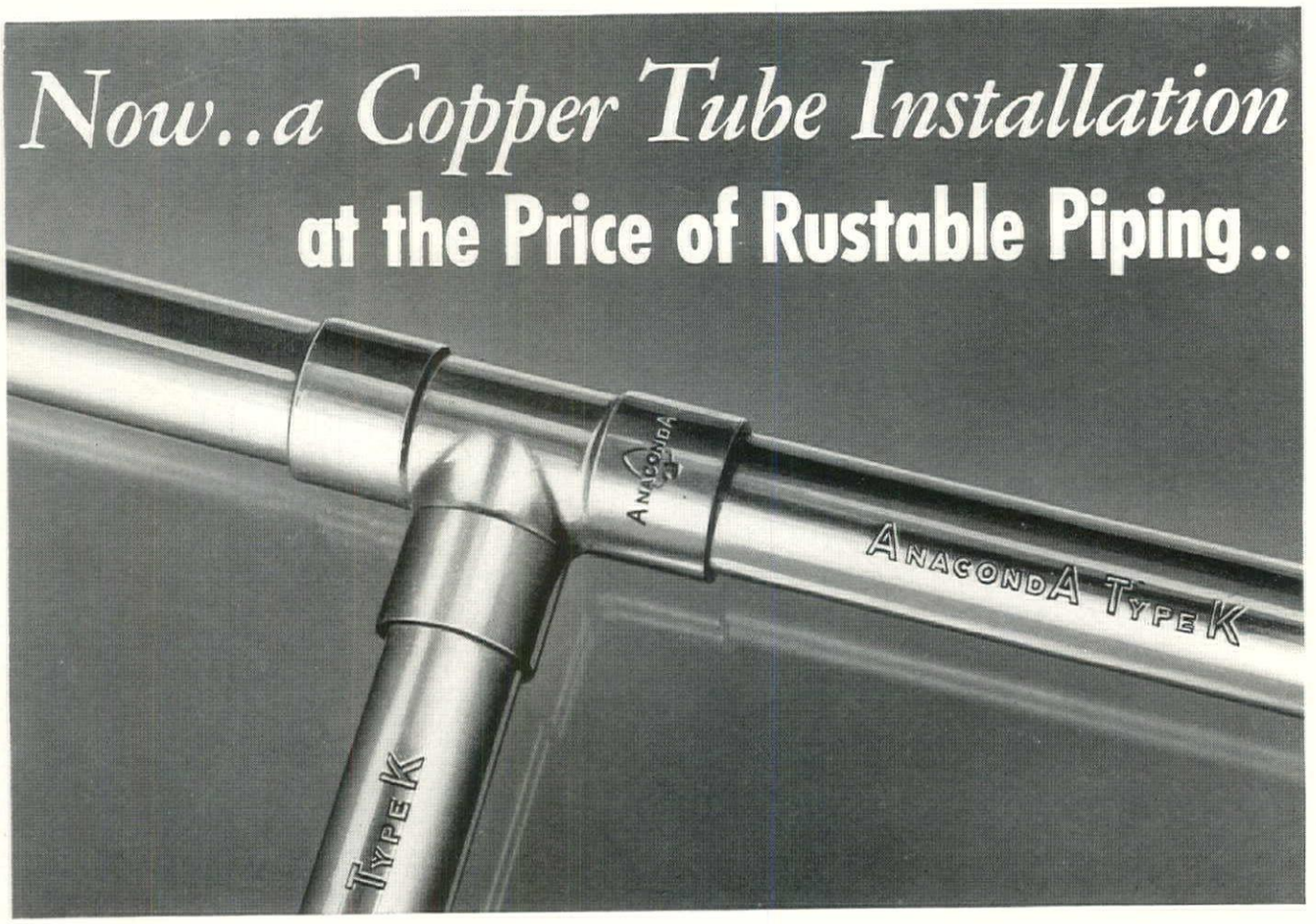
AMERICAN ARCHITECT and ARCHITECTURE

JUNE 1936 • THE BETTER HOUSE—NO. 2 WOOD CONSTRUCTION

Now..a Copper Tube Installation
at the Price of Rustable Piping..



for plumbing, heating and air-conditioning lines

IN specifying for plumbing, heating and air-conditioning lines, the first cost of non-rust material can no longer be considered a drawback to its use. For the price of Anaconda Copper Tubes, assembled with Anaconda Solder-Type Fittings, is little or no more than that of pipe that rusts.

In addition to low cost, this sturdy tubing offers all the traditional advantages of copper—long life . . . trouble-free service . . . immunity to rust . . . freedom from periodic repair expense.

Copper tubes for heating lines

For heating lines . . . Anaconda Copper Tubes are ideal. Hot water conveyed through them loses only about *one-half* as much heat as is lost when black iron is used. Permanently smooth interiors reduce resistance to the flow. The result is quicker circulation and maximum efficiency.

A complete line of Anaconda Fittings

There is an Anaconda Fitting to meet *every* copper tube requirement. Solder-type fittings may be had in either wrought copper or cast bronze; flared-tube-type fittings are cast bronze. All are furnished in elbows, tees, couplings and unions, including a complete range of reduction and adapter combinations. Anaconda Copper Tubes and Fittings are carried in stock by distributors of Anaconda Pipe.

Where standard-size, rigid pipe is required, Anaconda Brass Pipe has long been the standard of quality. Two scientifically-determined alloys are carried in stock by leading supply houses . . . *Anaconda 67 Brass Pipe* for normally corrosive water, and *Anaconda 85 Red-Brass Pipe* for highly corrosive water.

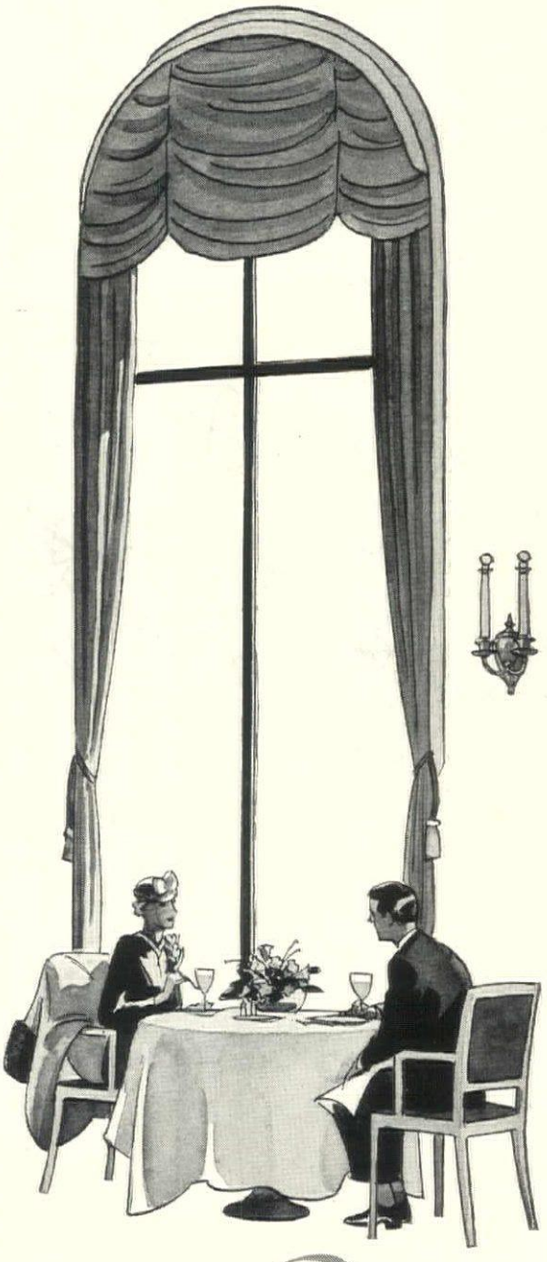
3645

ANACONDA
from mine to consumer

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Offices and Agencies in Principal Cities
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

ANACONDA COPPER & BRASS

The importance of planning large glass areas is quite evident when one considers that the average person spends at least half a lifetime between four walls. And the desirability of specifying the highest quality glass available is just as obvious.



LIBBEY·OWENS·FORD

Quality Glass

Libbey·Owens·Ford Glass Company, Toledo, Ohio manufactures a complete line of flat glass, including Flat Drawn Window Glass...Polished Plate Glass, both plain and colored...Heavy Sheet Glass...Greenhouse Glass...Safety Glass...Tuf-Flex tempered plate glass...Vitrolite opaque structural glass...Aklo heat absorbing glass...and distributes the Figured and Wire Glass manufactured by the Blue Ridge Glass Corporation of Kingsport . . . Tennessee.

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MELVIN L. & HARRY A. KING

BASE *Wrought Iron*

SPECIFICATIONS ON ANALYSIS OF LOCAL CONDITIONS

● Building construction is on the up-swing and greater attention is being given to pipe material selection than ever before. This, of course, presumes an accurate engineering study of conditions under which the pipe must serve.

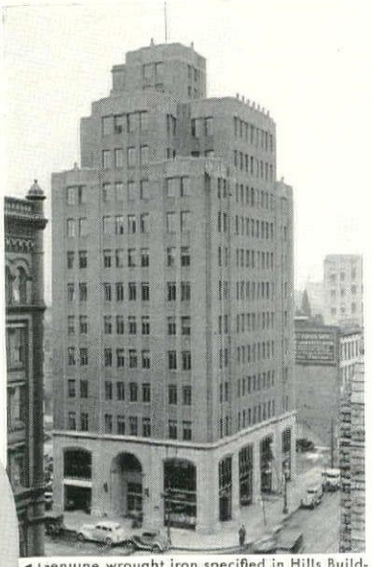
For many years we have compiled data on piping installations covering every section of the country. Architects and engineers say these records of actual service are invaluable as a basis for selecting material on today's projects.

Now we are broadening our scope of cooperation and will gladly assist architects and engineers in the study of local water, soil, and operating conditions in order to establish specific engineering data, which, in conjunction with the service records, may be used to select the most suitable piping material.

Illustrated are examples of specifications based on a knowledge of local conditions plus experience with wrought iron over a long period of years. We call this procedure of material selection "Pipe Prescription." Note that wrought iron is specified for those corrosive conditions where the records prove it longer lived and more economical.

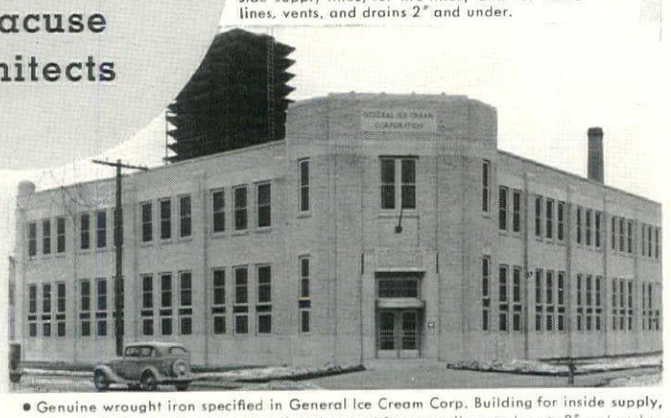
If you wish our cooperation in "analyzing local conditions," write our Engineering Service Department at Pittsburgh or forward your request through our nearest Division Office. Give location of building and state briefly the services involved. A. M. Byers Company. Established 1864. Pittsburgh, Boston, New York, Washington, Chicago, St. Louis, Houston.

Examples of "PIPE PRESCRIPTION"
MELVIN L. & HARRY A. KING
Syracuse Architects



● Genuine wrought iron specified in Hills Building for hot and cold and drinking water and inside supply lines; for fire lines; and for waste lines, vents, and drains 2" and under.

● Genuine wrought iron specified in John Van Duyn School for hot and cold and drinking water and inside supply lines; fire lines; and waste lines, vents, and drains 2" and under.



● Genuine wrought iron specified in General Ice Cream Corp. Building for inside supply, cold and drinking water lines; for all drains; and for waste lines and vents 2" and under.

BYERS GENUINE WROUGHT IRON PRODUCTS

PIPE - WELDING FITTINGS - RIVETS - SPECIAL BENDING PIPE - O. D. TUBES
PLATES - SHEETS - CULVERTS - FORGING BILLETS - STRUCTURALS - BAR IRON

Specify Byers Genuine Wrought Iron Pipe for corrosive services and Byers Steel Pipe for your other requirements

AMERICAN ARCHITECT and ARCHITECTURE

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JUNE, 1936

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AMERICAN ARCHITECT. Trade-Mark Reg. U. S. Patent Office, with which is combined ARCHITECTURE (Reg. U. S. Patent Office). Published monthly by Hearst Magazines, Inc., 572 Madison Avenue, New York. Other Offices, 919 N. Michigan Avenue, Chicago; General Motors Bldg., Detroit; 132 Newbury Street, Boston. William Randolph Hearst, President; Richard E. Berlin, Executive Vice President; John Randolph Hearst, Vice President; Earle H. McHugh, Vice President; R. F. Gardner, Vice President; T. W. Towler, Vice President; W. R. Peters, Treasurer; Arthur S. Moore, Secretary.

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TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS

PHOTO: COURTESY VIRGINIA STATE CHAMBER OF COMMERCE

John D. Rockefeller, Jr., with officers of the Institute and members of the Board of Directors in front of Raleigh Tavern in Williamsburg, after Mr. Rockefeller had been honored by the Institute. Front row, l. to r.—Louis LaBeaume, John D. Rockefeller, Jr., Stephen F. Voorhees, Edwin Bergstrom. Second row, l. to r.—William G. Nolting, Ralph Cameron, David J. Witmer, William T. Warren. Third row, l. to r.—Walter R. McCornack, Kenneth Chorley, Gerrit J. DeGelleke, Hubert G. Ripley, Francis P. Sullivan, E. C. Kemper, Charles T. Ingham, Richmond H. Shreve

BUILDING "HOT STOVE LEAGUE"

Baseball is definitely a warm weather game. Consequently, during the winter months fans and players alike must have some form of amusement that will replace their summer sport. To fill this need the "Hot Stove League" was organized. More or less of an informal organization, its chief activity has been to engage in pleasant conversation and bitter controversy as to whether Joe Jones is or isn't a better ball player than Joe Smith—and if not, why not.

In the minds of a good many observers last month, the fact dawned that for all practical purposes the Wagner Bill has been the architectural version of the "Hot Stove League." During the cold months, commissions are few. It is only natural that the professional mind should stray to Utopian schemes. But with the coming of warmer weather feet once more get back to solid ground, the actual ball game is played, jobs increase, and the "Hot Stove League" and the Wagner Bill are almost forgotten.

Apparently, that is just about what will happen. Everyone is agreed that Senator Robert F. Wagner has put up a good scrap. But with the Construction League opposing his plan, with most of private enterprise centered against him, it seems almost certain that this Congress will adjourn without coming to any decision about housing. Paradoxically, even the most ardent advocates of "housing by private enterprise" agree that this country so far has failed to build low-cost housing on a large scale—agree, in fact, that some form of rent subsidy is probably a temporary solution. But few people or agencies are willing to subscribe to any far-reaching government effort that might step on the toes of private capital. Because of this attitude of suspicion that exists between government and capital, there is little hope that a housing compromise can be worked out, particularly when construction seems to be making something of a comeback.

It seems likely, therefore, that any definite action toward solution of the low-cost housing problem will be postponed until fall. There will be talk, of course, and there will be the normal amount of housing propaganda, but any compromise results seem very doubtful.

CONSTRUCTION LEAGUE AND PWA

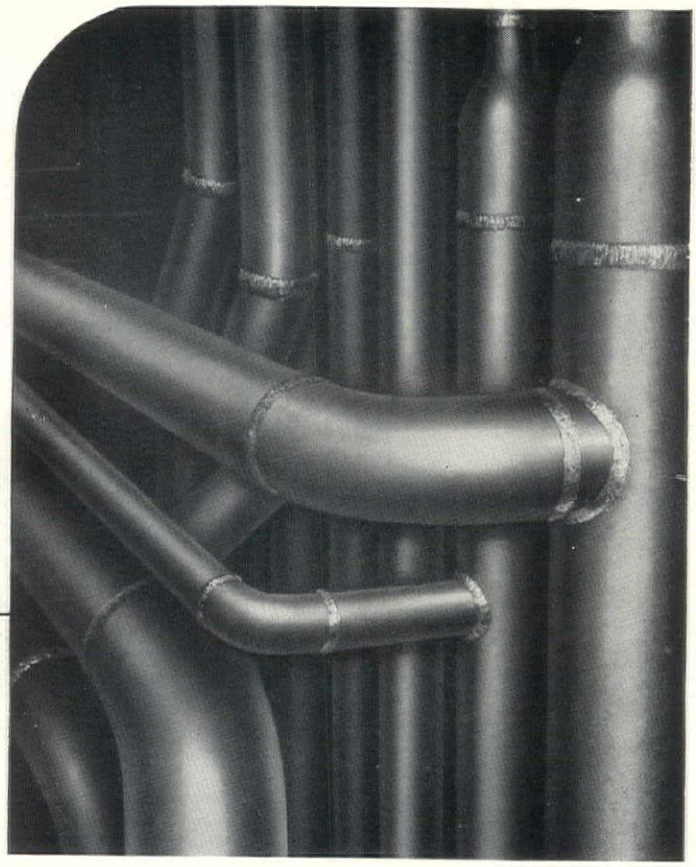
It is fairly obvious that unless PWA is extended and granted further government funds, the 2,000,000 men now employed on PWA jobs will be jobless by mid-winter. Realizing that as yet no provision has been made for PWA in the relief allotment, the Construction League is now making a strong fight to have $700,000,000 of the relief appropriation earmarked for PWA.

Fortunately, the League has a friend in court, for in the House there already exists a bloc that is trying desperately to prevent this abrupt termination to PWA activities. Led by Congressman Beiter of New York, the bloc is now circulating a petition calling on President Roosevelt to express his approval of the earmarking.

Meantime a statement by the League pointed out that a $700,000,000 allocation on a 45 per cent grant basis would allow the construction of approximately one and half billion dollars worth of useful, permanent projects. Said the statement in the League's official bulletin calling attention to projects already approved, "Cities and communities throughout the country have in good faith spent large sums of money and a great deal of time and effort in the preparation of these PWA projects and are willing and eager to commence them at once. In addition PWA operates on a 45 per cent grant basis with the remaining money being furnished either by the cities and municipalities or by loans from the PWA. So far, the sale of municipal bonds taken by PWA has brought a profit of over $5,000,000 to the United States Government."

Thus reasoned the Construction League. But even with the apparent soundness of its arguments it still remains doubtful that President Roosevelt will earmark further funds to PWA. Sensing that it will be imperative to devote large sums to flood rehabilitation, knowing that WPA, or possibly the dole form of relief, must be carried on for at least a time longer, the President is rightfully concerned over the gigantic sums to be expended. Therefore, necessary as further PWA expenditures seem, it is unlikely that as much as $700,000,000 will be allocated. Moreover it is more than possible that PWA has reached the end of the line.

STREAMLINED.. *inside and out*



WHEN THE PIPING IS WELDED

STREAMLINED . . . *smooth inside and out* . . . this installation typifies part of a large piping system made "jointless" and *leakproof forever* by oxwelding. This method of erection reduces friction and power losses—makes insulation easier to apply and less costly.

An oxwelded piping system is one permanent whole . . . just as if it were constructed from a continuous piece of pipe! It is easier to design, takes up less space, looks neater and involves no additional cost or time for construction. Welds have the strength of the original pipe and require no maintenance. Pipe of all sizes—any material—can be welded. Because these advantages cannot be obtained in any other way, oxwelded piping is being specified by architects and installed in more modern buildings each year.

Specifications for Welded Piping

Linde engineers have prepared clear and concise technical data especially for the architect interested in designing and specifying jointless piping systems that will remain leakproof forever. Ask the Linde Office in your city for complete details or write to the company at 30 East 42nd Street, New York, N. Y. The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation.

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES

FROM PRODUCTS OF UNITS OF UCC UNION CARBIDE AND CARBON CORPORATION LINDE UNION CARBIDE

TRENDS

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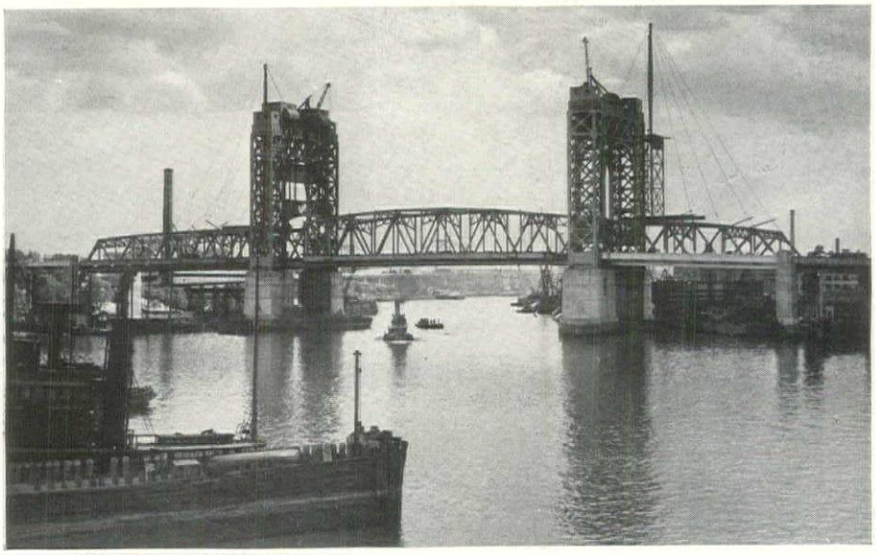


PHOTO: CHARLES PHELPS CUSHING

The new Triboro Lift Bridge across the Harlem River ship canal is the largest in the world. It was prefabricated and recently taken to the job on barges to be lifted into position

RENT SURVEY

In attempting to find a basis of fact for a practical supply-and-demand analysis of the improvements for which New Yorkers are willing and able to pay, the Mayor's Committee on City Planning dug up some surprising statistics. Middle of last month these facts were released.

According to their findings, there are a million families in New York City who pay $20 or less per month for rent. More families pay less than $20 than pay more than $60. The median rental is $34 per month, while the majority pay from $30 to $59.

"Of the 1,838,876 occupied family quarters," says the *New York Times*, "8.7 per cent bring the landlord $19 or less a month, a shade more than the percentage of those paying $60 or more, which is 8.4. In 22.9 per cent of the living quarters occupied by families or other groups, the tenants pay from $20 to $29, while in 60 per cent of the homes the rents range from $30 to $59."

Highest rents were found generally in the Park Avenue, Fifth Avenue, 57th Street and the Central Park and Riverside Drive districts of Manhattan; the Flatbush and Shore Drive sections of Brooklyn, and the Jackson Heights, Forest Hills, Kew Gardens districts and the outlying areas around Jamaica and Little Neck Bay in Queens.

The lowest rents, of course, were reported on the lower East and West Side of Manhattan, and in the Williamsburg and Red Hook sections of Brooklyn.

Through the use of these studies by the City Planning Committee, which show not only the number of family quarters at various rentals, but also the parts of the city in which they are found, city planners hope to control more rigidly the expansion of the City —give builders a more accurate picture of real estate requirements.

The detailed figures for rentals by borough follow:

	Occupied family quarters	pay'g $60 or more	$30 to $59	$20 to $29	$19 or less
Manhattan ..	448,317	18.6	36.5	24.2	20.7
Bronx	349,076	3.2	81.5	14.6	0.7
Brooklyn	694,918	5.6	58.6	27.2	8.6
Queens	305,517	6.7	73.7	18.3	1.3
Richmond	41,048	2.8	50.0	41.3	5.9
N. Y. City....	1,838,876	8.4	60.0	22.9	8.7

BEST BAROMETER

If you ask Federal Housing Administrator Stewart McDonald, he will tell you that the best barometer of the Nation's building activity is the number of commitments to insure mortgages issued by the Federal Housing Administration. Says Mr. McDonald, "The commitment to insure a mortgage starts the hammers and saws going." Last month throughout the United States FHA's commitments were starting thousands of hammers and saws going, and the result was that all previous FHA records were shattered.

April set a new pace. Home mortgages accepted for insurance numbered 7,137 for a total of $28,849,654—an all-time high for the organization. The grand total of mortgages taken for insurance is now $264,532,463, with large scale housing projects accounting for an additional $32,962,158 in insurance.

PHOTO: WIDE WORLD

Archibald M. Brown of the Architectural League of New York presenting the President's medal to Leon V. Solon, Secretary of the League, at a recent dinner

BUILDINGS UP, FORECLOSURES DOWN

Building permit records continue to show that the upturn in construction volume is here to stay. Volume of building for the first quarter of 1936 was 104.2 per cent ahead of the same period in 1935. But even more heartening than the increase in building activity is the decrease in foreclosures on all types of real estate.

According to figures released by the Federal Home Loan Bank Board, foreclosures in the first quarter of this year were 26.7 per cent below the corresponding period of last year—the lowest mark since 1931. Largest decrease occurred in the Chicago district, 39.5 per cent (includes Illinois and Wisconsin), while, in general, foreclosures were fewer in metropolitan centers than in rural districts.

WHAT—NO SKYSCRAPERS?

According to Herbert U. Nelson, Secretary of the National Association of Real Estate Boards, the United States cannot properly be called "the land of skyscrapers." In his book, "National Notes on Real Estate," he states that there are fewer than 600 in the United States.

The last authoritative survey was made in 1929. "At that time," writes Mr. Nelson, "there were but 4,778 structures of ten or more stories in the country, while forty-two of the nation's cities of 50,000 or more population had no buildings of that height. There were only 377 real skyscrapers, buildings of twenty or more stories, in the country in 1929. Nearly half of these, 188, were in New York; Chicago had 65; Philadelphia, 22. Since 1929 the Chicago figure has been increased 50 per cent." Assuming the same rate of increase for the rest of the country, the number of skyscrapers is still well under 600.

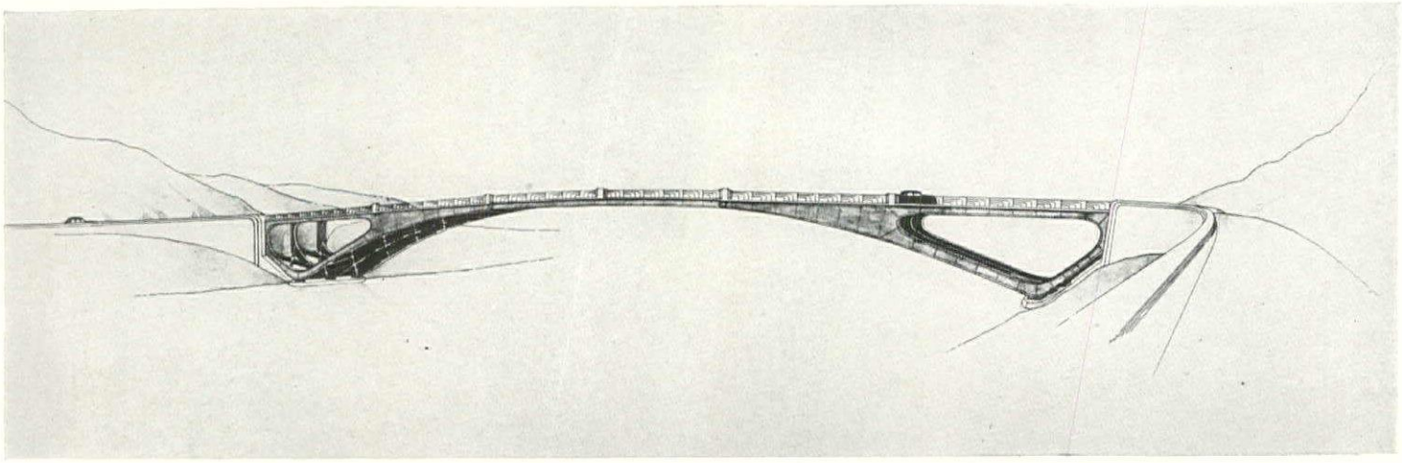
WHAT DOES A CHORUS GIRL KNOW ABOUT CONCRETE?

Les Femmes de Folies at New York's famous French Casino didn't know it—but 'Incor' 24-Hour Cement got them their jobs 12 days sooner. Balconies had to be remodeled, in converting Earl Carroll Theatre into a "music hall." Contractor used 'Incor'. Time saving? Yes, almost two weeks. But the economics of 'Incor' concrete cut deeper than that; for 'Incor' speeds completion, not at higher cost, but at a substantial money saving. Example: Because 'Incor' cures or hardens in one-fifth the usual time, contractor strips column forms first morning after concreting, floor forms that afternoon—re-assembling begins at once. Result, one form-set with 'Incor' does the work of two or three with ordinary cement—reducing form costs 50 to 70 per cent.

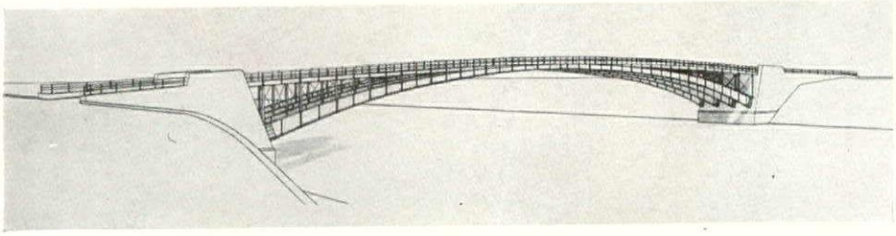
And, by curing thoroughly in the limited time concrete can be kept wet on most jobs, 'Incor'* makes stronger, denser, more watertight concrete. Significant, because speed is no longer obtained at the expense of quality. Instead, you get better concrete, in one-fifth the usual time. Suggesting that contractors be encouraged to estimate under specifications which take full advantage of 'Incor's greater curing efficiency and earlier service strengths. Made and sold by producers of Lone Star Cement, subsidiaries of International Cement Corporation, New York.

*Reg. U. S. Pat. Off.

