a properly applied priming coat. Flat wall paints should be applied with short, crisscross strokes, thickly enough so the paint will flow and obliterate brush marks. Paint for stippling should be mixed with somewhat less oil in the finish coat, or thickened slightly by the addition of a small amount of whiting.

No interior painting should be attempted unless the room has been thoroughly broom-cleaned and dust allowed to settle. Temperature for best results should be maintained at 70 degrees F.

**Repainting** involves most precautions necessary for new work. If surfaces are coated with calcimine they should be scrubbed with warm water and allowed to dry thoroughly. They can then be painted as new plaster.

Grease and dirt should be removed from old paint by washing with soap and warm water, then dried and brushed to remove loose paint. If damage is extensive, it will be necessary to remove the old film.

**Woodwork.** The only essential difference between the painting of exterior and interior wood, exists in the type of paint to be used. Less protection is required, except insofar as a special maintenance program may demand it. However, smoother surfaces are usually necessary with a more lasting effect of finish.

For these reasons, enamels are largely employed for finish coats. Enamels may be applied as "system paints," involving a special type of priming coat. But any interior wood can be satisfactorily primed with one good exterior primer and body-coated with a flat white lead or mixed pigment paint. It is good practice to specify that all knots be shellacked after the priming coat is dry, particularly when the wood is pine containing resin. Hardwoods with small pores require no other special treatment. Those with large pores, however, may require filling to produce a desired

smoothness of surface. Filler, which in such cases, can often replace the usual priming coat, consists of a pigment—usually with finely ground quartz (silica) as the chief ingredient—mixed with linseed oil and a paint drier.

#### CLASSIFICATION OF HARDWOODS FOR PAINTING

##### Filling Necessary

Hardwoods with large pores:

Ash  
Butternut  
Chestnut  
Elm  
Hackberry  
Hickory  
Khaya (African mahogany)  
Mahogany  
Oak  
Sugarberry  
Walnut

##### Filling Unnecessary

Hardwoods with small pores:

Alder, red  
Aspen  
Basswood  
Beech  
Cherry  
Cottonwood  
Gum  
Magnolia  
Maple  
Poplar  
Sycamore

Birch has pores large enough to take wood filler effectively when desired but small enough, as a rule, to be painted satisfactorily without filling.

#### PAINT ADULTERATION

**T**HIS is a relative term. It means little unless qualified comparatively in terms of the cost, required durability and type of paint and the objectives of the specific maintenance program in which the paint will be used. What might constitute adulteration of an exterior paint where maximum protection and great durability were essential, might be entirely justified in another type of formulation designed for interior use.

**Pigment Adulteration** generally implies the presence of large percentages of pigments that are transparent, or nearly so, in oil. Such are chalk, barytes, talc, asbestine, gypsum, etc. Since opacity is lacking, the paint must be applied in a heavier coat than usual.

**Vehicle Adulteration** may result if too much linseed oil is added in an effort to improve workability of a heavy paint. This reduces the proper pigment volume and tends to produce a slow-drying film that remains soft and soils quickly.

Another method of lowering the cost of exterior paint is by using drying oils bodied by heat treatment or by using varnish as part of the vehicle. These thicken the paint so that large proportions of cheap volatile thinners are necessary to produce the proper consistency for exterior application. The resulting paint film will contain too small a proportion of drying oil and will be subject to unusually rapid deterioration. Interior flat paints, however, normally contain large proportions of volatile thinners in a bodied oil or varnish vehicle.

The final stage of paint adulteration is the substitution of water for part of the linseed oil. Some cheap paints—particularly those for which unreliable manufacturers "guarantee" extravagant performance—have been found upon analysis to contain as high as 30 per cent water in the vehicle volume. The presence of water can sometimes be detected by suspending a strip of gelatin in the paint for about 18 hours. If the gelatin softens, a dangerous amount of water is present. Another test involves the use of a water-soluble dyestuff such as methylene blue. If a paint sample rapidly assumes the color of the dye, it contains much water. If a slight color is slowly developed only a trace of water is in

# Elements of OIL PAINTS

## PURPOSE

This sheet gives the characteristics of those basic materials most commonly used in paint formulation.

## DEFINITIONS

**Hiding power** indicates the square foot area of black surface that can be entirely obscured by brushing on a pound of pigment mixed with pure boiled linseed oil. Figures are the results of tests with hiding power differences of pigments compensated for by mixing oil and pigments in proportions to give the same *volume* hiding power. Calculations established the square-foot-per-pound figures listed here which are directly proportional to pigment hiding power. The higher the figure the better the hiding power. (Tests made by R. L. Hallett, Chemist, and reported in A. S. T. M. Proceedings Vol. 30, Part II, 1930.)

**Opaque pigments** are those with a high refractive index as compared with that of linseed oil (1.49) and, in consequence, relatively good hiding power when used in oil paints.

**Transparent pigments** are those with a refractive index substantially the same as that of linseed oil. When mixed with the oil, they transmit, instead of reflect light. They fail, therefore, to obscure the surface upon which they are spread and consequently hiding power is relatively low.

**"Extenders"** are white pigments which are comparatively inexpensive and often relatively transparent, but have bulky volume or special characteristics that may balance or desirably modify characteristics of opaque pigments when mixed with them. They are often used in paints to lessen cost, but are considered as an adulterant of paint when used beyond 15 per cent of the pigment volume in an exterior paint.

PIGMENTS		
MATERIALS	COMPOSITION AND MANUFACTURE	CHARACTERISTICS IN PAINTS
<p><b>WHITE LEAD</b>            Basic Carbonate of Lead available in two forms of paste: "Heavy" contains 91% pigment, 9% raw linseed oil. "Soft" contains 89% pigment, 9% oil and 2% turpentine</p>	<p>1. "Old Dutch Process" corrodes lead disks with fermenting tan bark aided by acetic acid. 2. "Carter Process" subjects powdered lead to action of acetic acid and carbon dioxide. 3. "Precipitation Process" treats basic lead acetate with carbon dioxide. 4. "Electrolytic Process" dissolves lead in cell, followed by precipitation. No. 1 generally preferred, though all chemically the same</p>	<p>A very durable, opaque white pigment. Combines well with drying oils. Can be safely combined with many pigments and colors. When mixed with linseed oil forms tough, elastic film, that wears by chalking. Hiding power: 12 to 18</p>
<p><b>WHITE LEAD</b>            Basic Sulphate of Lead not usually available in paste form</p>	<p>Made from refined lead by sublimation process</p>	<p>Characteristics generally similar, though slightly inferior, to basic carbonate white lead. Extreme fineness of particle resists settling in oil. Tends to chalk extremely if used alone. Often used in mixed-pigment paints. Hiding power: 13</p>
<p><b>ZINC OXIDE</b>            Also called zinc white, Chinese white or white zinc. Not commonly used in paste form</p>	<p>Reduced in fumes from zinc metal (the "French" process), or from zinc ores mixed with powdered coal in a closed furnace ("American" process)</p>	<p>Durable, very white opaque pigment of fine particle size. Combines well with drying oils. Can be safely combined with other pigments and colors. Not discolored by gases. Absorbs ultraviolet sunlight. Resistant to mildew. When mixed alone with linseed oil, forms hard inelastic film that cracks easily. Rarely used alone in paints. Hiding power: 20</p>
<p><b>LEADED ZINC OXIDE</b></p>	<p>Zinc and lead ores produce a number of zinc oxides by the fume process, containing lead sulphate in percentages from 5 to 35</p>	<p>These pigments have high opacities slightly inferior to zinc oxide and a particle fineness equal to zinc oxide. Less bulky than zinc oxide and only slightly inferior in whiteness. Mixes well with oil and resists settling. Used extensively in pigments of good ready-mixed paint</p>
<p><b>ZINC SULPHIDE</b>            "Technically pure" product contains 98% ZnS</p>	<p>Precipitated by passing hydrogen sulphide gas through a zinc sulphate solution</p>	<p>Very white, opaque pigment that mixes well with vehicles. Used extensively for interior paints. Hiding power: 58</p>
<p><b>LITHOPONE</b></p>	<p>A precipitated pigment of several grades. Most common contains about 70% barium sulphate and 30% zinc sulphide. Zinc sulphide content ranges from 30 to 50 per cent, the latter being called Zinc Sulphide Pigment (Barium). Another type contains calcium sulphate with zinc sulphide. "Titanated Lithopone" contains about 15% titanium dioxide</p>	<p>Soft textured, very white pigments of fairly fine particle size. Usually combined with other pigments mostly for indoor paints. Combines well with most pigments and colors. Inert in oil. Will not darken in sunlight. Hiding power: Lithopone, 27; Zinc Sulphide Pigment (Barium), 40; Titanated Lithopone, 44</p>
<p><b>TITANIUM PIGMENTS</b></p>	<p>Titanium dioxide (a brilliantly white, very finely particled pigment with great hiding power and durability), reduced with barium sulphate or calcium sulphate.</p>	<p>Great durability and resistance to gases, acid and alkali fumes, sunlight and moisture. Inert in oil. Much used for industrial paints, quick drying enamels, etc. Excellent in exterior mixed-pigment paints if not used in excess of 50 per cent of total pigmentation. Paints with high percentages tend to chalk excessively. Hiding power: Titanium Dioxide, 115; Titanium Barium, 40; Titanium Calcium, 48</p>
<p><b>BARIUM SULPHATE</b>            Also called Barytes. Permanent white, Barite and Blanc Fixe</p>	<p>Ground in the natural state (barytes) or in precipitated form (blanc fixe)</p>	<p>Extender pigments, of which barytes is most commonly used. Permanently white, and soft in texture. Pigment particles are very fine. Poor hiding power. Inert in oil</p>

# Elements of OIL PAINTS

## PIGMENTS . . . Continued

MATERIALS	COMPOSITION AND MANUFACTURE	CHARACTERISTICS IN PAINTS
<p><b>CALCIUM CARBONATE</b> Also called chalk, whiting</p> <p><b>GYPSUM</b> Talc or Asbestine, Silica, China Clay</p> <p><b>RED LEAD</b> Available in 85 and 95 to 97% true red lead grades. 97% grade paste usually contains about 7% linseed oil</p> <p><b>BLUE LEAD</b></p>	<p>Ground from various limestones, the best grades being made from natural chalk (cliffstone)</p> <p>Of various compositions. Prepared usually by grinding</p> <p>Combinations of lead oxides, consisting of true red lead with minor amounts of unconverted litharge</p> <p>Sublimed from galena ore. Contains about 50% lead sulphate and about 35% lead oxide, also small amounts of lead sulphite, lead sulphide, zinc oxide and carbon</p>	<p>Extender pigments used in putty and also in some paints as a filler. Good for calcimine, but has little body in oil</p> <p>Extender pigments, sometimes used in oil paints as fillers. All have little hiding power. Beyond 15% of the total pigmentation their use is regarded as pigment adulteration</p> <p>Resists moisture and usual corrosive agents in air. An excellent rust inhibitor for all ferrous surfaces. Good hiding and covering power. Characteristic color is bright red. Can be mixed safely with some other pigments and most colors</p> <p>Extremely fine in particle and resists settling in oil. Hiding power good. Excellent rust inhibitor. Resistant to moisture and commonly corrosive gases. Color is slate gray that fades slightly in finished film. Can be mixed with most common pigments and colors</p>

## DRYING OILS

<p><b>RAW LINSEED OIL</b></p> <p><b>BOILED LINSEED OIL</b></p> <p><b>STAND OIL</b></p> <p><b>TUNG OIL</b> Also called Chinawood Oil</p> <p><b>SOY BEAN OIL</b> <b>SAFFLOWER OIL</b> <b>FISH OILS</b></p>	<p>Prepared from seeds of flax plant. Good commercial quality contains 2% of "foots," the residue of preparation, and has an acid number of 4 and an iodine number ranging from 188 to 175</p> <p>Heat treated with drier cooked in</p> <p>Linseed oil processed by heating to promote polymerization</p> <p>Pressed from seed nuts of tree mostly imported from China but grown to some extent in this country</p> <p>Generally refined through pressure, settling and straining</p>	<p>Combines naturally with white lead and zinc oxide and wets many other pigments. Dries slowly by oxidization. Tends to shrink in drying and yellows with age, but forms tough, durable, elastic film. Most satisfactory drying oil used in exterior paint</p> <p>Hastens surface drying of paint film and much used prior to perfection of liquid driers. Dried film is equal to that of raw product. Slightly heavier and more viscous than raw oil</p> <p>A "bodied" oil used to increase gloss and durability in paint film. Improves "flow" of paint under adverse conditions of surface and weather. Drying rate is usually about the same as that of raw linseed oil</p> <p>Dries quickly. More resistant to water than linseed oil. Never used in raw state. Good as part of vehicle of quick-drying interior paints and exterior masonry primers</p> <p>Semi-drying oils often used as inferior substitutes for linseed oil. When processed they form part of special paints. Fish oils are useful in coating metal surfaces subjected to heat</p>
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## VOLATILE THINNERS

<p><b>TURPENTINE</b></p> <p><b>MINERAL SPIRITS</b></p> <p><b>"REDUCING LIQUIDS"</b> <b>"THINNING OILS"</b></p>	<p>Two general types are "Gum Turpentine," distilled from pine sap; and "Wood Turpentine," distilled from pine wood waste. The former is considered more uniform in properties and composition</p> <p>Reduced from petroleum as "fractional distillates." Types vary essentially in volatile characteristics and flash points</p> <p>Usually proprietary products generally bodied oils or varnishes thinned with turpentine or mineral spirits</p>	<p>Almost colorless, quick to evaporate and inert to properties of paint materials. Thins paint about twice as much as equal volume of raw linseed oil</p> <p>Substitutes for turpentine as paint thinners because of relative cheapness. Evaporates from paint film quickly. Very light naphthas or the heavy distillates, as kerosene, are not used in properly formulated paints</p> <p>Substitutes for turpentine and oil for thinning paste. If offered by a reputable manufacturer, they can safely be used. The major ingredients should be known before such substitutes are approved for use</p>
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## LIQUID DRIERS

<p><b>OIL DRIERS</b></p> <p><b>JAPAN DRIER</b> Also called Painter's Japan and Coach Japan</p> <p><b>NAPHTHANATE DRIER</b></p>	<p>Solutions of the oxides of lead (usually litharge), manganese or cobalt in oil accomplished by heat treatment</p> <p>Concentrated oil drier, thinned with a volatile oil and containing shellac or other gum. Content of metal driers ranges from 2 to 12 per cent</p> <p>Combination of naphthenic acid—a product of petroleum refining—and lead, manganese and cobalt salts. This is available in semi-plastic or in dilute liquid forms</p>	<p>Hasten formation of hard paint film by acting as catalyzers, promoting oxidation of drying oil content in the paint</p> <p>Used in the same way as oil driers. More than small amounts of driers slow up the hardening process. Too much Japan drier may decrease lustre of gloss paints</p> <p>A comparatively new type of drier, use of which is increasing. Characteristics in paint are similar to those of oil and Japan drier</p>
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# OIL PAINTS—EXTERIOR FAILURES

## EXCESSIVE OR PREMATURE CHALKING

Evidenced by surface dusting and rapid thinning of the film, sometimes to bare wood.

**Cause** may be due to improper formulation or faulty application. Paint containing water or too high a percentage of volatile thinner forms a porous film subject to rapid wear. Application in freezing weather often produces the same result.

**Cure of condition** is vigorous wire-brushing and repainting before the film has completely worn away.

**Prevention** requires merely a strict adherence to high standards of paint formulation and application.

## SAGGING AND RUNNING

Marked by irregular wavy lines that texture an otherwise smooth finish film.

**Cause** is usually paint formulation with too low a pigment volume, or too heavy and careless an application of a thin-consistency paint. It occurs sometimes when repainting an interior if an original gloss surface has not been cut by light sanding or rubbing with a cloth soaked in naphtha.

**Cure of condition** necessitates sanding the irregularities and repainting.

**Prevention** involves maintaining proper proportions of pigment and linseed oil as to formulation and careful brushing of properly thinned paint as to application.

## STORM SPOTTING

Not to be confused with dull spots from surface suction, storm spots usually occur after continuous rains and electric storms and are characterized by unsightly and irregular color changes.

**Cause.** Rain sometimes absorbs nitrates and peroxides formed by electrical discharges and penetrates the paint film, changing the refractive index of the coating.

**Cure of condition** can sometimes be accomplished by rubbing spots with alcohol. Subsequent weathering usually restores the original color within a month or two.

## WASHING

Characterized by streaking on the surface, fading color, the final exposure of original surface and accumulation of pigment particles below painted area.