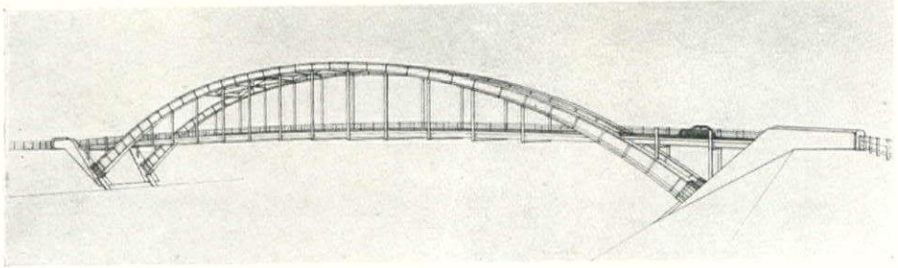
'INCOR' 24-HOUR CEMENT



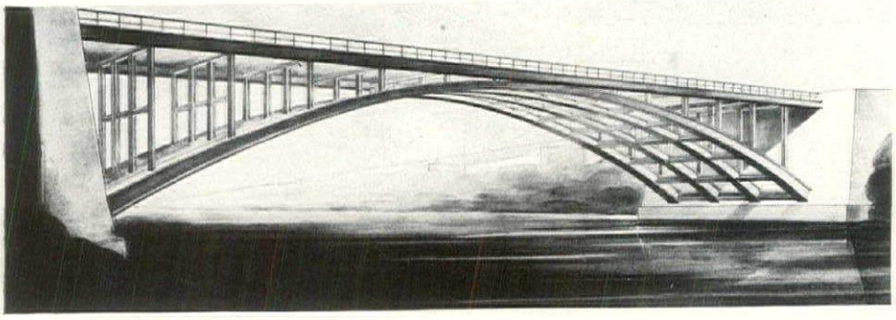
First prize design by Clarence H. Rosa of the University of Michigan



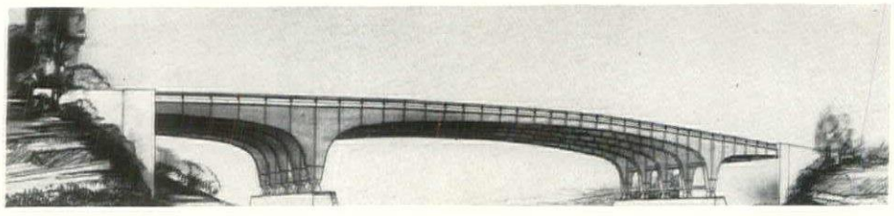
Second prize design by A. W. Millington of Rensselaer Polytechnic Institute



First honorable mention by Russell E. Madsen of Rensselaer Polytechnic Institute



Second honorable mention by John A. Grove of Carnegie Institute of Technology



Third honorable mention by Frank R. Streba of Carnegie Institute of Technology

STUDENT BRIDGE COMPETITION

Following the plan inaugurated several years ago, the American Institute of Steel Construction held this spring its eighth annual bridge design competition. Students from eighteen schools throughout the United States participated in a two-part competition, in the first part of which eighty-eight designs were submitted. From these the jury selected ten, and had their authors develop the designs in the final stage.

The problem was an ingenious one in that it gave a definite profile of the river banks covering a span of three hundred feet. A mandatory condition was the provision of thirty feet minimum vertical clearance for shipping. Some of the students contemplated highways parallelling the river on both sides, while others avoided the problem of traffic crossing at the ends by assuming the single highway to be carried on the bridge.

First prize was awarded to Clarence H. Rosa, a student at the University of Michigan; second prize was won by A. W. Millington, a student at Rensselaer Polytechnic Institute. First Honorable Mention went also to the Institute through the work of Russell E. Madsen, while the second and third Honorable Mentions, respectively, were given to John A. Grove and Frank R. Streba of Carnegie Institute of Technology. The first prize carried a cash compensation of $100; the second prize, $50. The jury: H. H. Allen, Vice President of the J. E. Greiner Company, Consulting Engineers of Baltimore; Arthur G. Hayden, designing engineer, Westchester County Park Commission, White Plains, N. Y.; Theodore E. Blake, architect of New York; Archibald Manning Brown, President of the Architectural League of New York; Henry H. Saylor, Associate Editor, *American Architect and Architecture*, New York.

This

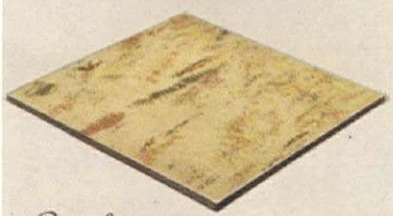
Armstrong's Accotile, Venetian Red Marble Pattern No. 320

Plus this

Armstrong's Accotile, Ebony Marble Pattern No. 305

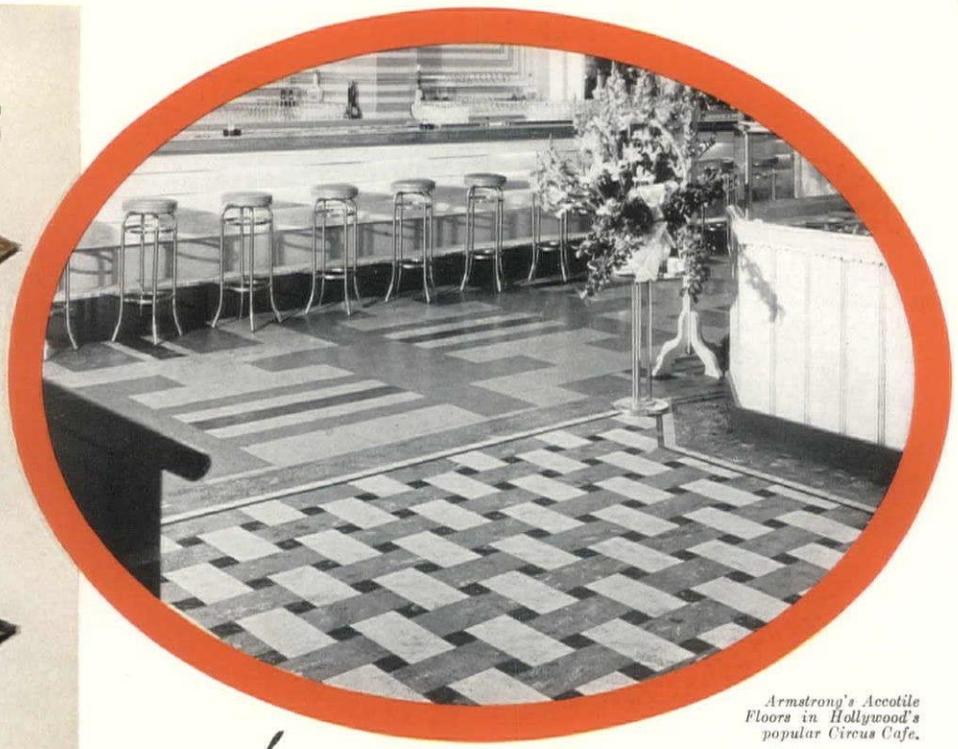
Plus this

Armstrong's Accotile, Travertine Marble Pattern No. 340



Equals this

attractive, long-wearing floor, designed for the Circus Cafe.



Armstrong's Accotile Floors in Hollywood's popular Circus Cafe.

Floors designed to PLEASE THE PUBLIC *and the man who pays the bill*

HOLLYWOOD'S smart Circus Cafe knows the sales value of "good showmanship" in attracting and keeping customers. That's why colorful Accotile floors are used to give it the modern note that alert operators of stores and restaurants find so profitable.

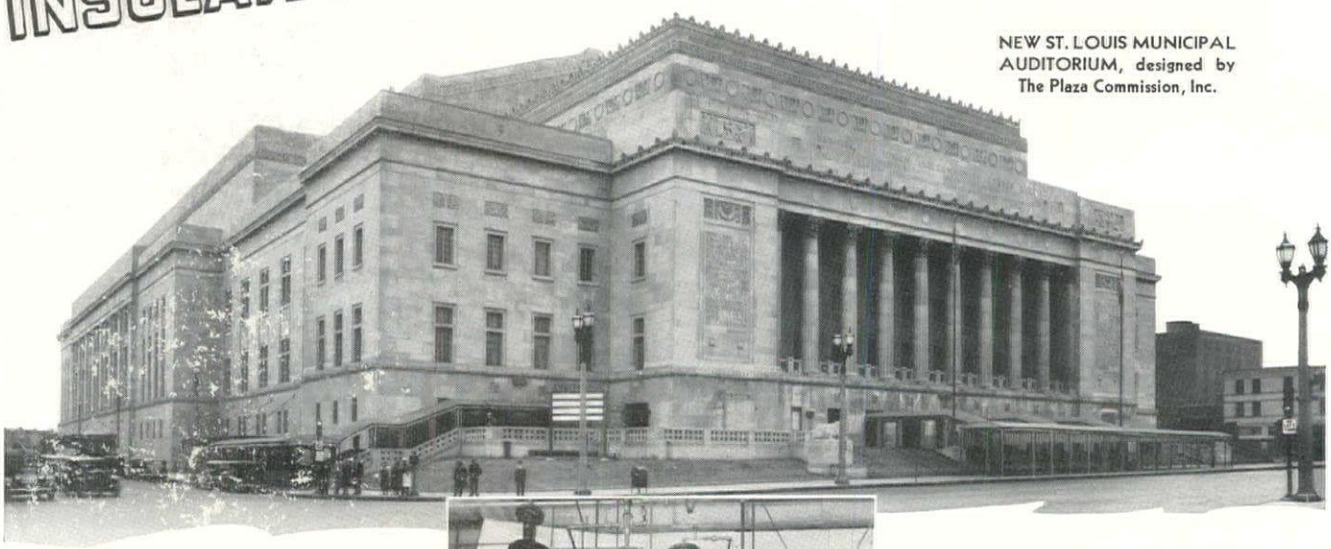
Resilient floors of Armstrong's Accotile offer a combination of style, economy, and durability that makes them ideal for stores and restaurants. Accotile is inexpensive to install and easy to clean. It is fire-resistant, moisture-resistant, and odorless. It does not become slippery when wet. And because the rich marble graining runs through the full thickness, traffic can't wear it off. Costly refinishings are eliminated.

When considering floors for stores, offices, or restaurants, it will pay to call Armstrong into consultation. Armstrong offers the *only complete line of resilient floorings*—Linotile, Accotile, Cork Tile, Rubber Tile, and Linoleum—and can give you unbiased suggestions. Write now for "Armstrong's Tile Portfolio" containing the latest ideas in sales-building floors. Armstrong Cork Products Company, 1414 State Street, Lancaster, Pennsylvania.

ARMSTRONG'S *Linoleum* *and* RESILIENT TILE FLOORS

LINOTILE · ACCOTILE · CORK TILE · RUBBER TILE · LINOWALL · ACOUSTICAL CEILINGS

INSULATED...AND ISOLATED...WITH CORK!



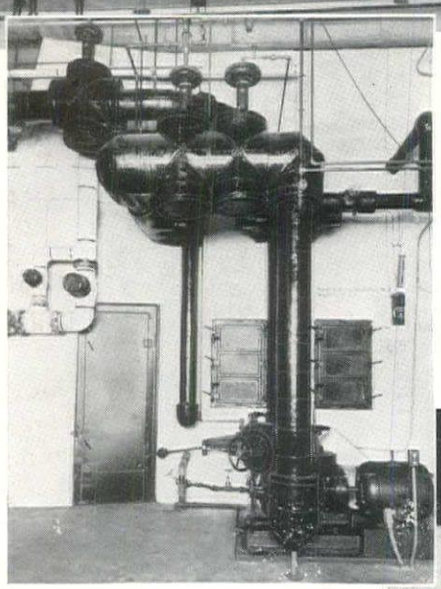
NEW ST. LOUIS MUNICIPAL AUDITORIUM, designed by The Plaza Commission, Inc.

. . . Throughout St. Louis' new Municipal Auditorium Armstrong's Cork Products guard air conditioning efficiency . . . prevent vibration transmission.

MORE than two million feet of conditioned air is supplied each minute to audiences in the new St. Louis Municipal Auditorium, designed by the Plaza Commission, Inc., a group of leading St. Louis architects.

This distinctive, modern building has a seating capacity of 17,000 and is equipped throughout to insure the greatest degree of comfort and maintenance economy. In providing for the permanent efficiency and minimum operating cost of the air conditioning system from basement to roof, Armstrong's Cork Insulation plays an important part.

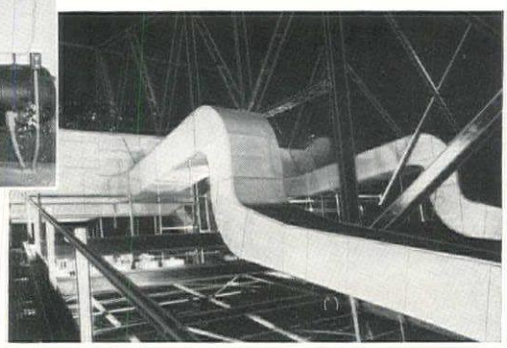
Thanks to the natural cell structure of cork, Armstrong's Cork Insulation offers a unique combination of advantages vital to the continued and economical maintenance of uniform temperature; that is, *low thermal conductivity plus definite ability to resist the efficiency-destroying effects of moisture.*



LEFT—*All cold lines in this air conditioned auditorium are insulated with Armstrong's Cork Covering for maximum efficiency. Armstrong's Vibracork under fans and motors eliminates the transmission of vibration.*

• • •

BELOW—*Air ducts are protected with 1" Armstrong's Corkboard; dehumidifiers, fans, and other refrigerating equipment, with 2" Corkboard. Engineers responsible for air conditioning, refrigeration, etc. were George E. Wells, Inc.*



In St. Louis' new auditorium, all cold lines are insulated with Armstrong's Cork Covering. Air ducts are protected with 1" Armstrong's Corkboard; dehumidifiers, fans, and other refrigerating equipment with 2" Corkboard; while 1", 1½" and 2" Corkboard is used on portions of the roof area.

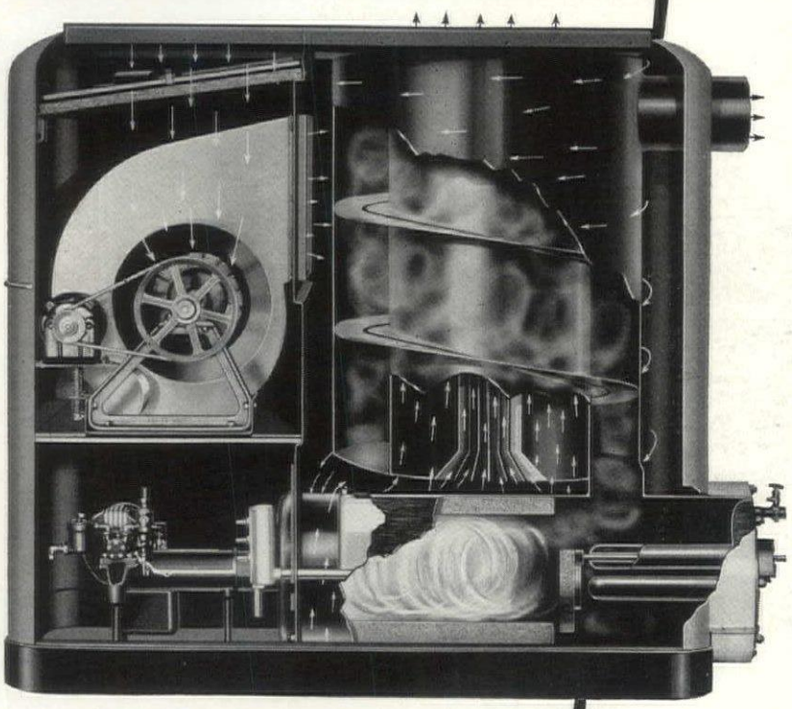
In addition, Armstrong's Vibracork—a special cork cushion—is installed under motors, fans, and other moving machinery to eliminate vibration transmission and noise.

Armstrong's Architectural Service Bureau will gladly work with you in developing your plans for the insulation and isolation of air conditioned buildings. Call our local branch or representative or write Armstrong Cork Products Co., Building Materials Division, 926 Concord Street, Lancaster, Pennsylvania.

Armstrong's CORKBOARD • CORK COVERING • VIBRACORK

NORGE

Fine Air Conditioning Furnace Unit



- COMPLETE CHANGE OF AIR EVERY 10 MINUTES
- 95% OF THE IMPURITIES REMOVED FROM AIR
- OVER 80% EFFICIENCY...AS COMPARED WITH 20% TO 40%
- CONTROLLED HOT WATER THROUGH HEATING SEASON
- QUIET, EFFICIENT FAN TO CIRCULATE AIR

This unit, by actual test, delivers to the rooms of the house from two to four times as much of the heat generated as the old-fashioned heating plant. That means extremely low operating cost.

In addition to providing heat, the Norge Fine-Air unit automatically circulates, filters, humidifies the air and heats plenty of water for household use. In summer it circulates the air or may be supplemented with cooling and de-humidifying equipment. The Norge Fine-Air Furnace is suitable for homes costing from $5,000 to $50,000.

Air conditioning is not just a desire for the future. It is a present demand. Get the facts about Norge heating and conditioning equipment. Call a Norge distributor or write direct to us.

NORGE HEATING AND CONDITIONING DIVISION
Borg-Warner Corporation, Detroit, Michigan

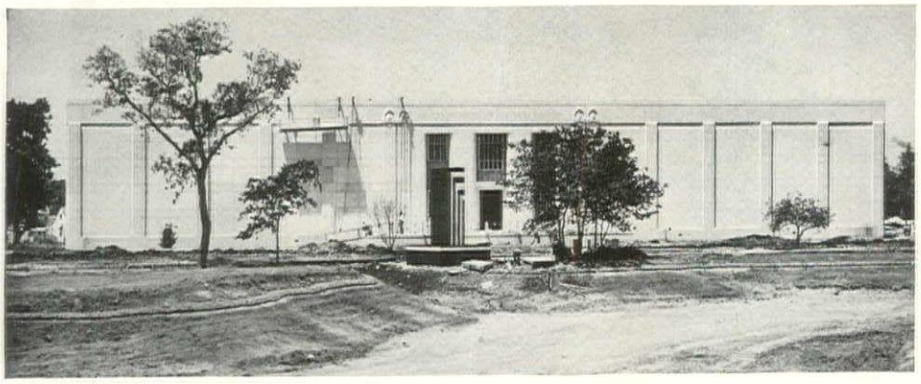
Get the complete story of Norge Home Appliances for apartment or home installation. There are distinct advantages in standardizing on Norge equipment—apart from the exceptionally high quality of the products themselves.

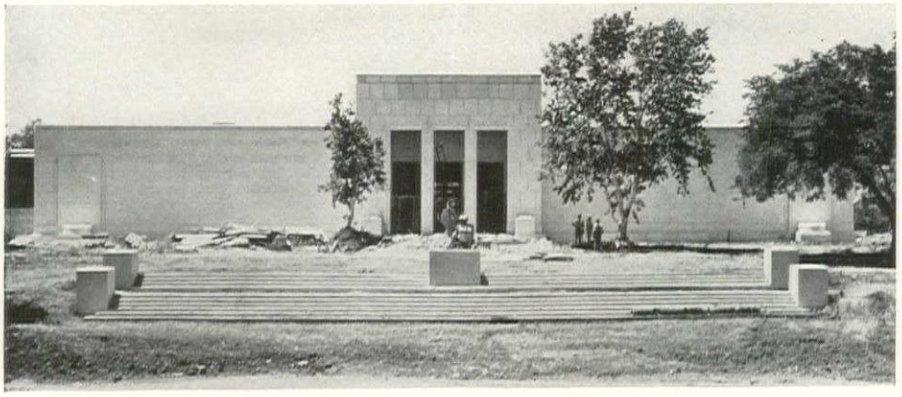
HEAT AND CONDITIONED AIR AT
Amazingly Low Cost

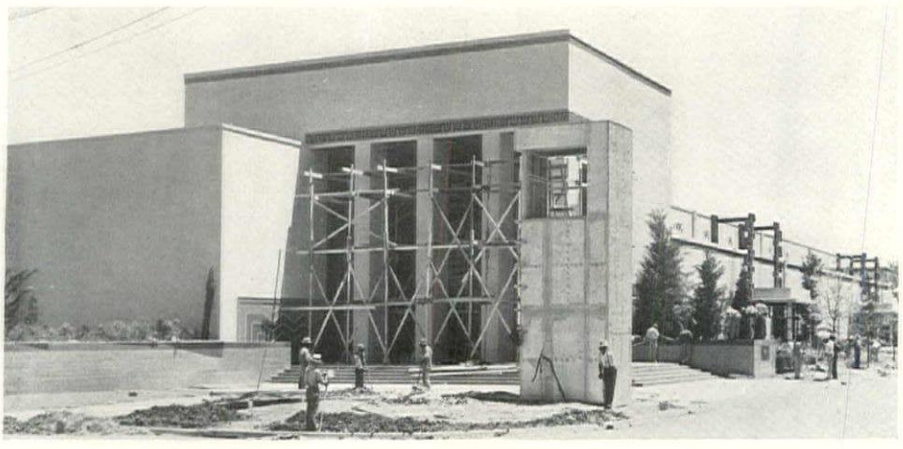
ROLLATOR REFRIGERATION (DOMESTIC AND COMMERCIAL) • GAS AND ELECTRIC RANGES • WASHERS AND IRONERS
WHIRLATOR OIL BURNERS • FINE-AIR FURNACES • AIR CONDITIONING • CIRCULATOR ROOM HEATERS

TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS







Architectural progress on Texas Centennial Fair buildings in Dallas

FACTS AND FAIRS

In Cleveland, Fort Worth, Dallas, New York and San Francisco last month, plans for Fairs of national scope went forward at a fast pace. From Cleveland, where the Great Lakes Exposition opens on June 27th, came the announcement that Otto Teegen and Irwin L. Scott, New York architects, have been appointed Art Directors for the Exposition. Meantime, things were humming in Texas. Many of the buildings for the Texas Centennial Exhibition, which is to open June 6th in Dallas, are nearing completion; and the largest single order ever given for theatrical costumes was placed with Brooks Brothers, the New York costumers, by Billy Rose for his "Frontier Frolic" in Fort Worth.

Because they were associated with the late Joseph Urban in a similar capacity for Chicago's Century of Progress, appointment of Otto Teegen and Irvin L. Scott as Art Directors caused little surprise. Just what the two have in mind for the Cleveland show is not known. In fact, as Mr. Teegen pointed out, even he has not decided. Said he: "While considerable experimentation has been engaged in, the color scheme for the Great Lakes Exposition has not yet been established. I can say, however, that regardless of the general similarity of purpose governing the plans, the color scheme of this Exposition will distinctly differ from that employed at the Chicago Fair and a more limited palette will govern. There we had to contend with a tremendous array of heterogeneous structures without relation to each other in plan or mass and the only thing they possessed in common was the color, the common denominator. Our palette there contained 24 colors. A palette of ten or twelve colors will suffice for the Great Lakes Exposition because of its more orderly arrangement. There will be a single basic tone, white, with colors used for supplementary purposes in small areas rather than on a huge scale, as in Chicago. That Exposition can truthfully be said to have made the public color-conscious and to have given people courage to employ brighter colors for their apartments and furnishings. Its influence even permeated the field of advertising and left a definite imprint upon illustrations, exhibitions, etc. Not only purer colors but better choices may be attributed to the influence of the Chicago Fair.

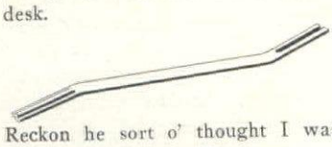
"Three years have elapsed, however, since Chicago's great effort and, as I

(*Continued on page* 14)

Honest Old Virginia Brick Joints

and Several Somethings You Ought To Know About Them— Whether You Want To Or Not

Last Wednesday dropped in to see a Boston architect: He was about as warmly cordial as the original iceberg. So I turned up my coat collar and reached in my grip for this piece of zig-zag iron, and laid it on his desk.



Reckon he sort o' thought I was threatening him. That's a true Old Virginian joint-striker, says I. He took it up and examined both ends. Asked why they were both alike. Told him. But don't think he believed it.

As you seem more interested than he did, I'll just turn down my coat collar and tell you all I know that's worth knowing about true Old Virginian joints, which won't take long. After which, might have something to say about that two-ended iron.

You see it's like this. Just because a few of the outstanding well-known Colonial-day houses of the big-rich have the slanted or weathered joints, a lot of architects seem to be dead sure they were *the* thing in those days. But they weren't.

Another bit of misinformation is that all joints were a half-inch or more wide. That's not so either. Being as how it was all lime or oyster shell mortar they used, the joints even though toned down by time, are still so white they look wider than they are. The truth is, there are plenty of quarter-inchers. And now and again even some that were buttered.

'Tother day got to prowling around among some musty Old Virginy building records. Ran across this: Half-inch joints are 30% of the brick in a building. Quarter-inch are 11½%. Got a smart college feller to figure back on those figures, and he found out the bricks came tolerably close in size to our Old Virginia Standards. Further down the page came across this reference to Thomas Jefferson's comments on the bricks in Monticello, made under his watchful eye: "It takes 4 hogshead of water to make a thousand brick. 11% of the bricks is mortar." All those bricks he referred to are Jefferson size. The size he started folks using in Virginia. They are exactly the same size as our True Jefferson Old Virginians we are making today down here at Salem. No brick maker need be so all-fired smart to add half an inch on top of a standard size brick and claim it's a Jefferson. But size is only one of the things that make a brick a True Jefferson. There's also the color, the softened edges, the now-and-again off-shapeness, the texture and that hardest of all to get—a born-old look. Believe you architects call it "time-toned," which reckon describes it best of all.

Although Mr. Jefferson had plenty of slaves he had it figured out to save wherever he could. Only 11% of his size brick being mortar, and there being a considerable passel less of them to make and handle, he was powerful strong for them.

So we Old Virginia brick-maker folks figure that it may not be any reflection on our intelligence to take all the brick leaves we can from Mr. Jefferson's book and if you should want, pass' em on to you.

While we are doing that passing, might be well to mention we make both the Standard and Jefferson-size Old Virginians. Either in mould-mades or hand-mades.

HENRY GARDEN
Brick Maker for
OLD VIRGINIA BRICK CO.
with Mr. Jefferson as a Guide

P. S.

Came well nigh forgetting to tell more about that joint striker piece of iron. It's the kind they used in Virginia Colonial days. Costs us 50 cents to have made by our local blacksmith. If at all interested, glad to send you one for what it costs us, or two for a dollar. But don't ask for 3 for $1.50. Our business is selling brick. The one and two offer is just to be accommodating.

OLD VIRGINIA BRICK

Old Virginia Brick Company
Salem, Virginia

TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS

PHOTO: WIDE WORLD

Grover Whalen, President of New York's 1939 World's Fair, congratulates W. Earle Andrews on his appointment as General Manager of the project

said, we contend with entirely new conditions, and pleasing the current era is our objective. Materials used for such structures no longer possess decorative features in themselves, so interest must be supplied to these large flat surfaces through a discreet employment of colors used in pleasing combinations, and in the right places."

The San Francisco Bay Exposition, Inc., put Senator Hiram Johnson's bill through the United States Senate, a measure giving their 1939 World's Fair the official recognition of the United States Government; and an architectural committee was finally appointed to take over the design of New York's 1939 World Fair. When the Senate passed the Senator Hiram W. Johnson Bill, authorizing President Roosevelt to invite all foreign nations to participate in the San Francisco Exposition in 1939, San Franciscans hoped it would sound the death knell for all groups interested in promoting World's Fairs in 1939. Passage of a similar measure in the House, known there as the Kahn-Welch Bill, will mean that plans can go forward at once to engage international participation. In the opinion of nearly everyone familiar with the situation, there will be no difficulty at all in getting the bill through the House. It is almost a certainty that San Francisco will be the site of a 1939 Fair.

Despite the Senate's passage of the Johnson Bill, New York is going ahead with plans for its own 1939 World's Fair. A proposed social theme and plan for the Fair was submitted to the Board of Design by an organization called "The Fair of the Future, 1939." The Fair of the Future's plan is primarily concerned with a matter of dramatizing and co-ordinating all factors of art, industry and science in the portrayal of expanding life in America. The facts of our everyday life will be so dramatized that the Midway, which is usually the big attraction at all Fairs, would seem tame in comparison. A synopsis of the proposed program is given herewith:

DEDICATION

1. This Fair for the first time should not be a mere demonstration of mechanical progress. This Fair must co-operate with Industry in dedicating itself to the service of Industry to human living.

2. The primary architectural consideration of this Fair must not be to create a rigid shell of superficial beauty having no relation to exposition technique. The architecture of this Fair must strive to express and maintain an organic relationship of exhibits.

FORM OF THE FAIR

1. This Fair for the first time must not confuse its dramatization of service by the usual division into such units as Machinery, Science, Agriculture, etc. This Fair must emphasize by controlled focal demonstrations, each within surrounding exhibits of individual companies, the principal factors in human life.

2. This Fair for the first time must not exhaust the public by faulty and circuitous circulation. This Fair must provide such a continuing relation of the focal exhibits as to maintain throughout its system a progressive circulation.

3. This Fair for the first time must not demonstrate human effort by isolated examples in displays meaningless through their lack of relation. This Fair must demonstrate always by integrated and sequential exhibits the fabric of man's life.

4. The exhibits of this Fair for the first time must be not static but dynamic.

5. This Fair for the first time must not demonstrate the products of yesterday and today in the artificial setting of the conventional salesroom normally found at a Fair. This Fair must demonstrate for the citizens the immediately realizable tomorrow as shown by the products of Industry in their functional environment.

PHOTO: WIDE WORLD

Members of the Board of Design for New York's 1939 World's Fair include, left to right, Walter Dorwin Teague, Gilmore D. Clarke, Jay Downer, Stephen F. Voorhees, Chairman of the Board, William A. Delano, R. H. Shreve, and Robert D. Kohn

BUILDING BAROMETER RISING

Clear weather ahead continues to show in the rising building barometer. According to F. W. Dodge Corporation reports for thirty-seven eastern states, contracts awarded for residential building in April, 1936, reached a total of over sixty-seven million in value. Not since June, 1931, has such a total been reached. This is a gain of almost sixty per cent over April, 1935, figures, and of twenty-one per cent over March, 1936, totals. As a result of this, the residential building total thus far in 1936, is more than one hundred ninety-one million, which represents a gain of sixty-nine per cent over the first four months of 1935. Contracts awarded for non-residential work in April, 1936, went above the ninety-four million mark. This is the highest non-residential figure,

ANNOUNCING

THE KITCHEN SINK THAT SCIENCE BUILT

FOR AMERICA'S HOUSEWIVES

THE CRANE *Sunnyday* CABINET SINK

—the axis of the scientific kitchen

Plan no more kitchens without studying the details of the startling new Crane SUNNYDAY Cabinet Sink. If only for its fixture panel or its new depressed drainboards alone, every woman interested in her kitchen (and who isn't!) will instantly desire it. She'll do without something else if she has to—in order to give her kitchen the scientific convenience of the SUNNYDAY. This new sink, in various styles, will soon be exhibited in Crane exhibit rooms in your vicinity. Take advantage of Crane Co.'s complete kitchen planning service to architects. Suggested floor plans and perspective illustrations in color if desired. Send for "Science Examines The Kitchen"—foremost manual on scientific kitchen arrangement—and full details of Crane co-operation.

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THESE ARE FEATURES

Women have been waiting for!

THE SINK

1. ACID-RESISTING PORCELAIN FUSED ON SOLID DURABLE CAST IRON.
2. BEVEL FIXTURE PANEL SOLVES FOREVER THE OBTRUSION OF FAUCETS AND SPOUT INTO BASIN WORKING AREA.
3. DEPRESSED DRAINBOARDS CONFINE SPLASHING, AID CLEANLINESS, ALLOW FREER USE OF SPACE FOR CLEANSING TASKS, REDUCE BREAKAGE.
4. FOUR-INCH BACK PERMITS LOWER KITCHEN WINDOW.
5. RETRACTABLE SPRAY FOR WASHING SINK, RINSING DISHES AND VEGETABLES.
6. CHROMIUM-PLATED FIXTURES; SWINGING SPOUT, LARGE CUP WASTE STRAINER.
7. SAFETY LEDGES APART FROM DRAINBOARD FOR DRYING GLASSES AND STEMWARE.
8. OFF-CENTER DRAIN CLEARS BASIN BOTTOM FOR LARGER WORKING AREA; NARROW BASIN RIM ELIMINATES REACHING.

THE CABINET

1. BRILLIANT BAKED-ON HARD ENAMEL FINISH ON DURABLE STEEL.
2. INSULATED DOORS AND DRAWERS FOR QUIETNESS AND RIGIDITY.
3. CUTLERY DRAWERS, LINOLEUM LINED, AND WITH PARTITIONED SLIDING TRAY.
4. CHROMIUM-PLATED STREAMLINE "FIT-THE-FINGER" HANDLES.
5. SEMI-INVISIBLE HINGES THAT WILL SWING FREELY, PREVENT "STICKING" OR SAGGING.
6. TOE-SPACE UNDER EVERY CABINET.

except for that of December, 1935, since October, 1931. This April, 1936, figure more than doubled that for non-residential building in April, 1935, and represented a gain of sixteen per cent over March, 1936.

Activity in educational building was one of the chief factors in the increase. Listed below are the April, 1936, contract totals in important classifications covering new and modernization programs.

Residential and Non-Residential Building April, 1936

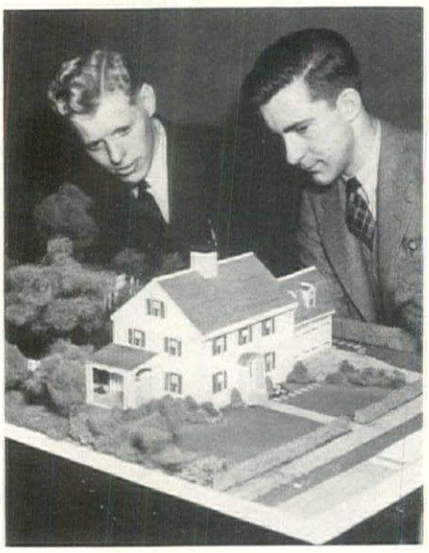
Class	*No. of Proj.*	*Valuation*
Dwellings	7,206	$44,904,100
Housing Developments	540	11,687,100
Apartments	394	6,937,200
Dormitories	36	1,941,200
Hotels	57	1,681,400
Offices	33	6,065,300
Schools and Colleges	262	21,310,900
Libraries	28	1,156,600
Hospitals	50	3,868,200
City Halls	108	3,185,600
Post Offices	20	1,665,600
Churches	123	1,900,800
Theatres	88	2,087,400
Park Buildings	120	4,219,200
Factories	450	25,545,600

Courtesy F. W. Dodge Corporation

Even more significant is the increasing importance of the architect in the building field. New work planned by architects is progressing even more rapidly than that of new construction. In 1933, of the total construction volume, 57.2% was architect-planned. By 1935, the amount of architect-planned work had increased to 67.8%, and for the first quarter of this year, the proportion shows a further jump to 73.8%.

MODEL HOUSE

In line with the present architectural education trend of simulating actual conditions as closely as possible in development of scholastic projects, the new system tried out at Massachusetts Institute of Technology has aroused considerable interest, and has met with a good deal of success. Although design is usually associated with advance work in architectural study, freshman and sophomore students at the School of Architecture at M. I. T., come in contact with the realities of the profession from the beginning of their training. This past year freshman and sophomore students designed a seven-room house inspired by early Eighteenth Century Colonial forms. It was designed to meet the requirements of comfort, taste, and economy for an average family. The designers and their classmates chose and managed the purchase of a lot, and are now supervising each stage of construction under actual conditions of architectural practice. When completed, the house will be marketed, and the proceeds used for carrying on a similar project by next year's class.



Left to right, Samuel Scott, freshman of Weymouth, Mass., and Thomas B. Akin, Jr., of New Bedford, Mass., a sophomore of Massachusetts Institute of Technology, inspecting the model of their seven-room house, which will soon be built

REAL ESTATE BONDS

After an April decline of 2.5 per cent, average prices for Eastern real estate bonds increased 0.3 per cent during May, according to statistics compiled by Amott, Baker & Company on the market action of 200 typical issues. The rise for the first five months of 1936 is 2.6 per cent.

The average price per $1,000 face value increased from $398 to $399. The average quoted price was $389 on January 1.

New York City prices decreased 0.5 per cent during May. Increases were noted on issues in the four other cities used in compiling the averages. The gains were, Philadelphia, 3.3 per cent; Boston, 1.6; Pittsburgh, 4; and Buffalo, 0.7.

Boston issues, which have risen 11.1 per cent since January, commanded the highest price, $581. Buffalo issues, unchanged in the five-month period, were quoted at $414, and New York, also unchanged, at $383. Pittsburgh prices were $284 and Philadelphia issues, which have increased 9.3 per cent since January 1, were quoted at $377.

Hotel issues, which have increased 7.7 per cent in the five-month period, rose 3.1 per cent in May. Other May increases were, theatres 8.6 per cent and apartment hotels, 0.6 per cent. Office buildings decreased 0.7 per cent and housekeeping apartments dropped 0.1 per cent.

PRIX DE ROME

The American Academy in Rome recently announced the winners of its annual competitions in sculpture, painting, architecture, and landscape architecture. The Fellowship in sculpture was won by Harrison Gibbs, twenty-seven, of Rosemont, Pa. Mr. Gibbs studied at the University of Pennsylvania and at the Philadelphia Academy of Fine Arts.

The Fellowship in painting was awarded to Matthew William Boyhan, twenty years old, of Newton Center, Mass. Mr. Boyhan studied at the Museum School of Fine Arts in Boston and under Charles H. Woodbury.

Richard Ayers, twenty-five, won the architectural Fellowship. Mr. Ayres is a graduate of Yale, and is now with Frederick Godley, architect of New York.

Robert S. Kitchen, twenty-three, of Dayton, O. won the landscape architecture Fellowship. He was graduated in architecture from Cornell University, last year, winning the Charles Goodwin Sands Medal for the best all-around record in design. He also studied landscape architecture at Cornell.

ARCHITECTS AT COLUMBIA

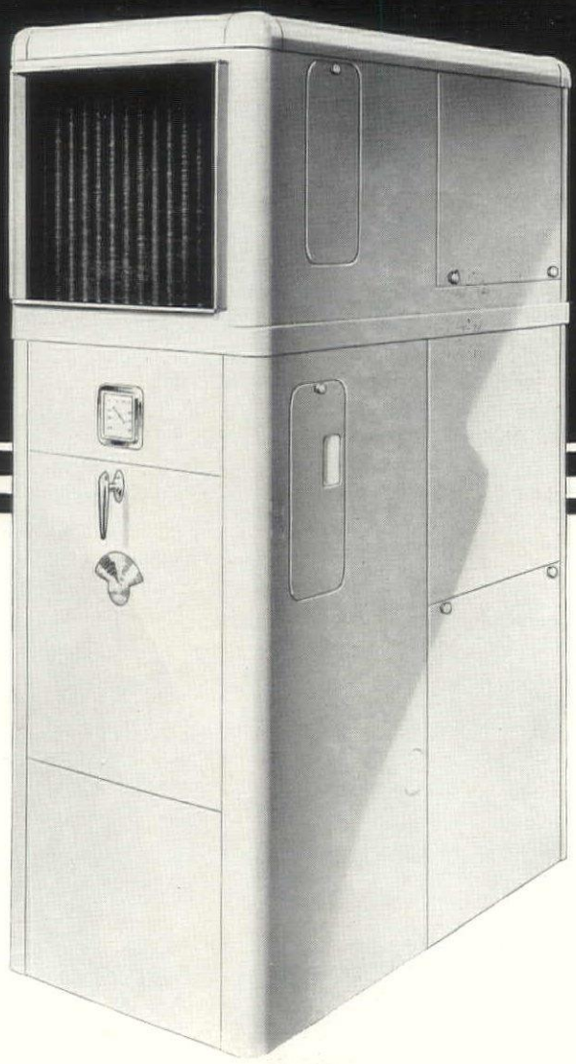
Seven New York architects were recently appointed to the faculty of the Columbia University School of Architecture. Edgar I. Williams, John Crosby Brown Moore, and Donald A. Fletcher were named Associates in Architecture, to be in charge of instruction in design. In accordance with the School's new plan of relating the study of design to "a creative and living architecture" four visiting critics have been appointed. They are Arthur Loomis Harmon, of the firm of Shreve, Lamb & Harmon; William Lescaze; J. Andre Fouilhoux, and George Howe. According to acting Dean Leopold Arnaud, "the practitioners of distinguished reputation will be called upon for advice and criticism of student work in design, thereby giving the student greater breadth of instruction. The plan of instruction is to simulate in the problems actual contemporary conditions as closely as possible, stressing the fact that design and construction are interdependent and inseparable. This method was established in the School two years ago, and is giving excellent results."

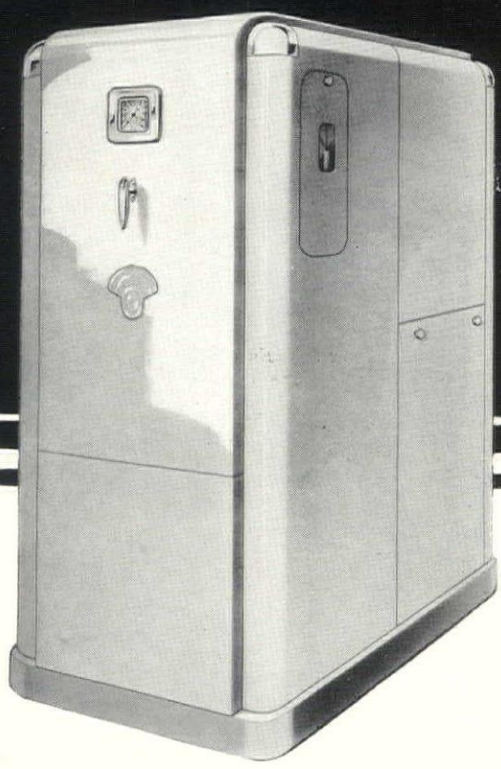
All of the appointed critics have been associated with modern design. Mr. Harmon's firm designed the Empire State Building. Mr. Fouilhoux was one of the architects of Rockefeller Center; Mr. Howe was architect of the Philadelphia Savings Bank Building, and Mr. Lescaze has long been recognized as an outstanding functionalist.

The two outstanding units!

for boiler-air conditioning

for automatic heat





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The FITZGIBBONS OIL-EIGHTY AUTOMATIC

They have taken the heating world by storm! Their beauty, compactness, economy, and above all, the *completeness* of the service which these units render, have made them preferred equipment by everyone from architect to home owner.

Learn *why* these units fulfill their functions so efficiently — *why* they both give YEAR-'ROUND HOT WATER without a storage tank — why they operate with ANY OIL BURNER, AUTOMATIC STOKER, GAS BURNER. Get the facts—write to-day.

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"It is certainly a cinch to cure SCRATCHITUS"

asserts eminent scientist,
DR. SMOOTH*

TIMIDITY, that shrinking sensation. Embarrassment. Pencil-loathing, the fear that folks can't read your writing.

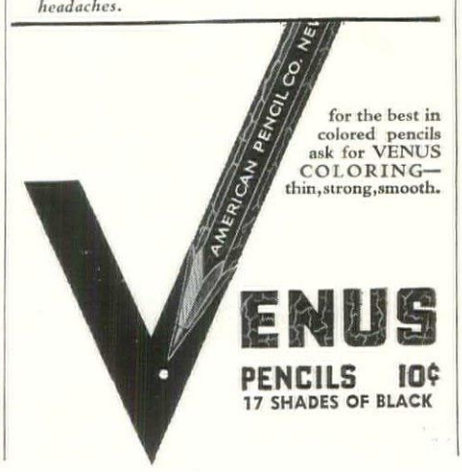
Four out of five men have these dread symptoms. Yet how ridiculous, leading writing scientist proclaims. Hark to the internationally famous, yet shy Dr. Smooth.

"Scratchitus (gritty pencils) can be cured by men who are open-minded. Simply change pencils. Get out of the rut. Venus Pencils—in 17 degrees of hardness and softness—give super-service. May I say in all modesty—they're wonderful!"

These are welcome words for worried business men and women, for Scratchitus (gritty pencils) is an unpardonable sin. It demotes men commercially. It disrupts happy homes. It's just too insidious.

People everywhere are giving Venus Pencils a trial, then adopting them.

** Famous diagnostician and discoverer of patented colloidal process used in making lead for Venus Pencils. He saves thousands from daily headaches.*



for the best in colored pencils ask for VENUS COLORING—thin, strong, smooth.

VENUS
PENCILS 10¢
17 SHADES OF BLACK

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

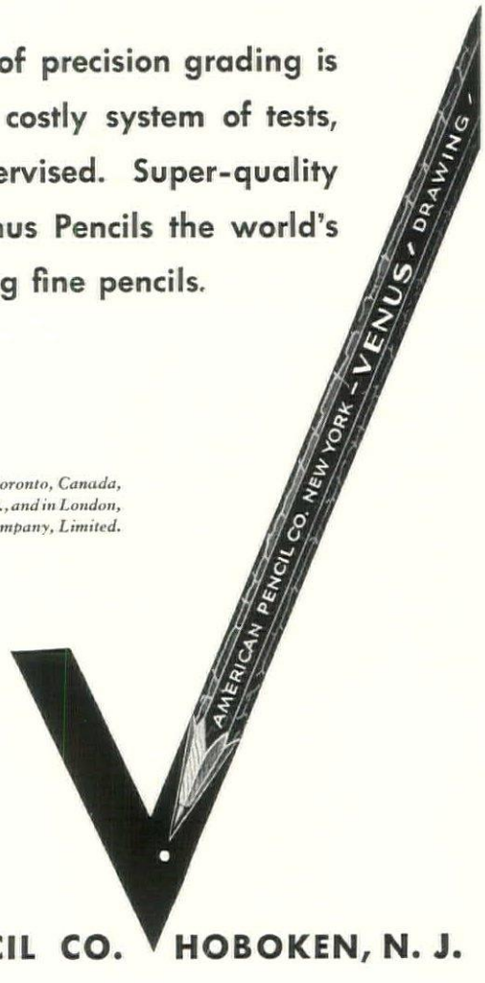
We have to tell the general public in this advertising what you already know —Venus Pencils are smooth.

Professional men, like yourself, are more interested in accurate grading, another Venus superiority.

Absolute precision—that is what makes Venus Pencils extraordinary. Every pencil in each of its 17 shades of black is always identical.

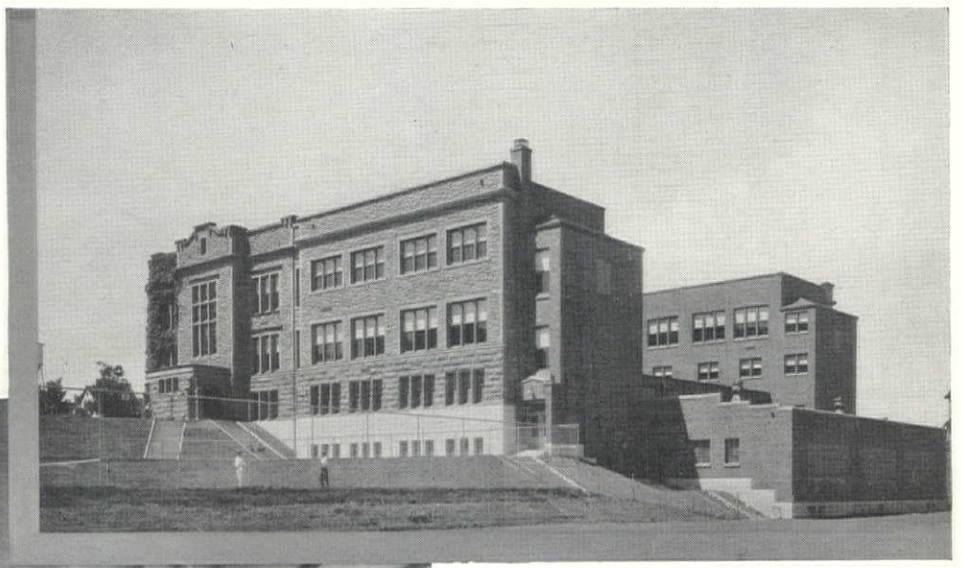
Your guarantee of precision grading is supported by a costly system of tests, elaborately supervised. Super-quality has won for Venus Pencils the world's preference among fine pencils.

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.

THE ARCHITECT SAYS . . .
about CHLORINATION



High School at Painesdale, Mich., and below, a view of the pool—John D. Chubb, Chicago, Architect.

The water in this pool is continuously recirculated, filtered—and sterilized with a W&T Chlorinator.

John D. Chubb says . . . . . "The W&T Chlorinators installed in the Painesdale High School have proven to be most satisfactory. The School Board, as well as myself, are well pleased with the excellent manner in which these chlorinators keep the swimming pool water up to a high uniform standard of purity. This is also in line with my experience with W&T equipment used in many other school buildings for which I have been the architect during the past 20 or 25 years . . . . . "

The continued satisfactory operation of W&T Chlorinators is the direct responsibility of a nationwide organization operating from 29 District Offices. Chlorination specialists will be glad to co-operate with you on any problem of water treatment. Feel free to call on them.

Ask for the W&T Swimming Pool Series reviewing sterilization of 8 different classes of pools.

"SWIM IN DRINKING WATER"

WALLACE & TIERNAN CO., INC.

Manufacturers of Chlorine and Ammonia Control Apparatus

NEWARK, NEW JERSEY

Branches in Principal Cities

The Glenn Building before remodeling...and as it is today

Rebirth in Cincinnati

HERE'S an office building that has a new lease on life—and lots of leases from new tenants, too! It's the Glenn Building in downtown Cincinnati, Mr. Walter A. Mundorff, Manager. This is the largest remodeling job ever made in the city. Plans for modernization were under the direction of Mr. Jesse F. Calvert, Architect.

A dual problem was presented. First, to create a modern-appearing building; second to provide for the particular needs of its clientele.

An essential need was an adequate supply of water through all seven stories of the building because a majority of the tenants are dentists, chiropodists, beauticians, etc.

The old plumbing system, consisting chiefly of steel pipe (with short runs of lead and brass pipe which had been installed as replacements) was totally inadequate.

To remedy this condition the William A. Boyle Company, Cincinnati, installed 3000 feet of Revere Copper Water Tube (Type L) . . . supplied by the Mutual Manufacturing and Supply Company of Cincinnati.

Eleven riser shafts were used so that 30 pounds pressure could

be maintained on the seventh floor at all times. Separate shafts were run to supply the lavatories on each floor. Also, provision was made for more than 250 additional outlets.

Mr. Mundorff, manager of the Glenn Building, says: "We selected Revere Copper Tube and Streamline soldered Fittings to have a trouble-free plumbing system and eliminate constant plumbing repair bills. On obtaining costs for the plumbing, we found that the long life of copper tube and the savings in installation cost with Streamline soldered Fittings made the cost about the same as if we had used rustable pipe and threaded fittings."

Have you a client for whom you are planning to modernize the plumbing system? Consider these specific advantages of Revere Copper Water Tube: (1) it is non-rusting and provides lifetime service; (2) it insures a full flow of water at all times, thanks to its gun-barrel interior finish; (3) no threading . . . joined with Streamline soldered Fittings only useful metal has to be paid for; (4) long lengths can readily be worked through riser shafts, which means less tearing up of walls and reduction in attendant masonry, carpentry, and painting costs; and (5) where required the tubing can be bent, which saves many extra fittings.

Glance down this check-list and see where other copper and copper alloy products can protect any building from future repairs. If you're planning a new building, secure that protection right from the start by specifying Revere products.

For *roofs, skylights, cornices, and other sheet metal work* . . . use Revere Sheet Copper, standard of America.

Through-wall flashings . . . use Cheney Flashing or Revere Thru-Wall Flashing.

Special decorative sheet metal effects . . . use Revere Leadtex (lead-coated sheet copper).

Entrances, fronts and grilles . . . Revere Architectural Bronze Panel Sheets and Extruded Shapes.

Hot water storage tanks . . . use Herculoy, as strong as mild steel and as non-corrosive as copper, or Revere Sheet Copper.

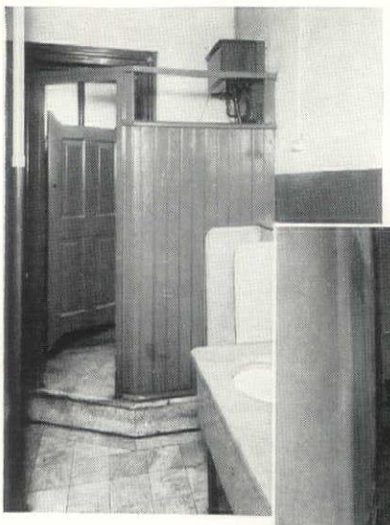
For information on any of these products, address our Executive Offices.

The Revecon System... Modernization's Newest Aid*

Today's architectural trend toward the use of flat sheet materials has necessitated the development of new elements with which these new material forms may be applied over any type of superstructure. The Revecon System accomplishes this by utilizing extruded structural metal shapes which can hold any rigid flat sheet material (up to $\frac{9}{16}$" thick) including glass; or formed-edge panels in any metal. The shapes are made of a strong rust-proof alloy. The system operates with equal effectiveness on interiors or exteriors.

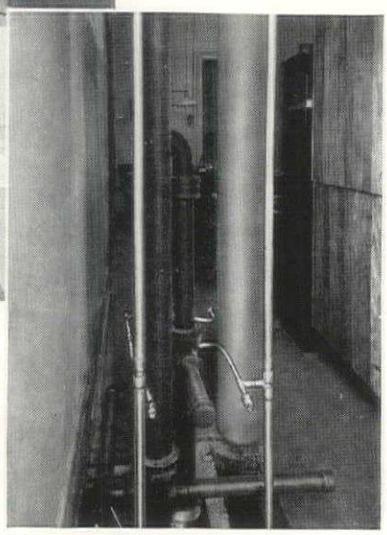
A valuable handbook describing the Revecon System is being prepared and will be sent on request when completed.

**U. S. Patents 1,973,795, 2,005,994 and 2,012,070*

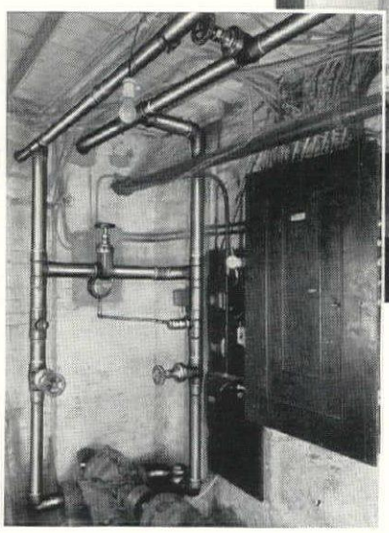


LEFT: Old-fashioned lavatory before remodeling.

RIGHT: Now the lavatories are up to date.



RIGHT: Risers of Revere Tube joined with Streamline soldered Fittings.



LEFT: Large size tube in basement. Note the trim fittings.

Copper *and* Brass Incorporated

Founded by Paul Revere 1801

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Sloane-Blabon AHOY!

Henry Davis III, Architect

Sloane-Blabon Linoleum, Azure Blue with Gray center circle and stars of Clear White, plays an important part in the decorative scheme of the club's lounge.

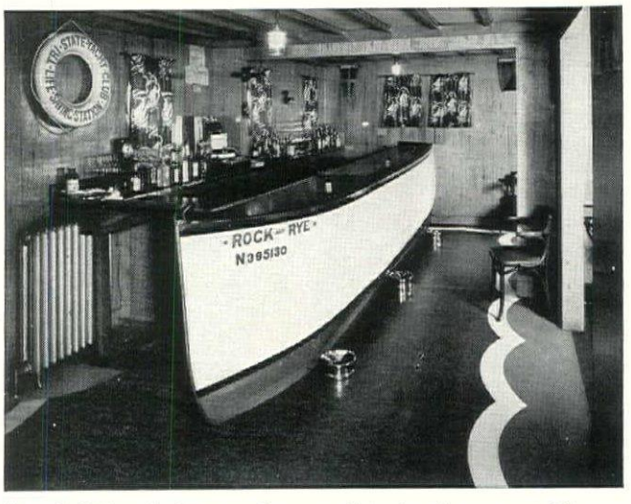
* * *

The Sloane-Blabon Linoleum floor in the bar, below, is particularly colorful. The largest area is Azure Blue; the wave effect, Clear White; the border, Burgundy.

IT goes without saying that a yacht club should have a nautical atmosphere. How well this has been achieved in the Tri-State Yacht Club at Essington, Pennsylvania, is shown in the accompanying photographs.

The officers of the club have been good enough to say the following about the contribution of Sloane-Blabon Linoleum to the attractiveness of these rooms:

"The smart and colorful appearance of the linoleum floor attracts all-comers and completes two extremely pleasing rooms. We are well satisfied with Sloane-Blabon Linoleum and the manner in which it stands up under hard wear."



We shall be glad to send you a list of other recent Sloane-Blabon installations together with our new, profusely illustrated Linoleum Handbook. Write W. & J. Sloane, Selling Agents Division, 295 Fifth Ave., New York.

SLOANE-BLABON LINOLEUM

Announcing

AMERICAN ARCHITECT and ARCHITECTURE

DURING sixty and thirty-six years, respectively, AMERICAN ARCHITECT and ARCHITECTURE have been serving the architectural profession in America. In that period the world has seen American architecture move steadily upward from the status of an awkward child among the arts until it has now reached the full stature of a leader among the building nations.

■

It is with some measure of pride in the part these two journals have played in that progress, and with a vivid realization of the still larger task looming ahead, that the respective publishers have determined upon a consolidation of AMERICAN ARCHITECT and ARCHITECTURE in the interests of a greater service to the architects of America.

■ ■

This country is entering upon a new phase of its development. The pause that the recent depression has induced in our building has had at least one marked effect: a widespread conviction that *America must be rebuilt.* Our knowledge of techniques, our recently gained wealth of new materials, new methods, new inventions, have suddenly far outdistanced our achievements. There spreads among us a vast discontent with what we have built. We can do so much better now,—we shall build far better structures tomorrow. In this better building the architect is the creator and co-ordinator. The service that these architectural journals have rendered the architect is now a matter of history. The service that they can provide, welded together—with the added power of a consolidated staff—one united effort rather than two independent ones of smaller magnitude, is something that must speak for itself in the days to come.

■ ■ ■

AMERICAN ARCHITECT and ARCHITECTURE will carry on the work of providing the architect with his professional journal. This journal is to be made *by* architects *for* architects. It has a definitely circumscribed field of immense potentialities—the architect of today will show how to rebuild America. Other branches of the building industry need, and have, their own periodicals—the engineer, the contractor, the banker, the real estate operator. Their varied needs are not the needs of the architect. He deserves, demands, and will have his own journal of information, instruction, inspiration. . . . AMERICAN ARCHITECT, with which is incorporated ARCHITECTURE, beginning with this June issue, will, we confidently hope, continue to measure up to that need.

PRACTICAL SMALL HOUSE PRACTICE

The small house requires the services of thinking architects. This largest single item in the country's building budget has been neglected by the profession for financial reasons. To serve this field on a professional basis, not as a philanthropy but as a straightforward economic venture, a group of architects has practiced in Detroit for the past year, as described

BY CLAIR W. DITCHY

TO produce better small houses through the medium of architectural service, Small House Associates (of Detroit) was formed May 15, 1935, by Clair W. Ditchy, Howard L. Farley, Leo I. Perry and Victor C. Adler, all registered architects. It aimed to assist in the movement sponsored by the Federal Housing Administration to promote new residence building, and, at the same time, to improve the standards of design and construction.

Many problems confronted the new organization. This was a field in which the architect had never engaged extensively and no established precedent existed as to the manner of administering this particular type of architectural service or the proper charge to be made for it. However, a number of ideas were prevalent, the most popular one being that the architect could not possibly function in this field unless he undertook it as a philanthropy. As Small House Associates was not organized as a benevolent society, it did not share this view, nor did it accept the theory that the architectural profession should maintain a free clinic or architectural dispensary. It subscribed rather to the theory that any one financially able to build is financially able to pay for one of the most valuable elements of his building venture, i.e., his architectural service.

The scheme of establishing a bureau had been rejected because it had been felt that a bureau, unless it were a closed affair, might be difficult to control, might result in a dilution of responsibility, might over-emphasize the value of plans as contrasted with the other elements of architectural service, and might suggest the patronizing character of a clinic. Further, if the venture were not a success, it might reflect unfavorably on the whole profession, but as a private venture, this danger would be eliminated.