**Cause.** Water-soluble compounds in pigments of poor paint or soluble compounds which develop by chemical reactions in the paint are dissolved during rain storms and wash out of the film. Also when paints are applied during periods of high humidity and low temperatures the film structure may be injured during the drying period.

## PURPOSE

This sheet describes and illustrates, in part, common types of exterior paint failures, states their causes, indicates procedure necessary as a remedy for such failures and notes measures to avoid them or to prevent their recurrence.

## GENERAL

Failure of a paint film is not to be confused with results of normal wear. Well-formulated paint, skillfully applied over a properly prepared surface, wears by gradual "chalking" and maintains a durable, satisfactory foundation for repainting for a period of three to five years, depending upon the locality and type of surface.

Premature, excessive chalking, cracking and other defects constitute film failure. These are traceable to three main causes:

1. Improper formulation.
  2. Inadequate surface preparation and careless application.
  3. Faulty construction or building materials.
- Film defects may result from one or any combination of these. The most flagrant can be, and are, very typically illustrated. Others constitute varying surface conditions difficult to picture accurately.

## STAINS

Surface discolorations often disappear gradually as paint films wear. Sometimes, however, they go through the film, necessitating its removal and subsequent repainting.

**Copper and iron stains** do not usually affect durable paint films seriously. They are caused by water dripping from exposed metal. They are difficult to remove and discolorations of long standing require repainting. Prevention involves coating the metal: Copper with oil spar varnish, aluminum or opaque pigment paint; iron with red or blue lead as priming coat. Galvanized iron should be painted with metallic zinc dust in spar varnish or paint containing zinc oxide.

**Mildew stains** are caused by air-borne fungi that feed on oil and multiply rapidly. They cannot be easily removed. Old growth should be removed before repainting by washing with one pound of tri-sodium phosphate or sodium carbonate in one gallon of water. For prevention the paint can be treated with about one-quarter ounce of mercuric chloride per gallon.

## CHECKING

This is characterized by minute cracks on the surface of elastic paint films. Usually it is not a serious film defect, for checks do not extend through the film.

**Cause** is improper application or improper formulation of undercoats. The finish film is applied over a body coat not quite hard enough for a proper foundation. Unequal tensions occur in drying and small surface checks result.

**Cure of condition** involves wire brushing affected areas and repainting if checking does not disappear under influence of normal wear.

**Prevention** involves allowance of sufficient drying time between coats (from 3 to 7 days) and formulation of the body coat with a minimum amount of oil in order to develop a hard foundation for finish.



# OIL PAINTS—EXTERIOR FAILURES



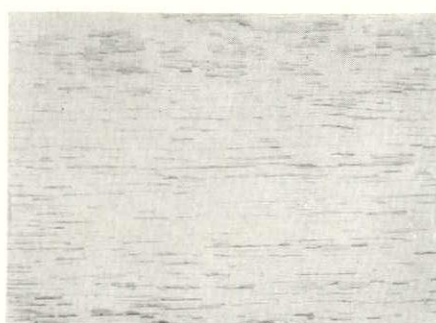
## ALLIGATORING

An advanced state of checking, varying in degree to a coarse texturing of the finish film.

**Cause** involves application of a harder drying finish over soft or slow-drying underlying coats. As in checking, poor formulation with too much linseed oil in the priming or body coat may result in alligating.

**Cure of condition**, if extensive, require: removal of the film and repainting.

**Prevention** necessitates precautions noted to prevent checking.



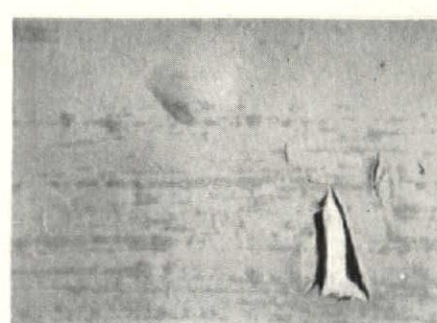
## CRACKING AND SCALING

Characterized by irregular cracks that subsequently curl at the edge, flake and finally scale off. Over wood, scaling is usually most marked in direction of or across the grain.

**Cause.** Cracking is a wear characteristic of hard-drying paints that contain large proportions of zinc oxide pigment. Scaling comes from water pressure when moisture seeps through the crack to the original surface. The condition is common to any surface coated with paint improperly formulated to withstand local conditions.

**Cure of condition** at an early stage requires vigorous brushing and recoating with a less brittle film.

**Prevention** involves formulation to produce a tougher, more elastic film. Usually this means an increased percentage of white lead.



## BLISTERING AND PEELING

Swelling of the entire film in irregular spots marks blistering which usually is followed by a break in the film and subsequent peeling.

**Cause** is water pressure from behind the film due to faulty construction that allows moisture seepage or abnormal condensation. This is a mechanical damage that may occur whatever the type or quality of paint used. It sometimes results also when damp surfaces are covered by quick-drying paints. This type of damage may be evident on wood, stucco or masonry surfaces and on cement floors.

**Cure of condition** requires complete removal of the paint by burning and repainting as for new work.

**Prevention** necessitates permanent removal of the moisture sources, often involving relatively extensive repairs and waterproofing.



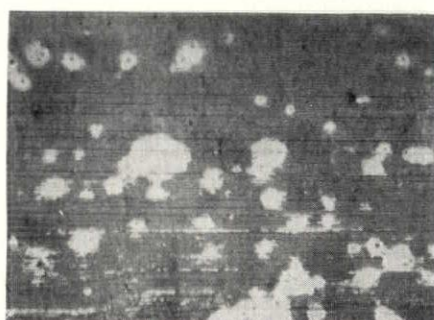
## BROWN STAIN

A general term for unsightly discoloration of paint over redwood and some cedars.

**Cause.** When these woods become wet, water-soluble substances within them work through the paint film, resulting in permanent discoloration. Also, resinous sap of some pines may work through the film causing stain and encrustation.

**Cure of condition** involves aging, elimination of moisture sources and repainting as for new work.

**Prevention** necessitates thorough seasoning of wood before painting and exclusion of structural defects causing moisture. Complete sealing of knots is particularly essential in the case of resinous pines.



## SPOT FADING

This is characterized by color changes and flatting of gloss in irregular patches on the finish film.

**Cause** is from uneven oil absorption, usually a result of insufficient coats or a priming coat improperly formulated to penetrate and adequately seal surface pores. It may be emphasized when "skimping" is attempted, that is, application of two coats when three are needed, or the use of a cheaply formulated paint.

**Cure of condition** is repainting.

**Prevention** requires merely the exercise of proper painting technique.



## WRINKLING

Not to be confused with alligating. This is marked by a tough, leather-like surface texturing.

**Cause** is usually when paint is put on too thickly and not well brushed out and may be contributed to by formulation if too high a proportion of oil is used in finish coats.

**Cure of condition** requires only sanding and repainting if texture is slight. Otherwise, film removal is indicated with subsequent painting as for new work.

**Prevention.** Strict adherence to high standards of paint formulation and thorough brushing out in application are adequate.

the paint. If no water is present the color of the sample will not change.

Tests on the job to determine paint adulteration are usually impractical. Here again, the experience of a qualified master painter and the use of products of reliable manufacture are the best assurances of suitability and purity in formulation and correct technique in paint application. Indeed, paint adulteration may often prove a cause of less serious difficulty than ill-advised formulation or painting processes carried out in good faith.

## FAILURE OF PAINT FILMS

**G**RADUAL disintegration of paint films does not constitute failure in the common meaning of the term. Only when characteristics of wear appear prematurely, or when defects other than slight soiling, chalking or minute checking are evident on the painted surface, can the film be said to be failing. Such failures can be traced to three main causes: improper formulation, faulty application and conditions generally inimical to paint, even in spite of proper formulation and the highest class of workmanship.

Moisture acting through a structure is one important cause of damage to paint films on exterior surfaces, usually characterized by blistering and peeling. No paint has yet been devised that will adhere to surfaces against pressure of water from behind, caused by capillary circulation, condensation, or both.

Capillary circulation is usually caused by rain water that seeps through leaky joints due to poor workmanship or faulty structural design. Improper flashings around openings, at roof valleys, at water tables, or around chimneys; any leaks of roofs, gutters and down spouts located where water gains access to the interior of construction; and seep-

ages due to poor fittings of joints at window frames, corner boards, porch floors, etc.—all these allow water to reach the unpainted side of painted surfaces in both heated or unheated buildings in any climate. They spell quick failure of an exterior paint film. The only remedy is water-tightness. In cold climates an additional cause of moisture damage to paint may come from frozen gutters which fail to dispose of roof water from melting snow. This can back up under the roofing and seep through to interior side walls.

Condensation of water on unpainted sides of surfaces results when moisture laden air comes in contact with areas cooled below the dew-point. Moisture may originate anywhere within the building. Convection spreads the humid air and condensation may result in areas far removed from the source of dampness. Thus, in a basement that has been improperly waterproofed moist air may rise through hollow walls to condense behind masonry or siding, eventually seeping through to affect the paint film. Leaks in plumbing lines may provide another source of moisture. Lack of adequate ventilation in attics and under porches may produce condensation that drains into joints and seeps through wood members to the paint film. And, unless dissipated by some means of ventilation, humidified air from kitchens and bathrooms may be a potential source of paint damage—interior and exterior—through condensation.

Paint failures on walls of new frame buildings may often be traced to an attempt to hasten drying without adequate ventilation during the drying process. Heat in a closed house permits water to distill from the plaster through hollow walls to sheathing and siding. Therefore, circulation of fresh air should be assured by leaving doors and windows open and, wherever possible, by leaving temporary openings at the top and bottom of air spaces between studs. Such a process is the only positive assurance against subsequent moisture damage to the finished paint film.



THE FOREGOING ARTICLE has been developed from a number of sources generally regarded as technically accurate and unbiased. Special acknowledgment should be accorded Dr. H. A. Gardner, Director of the Institute of Paint and Varnish Research, Washington, D. C., and Dr. F. L. Browne, Senior Chemist, The Forest Products Laboratory, Madison, Wisconsin. These men have been of particular assistance in consultation on technical matters. Acknowledgment is also made to R. L. Hallett, Assistant Director of Research, National Lead Company, Rulif Davison, New Jersey Zinc Co., and to John R. McGregor, The Eagle-Picher Lead Co., for helpful criticism of the manuscript

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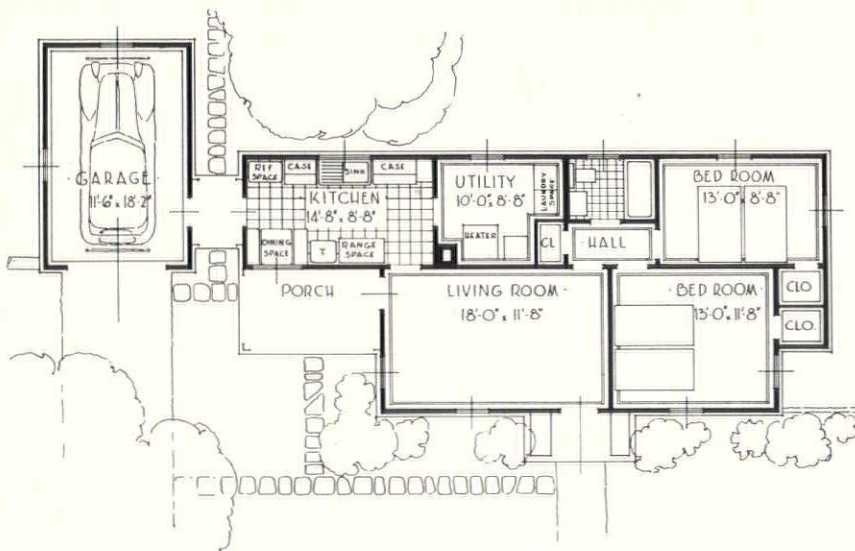
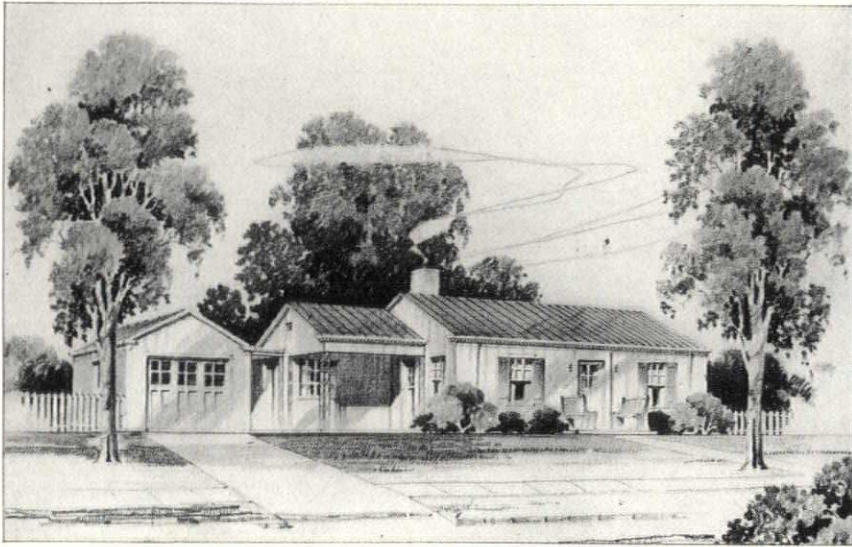
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# TECHNIQUES

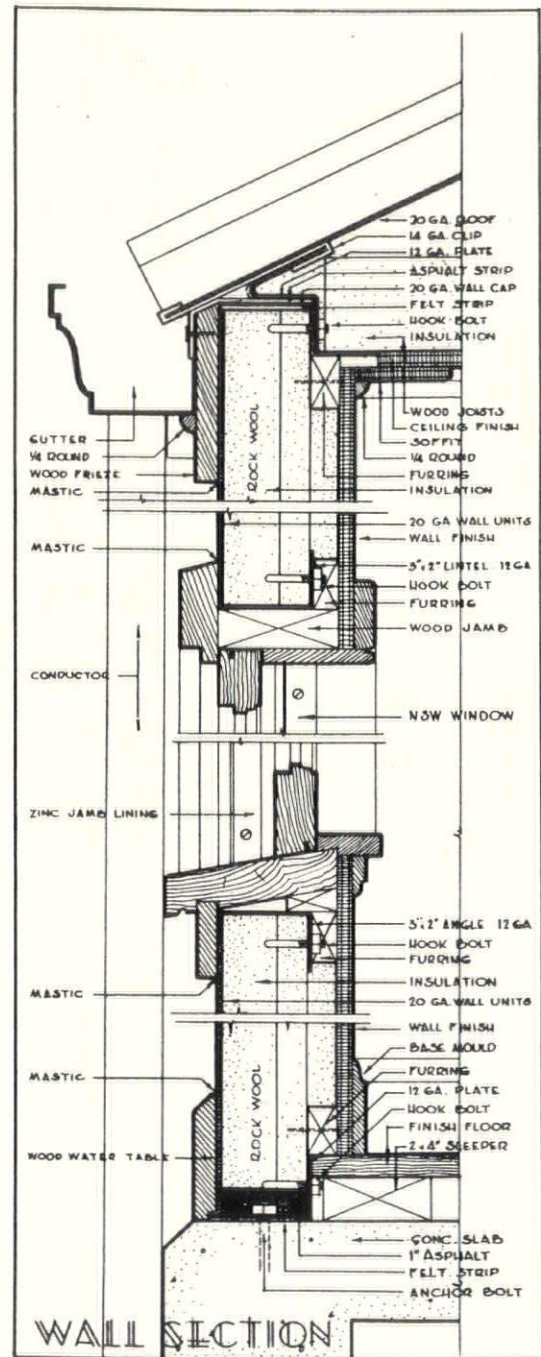
METHODS • MATERIALS • RESEARCH • PRACTICES



## PREFABRICATED STEEL HOUSE

A finished house within ten days! This was the record established at Middletown, Ohio, by use of Steelox, a newly developed steel panel unit, fabricated for use in a limited number of standard plans. Houses such as the one illustrated, are offered by the Steel Buildings Company of Chicago at f.o.b. prices ranging from about \$1,000 to \$1,500. These prices are said to include equipment and all necessary materials—even the sand and gravel for the foundation—but not the cost of erection, which

is the work of local, semi-skilled men. Structural wall panels of 20-gauge zinc-clad steel—interchangeable with roof panels of the same lengths—are interlocking. They form cell-like units which are packed with rock wool insulation and faced on the interior with plywood walls on furring strips. Roofs are pitched and the interlocking units clipped to an angle which also acts as the top wall plate. The entire structure is bolted to a concrete foundation—or basement—water-proofed with mastic



at all joints and trimmed, inside and out, with wood. Walls are said to have a thermal coefficient of .09 as compared to .27 for the usual frame construction.

The manufacturers have gone beyond the usual prefabricating organization in formulating plans to guarantee each building against structural failure of design or material. Further, they plan to guarantee their product against corrosion for twenty years, provided construction and maintenance are according to specification.

Dimensions and performance characteristics of 4 by 8-foot wall panels with stressed plywood coverings (Span 7 ft., 9-3/4 in.; third-point loading)

Panel No.	Width	Thickness	Studs	Stiffeners	Overall depth	Weight of panels	Moment of inertia	Section modulus	Max. load uniformly distributed	Equivalent load if distributed	Modulus of elasticity	Deflection at 15 lb. per sq. ft. if uniformly distributed	Maximum stress in extreme fiber	Shear
No.	In.	In.	No.	In.	In.	Lb.	In. <sup>4</sup>	In. <sup>3</sup>	Lb.	Lb.-per sq. ft.	1000 lb. per sq. in.	In.	Lb. per sq. in.	Lb. per sq. in.
1	48	1/4	5	0	1-7/8	53.2	10.05	10.74	2780	118	1520	0.33	4040	198
2	48	1/4	5	0	2-1/4	58.0	16.02	13.77	3140	134	1470	.22	3560	186
3	48	1/4	5	0	2-3/4	59.9	25.92	16.62	5140	219	1460	.15	4270	249
4	48	1/4	5	0	4-1/8	66.2	67.22	32.38	8760	373	1413	.05	4230	283
5	48	1/4	5	7	1-7/8	58.0	10.31	10.69	1860	79	1578	.31	2670	132
6	48	1/4	5	7	1-7/8	60.0	9.75	10.32	3500	149	1525	.28	5300	249

In calculating moment of inertia, plies which ran perpendicular to length of panel or specimen were neglected.

## STRUCTURE

### STRENGTH OF PLYWOOD PANELS

Remarkable strength developed by gluing plywood on both sides of wood strips was again demonstrated in a new series of tests recently made at the Forest Products Laboratory, in Madison, Wisconsin. The tests, conducted by R. F. Luxford, showed that a prefabricated panel measuring 4 x 8 feet and only 1 7/8 inches thick could withstand a uniformly distributed load of 118 lbs. per sq. ft. before failure. The loading limit of another panel similar in size, but with an overall thickness of 4 1/8 inches was 373 lbs. per sq. ft. Furthermore, the deflection limit of the latter at a uniform loading of 15 lbs. per sq. ft. was only .05 inches.

These tests included six panels, generally similar to those used in the prefabricated house built by the Laboratory last year for demonstration purposes. They were more inclusive than former ones, however, for stud thicknesses ranged from 3/4 by 1 3/8 inches to 3/4 x 3 5/8 inches. Two types of construction were also tested, one including the studs spaced as in Figure 1 (panels 1, 2, 3 and 4); the other with stiffeners as in Figure 2, which illustrates the notched jointing used in panel 5. In panel 6 stiffeners were not notched and the maximum load was nearly twice as high in consequence.

High strengths of these panels result largely because the plywood is glued, not nailed to the strips. According to the test report, "Rigid attachment of the coverings by means of glue gives high resistance to shear between studs and the coverings, thus causing one covering to be thrown into tension and the other covering into compression when resisting an external force. The panel acts essentially as a box girder, and thus permits the use of a very thin wall to obtain the required strength. . . . Use of wider studs increases the

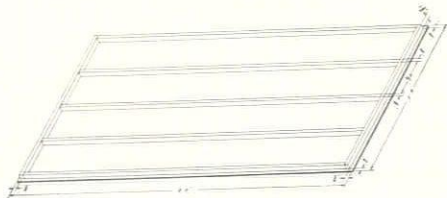


Fig. 1

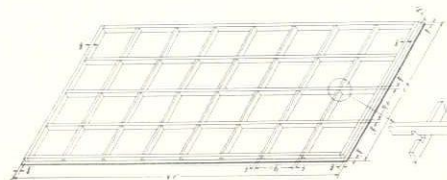


Fig. 2

bending strength about as the section modulus is increased; and the stiffness increases about as the moment of inertia is increased or in about the same ratio as the squares of the stud widths."

## FINISHING MATERIALS

### NEW WEATHERSTRIP METAL ALLOY

An entirely new metal alloy designed especially for use in the manufacture of weatherstrips, has recently been developed. Known as MetaLane, this alloy is a special combination of aluminum, used as a base to give lightness, and other metals, added to give it hardness, resiliency and durability. Prior to being formed into weatherstrips, the metal is subjected to an electro-chemical treatment, which gives it a hard-wearing surface, with a dull silver finish and without affecting its resiliency. In the next step the metal is treated with a special lubricant so that when in use two shapes of weatherstrip are permitted to rub, one on the other, without galling or scoring. Weatherstrips made of this new metal alloy have also been redesigned to provide positive continuous contact with the sash or door, and to simplify installation. Monarch Metal Weatherstrip Corp., St. Louis, has introduced it.

581M

## GLASS FOR CLOTH

Glass cloth may shortly be as common a material as window glass or the vacuum blocks used for the development of translucent walls. In Corning, New York, The Corning Glass Works have developed glass wool with fibers small enough to be spun into yarn, which can then be woven on standard textile looms. It should be a satisfactory material for theatres, restaurants and similar public places where proof against fire, dampness and chemicals is necessary. It will also stand high temperature and will not decay or deteriorate with use.

The same fibers can be made into glass wool insulation to be blown into a frame house or used in the form of bats in the same way that rock wool is now used. It is said to have an insulating value as high as any other type of blown insulation, but weighs only 1/4 to 1/5 as much per cubic foot. Glass fibers for both insulation and fabric are not yet being manufactured on a commercial scale, but the Corning Company believes that they will be on the market in the early fall and that their price will compare favorably with other types of insulating material. To facilitate production, Corning and the Owens-Illinois glass companies are pooling their research and development activities. Both companies will manufacture and sell the glass fibers in various forms.

582M

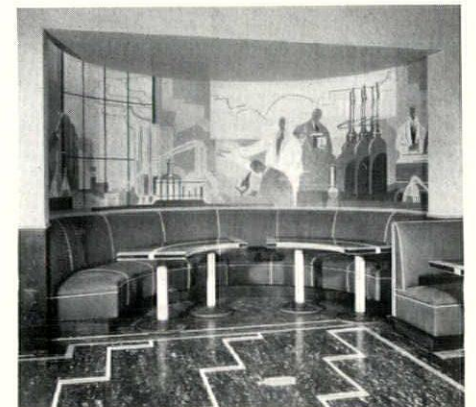


PHOTO: COURTESY B. F. GOODRICH AND GOODYEAR

### RUBBER ROOM

Murals made of rubber tile in eleven different colors and rubber coverings for chairs, table-tops, bar, floor and wainscot, carry the design of this air conditioned cocktail lounge, recently opened in the Partage Hotel in Akron, Ohio. Kenneth C. Welch of Grand Rapids, Michigan was the architect. The murals, cut from thin stock and secured in place with rubber cement, were designed by Ivor Johns, Cleveland artist.

583M



**IT'S A.D. 1936**

And Here's a

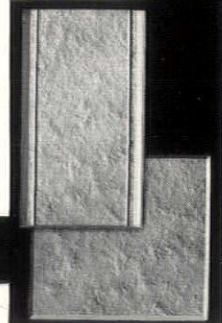
**MULTIPLE-PURPOSE Material**

*That Fits the Times*

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I want to know more about Nu-Wood. Please send me, without obligation on my part, information and illustrations.

Name .....

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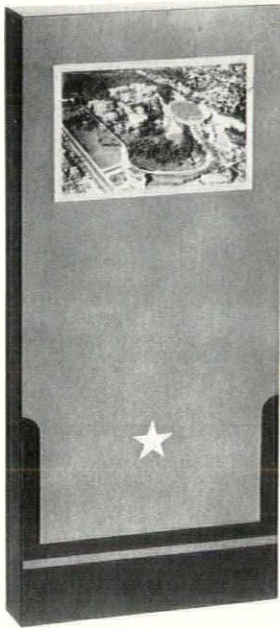
City..... State.....

# TECHNIQUES

METHODS • MATERIALS • RESEARCH • PRACTICES

## CONCRETE DARKENER

Inki-Black for darkening concrete and mortar is an emulsified carbon black which mixes with water immediately and, it is claimed, gives uniform dispersion throughout the mass of concrete or mortar. Concrete can be darkened in range from light gray to intense black, depending on the amount of material used. E. M. & F. Waldo, Muirkirk, Maryland, have introduced this new product. **584M**



## PLASTIC PHOTO-INLAYS

A new method of inlaying photographs in door surfaces, wall panels or table tops has been developed by The Formica Insulation Co., Cincinnati. These photographs may be of any subject and may be either black and white or black and sepia. They are said to retain their original color and tone values when pressed into a Formica sheet, and can be washed with soap and water or cleaning solutions. Sizes as large as 3 by 4 feet are possible. Silhouette inlays, made by cutting shapes from Formica in a contrasting color or from thin metal, and pressing into the Formica sheet, are available. **585M**

## PERFUMED PAINT

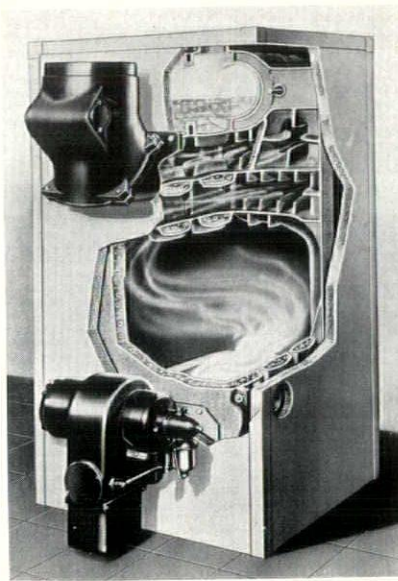
Odors as pleasing as colors will soon be an added characteristic of paint if the experiments being conducted at the National Paint, Varnish and Lacquer Association prove commercially feasible. According to Dr. Henry A. Gardner, director of the Scientific Section, tests already made indicate that one part of perfume to 2,000 parts of paint is suf-

ficient to impart a distinctive fragrance to the formula. "Before long," said Dr. Gardner, "we may walk into a paint store, specify the name and color of the produce we desire and then add, 'I'll take vanilla.'" **586M**

## LIQUID CATALIN

Liquid catalin for the impregnation and lamination of wood, paper, textiles and other materials is now in commercial production. By a process of impregnating and laminating with this liquid phenol-resin, it is possible to produce still thinner sheets than was possible under the alternate method of slicing the catalin material from cast blocks. A thin veneer of laminated catalin may be applied to heavy stocks, it is said, thus achieving luxurious effects economically. Thin wood veneers impregnated with liquid catalin also may be laminated to heavier materials for panelling purposes, according to an announcement issued by the Catalin Corp. of America, New York. **587M**

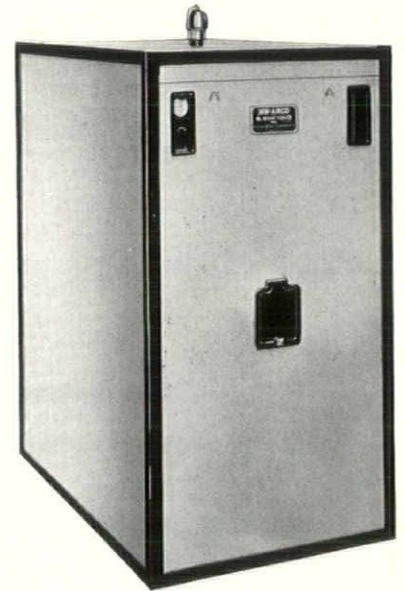
## HEATING



## OIL BOILERS AND BURNERS

Completion of an additional line of burners and oil boilers designed to sell at lower prices is announced by Timken Silent Automatic Co., Detroit. Both conversion and combination unit types of the new GC burners have been simplified in design and construction. Moving parts have been reduced to a minimum for pressure-type burners. Installation costs, it is claimed, are reduced through use of standardized refractories. One feature of the new units

is the "flame-control" device which is said to insure absolute control of the air supply, making for high combustion efficiency. **588M**



## OIL FURNACE IMPROVEMENT

An American Radiator boiler is used in a new oil-fired furnace for domestic steam and hot water heating and also for commercial hot water supply. Designated as the MW-ARCO Oil Furnace, the new unit is of cast-iron construction, and features a large water-backed heat chamber for quick heating response. Long flue passages with special finned surfaces are said to increase the amount of heat transfer. It also has machine-ground surfaces of all doors and sections preventing short-cutting of gases, infiltration of air and escape of odors, large flue clean-out door and heat chamber service door, low water cut off, and Pyrex observation port. The unit is fired by an MW Emancipator pressure burner. All models are furnished as standard with a Taco indirect water heater and controls for hot water supply for both summer and winter. The MW-ARCO is being marketed by Heater Division, Motor Wheel Corp., Lansing, Michigan. **589M**

## SOCKET DIAL THERMOMETERS

A new socket dial thermometer for industrial applications is manufactured in both the self-contained type and in the distant reading type. Type 61 self-contained instrument permits the use of one instrument as a vertical connection thermometer, a 90-degree back (Continued on page 88)

# "I suffered from Scratchitus for years—



## How I got cured for 10c"

ELMER ZILCH\*

*tells all in a confession interview  
about troubles with gritty pencils.*

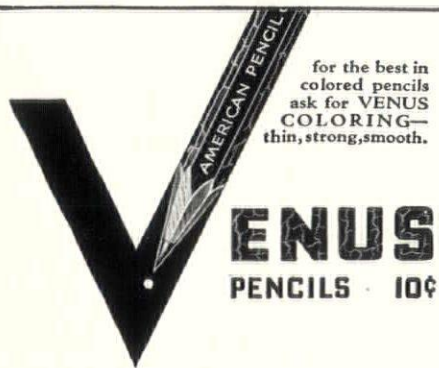
"I used to come on every morning—that sudden feeling that no one could read my writing. When I got to the office, I'd have a shrinking sensation. I could hardly get through the day. Work was a bore.

"I was all right before I got to the office, but after a few minutes I became so annoyed with gritty pencils that I'd get jittery. I imagined that people pointed at me, muttering "Scratchitus". I developed an inferiority complex which handicapped me commercially and socially. I was desperate.

"Then, like a miracle, Venus Pencils made me a changed man. Now everybody can read my writing. In fact, writing with a Venus Pencil is my greatest thrill in life.

"Now when I leave the office! Ah, life just begins with me—I leave as fresh as a daisy. Everybody wonders what has come over me. And I tell them how Venus Pencils have changed my life."

\*Not one cent was paid for this voluntary testimonial from Mr. Elmer Zilch, editor and bon vivant, member of many exclusive night clubs. Thanks Mr. Zilch—we hope you get as much of a kick out of this as we do.



• *This advertisement appears  
in Collier's and Time.*

In this advertisement to the general public, we stress the smoothness of Venus Pencils.

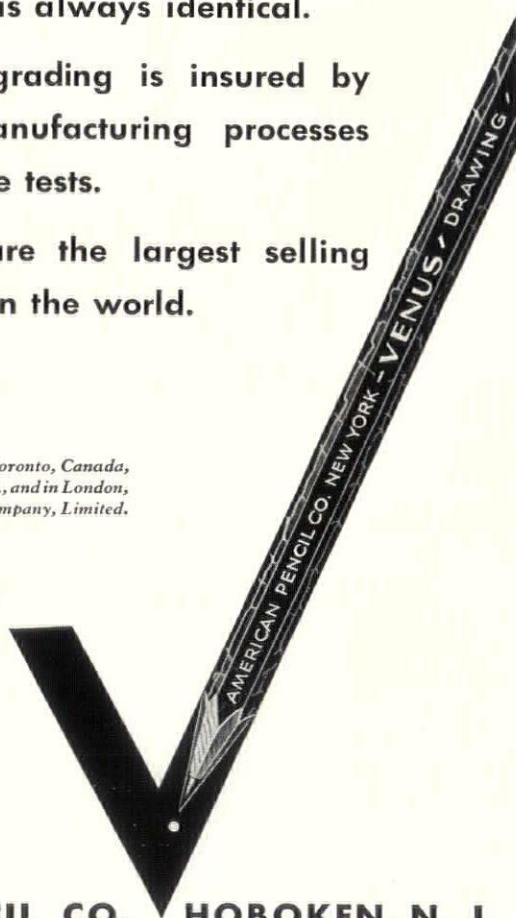
We realize, of course, that overshadowing it in importance to architects and engineers is another Venus superiority: uniform grading.