It was finally decided to announce as our objective the production of better small homes, and that we were prepared as architects to assist in any way we could to accomplish this end. We entered the field with open minds, realizing that our first efforts must be largely experimental, that preconceived notions might have to be abandoned, that we must try everything or anything that was honest and direct. We were invading a "market" completely monopolized by speculative builders who had established the prevailing standards of public taste and opinion and who had made use of every modern device to proclaim their wares, i.e., advertising in every form, the corner real estate office febrile with a rash of signs, high and low pressure salesmen, model homes, the radio, billboards, newspapers, hand dodgers, etc. An attempt to enter this field in a passive manner, even with the splendid endorsement of architectural service which the Federal Housing Administration was giving, would have died aborning. Consequently, banks, mortgage houses, realtors and others interested in the small house field were approached, speeches made before interested groups and over the radio, newspaper advertising was used (merely as an announcement and in a manner not to offend the most delicate of architectural sensibilities), local magazine and newspaper publicity was gladly accepted. The fact that Small House Associates had been formed to offer architectural service of every sort in the small house field was emphasized.

During the past year the following types of service have been rendered:

For banks, appraisals of old houses, appraisals of proposed houses, remodeling of old houses, criticism of plans for proposed houses with suggestions for improvement, and interviews with prospective home owners who had come to banks for advice.

Architectural service to operative builders.

Architectural service to realtors.

Architectural plan publication service in newspapers.

Co-operation with FHA and FHA lending institutions in missionary work and other matters of public education.

Architectural service to individual clients for houses as low as $4,500.00.

No opportunity to gain experience in the field was rejected even though it entailed financial loss.

After a year of such experience some of the conclusions reached were these:

1. The small house is an extremely difficult problem which requires extensive study and thorough familiarity with the field. Not many architects have given it sufficient attention to do it justice and in many cases this has reacted against the profession. The general tendency has been to dwarf a large house and call that the answer.

2. Much can be learned from the builder who has discovered that economies must be practised in the small house which are not considered in larger houses.

3. Mass development controlled by the architect offers possibilities. Street or group harmony will minimize the necessity of, or the demand for, a great variety in individual exterior embellishments, with consequent economy. To achieve the best results the architect must retain control of any mass development.

4. Any effort in this field which emphasizes plans as the main need for, or a definite assurance of, obtaining a good house, or which in any way tends to promote the long and firmly established conviction in the minds of the public that the one and sole purpose of an architect is to draw plans is pernicious and should be discouraged.

5. Houses costing $5,000.00 or slightly more or less constitute a special class. There is no room economically for both the builder (or general contractor) and the architect in the building of a single house in this class. In the past the builder has eliminated the architect. The architect must either eliminate the builder or make some modified arrangement which permits the architect to retain control for the owner over the entire operation, which will eliminate any duplication of supervisory services and which will keep costs at a minimum.

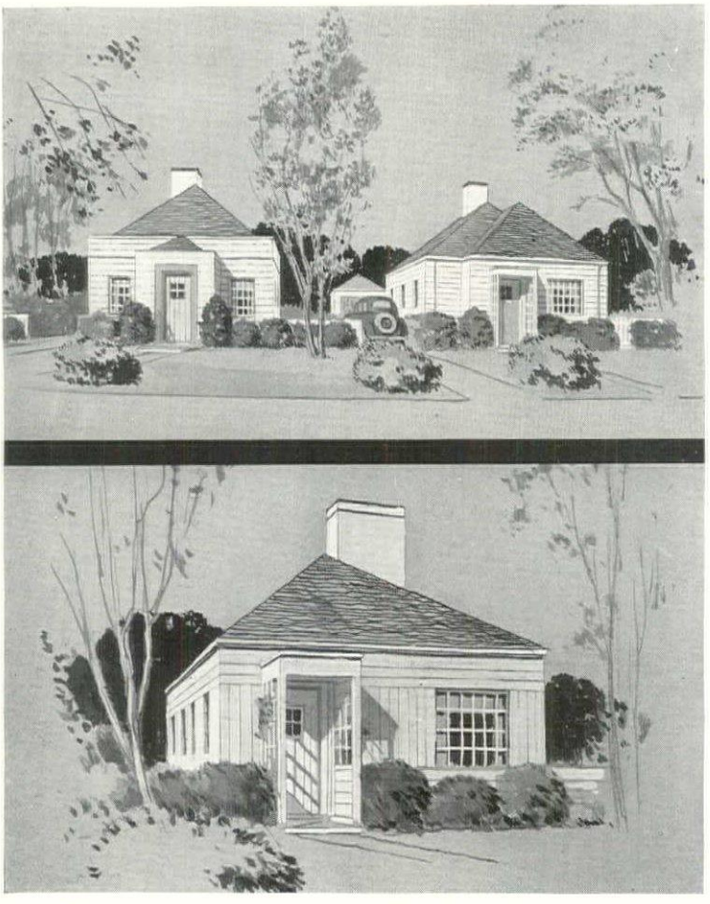
One proven method is for the architect to retain the mason or carpenter contractor as his representative on the job to correlate trades, to report progress and in general to run the job. The architect personally from his fee pays the contractor a stipulated sum for performing this service. The architect issues all certificates and makes supervisory visits as usual.

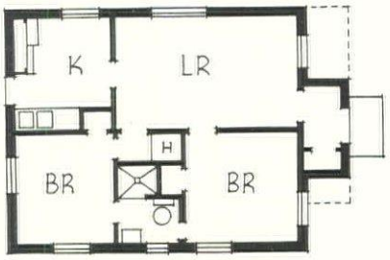
6. In mentioning the cost of a house, the architect's fee should always be included. To do otherwise may be regarded as an evil practice which often misleads the owner, and tends to give the impression that the architect's services are desirable but are not the indispensable element which they should be in every building undertaking.

7. The method of rendering architectural service for the small house may vary in different parts of the country. Conditions which affect the situation differ so greatly that what may prove highly successful in one locality may be a failure elsewhere.

8. A successful practice in this field can be established, but it may require aggressive policies not too common to the profession. Predicating our efforts on the assumption that the profession of architecture is charged with the duty of servicing every serious form of building activity, and recognizing from a social standpoint the importance of the small home, we are convinced that the profession must discover and promote methods which will produce better small homes for the majority.

A FEW OF THE HOUSES DESIGNED BY SMALL HOUSE ASSOCIATES (OF DETROIT)



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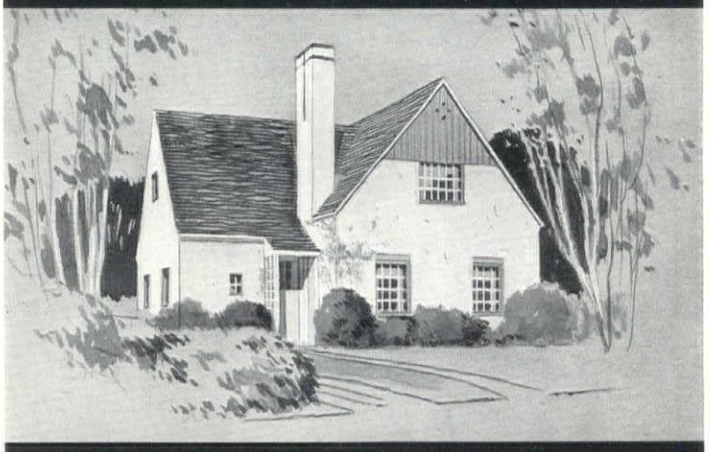

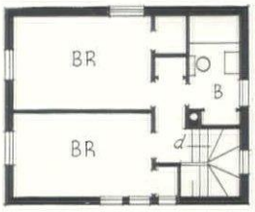
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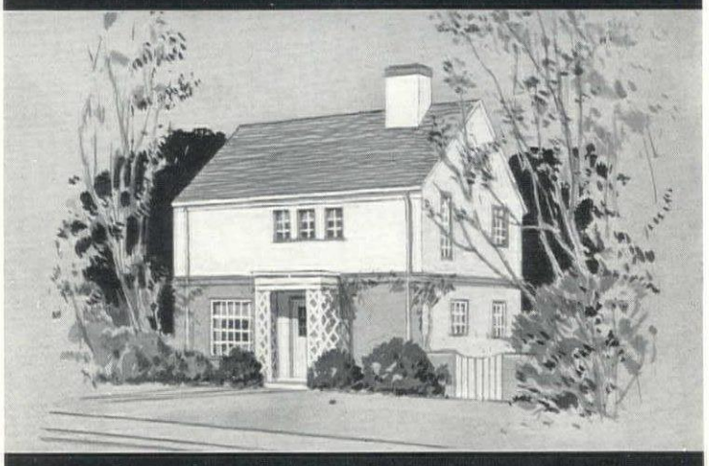


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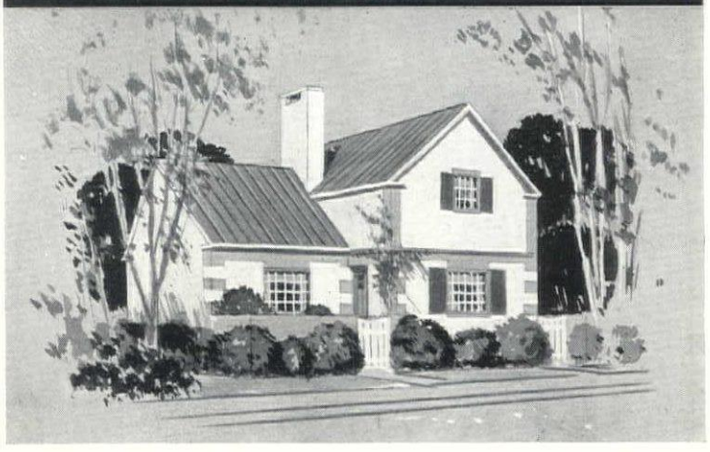


SO WE WENT TO WILLIAMSBURG

according to this unconventional account of the convention

by **ROGER ALLEN,**

sage and seer of Grand Rapids, who writes as he rides,—

I WAS dumbfounded when they asked me to write this. And I do not dumbfound easily, either, as any of the boys up at the county seat will tell you. But after thinking it over carefully, I said to myself, "I see it all now. The architects want a fresh viewpoint. Instead of having some city slicker describe the convention, they want a story by a boy from up at the forks of the creek, one who is riding on the steam trains and eating boughten meat for the first time in his life.

"These New Yorkers," I mused, "I bet they think to themselves that Grand Rapids is a remote settlement set two whoops and a holler from civilization. They figure that I will come down to that convention carrying a flintlock musket and a knapsack full of hominy grits, and spend my time complaining that the hard sidewalks hurt my feet.

"Such goings on," I said to myself, "to believe such stuff as that about a citizen of the Queen City of the Unsalted Seas (as I have nicknamed Grand Rapids, due to the fact that there is no unsalted sea within thirty miles of it). I do not come from the sticks, but from the town that turns sticks into furniture for 'em. But I'll humor this editor. I'll write him a letter saying as how he has hired himself a hand, and that I'll be right down there as soon as I can get one of the neighbor boys to come over to feed the hogs and fork down some hay for old Bess whilst I'm in furren parts."

Well, I talked it over with my wife and one word led to several million and in due time we started traveling. They say that travel broadens a man; it better not broaden me, as already it is all I can do to get in behind the wheel of my Ford. But it is broadening mentally. In Akron, for instance; we were walking down a hill to the hotel—in Akron you are always either walking down a hill or up a hill—and we overheard a large, determined woman say to her spouse, "And there *was* a time when I thought I could trust you anywhere." Just that and nothing more. "An American tragedy in one line," said I to my wife.

And we discovered, going over the mountains in Pennsylvania, that the mountaineer has vanished. There are no more hillbillies in the hills. They are all down to the city, trying to get an audition. Major Bowes will have to answer for thus depopulating our vertical scenery. Then we were in the middle of the Blue Ridge Mountains and the only way we could get to hear a rich contralto crooning that "she's be comin' raound the maountain when she comes" was to turn on the car radio, which we didn't do, so she didn't either so fur as I know.

So we got to Washington all safe. Washington is a city consecrated to the highest charms of life; a city without the intrusion of industrial production. I didn't think this sentence up for myself; it is printed right on the back of a map of the city I bought for ten cents (the map was ten cents, not the city). Personally I consider that this remark is a great big lie. As far as I can make out, Washington is consecrated to 4,200 taxicabs, all of which scare the life out of me every time I cross Dupont Circle. If this is the more abundant life, I am just a horse and buggy boy.

That evening it stopped raining by accident, and we walked down Pennsylvania Avenue and peeked through the railing at the White House. We dared each other to walk right up to the veranda and ring the door bell, just to see what would happen, but neither of us dast do it.

I know Washington like a book; better'n most books; 'cause I was stationed there part of the late unpleasantness with Germany. So I agreed to pilot my wife to the Willard Hotel, only when we got inside it turned out to be Loew's Fox Theatre, which explains why we had to buy tickets in the lobby.

"Is this fellow ever going to get to the convention?" you says. I'd of got there quicker if they was going to make me a Fellow. I'm going to write 'em to find out what sort o' fellow a fellow's got to be to be a Fellow. Well, my wife took the 'lectric train for New York, and I headed south fo' th' Sunny South, Old Point Comfort.

Right away I got into trouble. You know those markers along the Virginia highways reciting the historical facts about the region. Well, I'm a great fellow for history, and I read all those markers faithfully, while traveling at fifty. Unfortunately, while I was craning my neck around to read I run right spang past a sign saying "curve" or "Narrow Bridge." That got me into hot water and hay barns. I kept finding myself on back roads where the sole traffic was a languid mule astrided by a lanky colored boy. And some of these roads were so obscure that they didn't even have Burma-Shave signs on them. A road can't get any obscurer than that, now can it?

I was surprised, too, at the reticence of the natives, so contrary to tradition. Nobody with a goatee, frock coat and black fedora came up to me and said, "Stranger, I am Colonel Culpepper and I welcome you-all to the Old Dominion." Finally, on the Yorktown ferry a stranger did speak up. "Ah," said I to myself, "at last a Southerner has unbent," but he was an architect from Paterson, N. J., mumbling 'bout practicin' on small houses, or sumpthin'.

Another curious thing about Virginia is that all hams come from Smithfield and they sell oysters in May. And here I have spent my whole life believing it was unconstitutional to eat oysters in an R-less month. But the counterman says, "As long as they're fresh, they're good. I've eaten 'em in July, fresh out of the water. You take the shucks

Sketched in Williamsburg by one of the student guests at the convention

off, first." "Aw shucks, *you* shuck 'em," says I to him.

The convention (you remember, I was writing a piece about a convention, I hope) was held at Williamsburg, but the big hotel isn't put up yet, so we had to put up with the comforts of Old Point Comfort right at Fort Monroe where the other big guns are.

The lobbies of the Hotel Chamberlin were crowded with happy architects, but I soon fixed that. I told 'em there wasn't no bar! The only bars in Virginia are sand bars. I wasn't worried, though. I've been places before where the Producers' Council was. Who says dog is man's best friend? If a man is an architect, the Producers' Council is man's best friend. It was discovered that the proper spirits could be had in package form and there was no law against selling ginger ale and soda. Not that the absence of a bar meant anything to me; I am a very abstemious fellow, especially when I have to pay for it myself.

As a charter member of the Consumer's Council and Barflys Bureau of Research, I proposed a new "slump test," one like the concrete engineers use for testing the strength of the mixture. The subject (delegate, member or guest) would be supported againt the wall in an upright condition, supported by two trusted assistants. His height could be readily ascertained by consulting ruled lines on the wall 6" apart.

At the word "go," the assistants would release their hold, and the subject would slump. A 6-inch slump is normal, or par for the course. A 3-foot slump would indicate that the mixture was too strong, and bromo-seltzer would be added to the aggregate. If he slumped the full 6 feet, we would simply pour him back in the bottle and notify the next of kin. Alas, science will never be enriched by the notes of my experiments. I had no co-operation. I couldn't find any subjects, believe it or not.

Williamsburg, it seems to me, affords a perfect answer on the part of the Classicists to the Modernists. The Classicists and the Modernists, you know, have been feuding. Every time a Classicist sees a Modernistic building he tacks a sign on the door (in Modernistic houses the front door always has a round hole in it for circular letters), reading, "Be Humane to Your Building—Don't Chase Your Windows Into Corners." On the other hand, the Modernists retaliate by picketing Classical buildings, carrying signs saying, "The Classicists Have Ants in Their Pantheons." This leads to bad blood and nasty temper. But I am neutral.

But the traditionalists can offer Williamsburg as Exhibit A. It has a powerful appeal. A town completely restored in the last detail to the appearance of Colonial Days. It reawakens your faith in America. Our ancestors, one can see, lived like gentlemen and gentlewomen in a town fit for gentle folk. Their architects took old forms, old methods and design and worked them into something of enduring beauty; beauty of form, beauty of color and beauty of material. We even had beautiful weather.

• • •

Of course, I could improve things at Williamsburg quite a lot, if I had the time. I had time to read one item. The last two paragraphs of a book lying open on a table in the Capitol in the court room interested me. The book was "The Trial for Burglary and Felony of Col. James Turner" and the concluding paragraphs read:

"Accordingly the same Col. James Turner was drawn in a cart from Newgate to Lime-Street End in Leadenhall Street and was there executed on a Gibbet erected for the Purpose.

"When he was come to the place of Execution, among other things he declared, That whatever crimes he was Guilty of, yet he had this to comfort himself, that he never went into a Church in his Life without Pulling his Hat off."

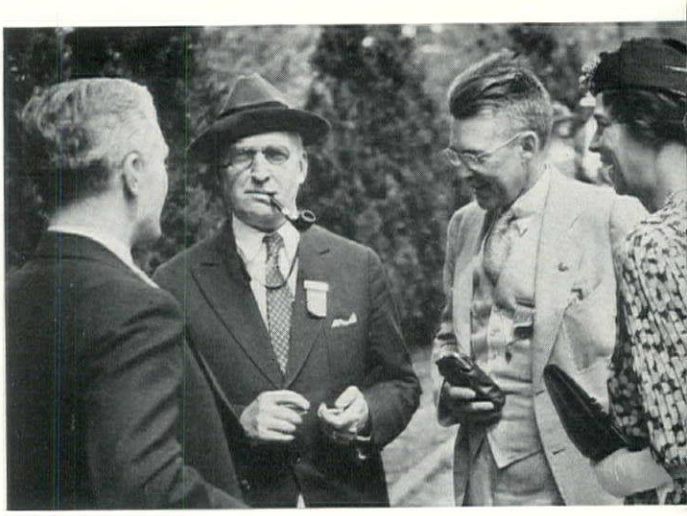
To think that they hanged a man as punctilious as that!

And another thing. In the garden of the Governor's Palace they have duplicated the box shrubs and flowers that bloomed there two hundred years ago. This is a touching idea, but not half as lovely and touching as it would be if they would duplicate, in the tap room of the Raleigh Tavern, those cheering drinks that our forefathers used to consume in that friendly room. There need be no waste; they could be mixed fresh every day and offered to discriminating visitors who could appreciate them properly; writers of articles about Williamsburg, for instance, who do not use the words "mellow charm." I'll be back.

But I must end all this: "you know the rest in the books you have read, how the British regulars fired and fled."—and how Whosis got up and here's what he said; and reports of committees that I thought were dead. I'm leaving the convention flat and setting out for New York City, "the Grand Rapids o' the East." Let them laugh; I am going to New York. I've heard rumored that it's twice as big as Grand Rapids. This is probably just a newspaper lie. But I'm going to see. See you at the next Convention!

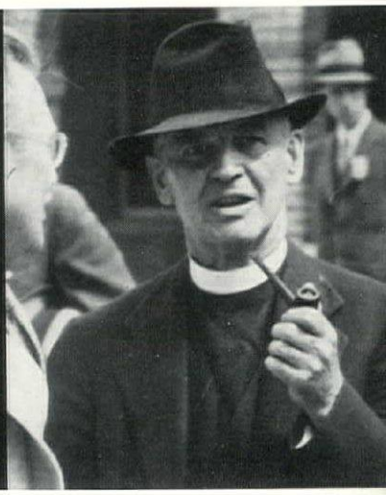
WILLIAMSBURG THROUGH THE CANDID CAMERA

The Sixty-eighth Convention of the Institute was, as had been prophesied, an occasion upon which many good fellows got together. Its more serious side is now a matter of record; a part of its human side is here set down through the medium of our editors' cameras



The A.I.A. president, Stephen Frank Voorhees, considering a weighty matter with Waldron Faulkner and Mr. and Mrs. Horace W. Peaslee

William G. Perry of Perry, Shaw & Hepburn, architects of the Restoration, on a visit of inspection with Mrs. Susan Higginson Nash, associated with the firm on interior decorations



The Reverend Dr. W. A. R. Goodwin, rec Bruton Parish Church, in whose mind idea of the Williamsburg Restoration orig

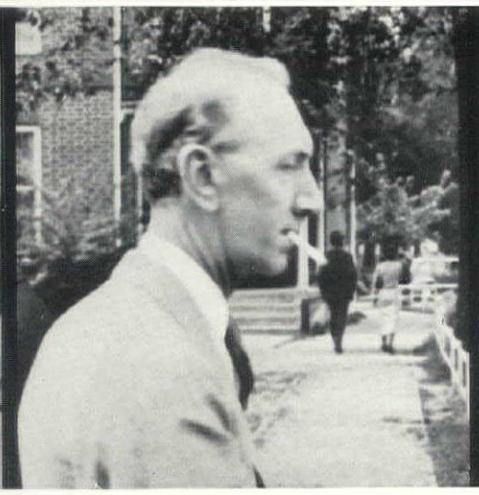
Not Benito Mussolini, but William Lescaze, of New York

Goldwin Goldsmith, who directs architectural education at the University of Texas

A. M. Edelman, one of those who traveled from coast to coast to the Convention

Frederick G. Frost, of New York, in a complacent mood

—after which President Voorhees may be considering the intricacies of some parliamentary rule of order

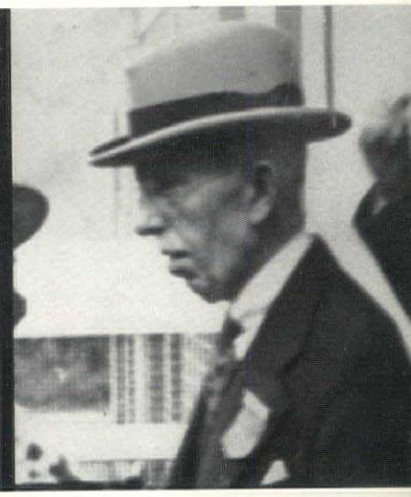


Francis P. Sullivan, the last to occupy the now abolished office of second vice president

Dwight James Baum, always a searcher after beauty,—with Charles Butler, of New York, a close runner-up

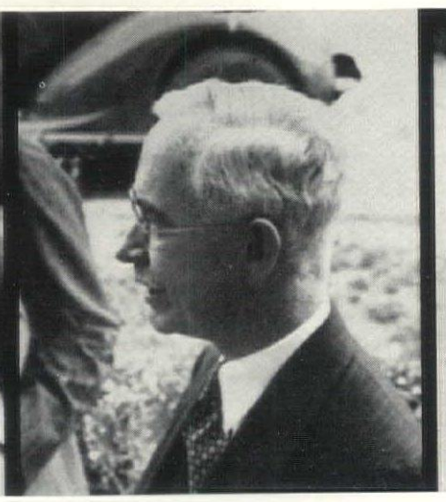
liam T. Warren, of Birmingham, Ala., a hful attendant of many conventions, who year was accompanied by Mrs. Warren

Mr. and Mrs. Charles D. Maginnis debate with Mr. and Mrs. Lorimer Rich the proper order of seeing things in Williamsburg

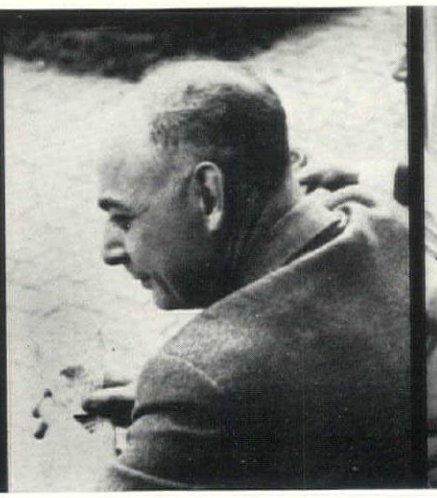


George C. Nimmons of Chicago, one of the elder statemen who very rarely misses a Convention

. Leicester B. Holland, of Washington, C., satirist of nudist architecture



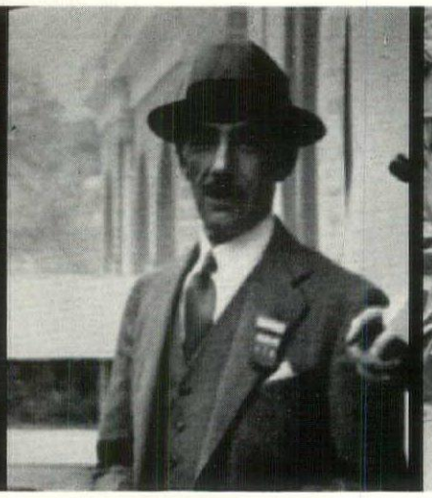
George S. Koyl, who trains architectural students at the University of Pennsylvania



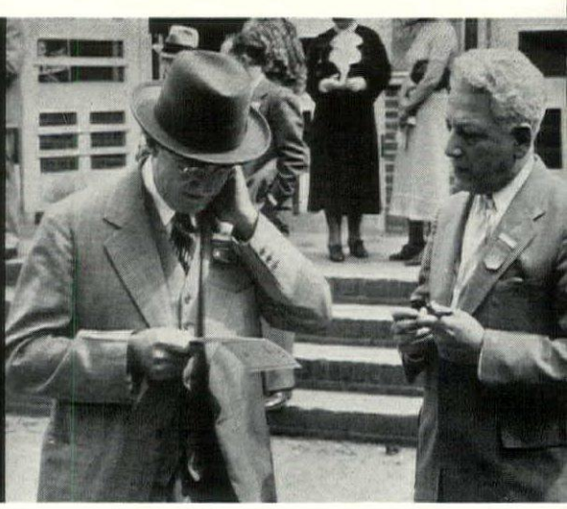
Marcel Villanueva, of Orange, N. J., finds a cooling drink at the Raleigh Tavern

With the Boston Chapter's delegation came Robert P. Bellows

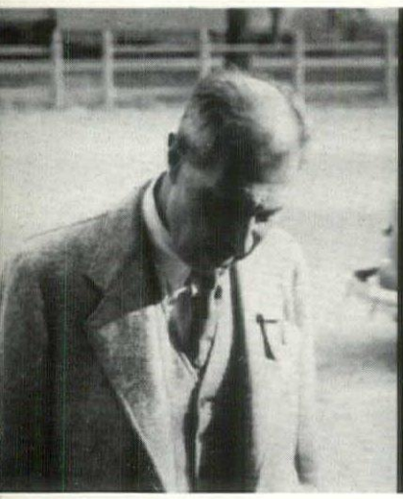
N. Max Dunning, of Chicago and more recently of Washington; and the Institute's able treasurer, Edwin Bergstrom, of Los Angeles



Edgar Williams, of New York, who championed the cause of more architectural competitions

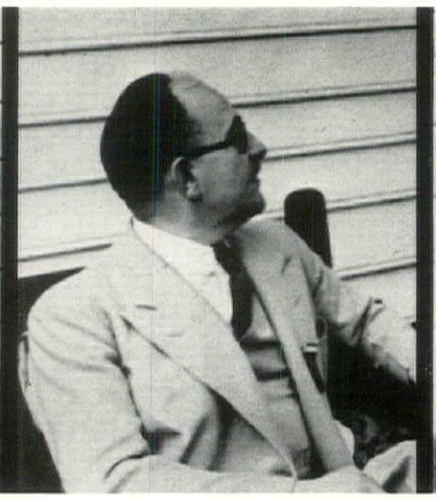


Frederick L. Ackerman, of New York, and Eugene Klaber, at present of Washington, faced by a serious problem, probably Housing

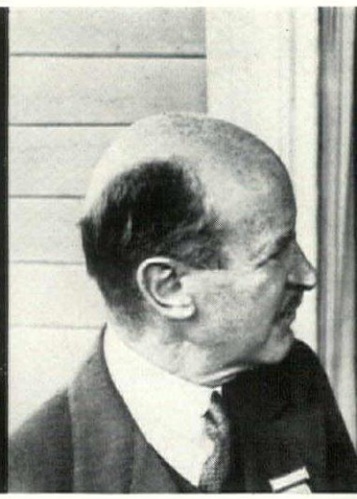


J. André Fouilhoux, of New York, bowed possibly by new appointment as visiting Columbia critic

Ralph W. Gray, of Boston, contemplating the serious responsibilities of being a newly elected Fellow

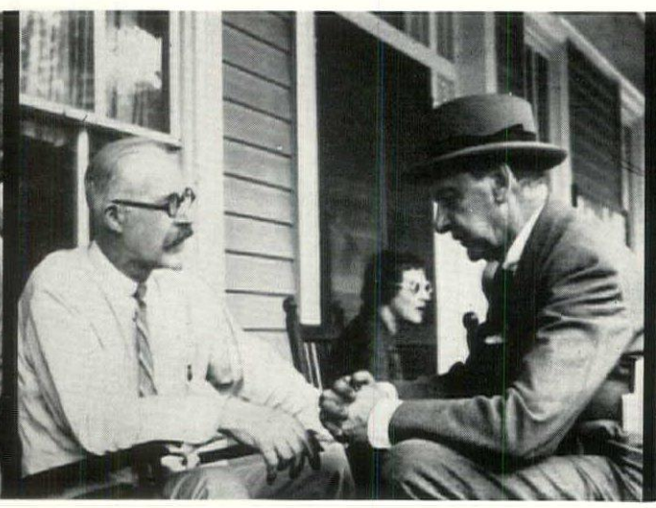


Edward D. Pierre, who came on to tell the Convention about "The Indianapolis Plan"



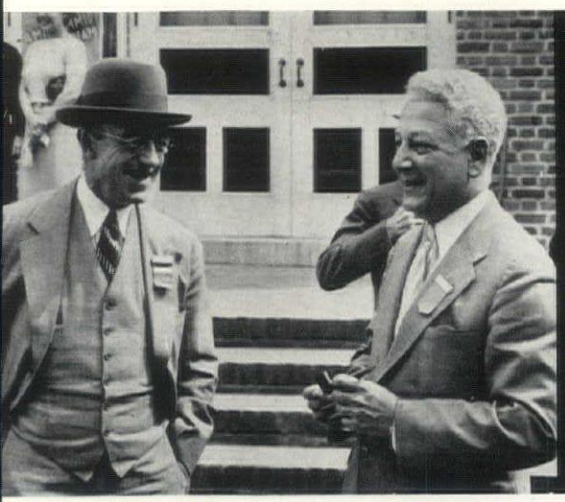
Henry Richardson Shepley, of Boston, another of the recently created Fellows

Frederick Mathesius, Jr., his daughter, and Frederick G. Frost investigating Henry Saylor's candid camera



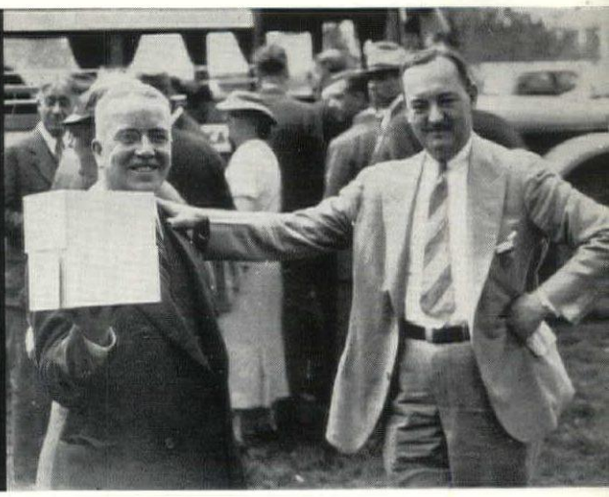
Thomas Mott Shaw, of the Williamsburg architects, talking with Charles Z. Klauder on the Raleigh Tavern porch

Henry Wright, of New York, g somewhere in a hurry, as u



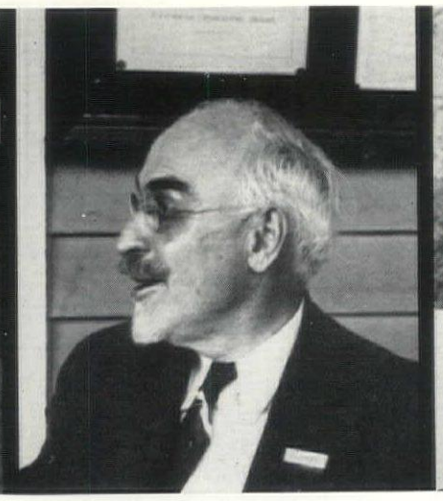
—and now that this problem is settled to their complete satisfaction, how about having a look at Williamsburg?