Particular men have come to place complete reliance in the precision of Venus grading. Every pencil in each of its 17 shades of black is always identical.

This precision grading is insured by costly extra manufacturing processes and by elaborate tests.

Venus Pencils are the largest selling Quality Pencils in the world.

Venus Pencils are also made in Toronto, Canada, by the Venus Pencil Company, Ltd., and in London, England, by the Venus Pencil Company, Limited.



AMERICAN PENCIL CO. HOBOKEN, N. J.

# REPRINTING IS A

AFTER MARCH 31, REPRINTS OF ORIGINAL TIME-SAVER STANDARDS WILL BE SOLD AT COST

Since October, 1935, Time-Saver Standards have been offered without any charge, except a less-than-cost charge for the Tubak binder. It was expected that the service would meet with widespread interest among architects and engineers but the number of applications (approaching 6000) has already exceeded the projected distribution.

The stock of back issues of Time-Saver Standards sheets published prior to March 31, 1936 is sufficient to supply only those applications already received. Reprinting of back issues will be necessary to fill applications received after that date. This is a costly job. To cover this added cost, all applications received after March 31, 1936 from qualified individuals resident in continental United States must be accompanied by check, cash or money order for \$3.00. This sum will cover the cost of the Tubak binder, and all Time-Saver Standards memorandum sheets and index pages issued to date, as well as all sheets to be issued during the remainder of the year. For non-eligible applicants within continental United States the charge is \$5.00; foreign, \$7.00.

Later in the year when further reprinting is necessary and the number of back-issue sheets has increased these prices will be subject to further change.



# OSTLY JOB

**COUPON GOOD UNTIL MARCH 31, 1936**

APPLICATION FOR AMERICAN ARCHITECT TIME-SAVER STANDARDS SERVICE  
Director, Technical Service, AMERICAN ARCHITECT, 572 Madison Ave., New York.

Please enroll me to receive without charge AMERICAN ARCHITECT Time-Saver Standard sheets, as issued. I enclose \$1.00 to cover cost of Tubak Binder  check or  cash. (Enclose \$3 if application is sent after March 31, 1936).

Name of Individual.....

Name of Firm.....

Address of Firm.....

Dominant class of work done by firm (principal types of buildings such as small or large residences, commercial buildings, schools, etc.).....

Position of applicant (firm member, designer, engineer, specification writer, squad boss, etc.).....

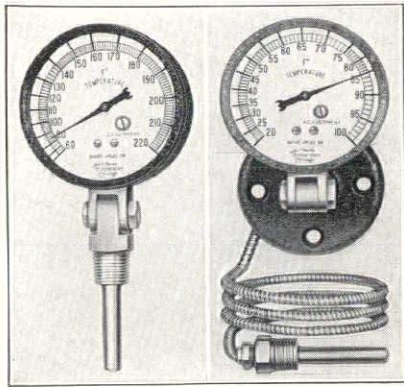
Are you a subscriber to AMERICAN ARCHITECT?..... If not, do you see it regularly?.....

I certify the above answers are correct. Signed.....

**T A N D A R D S**

# TECHNIQUES

METHODS • MATERIALS • RESEARCH • PRACTICES



angle thermometer, a front angle or any intermediate angle thermometer. Type 62 distant reading thermometer is standard with 6 feet of connecting tubing and a union bulb, or, in the case of high temperature thermometers, either a union bulb or a flexible plain bulb. The instrument proper may be installed at any point on top or in front of the apparatus or on a wall or pillar, and the bulb right at the point of temperature. Jas. P. Marsh Corp., Chicago, the manufacturer, announces that a complete assortment of Fahrenheit scale ranges is available. **590M**

## PLUMBING



### PEDESTAL LAVATORY

A lavatory with pedestal which permits the use of group or individual fixtures is one of the items in the new line of Briggs formed metal plumbing ware. The pedestal has but one nut to adjust when installing. The lavatory, which is 24 by 20 inches, is equipped with a removable overflow pipe for cleaning and has a wide ledge all around, providing ample space for the use of toilet articles. It is available in a variety of colors and color combinations. Both the lavatory and pedestal are finished in

acid-resisting porcelain. This pedestal lavatory is manufactured by Briggs Mfg. Co., Detroit. **591M**



### RUBBER PIPE JOINT

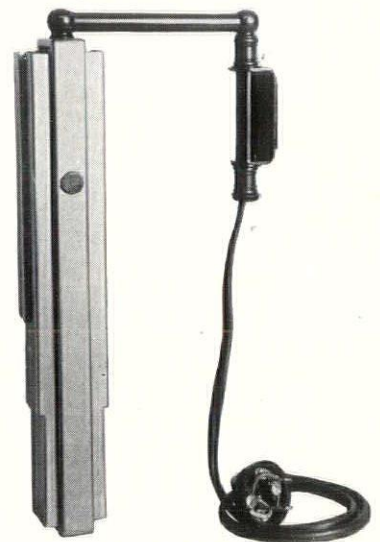
For use with specially constructed ceramic pipe in low pressure service and in temperatures not exceeding 175 F. a "Flexlock Joint" is now available. It is said to offer a permanent seal for bell-and-spigot pipe conveying acids, alkalis, sewage and other industrial wastes. The joint is a rubber ring or gasket having internal and external circumferential ribs which grip the bell and spigot of the pipe. While the gasket permits easy insertion of the spigot, the shape of the corrugations combined with the resilience of the rubber, forms a multiple seal which is said to resist any tendency of the pipe sections to pull apart. B. F. Goodrich Rubber Co., Akron, Ohio. **592M**

## ELECTRICAL

### NEW CONDUIT

In order that Electrical Engineers and Contractors may comply with section 503-h of the National Electric Code, a new conduit has just been put on the market. This conduit is manufactured from a non-ferrous, non-magnetic alloy, which, it is claimed, is highly resistant to the usual and unusual forms of corrosion. Its dimensions are identical with those of steel conduit and it will be furnished in threaded, standard ten foot lengths with a coupling at one end. Constructed by methods adapted to produce a raceway of accurate dimensions and uniform quality the threads are smooth, full and clean, permitting tight fitting of coupling, locknuts, bushings or other fittings. It may be cut, threaded, bent and installed with the same tools and in the same manner as steel conduit. A complete line of fit-

tings is available to meet every requirement. The electrical properties of the alloy are such as to make its use for conduit very desirable. A recent electrical test made of various materials used in electrical conduit work, show the electrical conductivity to be greater than that of Copper-Silicon-Manganese Alloy. In plants such as abattoirs, sewage disposal plants, filtration plants, railroad depots and round houses, storage battery rooms, chemical plants, powder manufacturers, oil and gas companies, where the atmosphere is highly charged with acid fumes it is of value. Called "Superduct" it is manufactured by the National Electric Products Corporation of Pittsburgh, Pennsylvania. **593M**



### FRIEZ WINDOWSTAT

Automatic protection against condensation on windows resulting from winter air conditioning is said to be achieved by the new Friez Windowstat. By placing this specially constructed humidity sensitive instrument in close proximity to the chilled window surface and at a point where its sensitive multiple human hair element is able to detect a high condition at that point, warning is given of the approach of a condition of condensation, and the Windowstat through its electrical contacts provides a means of overruling the humidistat and temporarily shutting down the humidifier until further humidity can be added without condensation occurring. In this way the highest possible point of relative humidity without condensation occurring on the windows is maintained. The instrument is installed at the bottom left or right-hand corner of the window (preferably one on the north side). It is a new product of Julien P. Friez & Sons, Inc., Baltimore, Md. **594M**

# TECHNIQUES

METHODS • MATERIALS • RESEARCH • PRACTICES



## ELEVATOR CONTROL CABLE

A totally fireproof, multi-conductor elevator control cable which is also said to be resistant to moisture, oil and corrosive vapors, has been announced by General Electric Co., Bridgeport, Conn. The cable is furnished in any required length and with any number of conductors up to and including 37. **595M**

## INDUSTRIAL LIGHTING UNIT

For use with 400-watt high intensity mercury vapor lamps, or 750 to 1500-watt incandescent lamps, a new industrial lighting unit has an X-ray silver-mirrored reflector encased in a ventilated aluminum housing. A socket adjustment on threaded pipe provides proper light control for each interior. The unit is 21½ inches in diameter and 21 inches high. The perfect light control of the X-ray reflector is said to put adequate light on the working plane, despite the high mounting of the unit. Designated as No. 1590 "Hi-Bay" Industrial Lighting Unit, it is a product of Curtis Lighting, Inc., Chicago. **596M**



## OVERHEAD CRANE SAFETY STOP

The Youngstown Safety Limit Stop has been developed for use as a safety device to prevent over-hoisting accidents on overhead traveling cranes and other applications. This limit stop is of the main motor circuit type, handling motor currents directly without the aid of additional equipment. When the limit stop

is tripped, it not only disconnects the motor from the power line but it also brings the motor to rest with minimum drift. The Electric Controller & Mfg. Company, Cleveland, has added this product to its line. **597M**

## VIBRATION ISOLATING UNIT

A high degree of vibration isolation for medium and light machinery is said to be achieved by the new Model T Seismo-Damper. In this unit the machine is directly supported by a T-iron separated from a base of two angle irons by natural cork or other isolating material. The angle irons are firmly connected by bolts, passing through the isolating materials and T-iron (but not touching it). Before installation these bolts are adjusted to produce a pre-compression of the isolating material to suit the machine load. Where machine frame is light or must be supported at several points the T-iron can be extended to form a continuous support between two or more units. This is a new development of The Korfund Company, Inc., Long Island City, New York. **598M**

## FIREPROOFED LUMBER

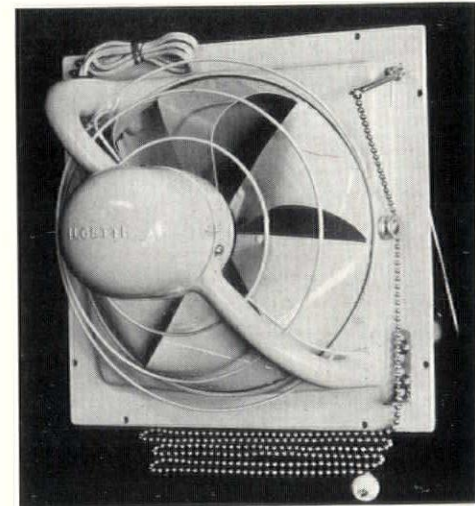
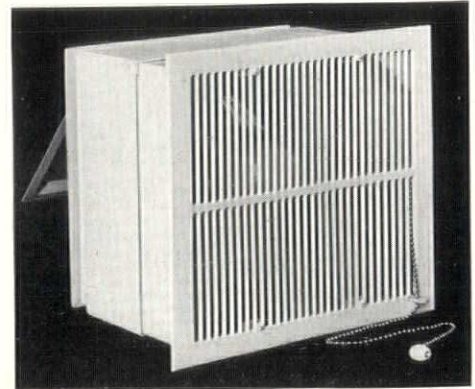
A new method of fireproofing lumber has recently undergone a comprehensive examination by the Underwriters Laboratories in Chicago. The material investigated and approved is red oak and maple for flooring and interior trim. The means of fireproofing is similar to that of creosoting telegraph poles, railroad ties and fence posts. Incombustible salts are used. The method of processing is apparently a delicate operation since both too much and too little of the mixture fail to give the desired result. Walls or floors of this material, it is claimed, will act as fire-stops, thus confining the blaze to its point of origin. It is also stated in the report, approving the material that its fire-resisting properties will last throughout the useful life of the wood. Protexol Corporation of Kenilworth, N. J., are the manufacturers. **599M**

## SQUIRREL-CAGE MOTORS

Construction which is said to provide protection from splash and spray and yet permit proper ventilation is a feature of the new line of squirrel-cage motors made by the Imperial Electric Co., Akron, Ohio. Small openings in the bottom of the end brackets for air

intake and louvers in the frame cover underneath the motor for exhaust are the means of doing this. Motors in all ratings from ½ to 200 hp. for constant and multi-speed, continuous or intermittent duty in all voltages and cycles, for any torque and starting current are made this way. **600M**

## AIR CONDITIONING



## KITCHEN VENTILATORS

A built-in-the-wall model for small kitchens, complete with fan, cabinet and grille is one of four new ventilators now on the market. It is equipped with a beaded nickel silver chain which, when pulled, starts the fan unit and opens the weather-tight outer door. When the chain is released the unit stops and the door closes. There are also two units for windows, one portable and the other built-in, while the fourth model is for transoms. The built-in window ventilator, approximately 12 inches square, is mounted in place of a pane of glass and has the beaded chain operating mechanism. These models are called Igettes and are products of Ilg Electric Ventilating Co., Chicago. **601M**

The World's Greatest Heating and Ventilating Organization Announces the

# AMERICAN RADIATOR

NEW

## 7 FUNCTIONS OF AMERICAN RADIATOR CONDITIONING SYSTEMS\*

### HUMIDIFICATION

1. Restores proper moisture content to air . . . prevents the drying out of indoor atmosphere in winter, injury to furniture or furnishings. Improves health.

### AIR CIRCULATION

2. Maintains proper air motion . . . stimulating and refreshing.

### AIR CLEANING

3. Filters dangerous and unsanitary dust, soot, pollen, etc., out of air admitted into house.

### VENTILATION

4. Brings in and distributes without drafts an adequate supply of fresh outdoor air.

### RADIATOR HEATING

5. The kind that uses two methods of supplying heat—radiation and convection. Each room has its own properly sized independent heat source, unaffected by drafts.

### CONTROLLED HEAT DISTRIBUTION

6. Assures a positive and adequate supply of warmth to every part of the house, regardless of wind or weather. Heat sources placed where they fight the cold.

### YEAR-'ROUND DOMESTIC HOT WATER

7. Continuous supply of year-'round domestic hot water is part of every American Radiator Conditioning System.

\*NOTE: Provision is made for the addition of mechanical summer cooling and dehumidification if desired.

**H**ERE is great building news for the booming home market. American Radiator announces new Conditioning Systems as the important new product to be used in every home built this year.

The illustration shows a typical American Radiator Conditioning System. The Conditioning Unit (in color) produces forced ventilation and controls the condition of the air. It is suspended below the ceiling of the basement. Air is filtered as it enters, then brought to a comfortable temperature by tempering coils. A spray humidifier provides the correct moisture content. A Sirocco Blower silently forces the conditioned air throughout the house.

A radiator system—steam, hot water or vapor—provides heat. Here, too, there has been remarkable advance. There are new boilers especially designed for automatic operation with any fuel... There are new radiators, in keeping with modern interiors... There are new controls, new valves, new vents which improve heat distribution... There are new materials such as copper for the piping system. Practically every part has been improved... producing in fact a new kind of radiator heating.

It is simple to install, for the Conditioner requires a minimum of duct work. Heating and Conditioning operate independently. Either can be operated separately at any time. Or both can be used together.

The entire system enables you to give your customers "Home Comfort You Never Dreamed Possible." This year really modern homes will include American Radiator Conditioning Systems. That fact is assured. American Radiator has already started a national magazine, newspaper and radio promotion campaign to make people demand it in new homes they build, or old homes they remodel this year.

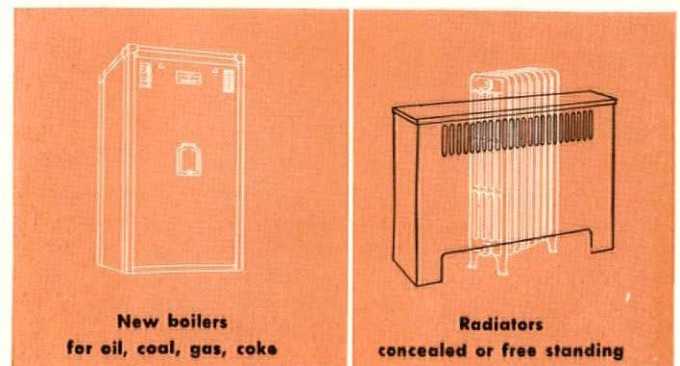
Send for literature and specifications . . . as well as a merchandising and promotion plan . . . Write today.