Hobart Upjohn, president of the New York Chapter, setting the pace for William Jones Smith, of Chicago



Buckminster Fuller of Dymaxion fame, and Carl Heimbrodt debate the functional fitness of the James River trip lunch-boxes

Theodore Irving Coe, formerly of New York City, who now calls Washington his home

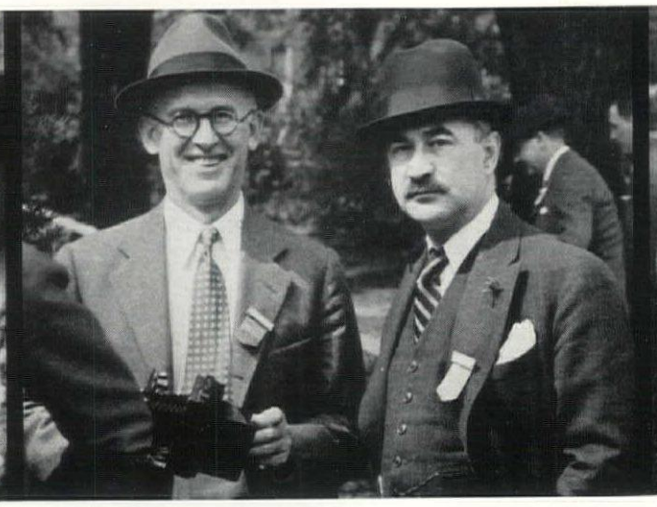


Chicago's doughty parliamentarian of many conventions, Henry K. Holsman

Arthur C. Holden in a persuasive mood, with Frederick Mathesius, Jr., nearly convinced

The center of attention in a wide circle of friends, Hal F. Hentz of Atlanta, Ga.

William G. Nolting, of Baltimore, a revered member of the Board



Richard Koch, of New Orleans, takes the affair far less seriously than does Pierre Blouke, of HOLC

William Lescaze finds an appreciative audience for his bon mot in Mrs. Lescaze and Julian Clarence Levi

THE URGE TO REMODEL

By SAMUEL CHAMBERLAIN

With drawings by the author

THE itch to investigate, improve and inhabit an old house lies dormant in most home-making humans. In an architect the urge glows like a live and dangerous ember. What traveler has not seen an irresistible old house by the roadside which kindled his possessive instinct and his restorer's zeal? The sight of sagging timbers, moss covered stones and bricks seems to act as a tonic on the city dweller, weary of too much newness. The locale doesn't seem to make much difference. He may be rolling through rural New England or the Cotswolds, through Burgundy, Andalusia or Flanders. Sooner or later he encounters a weather-beaten relic which transports him to architectural daydreaming. Water mains may be miles away, gas and electricity non-existent, but that makes no difference. One glance at the provocative pitch of the roof, the girth of the chimney, the irregular window spacing and your inveterate maker-over is already rearranging things in his mind.

Among the hundreds of old houses that would claim his attention in rural France, for example, is the proud, heart-warming little Manoir de Mémorin in Burgundy (facing page). Its picturesqueness, its haphazard openings and patchy texture are not studied. They "just happened" in the two centuries of the manor's lifetime. Originally it was faced with a tapestry of brick, but only the upper floors retain traces of this. Stone and stucco have been substituted where hard wear had scarred the lower facing. The little ingrowing balcony is one of the happiest features imaginable, an idea which could be adapted to many a modern house. The ground floor is certainly under-lighted, and needs additional windows. The stables at the left show a joyous and informal blending of timber, brick and stucco.

The texture, the confident poise and the utter livableness of this house make one yearn to possess it.

Then there is the long-roofed, jumbled up old farmhouse (page 36) in the valley of the Loire, near Blois. It is situated in the rich asparagus belt, with the silent rush of the river in the background. Here a central core and an outgrowth of several casual appendages blend into an unconscious and charming ensemble. An amazing succession of doors and windows, no two of which are alike, takes place on the ground floor. Discreet dormers should perhaps be introduced in the long sweep of roof at the right. This is the South facade. Perhaps possibilities for a more formalized treatment lurk on the North.

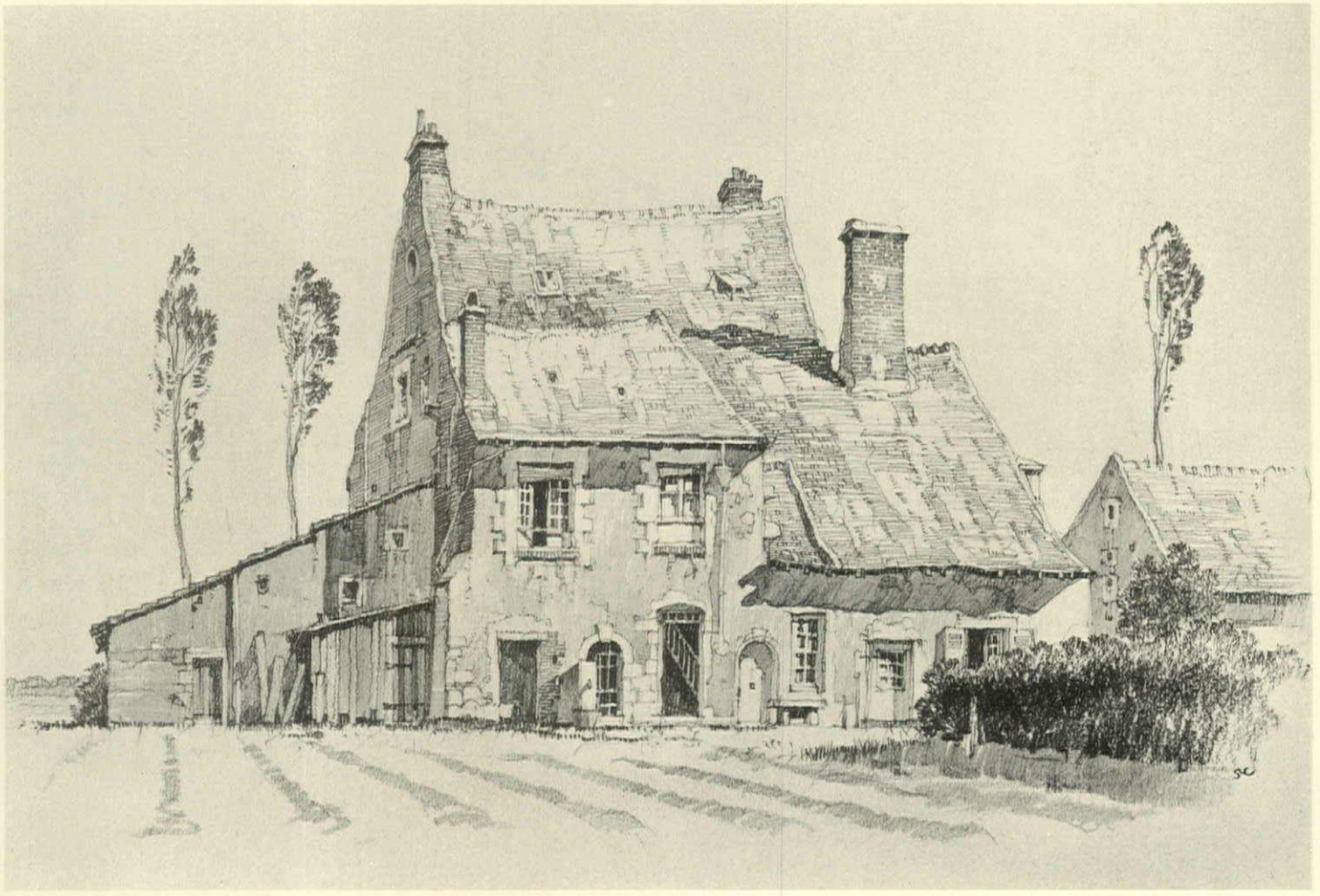
Many a traveler will recognize the glorious old landmark which lies on the broad Paris-Nice highway. St. Magnance (page 37) is a rambling village, wandering into a valley and out again. The last house on the upward slope is this irresistible, semi-feudal farmhouse, and it has caused covetous comment by many a bland industrialist in the back seat of his Hispano-Suiza. The essence of food-loving Burgundy exudes from its tattered walls, and one is not surprised to find that it lies midway between those Burgundian citadels of gastronomic splendor, Avallon and Saulieu. In the days of its prime it was a small château, but for two centuries at least it has assumed the humble rôle of farmhouse. The grizzled old proprietor tells of many an offer to buy, coming from romantic passersby. However, their enthusiasm usually waned when they saw the dejected condition of the interior. There are other perplexities. The amount of light allowed by those tiny windows is woefully inadequate. Could they be enlarged or could new window openings be pierced without weakening the feeling of substantial rotundity now so apparent? The roof is a handsome expanse of deep, wine-colored tiles, patched and re-patched, and mottled with a mustard-and-pepper growth of moss and lichens. The wall-enclosed barnyard would transform handsomely into a formal garden. Beyond there extend many rolling acres planted with grapes and grain and vegetables, and there are minor farm buildings which cry to be dressed up into horsy stables and guest houses. And for your night watchman, could you ask for a more strategic place than the little jutting tourelle?

More of the well-fed feeling of good cheer and plenty radiates from the huge mansion (page 38) in La Charité-sur-Loire, an unbelievably picturesque town in the Pouilly wine district. This magnificent veteran dates from Gothic times, as its buttresses and window details reveal. Its chimneys are Gargantuan, and a forest of timberwork is needed to support the tremendous roof. At present the house is a two family affair, and there is lots of space left over. Wine is obviously the trade of the occupants, for dozens of casks were rolled out of the low door in the middle while the sketch was being made. Here indeed is the perfect retreat for a genial old voluptuary who would like to lavish a small fortune on the setting for his wine festivals and his gout cushion.

A semi-feudal touch is evident in the old farm in Mourret (page 39), near Tarascon in southern France. Here is an amazing bit of unbalanced composition worked out with the utmost repose. The motif offers rich suggestions for a bisected dwelling in a warm climate, where an open air passage is practicable. Or the gateway might be converted into a handsome vaulted hall (and at what price!), by an enthusiastic acquirer. This sun-soaked hacienda is found in a region roasted by a blistering sun in summer and swept by ferocious "mistral" in winter, a blustering wind which rolls up the valley of the Rhône. Its sturdy walls and well cemented tile roofs are built to withstand these assaults. Often hedges of closely knit cypresses are grown about the house to break the wind and protect fertile parcels of land. The Spanish suggestion has left an indelible imprint on our domestic architecture, particularly in those regions blessed with a quantity of sunlight. Have not the solid and expressive farmhouses of the Camargue something to lend also?