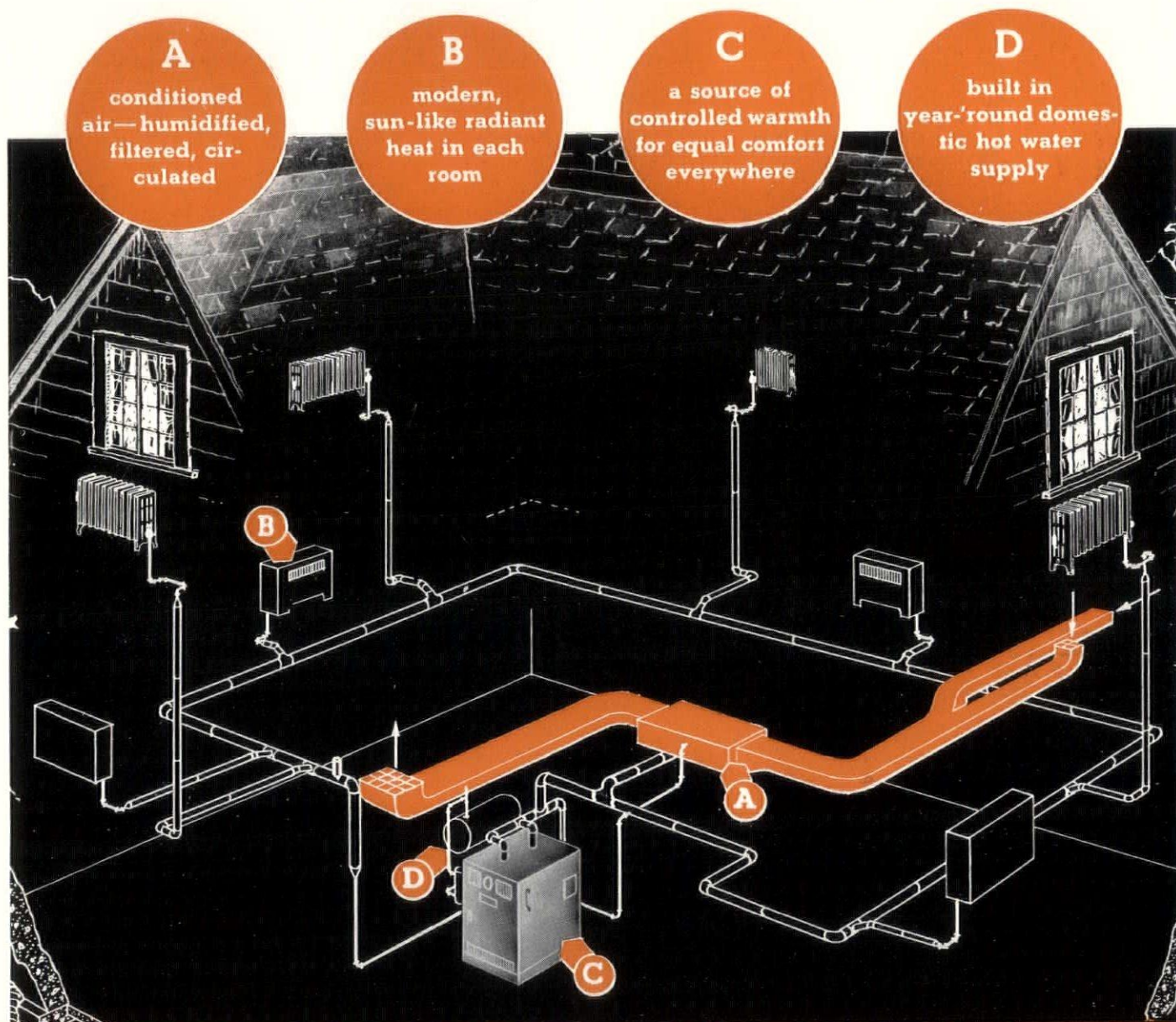
## AMERICAN RADIATOR COMPANY

40 West 40th Street, New York, N. Y.

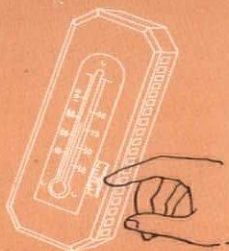
Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION



# CONDITIONING SYSTEMS



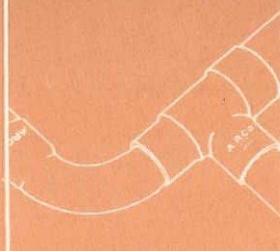
New vents and air valves for regulated venting



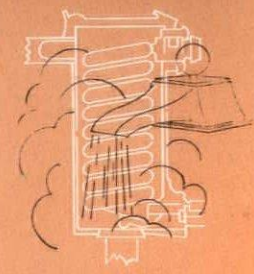
Automatic controls for every purpose



New Packless Valves for steam, hot water, vapor

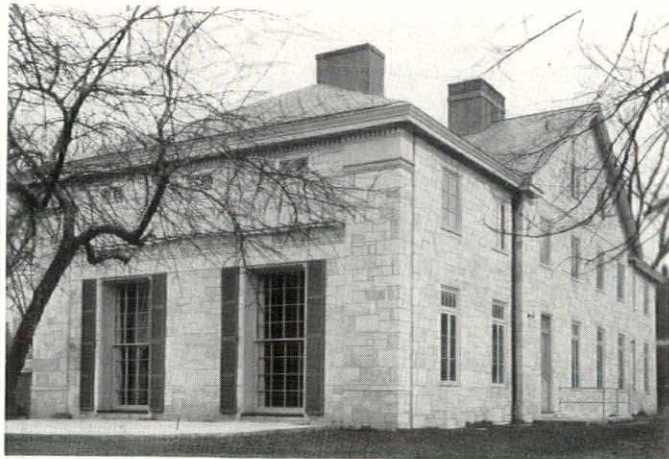


Pipe and Fittings of pure wrought copper



Automatic, year-'round domestic hot water

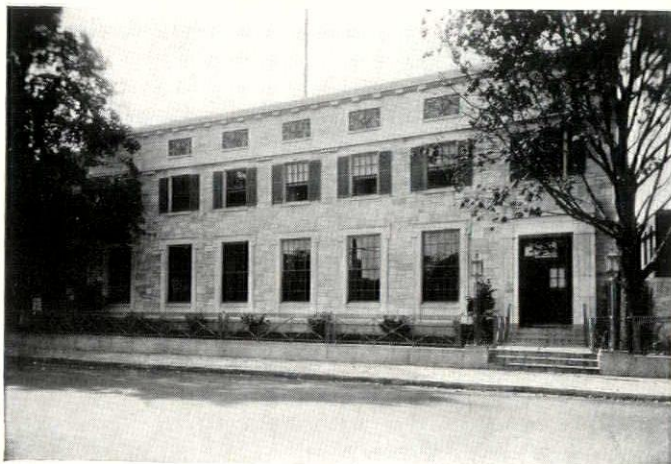
where **COST** is a consideration



Phi Delta Theta House,  
University of Vermont,  
Burlington. Architect,  
William McLeish Dunbar.

FOR buildings where the enduring beauty of marble is required and, at the same time, material costs must be kept as low as possible, the architect can make no better choice than Random Ashlar, which is ashlar made up in random sizes and varying shades. This form of marble work requires no matching, except for the trim, which is used in the normal way. The unstudied effects obtainable with Random Ashlar add to the beauty of this construction. And the cost is very reasonable, particularly when construction is near the quarries. The possibilities of Random Ashlar for exterior walls are suggested by the illustrations. Write for a free leaflet.

*Vermont Marble Co.*  
PROCTOR, VERMONT



Office of the Southern  
New England Telephone  
Company, Bristol, Conn.  
Architect, Douglas Orr.

#### STEPHEN F. VOORHEES HONORED

Stephen F. Voorhees was recently elected to the presidency of the Amateur Cinema League, following the death of the former president, Hiram Percy Maxim. Mr. Voorhees, senior partner in the firm of Voorhees, Gmelin and Walker and President of the American Institute of Architects, has been vice president of the league since it was founded in 1926.

#### HARVARD FORMULATES NEW POLICY

An important change in the educational policy of the Harvard School of Architecture was recently announced by Dean Joseph Hudnut. Beginning with the fall of 1936, instruction in architecture will be divided into two sections: an undergraduate course of a general preparatory nature and a graduate professional course. The preparatory course, largely of a cultural nature, to be given in Harvard College, will include sciences basic to architecture such as physics, economics and contemporary civilization, history of art and architecture, drawing, and the basic theories and practice of design. This course will lead to an A. B. degree. The School of Architecture will continue to include only the professional study of design.

#### SCHOLARSHIPS AT CORNELL

The College of Architecture at Cornell University announces a University Fellowship, three Graduate Scholarships, and five Scholarships in the College of Architecture for the second summer session of 1936. The course is intended for students who have had three or more years of design in either architecture or landscape architecture. Further information may be obtained from The Dean, College of Architecture, Cornell University, Ithaca, New York.

#### NEW DEAN AT COLUMBIA

Dr. Nicholas Murray Butler, President of Columbia University, recently announced the appointment of Professor Leopold Arnaud as Dean of the School of Architecture. Professor Arnaud succeeds Dean Joseph Hudnut who resigned last year to accept a post at Harvard. Before beginning his teaching career at Columbia in 1927, Professor Arnaud had been employed by Warren & Wetmore and by Voorhees, Gmelin & Walker, both architectural firms of New York. He attended both the University of Paris & Columbia.

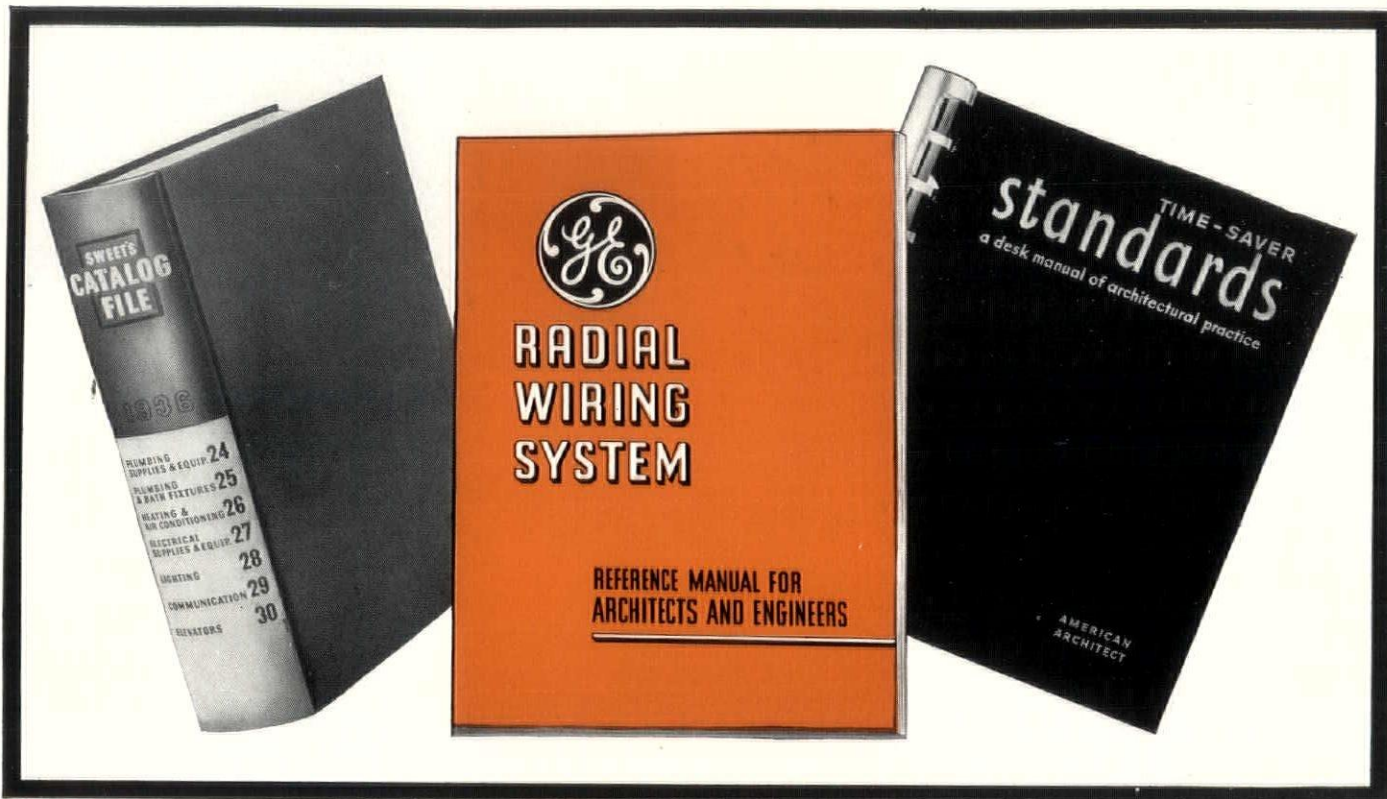
#### PRINCETON AWARDED MEDAL

For the second time in the last four years, the School of Architecture of Princeton University has been awarded the Medal given annually by the Groupe Americain, Societe des Architectes Diplomes par le Gouvernement Francais. The winner is selected on the basis of the record made by its students in the competitions in Architectural Design conducted by the Beaux Arts Institute of Design in New York. The faculty, curriculum and program of the School must also be approved by the Societe.

#### A. I. A. INHERITS CHICAGO LANDMARK

One of Chicago's outstanding residential landmarks, the stone mansion of the late John J. Glessner, one of the founders of the International Harvester Company, will soon become the property of the Chicago Chapter of the American Institute of Architects. Mr. Glessner, in his will, stipulated that the architects maintain the residence as a "Museum, library, gallery and educational institution, including a school of design, for legitimate architectural assemblages."

*Look At All Three....*



The new G-E Radial Wiring System, provides the type of wiring that modern homes must have. It is sound in design . . . fully adequate . . . economical . . . provides for the future. And behind the G-E Radial Wiring System are years of research, development and manufacture of high-quality Wiring Materials.

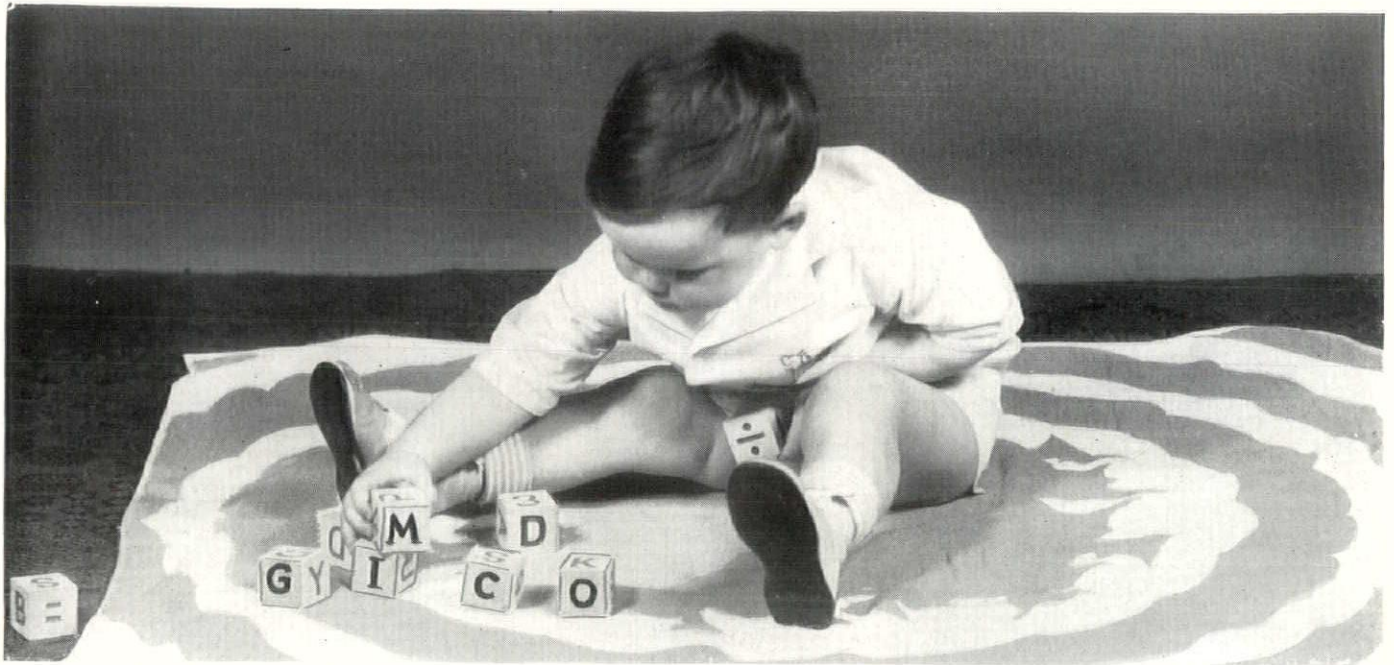
Complete information concerning this new G-E Radial Wiring System may be found in these three publications: "Sweet's Catalog

File", "American Architect Time-Saver Standards" and in our bulletin "The G-E Radial Wiring System Manual". This information is written for architects and engineers by architects and engineers. It gives you the specific technical details that you want. Send for our bulletin "The G-E Radial Wiring System Manual for Architects and Engineers". Write Section CDW-903, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn.

**GENERAL**  **ELECTRIC**

**WIRING MATERIALS**

**APPLIANCE AND MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONN.**



## Spelling Comfort

**GIMCO ROCK WOOL HOUSE INSULATION**  
brings year 'round comfort to the home

Full wall - thick, fluffy, fire - proof Gimco House Insulation will aid in making homes more comfortable the year around. Winter-time "hard-to-heat" north rooms—cold drafty floors (where embryo architects play at building)—and summer-time "bake-oven" bed rooms should be eliminated from home specifications.

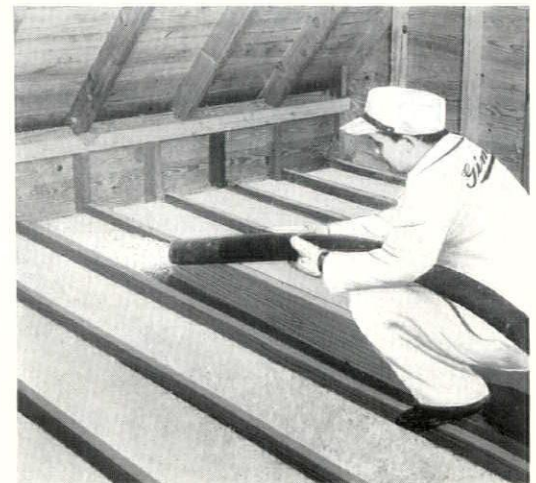
Architects specify Gimco Rock Wool because it is outstanding in efficiency and quality. For over a quarter of a century Gimco engineers have concentrated exclusively upon producing the finest insulation that skill and modern manufacturing methods can fabricate. Our sole aim is that the name Gimco shall typify the ultimate in home insulation.

**Write Gimco into your specifications and you write "maximum home comfort."**

Gimco Sealal Bats embody the most desirable features that can be demanded in home insulation. They are carefully felted to the proper density, constructed with just the correct rigidity and stand up excellently in handling. Sealal provides a uniform continuity of insulation.

The same high quality that characterizes Gimco Sealal is built into Gimco Granulated Rock Wool (for application by pneumatic method) by the same painstaking processes. Gimco Granulated is free from "shot" and may be easily, efficiently applied to almost any construction.

Have you received complete data on these leading insulators? Write today for samples of Gimco Rock Wool.



**GENERAL INSULATING & MFG. CO. Alexandria, Ind.**

Please send samples of Gimco Rock Wool, also full information.

Name

Address

City  State

**GENERAL INSULATING  
& MFG. CO., Alexandria, Ind.**  
**WORLD'S LARGEST EXCLUSIVE MANU-  
FACTURERS of ROCK WOOL PRODUCTS**



### JOHN STEWARDSON MEMORIAL SCHOLARSHIP

The Managing Committee of the John Stewardson Memorial Scholarship in Architecture announces a competition for a \$1,000 scholarship to study architecture in this or other countries. The competition is limited to those who have studied or practiced architecture in the State of Pennsylvania. Full details are available from Edmund R. Purves, The Architect Building, Philadelphia, Pa.

### SYRACUSE SCHOLARSHIPS FOR FRESHMEN

The College of Fine Arts of Syracuse University announces one \$300 and four \$150 scholarships for Freshmen students. The competition will be in two fields—drawing and preparatory school record. Full details can be obtained from Dean H. L. Butler, College of Fine Arts, Syracuse, N. Y.

### PRINCETON PRIZE COMPETITION

Two competitive prizes of \$500 each, in the School of Architecture of Princeton University, are announced for the year 1936-37. The Prizes will be awarded as the result of a competition in design to be held from April 2nd to April 14th. The winners will devote the following school year to the study of advanced architectural design, and will have the opportunity of attending other allied courses. Candidates for the prizes must be unmarried citizens, not less than 21 nor more than 27 years of age, who have been employed as draftsmen in architects' offices for not less than three years, or who have otherwise demonstrated their ability in architectural design. For application blanks write Professor M. L. Beck, Chairman, Princeton Prizes in Architecture, McCormick Hall, Princeton, New Jersey.

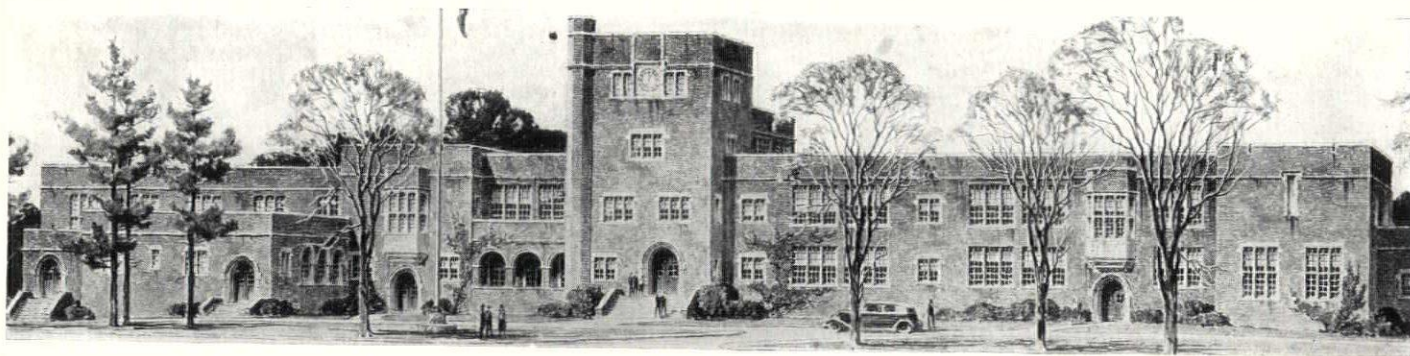
### FOLLOWING THE FAIRS

Publicity is obviously the life-blood of fairs. From this month's collection of press releases the following seem the most significant:

### CLEVELAND

The Great Lakes Exposition to be held in Cleveland, June 27th to October 4th will have as its basic theme the industrial growth of the Great Lakes area. Its site, covering a total of 125 acres, will be along the lakefront from West 3rd to East 21st Streets with the main entrance just west of Cleveland's Public Auditorium. A competition, open to architects of Cuyahoga County, for the design of the main entrance was won by Anthony Ciresi of Cleveland. It will be 460 feet long with seven central 75 ft. illuminated pylons. The entrance will house both general and press headquarters. A new \$100,000 bridge to connect the fair grounds with the lakefront is being designed by Walker and Weeks. Antonio di Nardo of Cleveland, is architect for the large Automotive Building. Built around a courtyard, it is 500 ft. long by 180 wide. One of the unusual features of di Nardo's building is the use of a louvered roof. Scissor truss spans of 60 ft. are designed so that chord members will support horizontal louvers. Screened against insects and dust, this device is calculated to open the roof to light and air yet protect it from rain. Warner and Mitchell are architects for the Agricultural Building which will have tea room accommodations and decks overlooking the lake. The Electrical Building 540 ft. by 180 has been designed around two interior courtyards by Hays and Simpson. Beside a theatre, stadium and midway, there will be a ten-acre concession called

*(Continued on page 102)*



A Genasco Standard Trinidad Built-up Roof was applied when built last year. Architects: Tooker & Marsh, New York. Roofing Contractor: Cunningham Asphalt Construction Co., New York.

## The roof that lasts with the building

For the substantial new building above, which required one of the most enduring roofs, a Genasco Standard Trinidad Built-up Roof was specified.

A Trinidad Built-up Roof is the only one of the built-up type constructed with thoroughly saturated long-fibred all-rag felts and water-

proofed with Trinidad Lake Roofing Asphalt, which also gives additional protection to roofing from the destructive action of the actinic rays of the sun.

Fill out the Coupon below and mail it for your copy of "For Your Roof."



# Genasco

Reg. U. S. Pat. Off.

## STANDARD TRINIDAD Built-up Roofing



Roof security is felt with Trinidad

THE BARBER ASPHALT COMPANY  
1600 Arch Street  
Philadelphia, Pa.

AA-3

Please send me a copy of your illustrated book "For Your Roof" showing many prominent buildings protected with Genasco Standard Trinidad Built-up Roofing.

Name .....  
Address .....

# 6,000 square yards of Sloane-Blabon Linoleum in Brooklyn's Newest High School



*The recently completed Brooklyn Technical High School. Architect—Walter C. Martin, Superintendent of School Building, Board of Education, City of New York.*

Here is what Strawbridge and Clothier,  
the linoleum contractors, say of  
this installation:



*Resilient, easy to clean and to keep clean, Sloane-Blabon Linoleum makes an ideal floor for the Corrective Gymnasium.*



*Colorful, sound-absorbing, easy on the feet and eyes, Sloane-Blabon Linoleum also was selected for the English Department Office.*

"Approximately 6,000 square yards of Sloane-Blabon heavy-gauge brown battleship linoleum were selected for installation in Brooklyn's newest and most elaborate high school. The floor in this school has been put to a tremendous amount of wear every day with its thousands of footsteps, and Sloane-Blabon Linoleum has met all the requirements for lasting qualities. The double-wax finish of Sloane-Blabon Linoleum is also an added protection."

The Brooklyn Technical High School is only one of many recent outstanding Sloane-Blabon installations. We shall be glad to send you a list of others, together with linoleum samples and our new Linoleum Handbook. Write W. & J. Sloane, Selling Agents Division, 295 Fifth Ave., N. Y.

## SLOANE-BLABON LINOLEUM

# NEW CATALOGS...

Readers of AMERICAN ARCHITECT may secure without cost any or all of the manufacturers' catalogs described on this and the following page by mailing the prepaid post card printed below after writing the numbers of the catalogs wanted. Distribution of catalogs to draftsmen and students is optional with the manufacturers

## Plumbing and Heating Materials

913. . . Kohler Company, Kohler, Wis., has recently prepared a 128-page, cloth bound catalog (No. K-36) describing and illustrating its complete line of plumbing, fixtures, heating equipment and electric plants. Prominent among the products shown are baths, fountains, lavatories, sinks, closets and bowls, urinals, fittings, boilers, radiators and convectors. Varied fixture arrangements, interesting decorative schemes, and the merits and uses of numerous wall and floor materials form the subject matter of several pages of introductory matter, with bathroom and kitchen illustrations in full color.

## Temperature and Humidity Control

914. . . A condensed 24-page catalog briefly describing Johnson automatic temperature and humidity control equipment for all types of heating, cooling, ventilating and air conditioning systems in buildings has been issued by Johnson Service Co., Milwaukee. The booklet discusses the application of the Johnson system in schools, hospitals, residences and other fields of activity and describes essential features of some of the more important devices in the line. Filing size; A. I. A. File 30-F-2.

## Truscon Building Products

915. . . The complete line of Truscon building products is presented in an 80-page filing-sized catalog issued by Truscon Steel Company, Youngstown, Ohio. The greater part of the booklet is devoted to Truscon windows and doors and related products. Each type of unit is described and illustrated and is accompanied by condensed specifications and plate pages showing standard types and sizes and construction details. This is followed by data on various types of plaster bases, steel joists, roof decks and other products.

## Asbestos and Magnesia Insulations

916. . . A new 32-page filing-sized catalog issued by The Ruberoid Company, New York, illustrates and describes a variety of Ruberoid-Watson Asbestos and Magnesia Insulating Products, ranging from low pressure, low temperature insulation for residential heating plants to coverings for high pressure, superheated steam lines as encountered in advanced power plant construction. A com-

plete insulating material specification for use with heating and ventilating systems and one covering plumbing systems are included, together with over 40 tables of pertinent data.

## Box Header Boilers

917. . . An illustrated catalog on the CE-Heine box header boiler for industrial and other large projects is being distributed by Combustion Engineering Co., New York. Besides descriptive matter and numerous photographs of boiler details and typical finished installations, there are included drawings of ten different setting arrangements as adapted to various fuels and methods of firing. Views of shop equipment for annealing and X-raying the drums are also shown.

## High-Tensile Steel

918. . . Useful facts about Armco H.T.50, a high-tensile steel that is said to absorb 5,000 foot-pounds per sq. in. in tensile impact tests and to elongate 33% in a 2-in. gage length, are presented in a new folder issued by The American Rolling Mill Co., Middletown, Ohio.

## Certain-teed Building Products

919. . . A 32-page reprint from Sweets Catalog File issued by Certain-Teed Products Corp., New York, gives factual data on its line of building products. The products described and illustrated include Certain-Teed and Vulcanite shingles and roll roofings, built-up roofings, structural insulation, paints and varnishes, gypsum plaster, lath and wall-board, gypsum partition and furring tile, Kalite sound-absorbing plasters.

## Air Conditioning Registers and Grilles

920. . . Hart & Cooley Manufacturing Co., Chicago, has recently published a 36-page catalog (No. 35 AC) which contains data on its air conditioning registers and grilles. A section is devoted to the problem of air distribution, and charts and forms are included which make it easy to select a grille of the proper type and size for a given project. In addition, installation and construction details of the complete line are given. Filing size; A. I. A. File 30-E.

## Balsam-Wool Insulation

921. . . The principal features of Balsam-Wool Sealed House Insulation are described in a 16-page, filing-sized catalog recently prepared by Wood Conversion Co., St. Paul, Minn. Illustrations show methods of application and many typical installations. Brief data on the merits of balsam-wool as a sound deadener are also given.

## Summer Air Conditioning

922. . . American Blower Corp., Detroit has issued Bulletin 4627—a 32-page manual interestingly outlining methods of determining summer cooling and dehumidifying requirements. Some of the things discussed include the scope of air conditioning, physical properties of air, sun effect, infiltration, equipment selection, design of ducts, duct velocities. Many tables and charts (including a psychrometric chart) are to be found in this catalog. Brief descriptions of Sirocco equipment for cooling and dehumidifying are also given. Filing size; A. I. A. File 30-D-2.

NO POSTAGE REQUIRED ON THIS CARD

AMERICAN ARCHITECT, New York

March, 1936

Please have the following catalogs reviewed in this issue sent to me.  
Numbers .....

• I also desire further information about the new products described in this month's "New Materials and Equipment." . . . (See pages immediately following this insert.)  
Numbers .....

• I would like to have catalogs and information concerning the following products advertised in this issue. (Write page number or name.)  
.....

Check here for FREE copy of "WHEN YOU BUILD" booklet.

Name .....

Firm name .....

Address .....

City .....

Occupation .....

These NEW Catalogs may be obtained through

## AMERICAN ARCHITECT

### Air Conditioning, Refrigeration, Space Heating

923. . . . Carrier Engineering Corp., Newark, N. J., has prepared a 12-page filing-sized reprint from Sweets Catalog File 1936 which illustrates and briefly describes its line of air conditioning, refrigeration and space heating equipment. Included are Carrier Weather-makers ranging from sizes for individual rooms to large control air conditioning systems; conditioned air distributing systems, unit heaters and heat diffusers; product cooling and storage equipment; refrigerating machines and condensers.

### Cabinet Sinks, Tops, Sink Bowls

924. . . . The complete line of cabinet sinks and tops, kitchen sinks, pantry sinks, scullery sinks and shower bath cabinets manufactured by Elkay Mfg. Company, Chicago, is illustrated and described in a new loose-leaf portfolio (Catalog D). Dimensions, details of construction and specifications are included. Filing size; A. I. A. File 29-H-6.

### Steel Heating Boilers

925. . . . The Fitzgibbons Coal-Eighty Automatic for stoker firing in residences is described in an illustrated 8-page catalog issued by Fitzgibbons Boiler Co., Inc., New York. A typical layout of a residence installation, ratings and dimensions and details of Fitzgibbons hot water supply units are given. Brief data on the R-Z-U Junior and the High Furnace R-Z-U for stoker firing in larger installations are also included. Filing size; A. I. A. File 30-C-1.

### Electric Welding Products

926. . . . Electrodes, arc welding machines, and miscellaneous apparatus are well described and illustrated in a 32-page booklet issued by Air Reduction Sales Co., New York. The first section pertains to electrodes and for each type is a paragraph stating uses, physical properties, welding procedure, etc. This is followed by data on miscellaneous ap-

paratus and on Wilson arc-welding machines. A series of tables of interest to the welder concludes the booklet.

### Floor-Flo Heater

927. . . . The features and operating characteristics of the Trane Floor-Flo gas-fired circulating heater for homes, apartments, stores, offices and factories are discussed in an 8-page catalog issued by The Trane Co., La Crosse, Wis.

### Centrifugal Pumps

928. . . . Specifications, a cross-section view and dimensional data are given for Types SHD, SMD, SLD, double suction, single stage, sleeve-bearing centrifugal pumps in a 4-page catalog (Bulletin 224) issued by Pennsylvania Pump and Compressor Co., Easton, Pa.