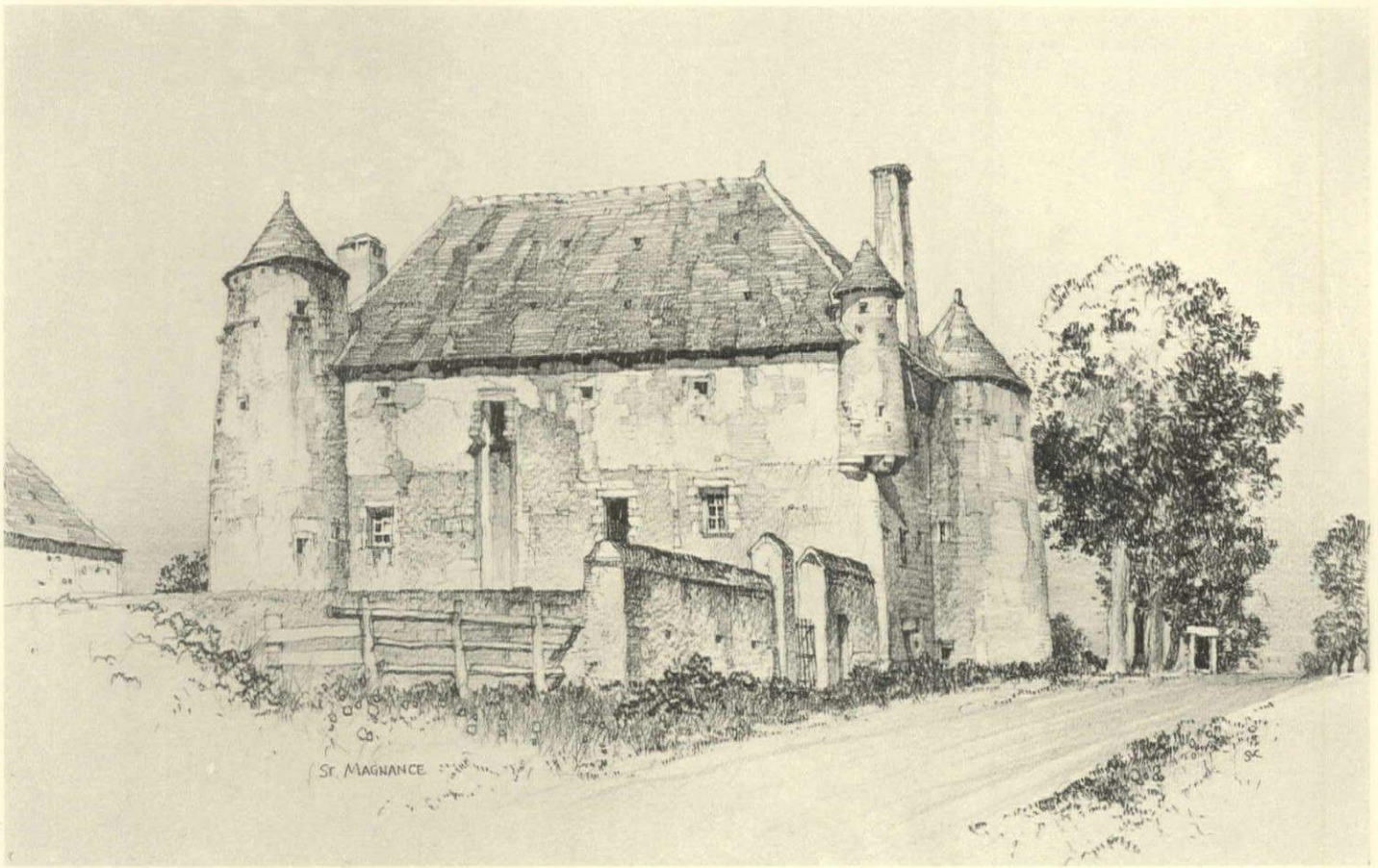
MANOIR DE MÉMORIN, LUSIGNY, FRANCE

EIGHT DRAWINGS BY SAMUEL CHAMBERLAIN



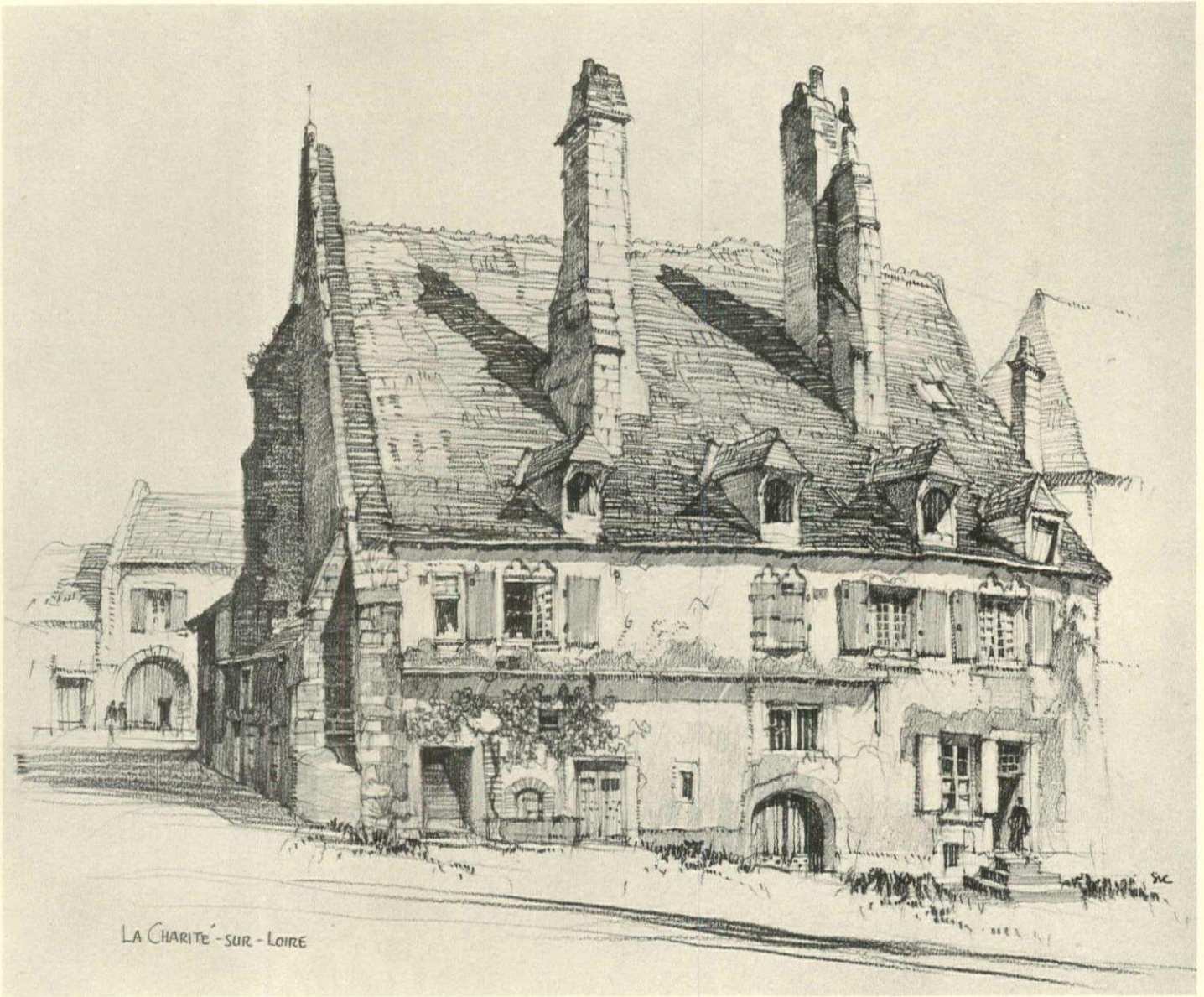
A FARMHOUSE NEAR BLOIS

DRAWING BY SAMUEL CHAMBERLAIN



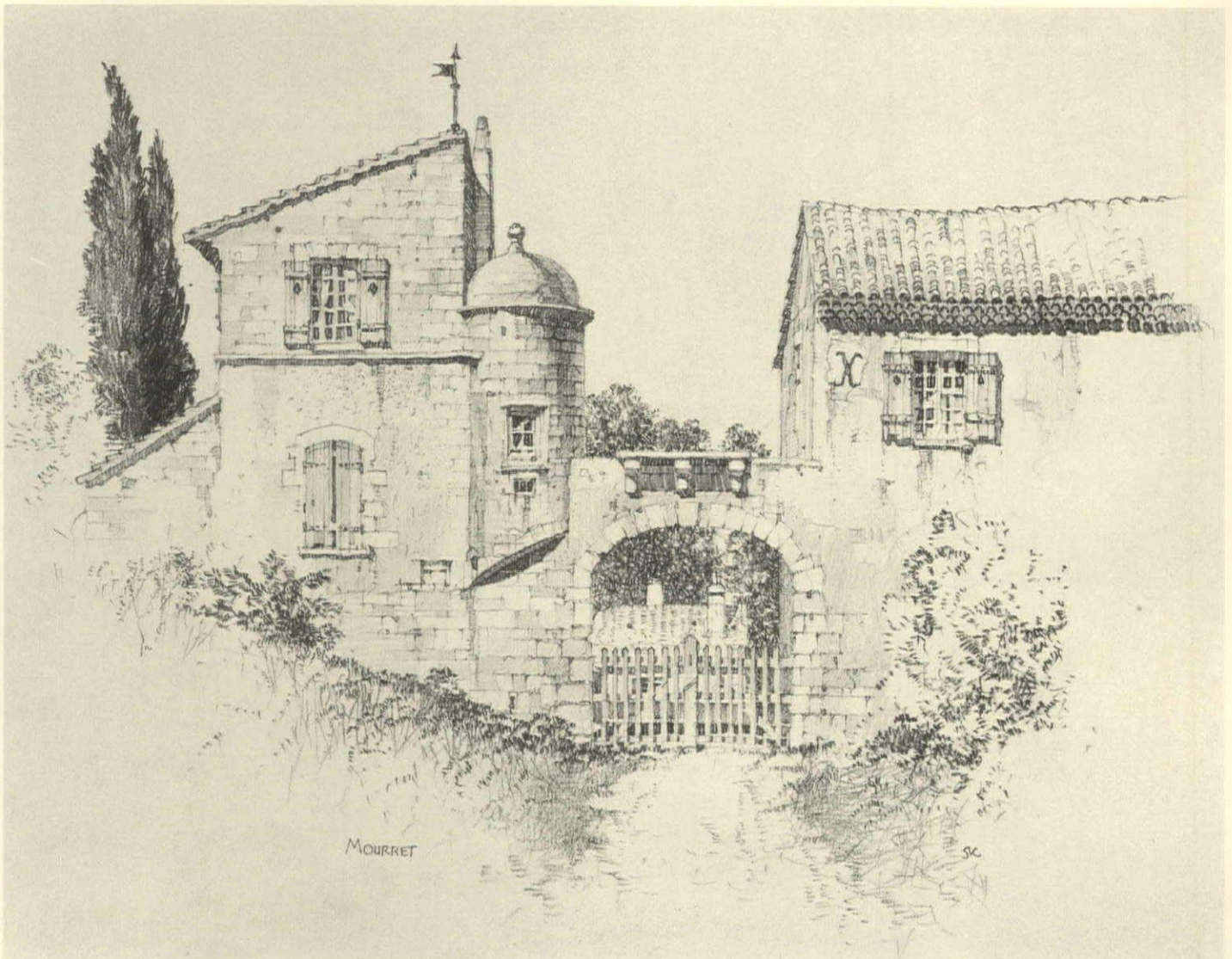
ST. MAGNANCE

DRAWING BY SAMUEL CHAMBERLAIN



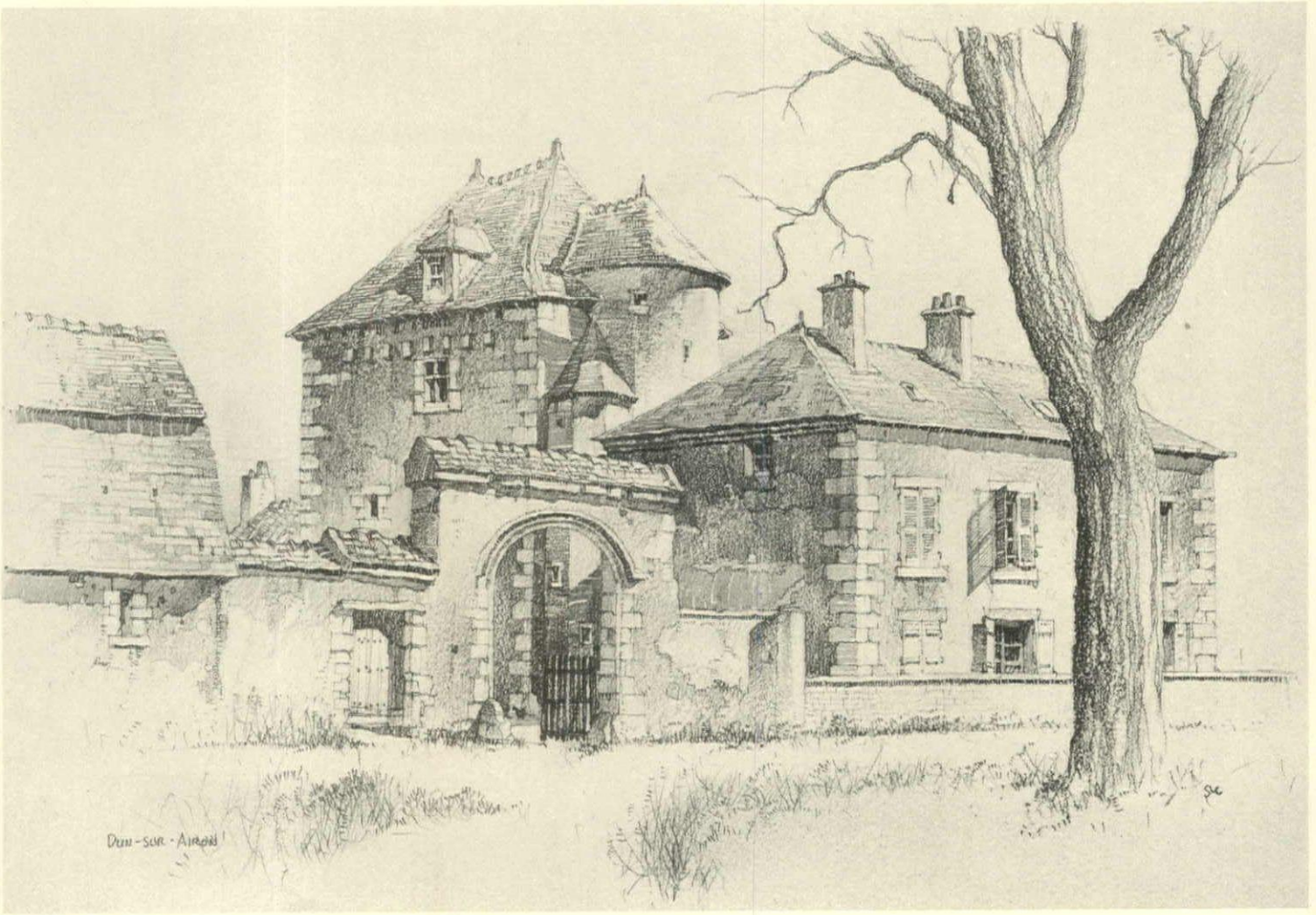
LA CHARITÉ-SUR-LOIRE

DRAWING BY SAMUEL CHAMBERLAIN



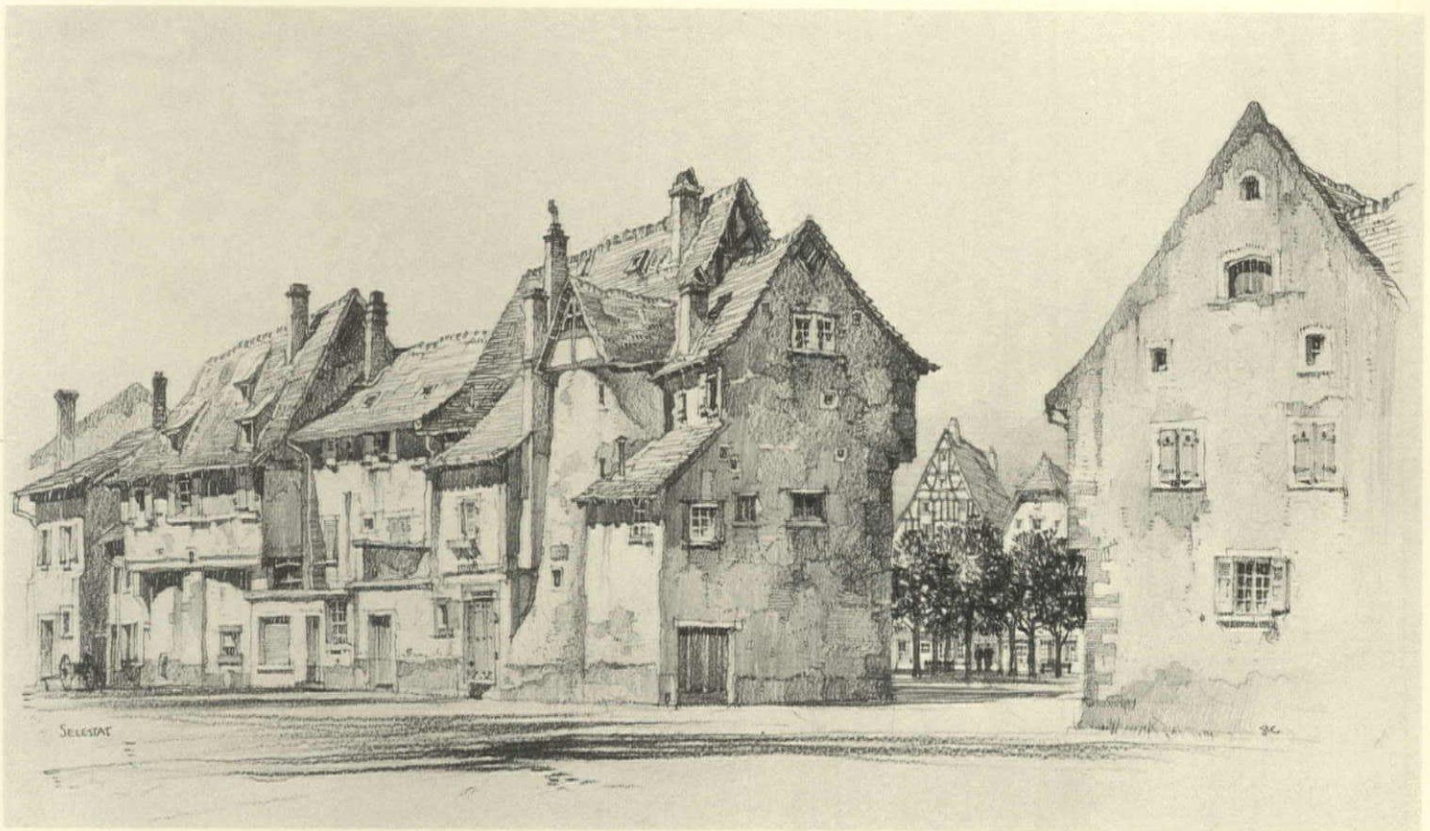
MOURRET

DRAWING BY SAMUEL CHAMBERLAIN



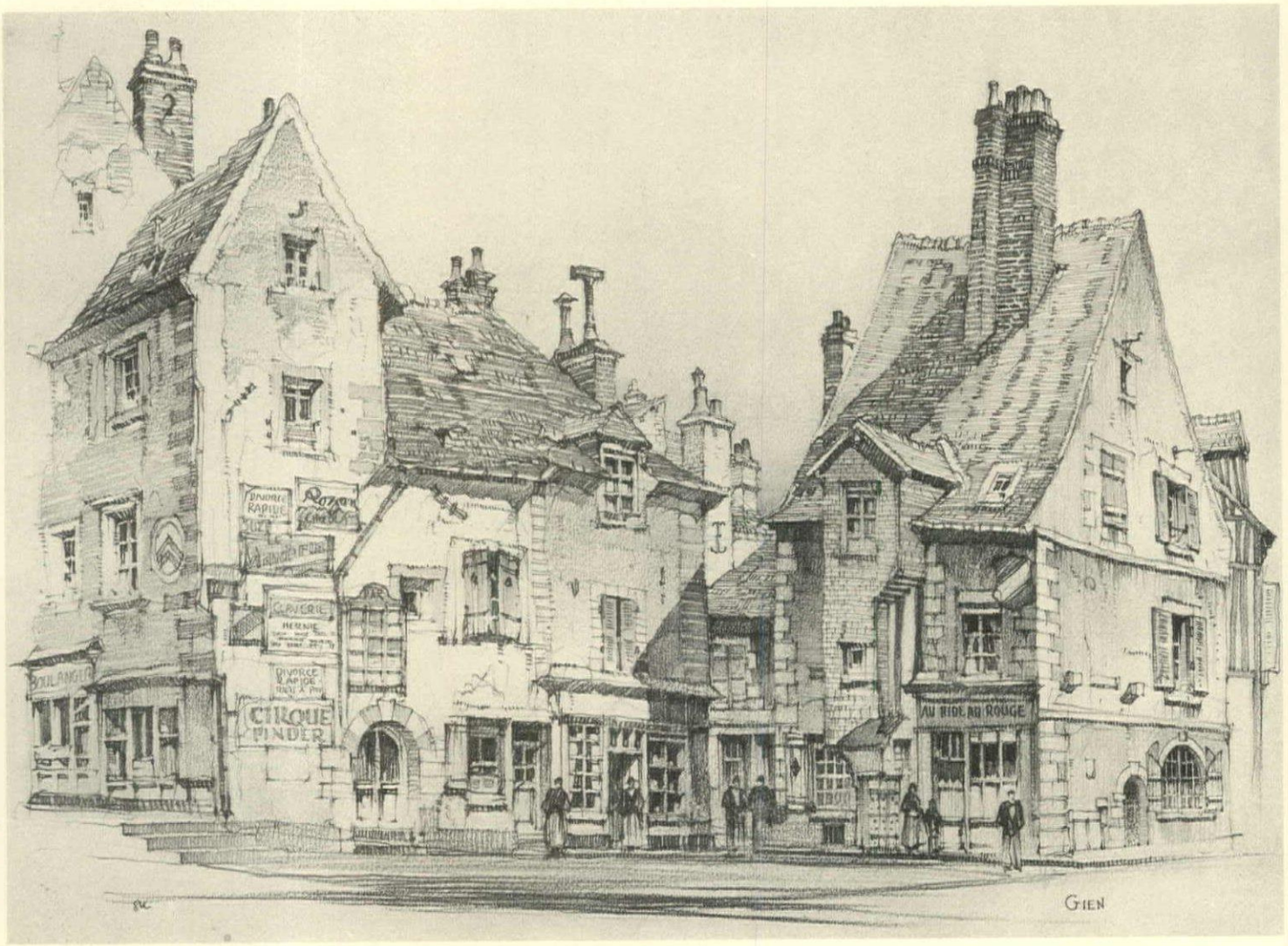
DUN-SUR-AIRON

DRAWING BY SAMUEL CHAMBERLAIN



SELESTAT

DRAWING BY SAMUEL CHAMBERLAIN



GIEN

DRAWING BY SAMUEL CHAMBERLAIN

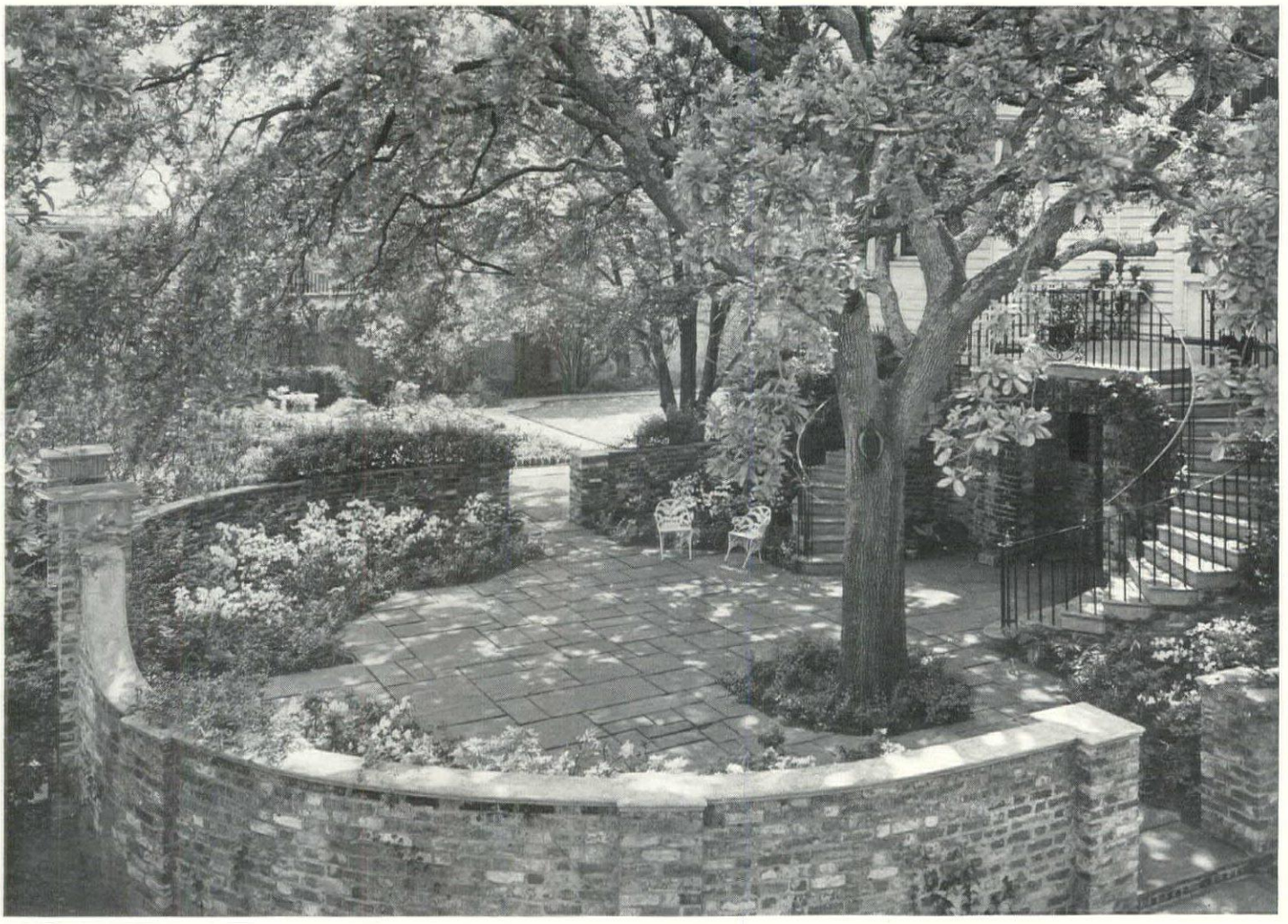
PHOTOS: SAMUEL H. GOTTSCHO

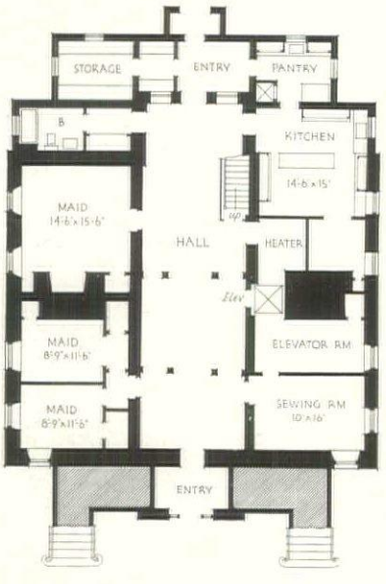
THE WILLIAM GIBBES HOUSE, CHARLESTON, S. C. MRS. W. A. ROEBLING, OWNER

DWIGHT JAMES BAUM, ARCHITECT OF RESTORATION

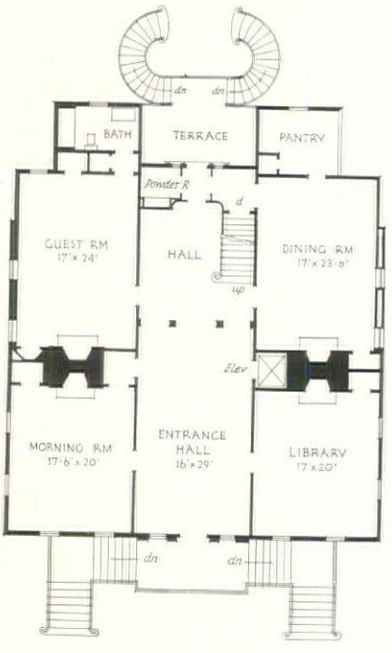
ELBERT SIMONS OF SIMONS AND LAPHAM, SUPERVISING ARCHITECT . . . LOUTREL W. BRIGGS OF BRIGGS AND STELLING, LANDSCAPE ARCHITECT . . . MARGARET OWEN, DECORATOR

Built about 1775, the William Gibbes House, despite many vicissitudes, is an outstanding example of the Georgian style. Like many other Charleston houses, it is built on filled-in land which is reason for the thick foundation walls and the raised main floor. The garden entrance, with its curved stairway (opposite page), is flanked by wings which were added just prior to the Civil War. The gracious and imposing main entrance (above) is approached by twin stone steps. (Right) The house as it looked before restoration

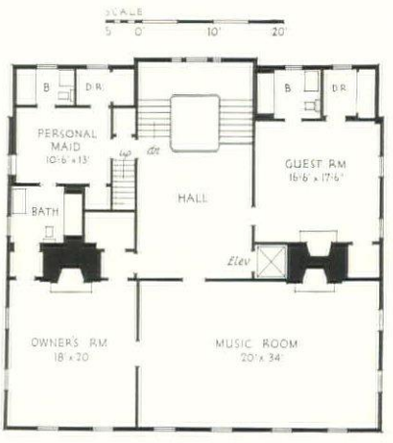




Ground Floor



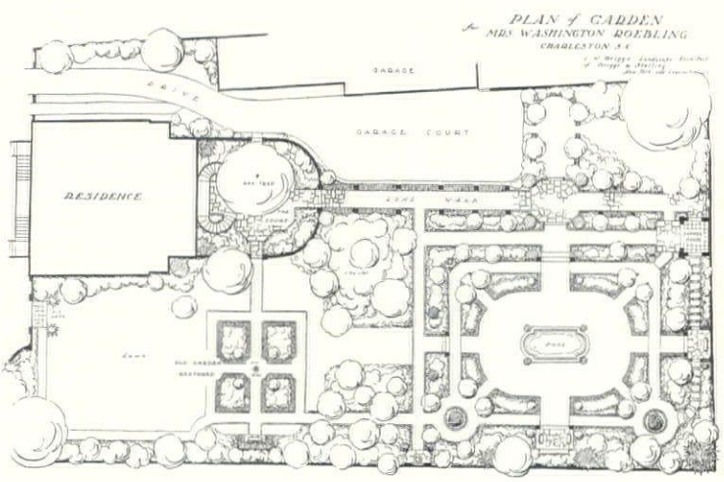
Main Floor



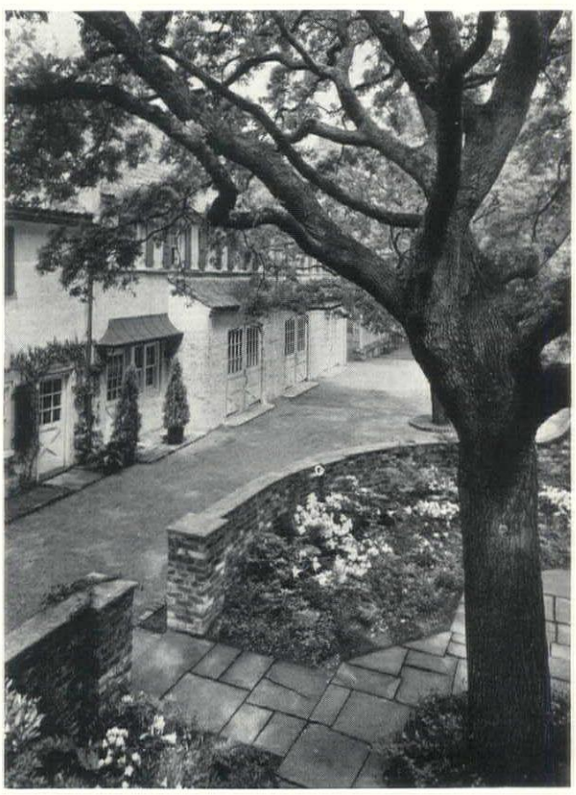
Second Floor

WILLIAM GIBBES HOUSE, CHARLESTON, SOUTH CAROLINA. **DWIGHT JAMES BAUM, ARCHITECT OF RESTORATION**

The brick wall flagstone court is shaded by a fine old Oak (opposite page). The dependencies have been made into garages with a chauffeur's apartment and additional maids' rooms

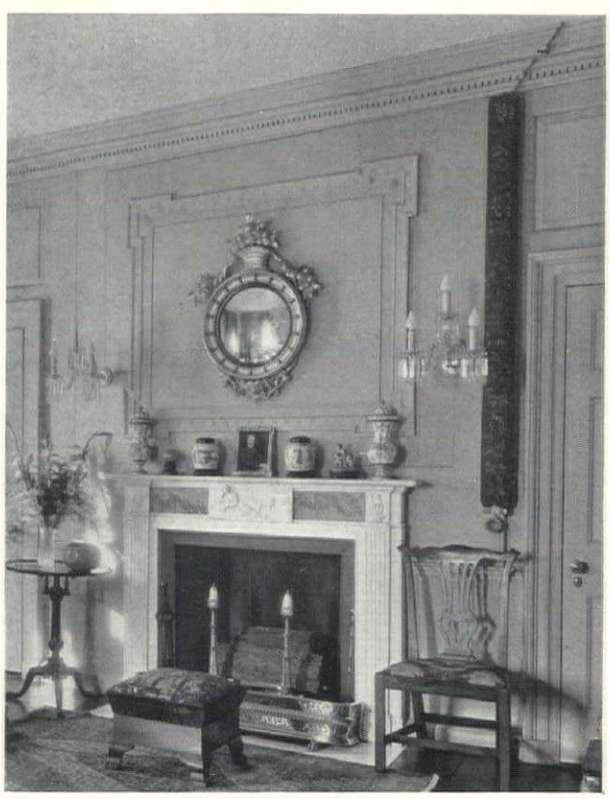


Garden Plan



WILLIAM GIBBES HOUSE, CHARLESTON, SOUTH CAROLINA

DWIGHT JAMES BAUM, ARCHITECT OF RESTORATION

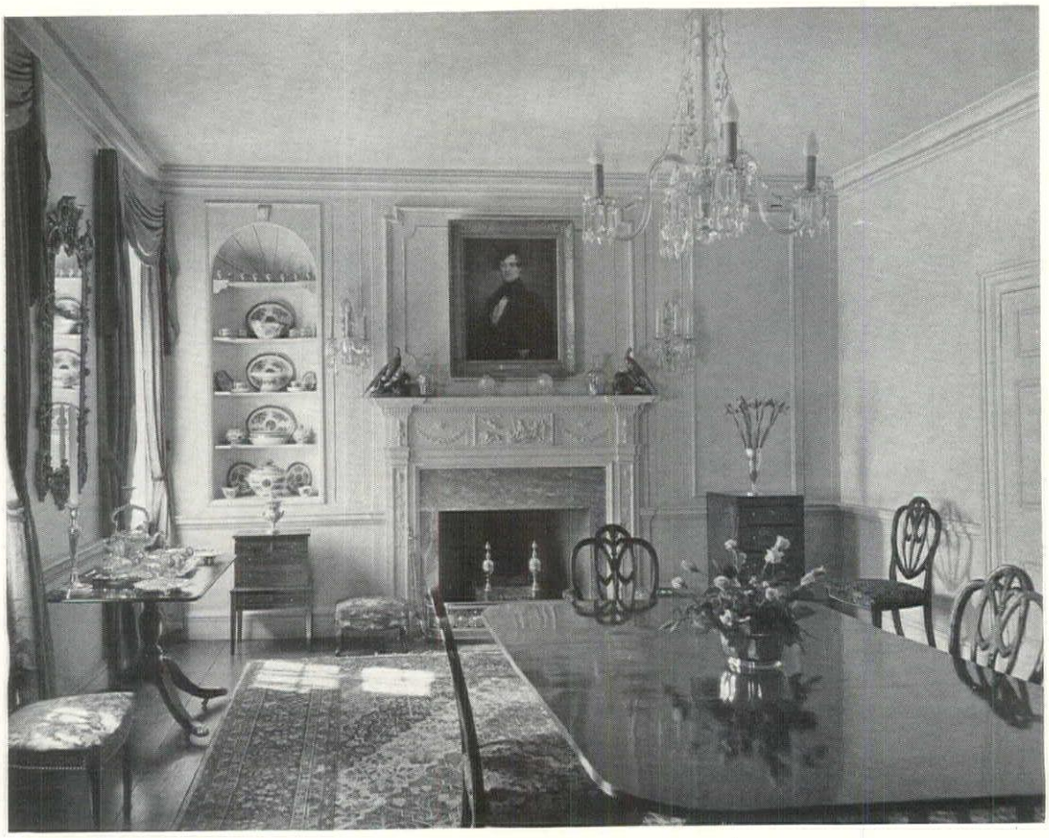


A brilliantly colored reproduction of a wallpaper of the period is set off by the oyster-white woodwork in the hall (opposite page). During the great hurricane of 1886, the entire wood trim, of the then library, was lost (above). Its present Chinese Chippendale treatment is based on that of a room in another Charleston home. Walls are Chinois papered; trim is blue-green. Curtains are green and the furniture is covered in red and gold. (Right) Marble mantel in the morning room

WILLIAM GIBBES HOUSE, CHARLESTON, SOUTH CAROLINA

DWIGHT JAMES BAUM, ARCHITECT OF RESTORATION

The music room has white walls, yellow curtains and chair coverings which repeat the soft, pastel tones of the Aubusson rug. The lighting fixture design is based on traditional fixtures elsewhere in the house. (Opposite page) One of the beautifully proportioned door enframements from the hall into the music room Lafayette was once entertained at a ball in the Gibbes House and it is recorded that one of the belles of Charleston played the harp and sang for him. The harp is shown in the picture above.



Much of the trim in the dining room is new. The wood-work and walls are gray, and the heavily valanced draperies are a rich blue that matches a collection of old China

Mrs. Roebling's bedroom has light blue walls, a color repeated in the ground of the flowered chintz used for curtains and furniture covering. Blue-quilted sateen is also used

WILLIAM GIBBES HOUSE, CHARLESTON, SOUTH CAROLINA. **DWIGHT JAMES BAUM, ARCHITECT OF RESTORATION**

BETTER CONSTRUCTION IN WOOD

New methods of manufacture and grading, new fabricated units, better methods of assembly of wood parts are slowly modifying the technique of building the better house

By H. VANDERVOORT WALSH

WOOD as a material for the construction of houses continues to be used more than any other building material. From 35% to 40% of the total cost of a house goes into carpentry labor and rough and finishing woods. Its cellulose fibers are so interlocked and cemented together by lignin that, in proportion to its weight, wood shows a resistance to bending that compares favorably with metals. But unlike metals, wood is very easily shaped by hand or power-driven tools and being comparatively lighter, is cheaper to transport. Consequently, the cheapest floor and roof construction, and framing for walls, is still of wood.

Thin slabs for structural purposes are more easily made from wood than from most other materials. By slicing wood into very thin layers and gluing these together so that one layer reinforces the grained-weakness of the next, we have improved upon Nature's product and have made large, thin building sheets of plywood that have qualities of beauty, strength and lightness unequaled by most other materials. Likewise, under high pressure steam, the fibers of the waste ends of lumber are separated and are then hydraulically pressed into large, strong, waterproof sheets, using the original lignin to again cement together the fibers.

By another steaming process, woods can be easily bent into curves, and permanent, strong curved forms are inexpensively made by gluing together a number of layers of bent wood.

Mouldings and turned forms can be made from wood by modern power-driven machines more cheaply than from any other material. Even repeated ornamentation on mouldings can be made by machines which stamp, cut or burn the design into the wood very rapidly.

Wood continues to be a favored material for house building, in spite of the fact that it is not fireproof, that it is subject to decay, that it swells and shrinks according to the moisture in the air, and that it is subject to attacks by termites and other insects.

Modern technical improvements in painting and septic treatments are reducing the hazards of decay and of attack by insects. Even the fire hazard of wood may be reduced by impregnating the fibers with protective salts. The swelling and shrinking of wood under changes in moisture content of the air is being overcome by the modern technique of using veneers with waterproof glues and chemical compounds to fill the cells so that they cannot absorb water.

GRADING. Improvements in seasoning, grading, and manufacturing provide us today with better lumber than anything our ancestors used in building. The old commercial grading rules which were not found to be satisfactory from a practical standpoint have been supplanted by rules which are a decided advance, in both theory and practice. These were worked out by a joint committee of the American Railway Engineering Association and the American Society for Testing Materials, and first published as "American Lumber Standards."

As an aid to architects and the consumer in identifying graded lumber, a method of stamping it with a grade mark was incorporated in the "American Lumber Standards." A growing number of manufacturers are adopting this practice, as, for example, the "4-Square Guide Line Framing Lumber" of the Weyerhaeuser Sales Co. This is No. 1 common grade seasoned stock, surfaced on four sides, with the ends squared and stamped. In addition, for every inch of length on this stamped lumber, there is a guide line for cutting pressed into the face of the timber.

The framing lumber used in jerry building is an anonymous bulk material, unidentified and unimproved. It is impossible to know whether or not such lumber conforms to the grades in the specifications. To avoid this situation the architect who is seeking quality, rather than lowest first cost, should specify stamped graded lumber.

A brief summary is given here of the various lumber grades for materials used in house construction:

(a) **Select Lumber.** (Appearance good and finishing qualities satisfactory.)
Grades A and B are suitable for natural finishes in wax or varnish.
Grade C is suitable for paint finish.
Grade D should be used only in the cheaper class of houses.

(b) **Common.** (Contains defects which detract from the finishing appearance but not from the structural.)
No. 1 Common is to be specified for joists, rafters, studs, etc.
No. 2 Common may be used for studs in non-bearing partitions.
No. 4 Common is sometimes specified for sub-flooring and sheathing.
There are also No. 3 Common and No. 5 Common.

Grades for the Architect's Specifications for Rough Framing Lumber.

1. For joists, girders and studs in bearing partitions, call for No. 1 Common (Douglas fir or other acceptable softwood) kiln dried to 12% moisture content or less.
2. For studs in on-bearing partitions, call for No. 2 Common (Douglas fir or other acceptable softwood).
3. For exterior sheathing, walls, roof, and sub-flooring, call for No. 2 Common softwood from West Coast or South, or No. 4 Common from Inland Empire or North producing regions.

SEASONING. Wood's long, hollow cellulose fibers cemented together by lignin, can hold moisture. When dried out the walls of these fibers shrink. Consequently, boards grow smaller in width but not much less in length, since the majority of the fibers run parallel with the trunk of the tree.

After lumber is cut, the water in its fibers must be dried out, the wood "seasoned." This is done by natural air-drying in the yards, or in a kiln through which heated air is mechanically forced around the lumber. Green lumber, just cut, usually contains 20% moisture or more. Framing lumber when properly kiln-seasoned contains 12% moisture or less. From the green state to the seasoned, the average lumber decreases 5% in volume.

Interior finishing lumber should contain only 6% moisture. If it is dried out more than this, it will reabsorb moisture from the air until it is up to 6 or 7% again.

The average steam-heated house dries out the moisture from the woodwork, so that in many cases the content is reduced to 2% or less. This causes shrinking, warping, checking of boards and opening of mitered joints. The warm and moist air of spring causes the doors to swell and stick. Hence wooden houses need air conditioning plants to maintain proper moisture.

The framing timbers are likewise affected by the changes in humidity. In the summer the house swells, in the winter it shrinks. These strains often cause the cracking of plaster and the loosening of tile in the bathrooms.

By veneering, and by locking mitered joints with dowels and metal strips, etc., manufacturers of modern furniture have succeeded in making their products withstand the effects of over-dried and over-heated houses. Antiques are not usually proof against these effects.

Well-seasoned interior trim should never be installed until the plaster has dried out. In cheap work most of the troubles of faulty woodwork are due to excessive moisture from the walls, because trim is installed before plaster is dry.

It is good practice to require that the back of all interior trim be painted with an aluminum or lead and oil primer. A similar priming coat should be applied to all exterior woodwork before it is set in place. Until the building is finished it is best to fasten the doors of closets open—to prevent the dampness of the interior from working the wood on the inside of the doors.

STANDARD SIZES. The so-called 2″x4″ stud is not the real size, but is 1¾″x3¾″. The first is called the *nominal* size and the latter the *actual* size. This is true for all framing lumber. In the days when lumber was not trued up and surfaced on four sides but was sent to the job with the rough surfaces made by the saw, it was difficult to get an even surface for the laths.

The architectural detailer should know standard sizes for framing lumber and finishing lumber. The common thickness for boards, as used by mills, are nominally known as 1″, 1¼″ and 1½″. Other sizes are available but seldom used.

FACTORY AND SHOP LUMBER*

Thickness of Board	Softwoods		Hardwoods	
	S_2S	Finished	S_2S	Finished
1″	26/32″	¾″	1 1/16″	25/32″
1¼″	1 5/32″	1 1/16″	1 3/16″	1 1/32″
1½″	1 13/32″	1 3/8″	1 5/16″	1 9/32″
2″	1 13/16″	1 25/32″	1 3/4″	1 23/32″
2¼″	2 1/8″	2 3/32″		
2½″	2 3/8″	2 11/32″		
3″	2 6/8″	2 23/32″		

* From "Wood Construction" by Dudley S. Holtman.

Nominal widths of boards run 7, 8, 9, 10, 11, and 12″. These finish down to 6½, 7¼, 8¼, 9¼, 10¼, and 11¼″.

It was customary for architects, and still is to a certain extent, to detail mouldings as though 1″ boards came full thickness and finished down to 15/16″. But to actually produce a 15/16″ moulding requires stock of 1¼″ thickness. This is wasteful practice. Likewise, the so-called 4″ hardwood casing is actually only 3⅝″ and a 6″ hardwood board will produce only a 5½″ baseboard. When detailing or specifying thicknesses for millwork, the actual sizes of finished lumber must be taken into account.

In detailing the spans for floor joists, it is more economical to adjust the widths of rooms, if this is possible, so that standard lengths can be used without wasteful cutting. Framing lumber comes in even lengths, multiples of 2′-0″. To use fourteen-foot joists, it is necessary to keep the span between supporting studs to 13′-6″. The selection of story heights to make use of standard lengths of studs should also be considered. However, to sacrifice the planning of rooms for a minor savings is not worth while, except in minimum housing, especially as it is the experience of architects that contractors as yet make no allowance in their bids for such niceties in economic framing layouts.