### Lumiline Lamp Fixtures

929. . . . Bulletin No. 35-120 issued by Garden City Plating and Mfg. Co., Chicago, illustrates and describes various types of lumiline lamp fixtures manufactured by this company, including wall or mirror units, cove lighting reflectors, wireways, display case reflectors, etc. List prices are given. Filing size; A. I. A. File 31-F-1.

### Shingle Stains

930. . . . Pertinent facts about Creo-Dipt Stains for roof and sidewall shingles are given in a new 16-page filing-sized catalog issued by Creo-Dipt Company, Inc., North Tonawanda, N. Y. Several typical applications on residences are shown in full color reproduction.

### Combination Lighting Equipment

931. . . . The line of Miller Mer-Tung combination lighting equipment for high intensity mercury vapor and mazda lamps is described and illustrated in Catalog 870 issued by The Miller Company, Meriden, Conn. Dimensional data, prices and charts showing illumination values of each unit are also included.

### Gypsum Wallboard

932. . . . New remodeling ideas for homes, offices, apartments and business establishments conceived by Lurelle Guild and incorporating the use of Gold Bond Gypsum Wallboard are contained in a new Gold Bond Sketch Book issued by National Gypsum Company, Buffalo. The new Gold Bond Wallboard with aluminum foil insulation and Gold Bond Color Texture are also fully described.

### Rolling Doors

933. . . . Steel rolling service doors, fire doors, rolling grilles, sliding doors, bi-folding doors and other types of rolling doors and door equipment are illustrated and described in a new 32-page catalog issued by The Kinneer Mfg. Co., Columbus, Ohio. Applications, clearance requirements, installations, operation methods and specification data are given for each type of unit. Filing size; A. I. A. File 16-D-13.

### Multicoupler Antenna System

934. . . . The All-Wave Multicoupler Antenna System, a system designed for the operation of a plurality of radios from one aerial is described and illustrated in a new 8-page catalog issued by Hart & Hegeman Division, The Arrow-Hart & Hegeman Electric Co., Hartford, Conn. Installation instructions, typical riser diagrams, price list and suggested specifications are included. Filing size; A. I. A. File 31-C-7.

### Roofing and Waterproofing

935. . . . A 20-page specification manual on various types of built-up roofing, flashing, dampproofing and waterproofing has been issued by Koppers Products Co., Pittsburgh. Six Don Graf Data Sheets on Waterproofing are also reproduced.

### Venetian Blind Hardware

936. . . . Fiwale Equipment Mfg. Co., Inc., New York, has issued a 16-page filing-sized catalog illustrating and describing its line of Venetian blind hardware and fittings. Prices are given for each item listed.

### Bronze Welding

937. . . . The Linde Air Products Co., New York, has issued a 12-page filing-sized booklet which summarizes the available information on bronze-welding and bronze-surfacing. This is a practical presentation of the fundamental theory and technique of this procedure. The step-by-step procedure for bronze-welding and bronze-surfacing is given, as well as special information and advice. Other topics covered are preheating considerations; the bronze-welding of cast iron, malleable iron, carbon steels, etc.

FIRST CLASS  
PERMIT NO. 5  
(Sec. 510 PL & R)  
NEW YORK, N. Y.

BUSINESS REPLY CARD

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

2c. POSTAGE WILL BE PAID BY

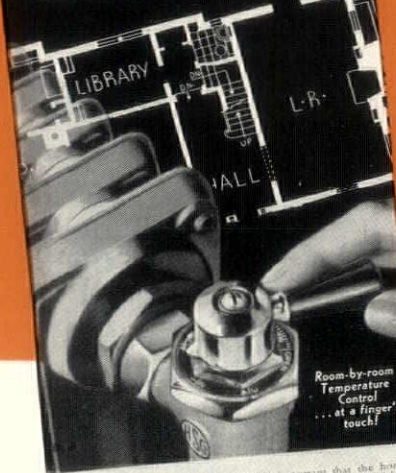
AMERICAN ARCHITECT

572 Madison Avenue

New York, N. Y.

AMERICAN ARCHITECT

Of course you'll plan for  
**CONTROLLED RADIANT HEAT**  
The basis of *True*  
**AIR CONDITIONING**



Room-by-room  
Temperature  
Control  
... at a finger's  
touch!

Today it is doubly important that the home builder give more critical thought to the selection of his heating system— from both the angle of efficient heating and that of adaptability to air conditioning.

Modern heating engineers agree upon this fact: *Correct heating is the foundation of true air conditioning in the home.* Our tests show that radiant heat— as provided by radiators— is most easily controlled, cleanest, most healthful and comfortable. And that only when air conditioning equipment is furnished as an auxiliary and not as a substitute.

Hoffman Controlled Heat delivers to each radiator as much heat as is desired— without affecting air conditioning.

is the highest type of builders are now planning to install Hoffman Controlled Heat— with auxiliary air conditioning equipment to be installed immediately up to the future. This system affords a sensitive room-by-room control of temperature... a finger's touch upon the level of the Radiator Modulating Valve instantly increases or decreases the heat output of that radiator. Room temperature can thus be promptly adjusted to personal preference or to changing weather conditions. Like ice, fuel is consumed only in proportion to the demand for heat— no over or under-heating.

Hoffman Controlled Heat costs no more than any good two-pipe system and its equipment is adaptable to any type of steam boiler. Send for our new booklet which contains full information and will add considerably to your knowledge of heating. Hoffman Specialty Co., Inc., Dept. HG-2, Waterbury, Conn.

**HOFFMAN CONTROLLED HEAT**  
The Makers of Venting Valves and Hoffman Economy Pumps

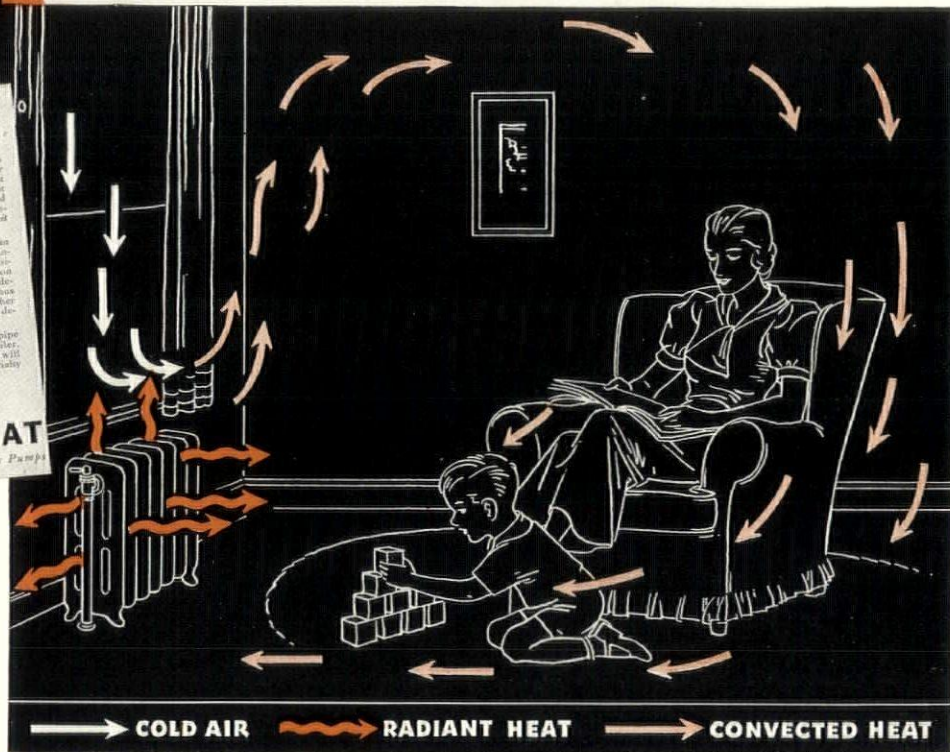
One of a series of educational advertisements now appearing in nationally circulated magazines.

# AIR-CONDITIONING

with assured

# SATISFACTION

... AS EXPLAINED IN HOFFMAN NATIONAL ADVERTISING TO BUILDERS OF NEW HOMES



● Satisfactory air-conditioning is about 85% dependent upon proper heating. Cleaning, humidifying, and circulating of air in winter are desirable features in any home, but their value is decidedly minimized unless the heating system is adequate and efficient. This indicates the need for **radiant (radiator) heat** with air-conditioning furnished by equipment *separate* from the heating plant.

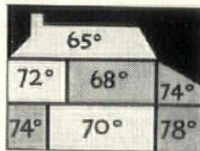
To place this important fact before today's home-builders, Hoffman is sponsoring a national educational campaign, typified by the advertisement shown here.

Hoffman Controlled Heat, a vapor-vacuum system, furnishes an ideal method of heating as a basis for true air-conditioning. In this system, the heating units are placed where they logically

belong— *UNDER THE WINDOWS*. Thus, in-leaking cold air is thoroughly warmed before circulating through the room and there is no stratification of cold air along the floor. As shown in the illustration above, **comfort is assured by both radiant and convected heat.**

When auxiliary air-conditioning equipment is installed with Hoffman Controlled Heat, the conditioning process is not dependent upon the heating plant and will function whether or not heat is being supplied. Further, the temperature in each individual room can be adjusted to personal preference at a finger's touch on the handle of the Hoffman Modulating Radiator Valve.

For full information on Hoffman Controlled Heat, write to the Hoffman Specialty Company, Inc., Dept. AA3, Waterbury, Connecticut.



Hoffman Controlled Heat delivers to each room individually as much or as little heat as desired— without affecting air-conditioning.

# HOFFMAN Controlled HEAT

Made by the makers of Hoffman Venting Valves, Supply Valves, Traps and Hoffman-Economy Pumps



Phoenix Building, Duluth, Minn.

## HEATING COST REDUCED AFTER MODERNIZATION

Webster Moderator System Helps  
Phoenix Building, Duluth, To  
Check Heating Faults

### SERVES SEVEN RETAIL STORES

Duluth, Minn.—Heating modernization helped the Phoenix Building, in downtown Duluth, to reduce its heating steam consumption from 359 to 206 lbs. of steam per degree day.

Installation of the Webster Moderator System together with new concealed Webster System Radiators was completed during the 1933-34 heating season as an important part of a thoroughgoing program of property modernization.

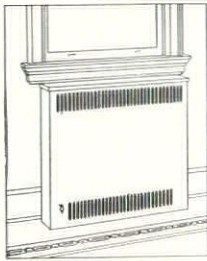
In a typical month before modernization, the Phoenix Building required 559,800 lbs. of steam. With the Webster Moderator System, after correction for degree day differences, the building saved 194,000 lbs. of steam—a cash reduction of \$172 for a single month.

The heating modernization program is not solely responsible for these savings, but the owners credit the Webster Moderator System with a "very considerable portion of the reduction." Other factors include the lowering and insulation of ceilings on the second floor and a slight reduction in floor area.

In addition to the remarkable fuel savings, heating service is greatly improved. The new system is able to meet every heating need of a variety of tenants, by careful control of steam circulation.

Regardless of the severity of the weather, the entire building heats evenly and rapidly. The warm-up period has been considerably shortened.

"The Webster System has given us everything that we expected of it and more too," says H. L. George, representing the Massachusetts Real Estate Co., owners of the building. "There is absolutely no comparison in tenant satisfaction."



Webster System Radiation included in the Phoenix Building modernization provides balanced heating service. . . No cold corner rooms. . . Harmonizes with decorative scheme. For modernizing interiors or for new buildings. Send for booklet "Webster System Radiation."



Outdoor Thermostat which provides "Control-by-the-Weather."

If you are interested in (1) improved heating service and (2) lower heating cost in your building, address

Warren Webster & Company . . . Camden, N. J.  
Pioneers of the Vacuum System of Steam Heating  
Branches in 60 principal U. S. Cities . . . Darling Bros., Ltd., Montreal, Canada

"Streets of the World." This will be an international affair with the usual emphasis on quaint architecture and dress.

### DALLAS

The best sign that the Texas Centennial Exposition, scheduled to open on June 6th, is progressing rapidly is the type of press releases being sent out. The theme song of architecture has been relegated to the background in favor of Billy Rose. Mr. Rose, husband of Fanny Brice, the comedienne and, in his own right, producer of the circus spectacle "Jumbo," is rapidly becoming somewhat of a legendary character. Apparently a victim of acute claustrophobia, he makes statements about his productions that numerically are as incomprehensible to ordinary mortals as a light year description of the distance to the sun. Therefore, when Mr. Rose revealed to the press that his pageant in Texas would make "Jumbo" look like "peanuts" no one was surprised. It is rumored that he will receive \$100,000 for his work. Albert Johnson will design costumes and sets for "Frontier Frolics."

### MODERNIZATION MOVIE

A new talking moving picture, "The Courage of Kay," telling the way by which kitchens can be modernized, is now being shown by electric light and power companies, electrical appliance manufacturers and other groups to consumer audiences all over the country.

Sponsored by the Edison Electric Institute, McCall's Magazine and selected industrial groups co-operating with the Federal Housing Administration, the new talkie tells how a typical young couple finance a complete remodeling of their kitchen, through the Federal Housing Plan. Woven into the story is the rejuvenation of home life in the Harper family, with the resulting social success of Kay Harper and the business triumphs of her husband.

### ERRATA

We are in receipt of a letter from Benjamin F. Betts anent his article "With Five Thousand Dollars" which appeared in the February issue. Mr. Betts points out the fact that both Clayton Grandy and Harry Plumber (whose name was misspelled) are with the Common Brick Manufacturers Association. He has also given us the final cost of House Number 2 which is \$4,625 instead of \$4,236.

### COMMEMORATING FORGOTTEN PRESIDENTS

A great many people evidently spend a good deal of time looking up things to commemorate. Recently, Dr. Gertrude Duncan, a New York civic worker, and Miss Elizabeth Hall, an English teacher, decided that there are too many forgotten U. S. Presidents and decided to do something about it. The result is a proposed 1,000-foot tower terminating in a million candle-power beam for aviators. The design in concrete, steel and blue glass is the work of Hilaire Hiler, modernist American painter. There is to be a large central hall decorated with murals of important historic events during the administration of every president including Millard Fillmore's, a restaurant and a broadcasting station. It is estimated that the project will cost \$1,000,000. This is to be raised by public subscription. The proposed site, offered the committee by Daniel W. Blumenthal, is immediately adjacent to that planned for New York's 1939 Fair. After the memorial is completed someone can proceed with plans for a sadly needed reminder of forgotten vice presidents.

# Miles of Velmo . . . . .

## KANSAS CITY AUDITORIUM



Architects: Alonzo H. Gentry;  
Vaskamp & Neville, Associate  
Architects; Hoyt, Price & Barnes,  
Theatre seating; American Seat-  
ing Company. Upholstery: Velmo  
"Montauk," special blue.

**S**tretched over the thousands of seats in this impressive new auditorium, several *miles* of Velmo mohair frieze make a beautiful vista. Velmo is truly "good theatre." It is acoustically perfect. It wears beautifully. It doesn't catch dust. It's easily cleaned. And it's guaranteed permanently against moth damage. Chase men have plenty of tips on tap to help you with upholstery jobs of any size, from a lounge to another "lauditorium." *Just ask!*

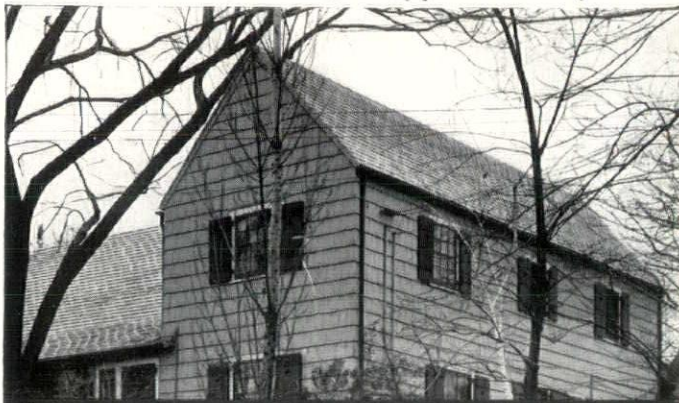
# VELMO

IS A *Goodall-Sanford* PRODUCT

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L. C. Chase & Company, Inc., selling division of Goodall-Sanford, 295 Fifth Avenue, New York  
BOSTON CHICAGO DETROIT SAN FRANCISCO

## KENMAR *Copper Shingles*



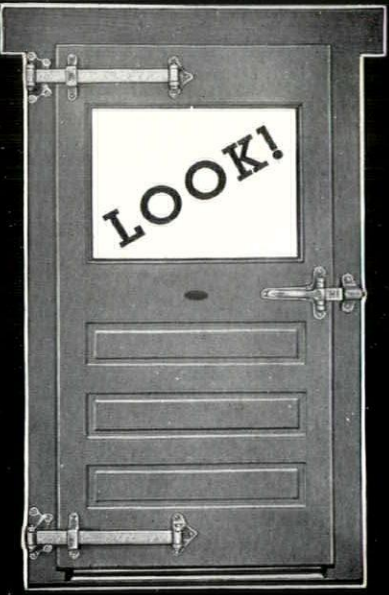
*Pelham Manor, N. Y. Residence of Edmund C. Gause  
Re-roofed by Benj. Riesner, Inc., N. Y. with Kenmar Shingles, Patinated*

**I**F you are not already aware of the new opportunities afforded architects to achieve distinctive and beautiful roof effects with Kenmar Copper Shingles, see our catalog in Sweet's, Section 8-36. And write for descriptive literature.