FRAMING. The newest developments in methods of wood framing are seldom known by every carpenter. He has grown up with his traditional practices and has rarely gone beyond his practical school of competitive building methods.

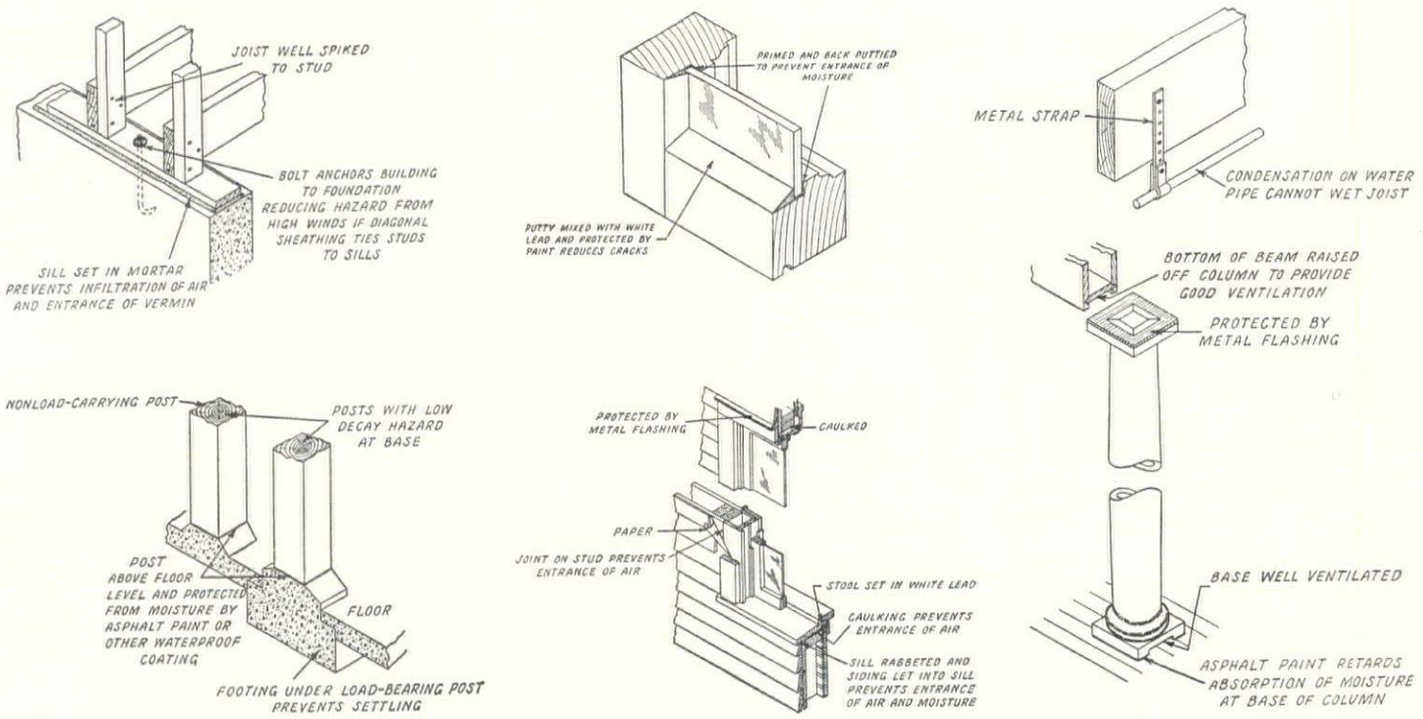
Theoretically, to obtain first class framing, the architect should prepare framing drawings, explanatory sections and detailed specifications, based upon the newest research data obtainable. Actually such a procedure, in the case of the small house, is almost certain to bring in very high bids. Highly detailed and technical-looking plans are certain to create this reaction with the average country contractor.

The best solution is probably a middle course. The specifications may be fairly complete, covering the basic methods of framing desired, but the general drawings let out for bids may only show arrows indicating the direction of joists, sizes and spacing. After the contracts have been let, framing plans can be prepared with sections at critical points showing the desired construction. To save time and blue prints, these plans need only be made at eighth scale.

Against all of this procedure there is another economic force: in practice the architectural fee is usually too small to warrant this expenditure of time. In that case, the carpenter may make his own framing plan, subject to the criticism of the architect and controlled by certain details in the specifications. This is probably as good a method as any, because it increases the co-operation between carpenter and architect. The former does not feel that arbitrary ideas are being imposed upon him by one he may consider a theoretical designer, the architect.

FRAMING SYSTEMS. The three systems of framing have been designated in "Recommended Minimum Requirements for Small Dwelling Construction," as (1) Braced-frame, (2) Balloon-frame, and (3) Platform-frame.

The historical development of these trends in wood framing clearly shows that the types of framing set forth under these names were not actually to be found as universally accepted and used separate systems. They represent, rather,



Examples of Good Practice; from "Selection of Lumber," U. S. Department of Agriculture Bulletin No. 1756, April 1936

classifications of basic-types. Another government publication, "Light Frame House Construction," repeated the diagrams of the systems. The forerunner of these two government pamphlets mentioned above were a pamphlet "Frame Construction Details" issued by the National Lumber Manufacturers Association in 1920, and another, "The High Cost of Cheap Construction" by Weyerhaeuser Forest Products Co., in 1922. These have been revised in more condensed and useful form.*

EQUALIZED SHRINKAGE. It should be borne in mind that a well built frame of wood avoids unequal settlement by having a balanced quantity of cross-sectioning timbers in all bearing walls and all interior bearing partitions. If an interior bearing partition has more cross section of timber than an outside bearing wall, the floor joists on the upper stories will settle more on the interior ends than at the ends on the wall. This will cause the doors to get out of plumb, the plaster to crack, and the other common defects to be found in cheap wooden houses. The platform frame was devised to establish equality of cross section of wood in all walls, but it has an excessive amount of shrinkable members compared to the balloon frame in which the studs run from the sill to the plate.

Often the judicious introduction of steel girders in the basement or elsewhere in the building will eliminate many of the troubles on this score. Likewise, due to the inelastic property of stucco exteriors, it is wise not to use the platform frame for a stucco-house, it is preferable to use the balloon frame details. In this case it is important to see that studs in bearing partitions run down to the tops of partitions below and rest directly on top of the steel girder at the first floor.

*"Standard Specifications for House Framing," published by the Weyerhaeuser Sales Co., 1936.

IMPROVEMENTS IN WOOD FRAME CONSTRUCTION,
selected from recent specifications and authoritative publications.

1. **Sills:** The double sills, made with two 2″x6″ members spiked together with 16 penny nails are now acceptable in place of the solid sills, both in the balloon frame and the braced frame. The joists preferably rest on top of the sill and are not cut around it but are toe-nailed to it with three 10 penny nails and to the studs with three 16 penny nails.

Protection of the sill from dampness by laying it in a bed of waterproofed cement mortar is another improvement.

Termite protection with creosote or zinc chloride treatment of the sill is also emphasized, due to the spread of this insect. A termite-stopping shield should be placed 18″ above the grade, capping the foundation wall on both sides. The shield consists of non-corrosive sheet-metal extending at least one inch beyond the surface of the wall.

The box sill which was developed only for the platform frame is now acceptable with the balloon frame. What is even more radical is that the sill plate is omitted and the joists get their bearing directly upon the foundation wall.

It is now considered bad practice not to anchor all sills to the foundation every 8 ft. with ¾″ bolts. Experience with windstorms has stimulated this procedure.

2. **Lumber:** Stamped graded lumber is advocated for quality, accuracy of construction and elimination of waste.

3. **Dimensions:** Hip and valley rafters should be 2″ wider than regular rafters. Space rafters 16″ o.c. instead of the old practice of 20″ or more, to allow for the proper application of laths.

Make exterior wall studs 2″x6″ in buildings over two stories in height.

4. **Nails:** Use cement coated nails because of their greater holding power and the fact that in the same sizes as standard wire nails they are less in diameter and therefore less likely to split the wood. The comparative cost per pound is about the same.

5. **Joists:** In framing around openings, if the header is longer than 6 feet and set back more than 3 feet from the ends of trimmer, the trimmer should be *tripled,* unless it is supported by a bearing partition column or girder.

The ends of all headers longer than 3′6″ should be carried by steel stirrups, supported by, and secured to the trimmer. Stirrups should be countersunk, above and below.

Under non-bearing partitions running parallel to joists, double the joists for spans less than 10 feet. For spans over this, or when partition is higher than 9′6″, triple the joists. Block apart the doubled joists.

When one or more non-bearing partitions run at right angles to joists near the center of spans exceeding 10 feet, alternate joists should be doubled.

When bearing partitions are not directly supported on girders or other bearing partitions but are offset, not to exceed 1/20th of the span of the supporting joists running at right angles to the partition, then the alternate joists should be doubled. If the distance away from girder or bearing partition is greater than 1/20th of the span, then all the joists should be doubled.

When framing joists under bathroom tile-floors allow for an extra load of 30 lbs. per sq. ft. for the tile and 20 lbs. per sq. ft. for the fixtures. Spacing joists 12" o.c. is usually sufficient. Insist on framing around the pipes, rather than cutting joists.

6. Cross Bridging: 1 row for spans from 6 to 10 feet. 2 rows for spans from 10 to 20 feet.

The bottom ends of the cross bridging should be nailed after the sub-flooring has been laid.

Put in bridging between the first three or four joists opposite the ends of headers when these headers are set 2 feet or more away from the end of the trimmer or the regular row of bridging.

If no plastering of ceiling is done over unexcavated portions, nail a continuous 1"x4" strip beneath each line of bridging.

7. Corner posts: The old standard solid corner post is no longer used, instead the built-up post, composed of three studs so set that they provide a full stud thickness on each side of the internal angle, is in favor.

8. Framing openings: The usual doubling of studs at the sides of openings is called for, but definite standards for framing over the openings are:

For openings 3' wide or less in bearing partitions, and 4' wide or less in non-bearing partitions, use same size studs over the top of the opening.

For wider openings up to 5' in bearing walls, and up to 7' in non-bearing walls, use material of the same thickness as the studs but 2" wider.

For openings wider than these, the top should be trussed.

9. Bracing: The best method of bracing is to use diagonal sheathing, as was demonstrated in recent tests.

The next best is to let in diagonal bracing at corners on each floor, making 45-degree angles and running full story height, sheathing being horizontal.

The third choice is to use diagonal bracing let into the outside of the stud, with the sheathing put on horizontally.

10. Studding around stairwells: Carry all studding in stairwells continuously from first story to top story ceiling. Use ribbands to support the second floor joists. Plaster cracks are greatly reduced by this method of framing.

11. Fire-stopping: This is more than ever an important feature. It should be put in at every floor level. Mineral wool, crushed mortar, etc., in specially detailed box supports are recommended.

12. Rafters: Except in hipped roofs, collar ties of same size material as the regular rafters should be nailed to each pair of rafters as nearly half-way up from the plate as possible. Where lack of headroom prevents use of collar ties, nail 1"x4" or 1"x6" ties to the underside of rafters on both slopes extending from the center of the ridge diagonally to the corners of the building.

In climates having heavy snows, the rafters should be braced near the middle of the span about every four feet.

13. Sub-flooring: Sub-flooring boards should be laid as formerly, diagonally across the joists—all joints should be made directly over the joists. Boards should extend to the outside face of the studs in platform framing; otherwise they should extend only to the interior face of the studs and the ends be supported on cleats between joists.

14. Building paper: Lap joints 2", and when window and door frames are installed put up 8" wide strips, secured over the frames back of outside casings and lapping over the regular building paper.

Many of these items may be familiar to the reader as customary to his own practice, but in general, they represent decisions on what constitutes good construction for those parts of the structure which have been left out of former regulations, books, and specifications. Many of these suggestions will be innovations to the ordinary carpenter.

EXTERIOR FACING. The wood frame house is usually covered with clapboards, siding or shingles. Stucco, brick, stone veneer, and artificial half-timbering are omitted from this summary, as they will be covered in subsequent issues.

If the climate is moist, the selection of woods for siding should be confined to western red cedar, cypress, white pine, redwood, vertical grain Douglas fir, or an equally durable species. Preferably the heartwood should be used. In dryer climates the choice of woods may be wider and sapwood as well as heartwood used.

When corner boards are used, they should be thick enough to receive the butt ends of the siding. Where the siding joins at the corners, it should be mitered. This is better than any substitute methods. The exposure of lap siding should be:

for 4" siding, allow 2¾" to the weather
for 6" siding, allow 4¾" " " "
for 8" siding, allow 6¾" " " "
for 10" siding, allow 8¾" " " "
for 12" siding, allow 10¾" " " "

When wood shingles are used for the sidewalls, the specifications should call for No. 1 or 2 western red cedar shingles or cypress or redwood, applied in accordance with the recommendations of the manufacturers. If the shingles are of the pre-stained type, they should be laid according to the recommendations of the manufacturer.

Neither in the case of shingle walls or siding walls should the wood come nearer to the ground than 6 inches. This is a practical rule, very often broken for the sake of making the house appear to be low and connected with the ground and site.

For certain architectural effects in line and texture, the old-fashioned barn siding, (really vertical boarding with battens to cover the joints) and also tongued and grooved narrow boarding with joints filled with white lead, are often used. Smooth texture effects, without the nuisance of joints which open, can be obtained by using hydraulically pressed wood-fiber boards.

FIREPROOFING WOODS. Much has been done to develop fire-resisting treatments of wood in recent years, but actually it is an old problem going back as far as the days of ancient Rome. They used a calcimine or cold-water paint. Today, the New York Building Code refers to this type of paint when it mentions fireproof paint. For exterior use, there is a fire-retarding paint made with a high concentration of metallic earth pigment in linseed oil.

Commercially, the impregnation of the cells of wood with fire-retarding chemicals dates back to 1895. Modern methods of fireproofing wood can be classified into surface treatments such as described above, or those in which the pores of the surface of the wood are filled with chemical salts that retard the spread of flame.

The chemicals are selected which control the gases given off by the wood in combustion. When wood is first heated, it gives off water vapor. Next it gives off volatile gases which ignite and cause flame. Further heating sets up the burning of the non-volatile wood substance and carbon monoxide, which burns, is given off.

Salts of alum and carbonate of soda are effective where the wood is used inside, but they leach out on exposure to exterior weather conditions.

Ammonium compounds, chlorides and reduced oxides of tin, lead, zinc, antimony, and bismuth are effective. Ferrocyanides and sulphocyanides evolve nitrogenous vapors when exposed to heat, causing a smothering of the combustion.

Manganese carbonate liberates carbon dioxide. Borax and ammonium phosphates, when the wood is ignited, flow around the glowing carbon and choke off the combustion.

MILLWORK DETAILS. The inexpensive small house cannot afford to have specially designed doors, windows, trim and cabinet work. In houses over $10,000 and up to $25,000, this is not so true. But even in such houses the doors and windows are usually selected from stock.

The contractor knows that the bulk of the millwork he buys comes through a competitive market, the name of the manufacturer being known only to the local lumber dealer, unless particular trade-marked material is demanded in the specification. The cost and quality of such millwork is often variable, often a competitive product of a very poor order.

Then there is the standard millwork made up by the local mill, not common to the majority of dealers in other sections.

The very high class mill that makes special doors, trim, cabinets and the like, from the architect's details, hardly touches the small house field except for special doorways, cornices, stair-rails and fireplace mantels, for houses costing over $10,000.

The question always comes up as to the method of specifying stock details for millwork. The name of the known manufacturer can be mentioned in the specifications, and the number of the detail taken from the catalog. This almost eliminates competitive prices, when low cost rather than quality is the prime consideration.

The local dealers may be visited, their stocks of standard trim, doors, and windows seen, and the catalogs of the wholesale dealers with whom the mills do business may be consulted. Within this range a selection may be made. The architect cannot very well do this when preparing his plans, for until the contract is let, he does not know from which dealer the millwork will be purchased.

To get around this difficulty, the following method may be used. The general character and type of doors can be described in the specifications, based upon well-known standards. It can then be agreed that before the doors are ordered, the architect should be taken to the mill to make the final selection from the stock. Also, samples of the trim should be submitted to him for approval.

Special details for front door entrances, fireplace mantels, bookcases, kitchen cabinets, etc. should be shown at three quarter scale on the drawings, with larger scale profiles of the mouldings. However, a note should state that all mouldings are to be taken from stock, the selection being as near to those shown on the drawings as possible. Samples of such mouldings should be submitted to the architect for his approval before any assembly of details is made. In this way, a certain leeway is permitted to fit the local conditions and lower prices will usually result.

For the better house, of high quality throughout, the best course is to call specifically for certain millwork units by manufacturer's name. This is particularly practical when it comes to windows. There are standard makes of these, equipped with weatherstrips and screens and hardware, that usually are superior to anything the architect could have made up from his own details. Even in the low cost house, the specific selection of a standard well-made nationally known window is a wise procedure, for the competitive product in the unnamed class is never as good even though it may cost from two to three dollars less an opening. First class windows are always a good investment.

For especially detailed millwork, the best specifications and the best details will not produce good millwork unless the mill which does the work is selected on its reputation for doing high class jobs. When the material is ordered from such a mill, then the importance of meticulous architect's construction sections becomes less, for such a mill prefers to make its own shop drawings and to use its own methods of construction which it can stand behind. Then the architect should supply the mill with details of design and profiles of mouldings, but the sections showing methods of construction should only be suggestive, rather than final, since the mill is more experienced in matters of this kind than the architect's draftsman.

STANDARDIZED DOORS. There is a need in the small house field for a cheaper standardized flush panel or slab door. Nearly all kinds of paneled doors listed in the catalogs are cheaper than the so-called flush type. For cabinets and small closets, doors cut from 5-ply plywood give that clean, simple surface which is desirable in the modern house.

From the construction point of view, all doors can be classified into (a) panel doors, (b) glazed panel doors, and (c) flush or slab doors.

Panel doors of the cheaper type have the panels made up of plywood. The solid panel doors, usually called raised panels, are a heavier type. However, the so-called veneered door does not refer to the panels but to the rails and styles. The most expensive doors are the veneered ones with solid raised panels.

In the cheapest doors the panels fit into a groove in the styles and rails. In the more expensive types, the panels are held in place by mouldings and are called flush moulded doors.

The flush or slab door is usually made with a core of interlocking blocks, glued together with waterproof glue, and covered with two layers of veneer on both sides. Thus the door is essentially of 5-ply construction. In England they have a standardized slab door with a cellular core composed of blocks interlocked like a lattice and covered on both sides with sheets of 5-ply veneer.

WINDOWS. Some of the standard windows developed by nationally known manufacturers show great advances over the older types. In the class of double hung windows, the improvements have been great. Cords and weights in many cases have been eliminated and efficient spring balances are used. Special weather protective grooves have been designed between sash and frame. With the weather strips applied at the factory, the window is not only tight but slides easily, even in damp weather.

Casement windows, too, have been improved. Standardized wooden casement windows have been developed, complete in all details, equipped with weather strip, screens that are pre-fitted, and hardware in place.

The architect should recognize the change in window manufacture and use standard windows as units of construction just as he uses other standard units.

MOULDINGS AND TRIM. The usual difference between special mouldings designed by an architect and standard mouldings is very slight, and in a field where low cost is uppermost, delicate refinements cannot be expected.

The comparatively new, narrow, stock trim with interlocking mitered joints is neat enough to satisfy the most fastidious. Because of the elimination of the weight boxes from double hung windows, due to the introduction of the spring balance, this trim is now quite practical.

The opening of mitered joints in the trim around doors and windows has always been a source of disfigurement in the cheap house. In first class work where the trim is put together at the mill, locked by dowels or metal cleats and glued, its possibilities of opening up are not very great. But such construction is too costly to expect in a small house. Before the narrow line trim and interlocking joint were put on the market, there were two practical methods of overcoming this difficulty. One was to use a square block in the corner and butt the ends of the trim against it. The other was to butt the side casing against the top piece and make this something like an architrave supported on two pilasters. This has been used in so many speculative houses that it is now only associated with the cheapest kind of construction.

The baseboard has been and still is a problem in the wooden house. It invariably opens up, unless particular attention is given to its construction. If the quarter-round moulding in the corner between the baseboard and the floor is nailed to the baseboard, the floor drops and leaves a crack. If it is nailed to the floor, the moulding pulls away from the baseboard. If it is nailed to both, it splits.

One solution to this problem is to see that the finish floor boards do not run under the baseboard but just up to it. Then the quarter round is nailed to the underflooring by a diagonal nail that pulls it against the baseboard and the floor. If settlement and shrinkage take place, it can be tapped with a hammer and made to close up the joint again.

Replacing the quarter round moulding with one carrying electric wires, with a plug receptacle every few feet, is one of the newest contributions to the solution of this problem.

PANELING. Walls finished in wood are economical for the small house living room and are growing in popularity. They do not have to be redecorated and they seem to give a warmth to an interior. Douglas fir plywood, adapted to wall paneling, is one of the most interesting developments. It can be put on the wall in large sheets to extend from the floor to the ceiling, with vertical joints butted and the edges of the boards slightly chamfered. Horizontal strips of plywood with half round mouldings put over the joints makes a pleasant finish. If traditional feeling is desired, the plywood may be divided into small panels by narrow boards and moulded edges nailed to it, resembling somewhat the old-fashioned rails, styles and panels in Elizabethan houses.

Wide, random-width boards of knotty pine, with lapped and moulded joints have been revived as a finish for the living room of the smaller house. As a matter of fact, plain pine shelving set up vertically with the joints covered by 1¼"x¼" strips of wood makes an attractive interior at low cost. If nails are soaked in vinegar and the concoction washed over the pine, a beautiful old finish will be obtained when waxed and polished.

STAIRS. The best stairs are those which are built by the specialist in the mill, brought to the job complete, and set in place. The treads and risers will be thoroughly wedged and glued into the stringers.

In the cheaper houses, though, the stairs are assembled by the carpenter on the job. The stringers, the treads and risers may come already fitted together, but the actual building is done in the house. Such stairs are not as satisfactory as the factory-built type.

In rough framing for stairs up to three feet in width, three stringers should be put in. In cutting the rough stringers, at least 3½" of wood should be left on the under side.

Standardized and machine-made newel posts, handrails, and balustrades have been developed to a very high degree by some manufacturers, and the selection of designs has been made wide enough to satisfy the usual demands for variety. Economies may be effected by using these parts, instead of calling for special ones.

FINISH FLOORS. Changing prices have made hardwood floors common to modern small homes. Fifteen to twenty years ago, only softwood floors were used. Oak is more often selected than maple. Of course, where linoleum is to be laid a finished floor of fir or yellow pine is usually called for as a foundation.

Second grade red or white oak and maple flooring is quite satisfactory for the small house. Some very interesting effects can be obtained by using a third grade, although this is usually considered only fit for very cheap houses.

The standard thickness of flooring, of 13/16", with the 2¼" face and the 2" face, are about the only sizes used in small houses.

Softwoods come in three standard thicknesses. The 25/32" is the one usually called for. When the flooring is to show, the 1½" and the 2⅜" widths and the comb or edge grain are used. When the floor is to be covered with linoleum, a cheaper and wider strip is specified—such as 3¼" or 4½", with flat grain.

Wide plank floors of oak, impregnated with compounds which seal the pores against the changes in moisture have been used a great deal in the living room, hall, and dining room of the medium cost house. They provide a scale and finish that is more in keeping with the cottage type.

Another improvement has been the development of square blocks of oak flooring, chemically treated to resist moisture changes. When laid, these blocks resemble the old parquet floor.

As all flooring boards are seasoned very thoroughly, it is important not to lay any until the plaster is dried out. The baseboard should also be in place and its lower edge level with the top surface of the finished flooring. The first strip of flooring should be nailed up with its edge in line with the face of the baseboard. This will permit the nailing of the shoe moulding to the underflooring as described before.

The proper finish of floors has long been a subject of debate. One principle seems to be sound, that the finish should be of a penetrating type that goes into the wood rather than forming a film on top of it. Waxes and special floor finishing compounds have been made for this purpose and they are usually looked upon with favor today.

PHOTO: SAMUEL H. GOTTSCHO

The Storrs House in Long Meadow, Massachusetts, was built in 1786

WOOD PRECEDENT IN AMERICAN ARCHITECTURE

The Parson Capen House in Topsfield, Massachusetts, was built in 1683

Wood imitates stone in the Wentworth Gardner House in Portsmouth, New Hampshire

PHOTO: COURTESY OF JOHN MEAD HOWELLS

PHOTOS: ROBERT W. TEBBS

One of the Vaughn Houses in Hollowell, Maine, was built in 1799

The Burnham Tavern, erected in 1770 in Machias, Maine, is now a museum

PHOTO: ROBERT W. TEBBS

PHOTO: FRANCES BENJAMIN JOHNSTON

PHOTO: FRANCES BENJAMIN JOHNSTON

The Coleman House in Macon, Georgia (opposite page, top), is a good example of the Greek revival. Edgemont in Albemarle County, Virginia, was built after plans by Thomas Jefferson (opposite page, bottom). The McGuire House in Alexandria, Virginia, has a splendid porch (right). (Below) A typical plantation house of about 1800 near Camden, South Carolina. . . . Four examples of little known Virginia farmhouses, photographed by Frances Benjamin Johnston, appear on the next two pages. They occur in the following order: Farmhouse at Buffalo Springs, Apperson Farm in New Kent County, the Sampson House, built in 1732, in Albemarle County, and an early type log farmhouse near Roanoke

PHOTO: ROBERT W. TEBBS

PHOTO: ROBERT W. TEBBS

PHOTO: FRANCES BENJAMIN JOHNSTON

PHOTO: ROBERT W. TEBBS

PHOTO: ROBERT W. TEBBS

Fairfield Plantation near Georgetown, South Carolina (top, left). Farmhouse in Sweetwater Valley, Tennessee (lower left). Porch at "Plain Dealing," Albemarle County, Virginia (top, right). Sotterley in St. Mary County, Maryland, was built in 1730 (lower right)

REBUILD AMERICA

WE FACE TODAY more formidable foes than those of the old frontier. The defeat of the Indians and the seizure of their lands to exploit for our own profit, was a simple, direct adventure compared with the facing of the intricate problems which this very conquest has built up in our path. The building of cities and industrial towns on vacant land is largely a thing of the past unless we are willing to abandon what we have built. Replacement and rebuilding is the order of today. America has been built,—it now must be rebuilt. And our own works are our chief obstacles. Our new frontier is lined with outmoded buildings which have served their purpose, run their course, and are no longer fit for the uses of commerce, manufacture, recreation or habitation,—and especially unfit for habitation. We have abandoned a third of our population by condemning it to live in unfit, unsanitary, uneconomic buildings.

■ As building has proceeded outward from the centers of our cities, each succeeding spread of new buildings has left behind it areas of decay and blight. The mansions of fifty years ago are the rookeries of today, and the rows of flats and jerry-built houses are the slums which will stand to mock us and to take their toll in the degradation of our citizens.

■ Our market is the replacement market—not only the replacement of our dwellings but of our "Main Streets" and our back streets. The hodgepodge of America's "Main Street," and former "Main Streets," is neither functionally efficient nor esthetically satisfying, and cries out for rebuilding on a more scientific pattern, a pattern which considers the tempo and requirements of an automotive age. In this rebuilding, the advanced technique and the vision of the architect and city-planner must play a more important part than ever before, if we are to avoid the mistakes that have reared the congested, time-wasting accumulations of obsolescent buildings which form our cities.

■ It was far easier for our forebears to clear the acreage,—cutting down trees and piling up rocks,—than it is for us to attack the problems of this new frontier of obsolete buildings, for the debt structure which these buildings represent is far more difficult to remove than the wood and stones. The financial structure presents more problems than the physical. Until buildings are so financed that the debt vanishes concurrently with the buildings' usefulness, even our new buildings will be doomed to the fate of their predecessors.

■ Building in America, with a few notable exceptions, has always been of a piecemeal, unorganized, unplanned variety, inaugurated at the whim of the speculative builder or to meet the needs of a particular landholder without regard for the organization of the city as a whole. The question of today is whether building will follow this path, or whether it will follow a more enlightened pattern which offers a greater probability of more enduring service. One way out for both the building industry and for the property owner (or the owner of debt certificates) might be for them to pool their interests in particular localities to undertake large scale developments conforming to the larger city plan.

■ Rebuilding is already under way. A new building boom looms on the horizon. To a large extent the old pattern is being followed. The developments of the past few years have provided better site-planning, better city-planning, better ways of building, which point to a new physical standard for American life. Which pattern will be followed—the old or the new? To rebuild only for immediate speculative profit is to invite the disasters of the past on a still larger scale. To rebuild intelligently with a long range view toward providing for future needs and future uses is to rebuild well.

Kenneth K. Stowell

EDITOR

THE DIARY

Henry Saylor

AT THE WILLIAMSBURG CONVENTION

SEVERAL special cars on a night train brought The Producers' Council members, many architects, guests, and delegates to Old Point Comfort. As we changed from train to boat at Cape Charles, the dining salon welcomed in rapid succession the well-known figures of many who never miss an Institute convention. Arriving at the New Hotel Chamberlin, we found the lobby filled with an array of ribbon insignia—orange for the delegates, blue for alternates and other members, white for affiliates, green for The Producers' Council, and red for guests and press. It was a big Convention—the largest, it seems to me, in the last ten years, and there were many more wives, sisters, daughters, and aunts than usual. The lure of Williamsburg had taken effect.

The president, Stephen F. Voorhees, set a precedent for the breaking of many precedents during the Convention days that followed, by making the annual address an informal talk, rather than a written speech. Edwin Bergstrom presented his usual masterly summary of the financial situation; whenever our present treasurer presents a mass of complex figures, the delegates relax and look pleased—probably no one but Bergstrom knows what they mean, but he does, and that's enough.

At the luncheon immediately following the morning session—a joint meeting of The Producers' Council and the Institute—Carl Snyder read a particularly interesting paper on the general subject of prefabrication. Since Mr. Snyder is a member of the General Electric organization, I had rather expected to hear an enthusiastic presentation showing the imminence of the prefabricated dwelling in our midst. Quite the contrary. Mr. Snyder had figures and facts to demonstrate conclusively that with the geographical variations involved, together with the size and cost variations, there is not enough of a market to justify the expensive plant that would be necessary. Obviously, the march of prefabrication in smaller unit form goes rapidly on.