*The New Haven Copper Co.*  
MANUFACTURERS OF SHEET COPPER SINCE 1849  
*Seymour, Conn.*

JAMISON-

BUILT DOORS



Look into the cold storage room thru this Jamison Window Door. Especially adaptable for display purposes. Combines all Jamison qualities of long wear and ease of operation—plus the tight, conforming seal of the new Jamison resilient, pure rubber gasket. Get Bulletin today.

**JAMISON COLD STORAGE DOOR CO.**  
Jamison, Stevenson, & Victor Doors  
Hagerstown, Md. U. S. A.

### OBITUARIES

**Emlyn Lamar Stewardson**, a Philadelphia architect known especially for his designs of college buildings, died recently in Atlantic City after an illness of more than a year. He was 73 years old. A graduate of the University of Pennsylvania, Mr. Stewardson planned many buildings for Haverford, Byrn Mawr, Princeton, Washington University of St. Louis, and the University of Pennsylvania.

**William B. Ittner**, nationally known architect and President of the Architectural League of America, 1903-04, died recently at his home in St. Louis after a six months' illness. Mr. Ittner, specializing in school architecture, designed 430 such buildings in 105 cities in 28 states. He was a graduate of Cornell in the class of 1887, and at the time of his death was President of the St. Louis Plaza Commission, a member of the American Institute of Architects and a thirty-third degree Mason.

**Richard B. Derby**, a Boston architect, well-known for his domestic architecture died recently in Winchester, Massachusetts. He was 58 years old. A graduate of Massachusetts Institute of Technology, he was for many years a member of the firm of Derby and Robinson, and later a member of the firm of Derby, Barnes and Champney.

### NEW OFFICES

**Roger Allen**, architect, succeeding the firm of Frank P. Allen and Son, announces the removal of his office to 1228 Grand Rapids National Bank Building, Grand Rapids, Michigan.

**Kroman & Braun**, architects, announce that they have become associated and will continue their practice of architecture at 180 N. Michigan Ave., Suite 1610, Chicago, Illinois.

**Skidmore & Owings** announce their partnership as architects and industrial designers with offices at 104 South Michigan Avenue, Chicago. Both of these men were previously connected with the Chicago Fair.

**Phillip Russell**, architect, formerly of the firm of Bowden and Russell will continue the practice of architecture at 420 Madison Avenue, New York City.

**Frederick N. Clark**, architect, has recently opened an office at 441 North Beverly Drive, Beverly Hills, Cal.

**D. G. Spahr** has been named manager of the newly created eastern division offices of the Delco-Frigidaire Conditioning Corporation. The new offices will be located at 35 West 45th Street, New York City.

**Mrs. Dorothy Doyle** has been placed in charge of the Better Homes in America information service, Frank Watson, executive secretary of the organization, announced recently. Mrs. Doyle, widely known in Home Economics circles, will have her office in Lafayette, Indiana, where the organization is working with the Purdue Housing Experiments.





Main building and detail of entrance facade, Venice High School group, Venice, California. John C. Austin and Frederic Ashley, architects; G. A. Schulte, engineer; Clinton Construction Co., contractor.

“Throughout the design, the appearance of the exposed structural concrete was a major consideration and details were studied that would facilitate perfect removal of forms.”



Another  
distinctive school  
**DESIGNED**  
for  
**CONCRETE**

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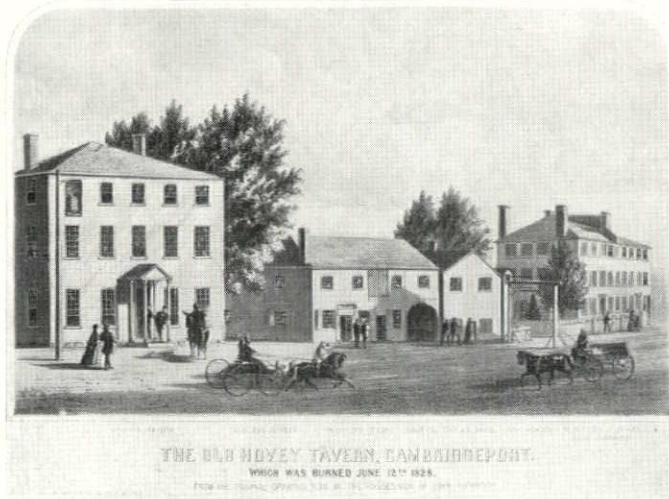
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- |   |   |
|---|---|
| Locate heater near point of greatest use          | Use draft diverter in flue (if not part of heater's standard equipment) |
| Use small-size pipe or tubing for hot water lines | Install proper size and type of heater for hot water requirements       |
| Install heat-trap in main hot water line          | Check thermostat for proper setting                                     |
| Make direct runs on hot water lines               | Check pilot adjustment for economical performance                       |
| Install self-closing faucets on hot water lines   |   |

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These tests have yielded comparative cost data for various types of heaters using not only gas but other fuels. By applying these data to your local fuel costs, you can readily determine the most economical form of water heater installation to recommend.

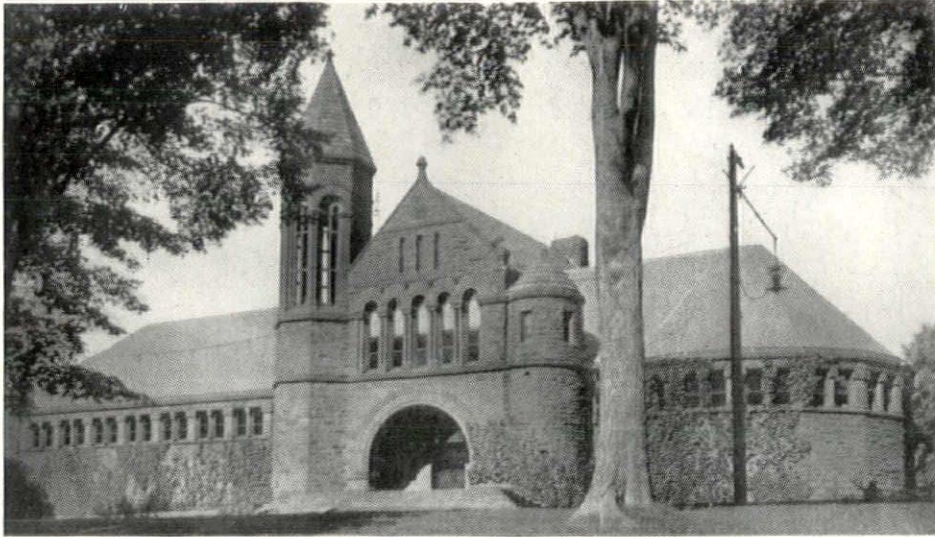
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Illustrations from "The Architecture of H. H. Richardson and His Times," the Library, University of Vermont

## REVIEWS OF THE MONTH

### THE ARCHITECTURE OF H. H. RICHARDSON AND HIS TIMES

By Henry-Russell Hitchcock, Jr. Published by The Museum of Modern Art, New York. Cloth binding; 375 pages; size, 7 1/4" x 10 1/4"; price \$6.00

THIS book is not simply a biography of Richardson, the man, but rather is it an analytical study of Richardson's architecture in the light of the setting in which he worked. The author has here presented a complete and carefully balanced survey of the works of this famous American architect.

The period of Richardson's creative activity in the decade after the Civil War extended through nearly thirty years of the most turbulent and exciting years this country has ever known. Much that is pertinent to the social, economic and political life of the times is revealed in the story of Richardson's struggles for stability and coherence and in the gradual emergence of his strongly personal style.

Richardson, undoubtedly was the most important architect America produced in the 19th Century, and his work stands out in bold relief against a background filled with squalor and incoherence at every hand. Trinity Church, Boston; Sever Hall, Cambridge; the Allegheny County Buildings, Pittsburgh; the Marshall Field Wholesale Store, Chicago; these buildings are monuments to Richardson's achievement and landmarks to the later architects for whose achievements he prepared the way.

There are 145 photographic illustra-

tions including many of original drawings which have never before been published. The text is divided into five parts: Part 1. Background and Preparation; Part 2. First Works in America; Part 3. Early Maturity; Part 4. Achievement; Part 5. Late Works.

To architects and historians, Mr. Hitchcock's appraisal of Richardson's work should prove indispensable as the definite work in its field. The text is scholarly, sympathetic, and based on exhaustive research pursued with a keen insight into the significance of the man and his works.

### ARCHITECTURAL DRAWING AND DETAILING

By J. Ralph Dalzell and James McKinney. Published by American Technical Society, Chicago. Cloth binding; 207 pages; size 5 1/2" x 8 1/2"; price \$2.00

IT IS the purpose of this book to present the general principles, practices, and techniques of architectural drawing, detailing, rendering in pen and ink, and landscaping in such a manner as to serve students or draftsmen who are in need of this practical information.

The general presentation includes a discussion of each principle, followed by simple and thorough directions for procedure. To a great extent, the question and answer method has been used, together with actual working sketches, to illustrate the principles. The pictorial drawings facilitate visualization of standard drawings and details.

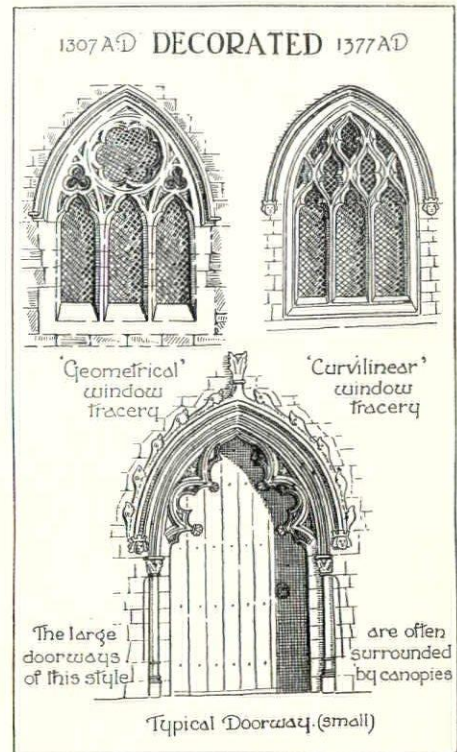
### THE HISTORIC ARCHITECTURE OF BRITAIN

By F. R. Smith. Published by the Pitman Publishing Corp., New York. Cloth binding; 113 pages; size 5 1/2" x 8 3/4"; price \$1.25

AS the name implies, this book is concerned with the historic background and development of architecture in Britain. The author traces this development from prehistoric times through all the various periods and styles, including: Roman, Saxon, Norman, Gothic, Early English, Tudor, Renaissance; with chapters on the Evolution of the Castle and Domestic Architecture of the Tudor period, Elizabethan and Jacobean periods. A vivid picture of the influence and effect of climate, materials, race, politics and local traditions, upon the development of British architecture is presented.

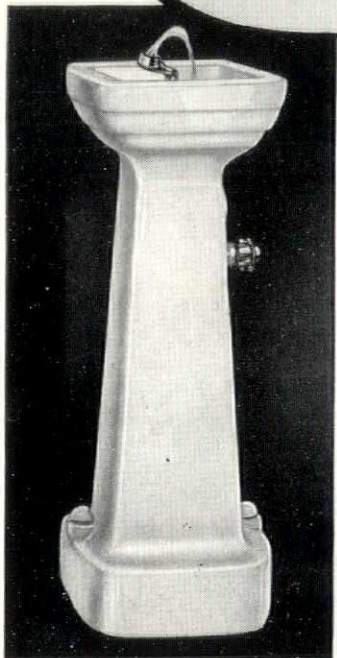
The book is profusely illustrated with 40 pages of pen and ink sketches of plans, construction details, and decorative elements which show the outstanding characteristics of each period style. The illustrations help to clarify the text and accentuate the major differences of the various period styles.

Much can be learned from a study of these old buildings and the pioneering work of the early craftsmen. To the architect and student who is interested in British architecture and its development this book should prove of value.

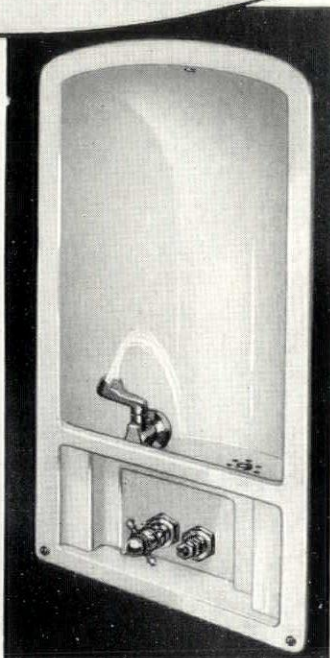


Page from 'The Historic Architecture of Britain'

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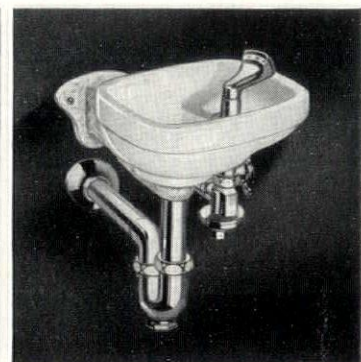
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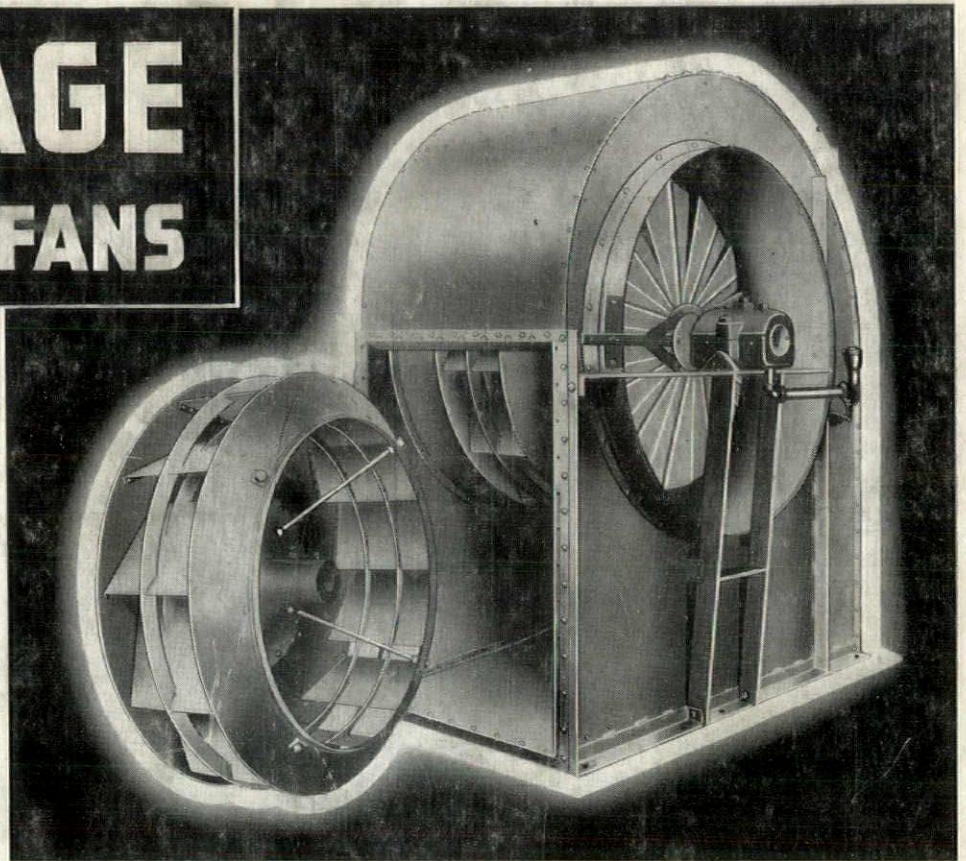
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