I think Louis LaBeaume, who followed the speaker, must have been writing his speech instead of listening to Mr. Snyder, for he spoke as if Mr. Snyder had said precisely the reverse of what had been set forth. I admit the desirability of utilizing the time occupied by most post-prandial speakers in other ways than listening, but when one is to follow as a speaker, it is a dangerous practice. Louis LaBeaume may have sensed in the Snyder speech some of the sinister threats to the architectural profession that he attacked with his satire, but I found no one else who did, and neither Mrs. LaBeaume nor I were able afterwards to convince him that he and Mr. Snyder were on the same side of the argument.

In the afternoon session the committee reports were read in synoptic form, and approved in rapid succession. The Institute's many committees had, for the most part, achieved reasonable progress in the year toward the various goals sought, and their endeavors and unselfish labors were gratefully acknowledged by those who had merely sat on the side lines.

We topped off the afternoon by attending in vast numbers on the roof of the hotel, high above the waters of the Bay, the reception given by President and Mrs. Voorhees. It was an occasion upon which the Southern members' knowledge of mint juleps and their proper preparation and consumption was passed on to the less accustomed tastes of members from the North, Mid-west, and far West.

Ely Jacques Kahn and Ralph Walker have been down here, apparently, for the better part of a month, arranging an exhibit which presents the latest products of the contemporary market in furniture, materials, and equipment for the home interior. A group consisting of an entrance foyer, living room, drawing room, dining room, lounge, study, kitchen, and bathroom had been brought together with all of the care in arrangement and lighting that marks the periodical exhibitions of the crafts at the Metropolitan Museum. It might have been thought, but for a specific disclaimer by the president, that this array of contemporary achievements had been introduced as an effort to neutralize the romantic appeal of the Williamsburg restoration.

The Convention settled down to an evening session tonight in an attempt to dispose of routine matters. Through the clever device of dealing with all the changes in by-laws by a committee of the whole, expressing opinions of the sense of the meeting throughout the afternoon, everything had been ironed out ready for a formal vote by the delegates. In the evening, with one motion, unanimously carried, the various changes in the by-laws were put behind us. It was a very pretty exhibition of skilful planning, avoiding very neatly the intricacies of last year's Milwaukee Convention, when a roll call of delegates had to be called every few minutes to keep the record straight.

However, the machinery was working rather too rapidly, for, in the election of regional directors, we came upon a snag that suddenly halted progress, brought calls for a copy of Roberts' "Rules of Order" and other parliamentary precedent, threatening for a time to entangle the Convention in a grand snarl. The great good humor of the delegates, however, was not to be quenched, and with an adroit resolution by Richmond Shreve, peace reigned once more, not again to be disturbed.

Having put behind us a lot of the work of approving committee reports, revising the by-laws, electing officers and other routine matters, we were off to Williamsburg in the morning, a motor drive of perhaps forty miles, to occupy as our new headquarters, Phi Beta Kappa Hall on the campus of the College of William and Mary. Three superb addresses marked the morning session: the welcome of Dr. John Stewart Bryan, President of the College; the explanation by Mr. Vernon Geddy of the Williamsburg restoration idea and its progress; and finally the words of William G. Perry of Perry, Shaw & Hepburn, the architects, who have labored for years in what must have been, with all its difficulties, a pleasant task.

It seemed particularly fitting that at noon we should gather for a special service in old Bruton Parish Church, where Dr. W. A. R. Goodwin, in whose mind the Williamsburg restoration idea originated, spoke of the spiritual forces that may, it is hoped, be recaptured from the days of our pioneer forefathers. The old Bruton Parish Church had been restored in a measure before the Williamsburg general restoration started. Nevertheless, there are still some things that should, and doubtless will, be done to bring the famous old pile to the form intended by those who built it, back in 1710.

In the afternoon, free of all Convention duties, we roamed in small groups about the town, visited the Capitol, the Raleigh Tavern, the Public Gaol, the Ludlow-Paradise House, and saved

for the last the magnificence of the Governor's Palace. It is difficult indeed to hold oneself down to ordinary words in speaking of Williamsburg. Possibly I can express the utmost when I set down the fact that I observed William Lescaze, that foremost figure of rampant modernism, looking at Williamsburg and liking it.

In the morning session on Thursday, for which we again made the journey from Old Point Comfort to Phi Beta Kappa Hall in Williamsburg, two live subjects were discussed: housing and public works. Led by Richmond H. Shreve, the discussion on housing followed, for the most part, the activities of the various small groups throughout the country who are endeavoring to find some rational means of affording architectural service to the small house owner. No conclusions nor decisions were reached; the whole matter is still in the exploratory stage.

Under the leadership of Francis P. Sullivan, the discussion on public works resolved itself chiefly into an argument for and against the principle of competition. Youth had its say, arguing that the logical and fairest method of selecting an architect for buildings involving the use of public money is by competition. Personally, I think the resolution seeking this end failed because of its too-inclusive phrasing. Obviously, it is impossible to have competitions for every minor alteration or addition to the country's vast array of post offices. Thus, while the resolution failed of passage, it was later reframed in a much milder form as a recommendation to the Board, and passed almost unanimously as an expression of the sense of the meeting.

The far-famed Southern hospitality was very much in evidence at the three luncheons served us in the college refectory on Wednesday, Thursday and Friday, each of them a welcome relief from typical hotel fare.

There were voices heard at and after the morning session, to the effect that the great subject of housing should not be dismissed with a few reports about small-house practice. In answer the president announced a rump meeting in one of the smaller rooms in the afternoon, where, under the chairmanship of Richmond Shreve, the subject that has been called "merely a form of oratory" was discussed ad lib by all and sundry. While thoughts on the Wagner Bill, PWA and WPA sought expression from the tongues of intense protagonists and their opposers, the chairman steered the crowded room through some controversial whirlpools to a quiet adjournment—aided, doubtless, by the fact that outdoors the sun shone upon a perfect day and the birds sang ecstatically of Williamsburg.

Back to Old Point Comfort—this travelling forty miles twice a day to meetings was the only thing many of us could find against the Convention. Architectural education came in for its customary evening session, with Dean William Emerson's suave presentation of a report of progress, together with his announcement that we had as our guests many students from the architectural schools of the country.

The last day of the Convention proper opened with a session, again in Phi Beta Kappa Hall, in which the agenda contained the harmless-looking line, "Report of the Committee on Resolutions." It was a very disarming item. Nevertheless, I have noticed that most of the real action taken by a convention occurs in a few unguarded moments. Some one succeeds in getting a resolution past the Resolutions Committee, which has been hastily formed during the Convention, and some entirely unexpected phase of Institute activity is proposed, rarely discussed, and automatically voted through. Nothing so revolutionary as re-writing the by-laws, establishing several new kinds of memberships, or withdrawing the support of the Institute from any of its accepted activities took place this year, as will be seen from a careful reading of the proceedings when they appear in *The Octagon*.

One last delightful luncheon in the college refectory, and another glorious afternoon roaming about Williamsburg. The committee in charge of the weather did its best for us. Some of us stopped at Carter's Grove on the way back to Old Point, delighting in the restoration which Duncan Lee had made in this grand old James River plantation for Mr. and Mrs. Archibald M. McCrae.

The final dinner of the Convention was notable in several particulars, one of the chief of which was the fact that there were no speeches, aside from the president's direction of the program. The Hampton Institute singers appeared in a large body, singing for us, as only a trained body of Negroes can sing, the spirituals and Southern folk songs.

As in all conventions in my recollection, the presentation of certificates to the newly elected Fellows, was one of the particularly bright spots of the evening. Boston and Philadelphia stood out in front with the election of Ralph W. Gray, William G. Perry, and Henry R. Shepley of Boston; Walter T. Karcher, Sydney E. Martin, and Charles Willing of Philadelphia. The other men thus honored by the Institute were Moise H. Goldstein of New Orleans, Horace W. Peaslee of Washington, Hardie Phillip and Stewart Wagner of New York, and Wilbur T. Trueblood of St. Louis.

The traditional modesty of Mr. John D. Rockefeller, Jr. kept him away from the dinner, where he would have been most enthusiastically honored for making possible the restoration of Williamsburg. Under some pressure, no doubt, he had consented to meet with a small group of the Directors at a luncheon in Williamsburg today, when the Institute presented to him an engrossed citation reading: "The American Institute of Architects assembled in sixty-eighth convention at Williamsburg in the Commonwealth of Virginia in the month of May of this year, recognizing the great historical values preserved in the restoration of Colonial Williamsburg, symbol of an early American culture beautifully expressed in the architecture of the buildings and the plan of the city, especially commends John D. Rockefeller, Jr., honorary member, for his vision, direction and generosity in the creation of this enduring national monument, inspiring alike to laymen and to architects."

William G. Perry and Thomas M. Shaw of Perry, Shaw & Hepburn, the architects, and Arthur A. Shurcliff, landscape architect, were commended with great fervor for what they had done. Dr. William A. R. Goodwin, rector of the Bruton Parish Church, brought the whole company to its feet in recognition of his vision, devotion and leadership in the restoration of Williamsburg.

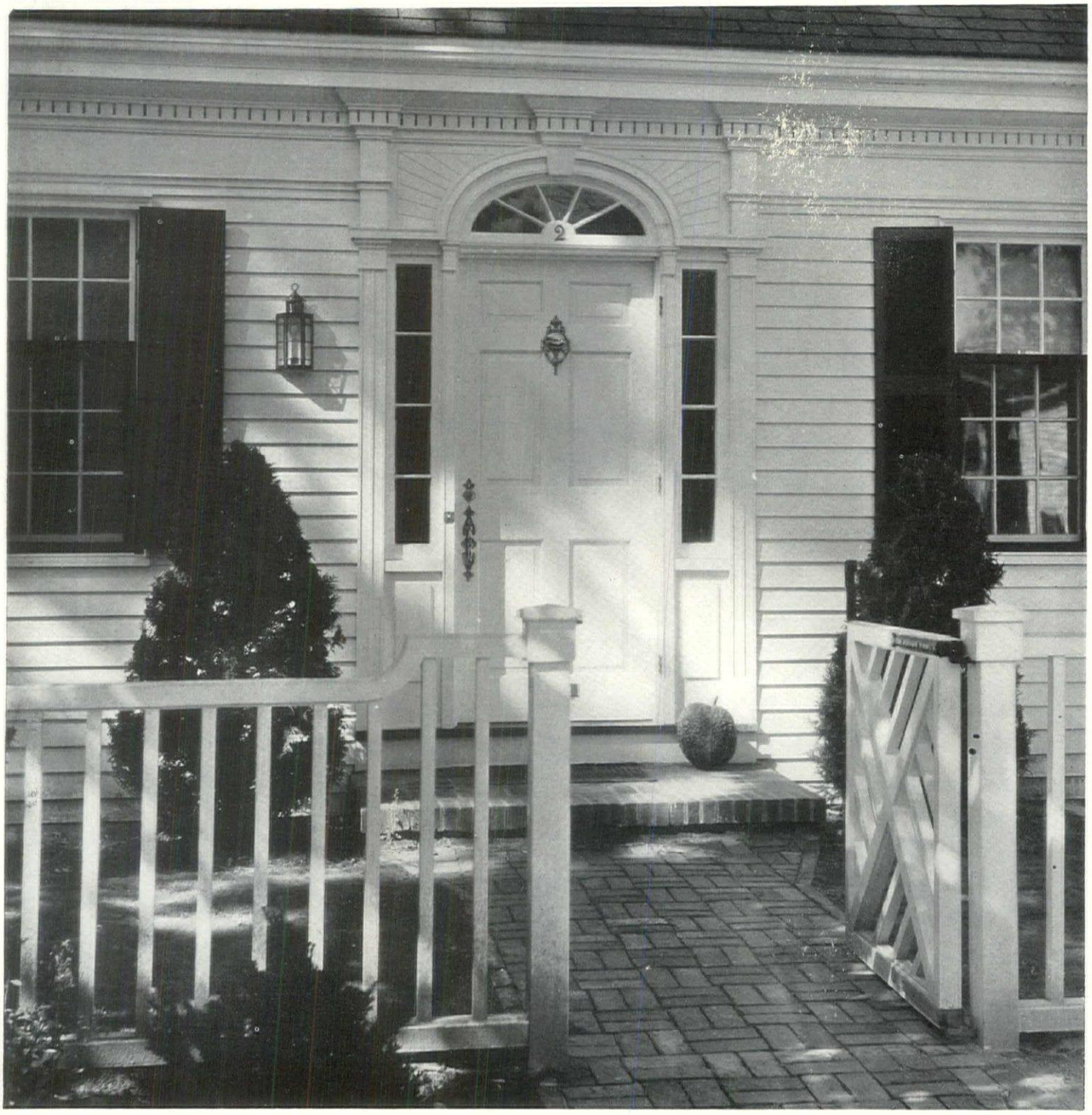
John J. Earley, of Washington, was awarded the Craftsmanship Medal, for his work in the application of color to masonry and the development of a new technique for the decorative use of concrete. In awarding the Fine Arts Medal this year, the Institute turned to the stage, and honored Robert Edmond Jones as a designer for the theatre.

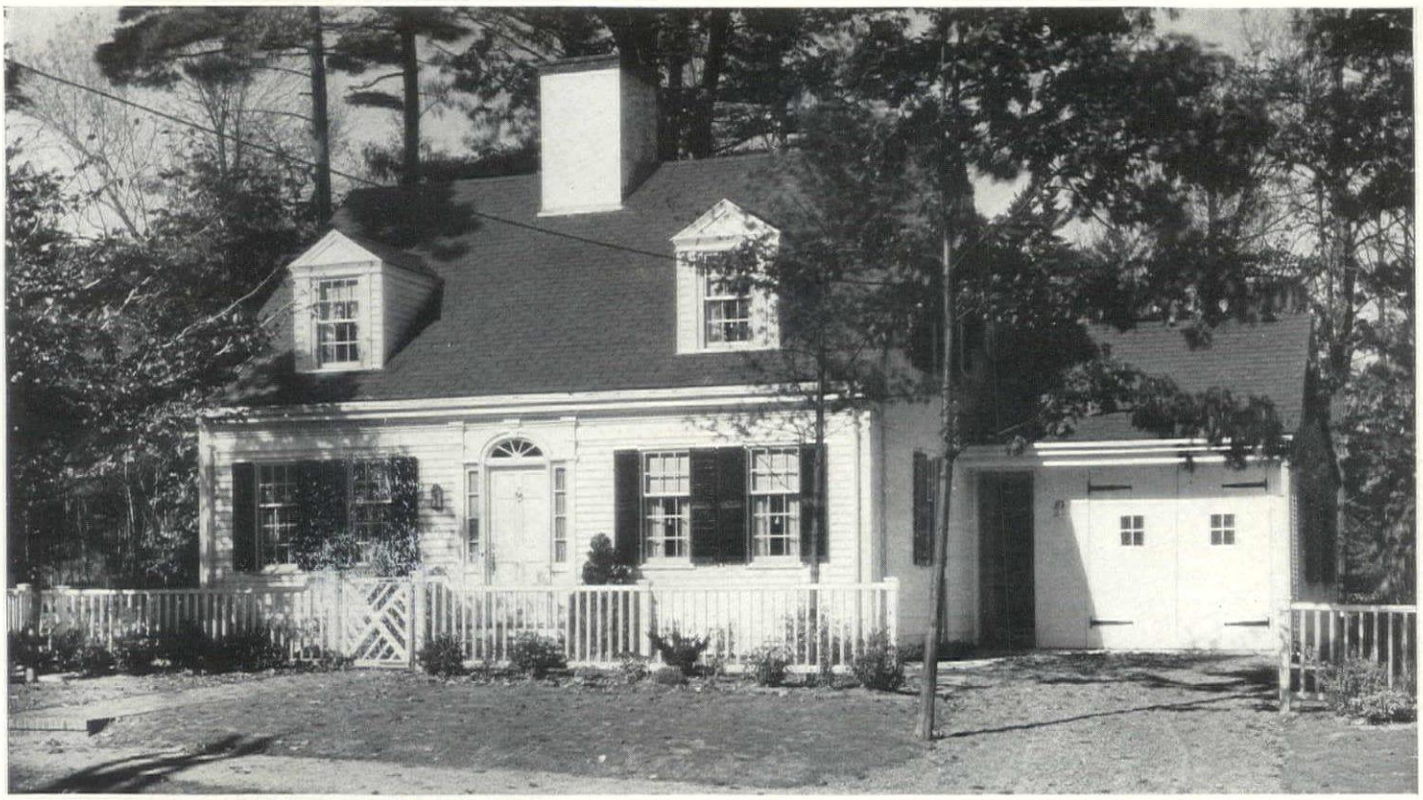
With the induction of the new officers and the introduction of Chapter presidents who were in attendance, the Sixty-eighth Convention of the American Institute of Architects was declared adjourned.

ELEVEN SMALL HOUSES OF WOOD

A predominant characteristic of American domestic architecture is a wide and varied use of wood. From the founding of the first colonies, the outstanding inspiration for our homes has been English, particularly, Georgian English architecture. In interpreting what is essentially a brick style to the medium of wood, we have given these influences a new identity that is definitely American. Several years ago when the contemporary style first began to affect the design of American houses, dire forebodings were felt for the future of wood in architecture. Subsequent developments have proved conclusively the falseness of those prophecies

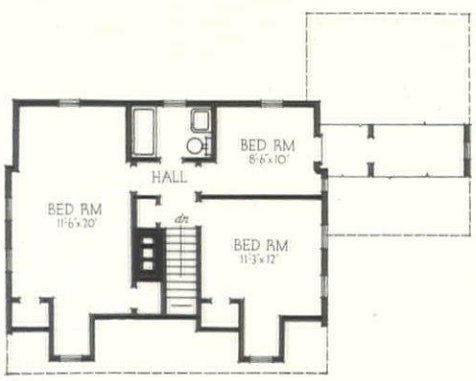
PHOTOS: HOWARD E. GILLESPIE

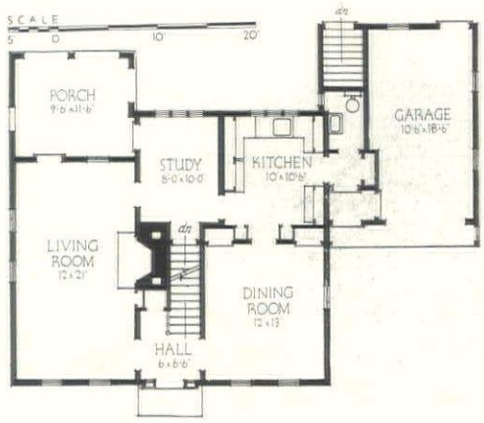




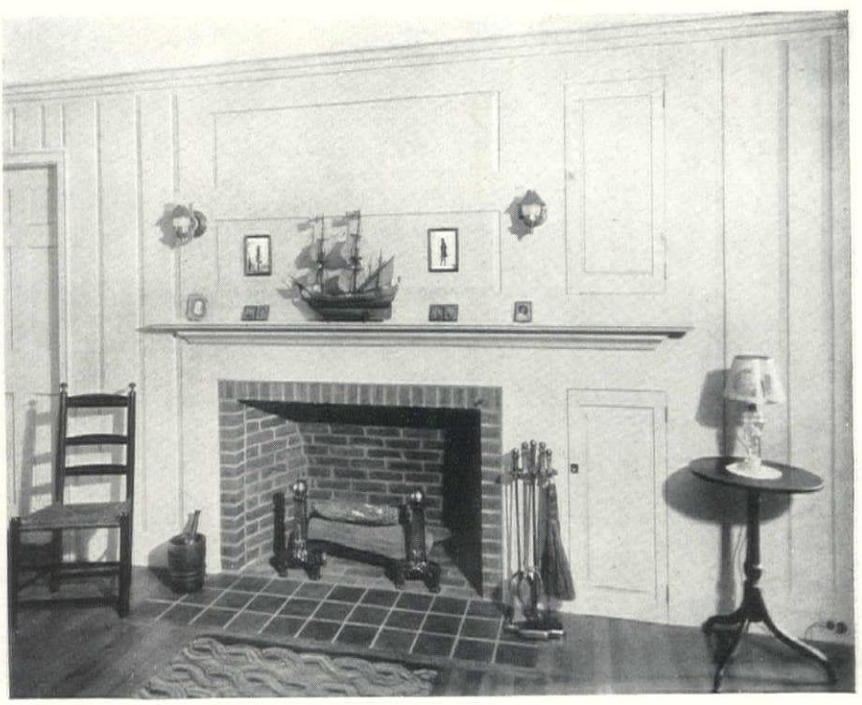
HOUSE OF MRS. HARRIET F. WOOD, STONEHAM, MASSACHUSETTS

DAVID J. ABRAHAMS, ARCHITECT

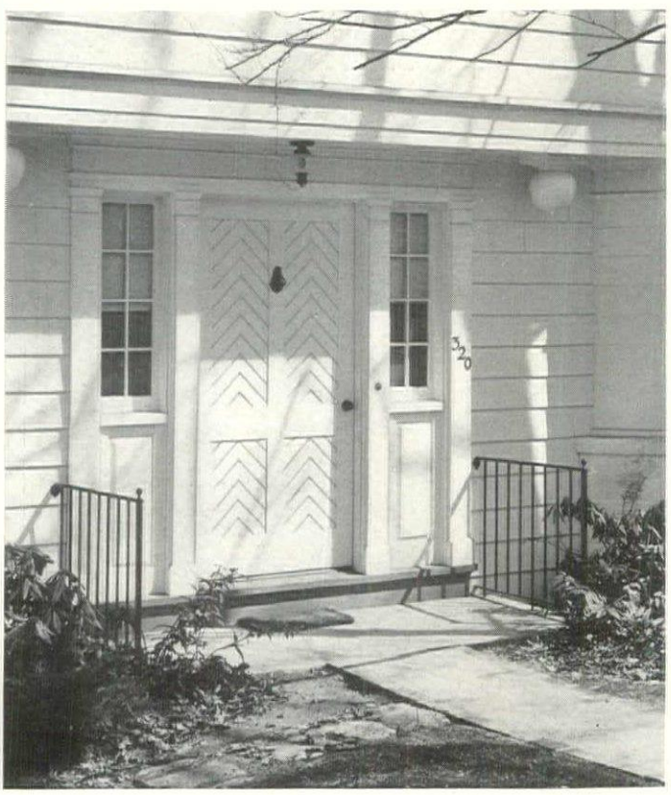




Front elevation and oversized dormers are clapboard, garage front is flush boarding and the remainder of the house is shingled. White exterior finish with black shutters and chimney top. Interior finish, light ivory woodwork, wallpaper and natural stained pine in study. Floors are dark-stained, select grade oak



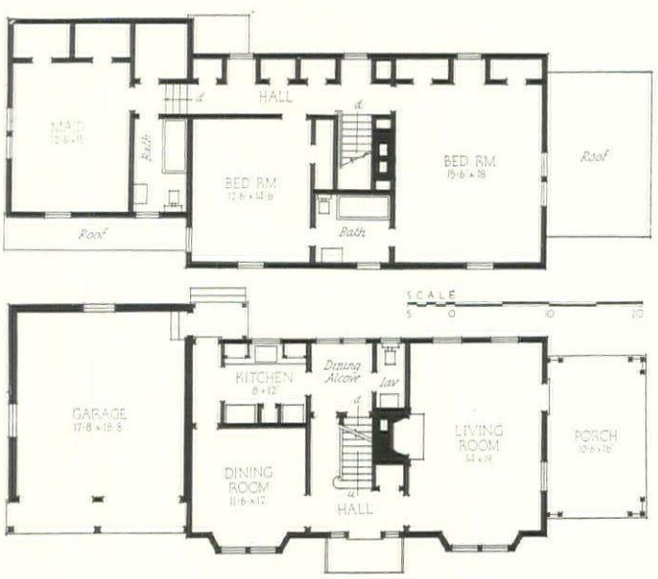
PHOTOS: GUSTAV ANDERSON



HOUSE IN YONKERS, NEW YORK

RANDOLPH EVANS, ARCHITECT

Framing of Douglas fir, sheathing of North Carolina pine and painted redwood clapboards are used. Roof shingles are of red cedar. Select red oak for floors. White pine trim and birch stair railings in the interior

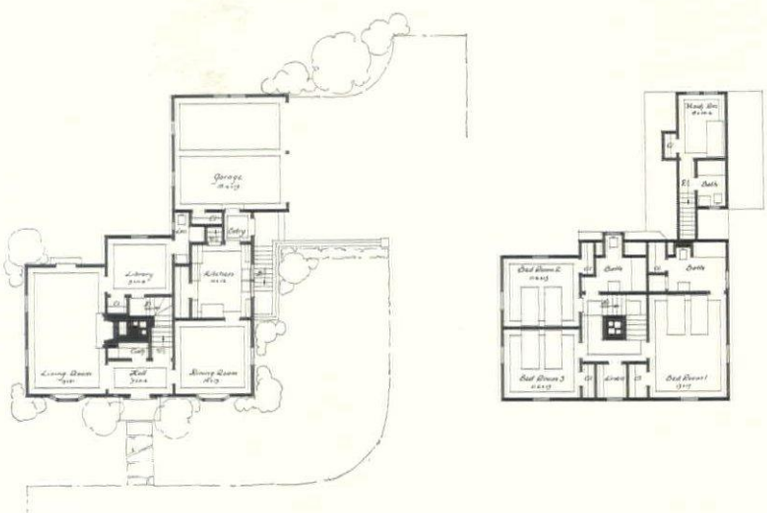


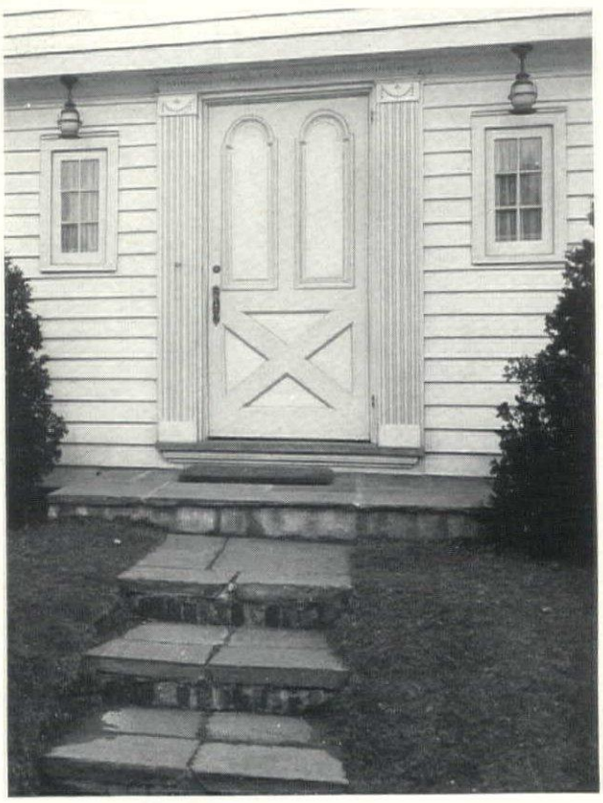
PHOTOS: RICHARD GARRISON

HOUSE OF PARKER NELSON, IRVINGTON, NEW YORK

ERARD A. MATTHIESSEN, ARCHITECT

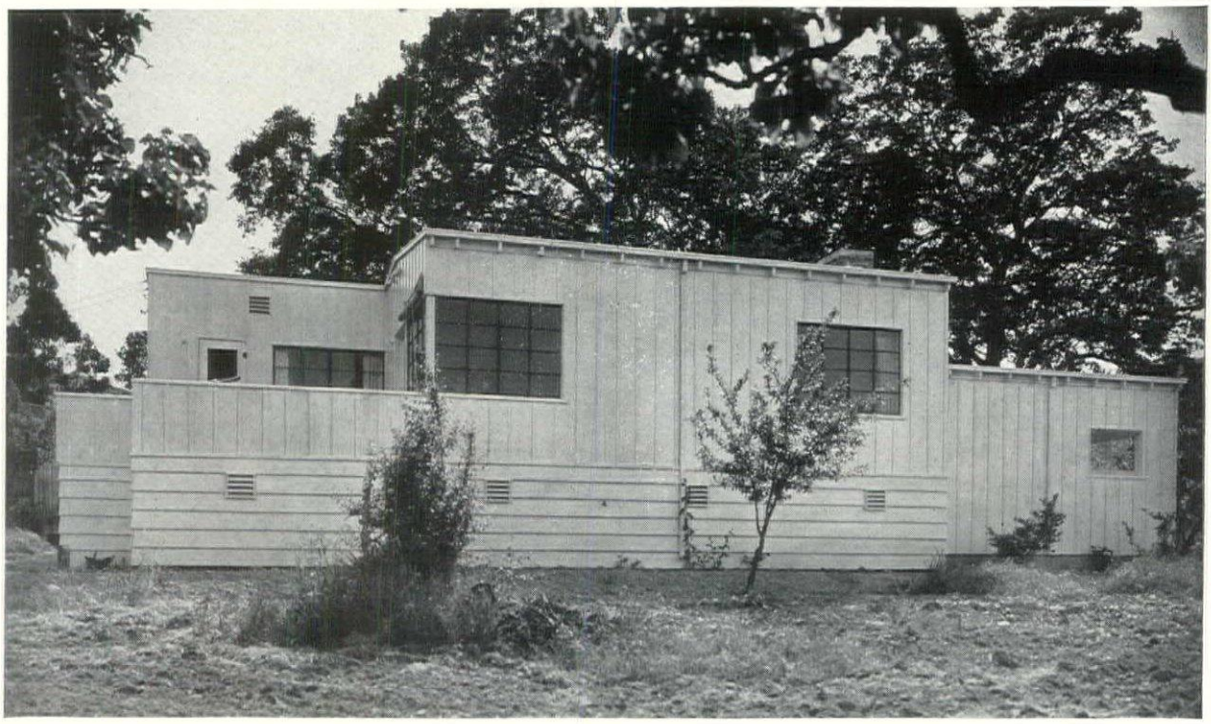
Cedar clapboards, painted white, are used for exterior finish. Dark green shingle roof and olive green shutters. Stained and waxed red oak used for flooring. Window and door trim, except special detail at main entrance, is stock whitewood

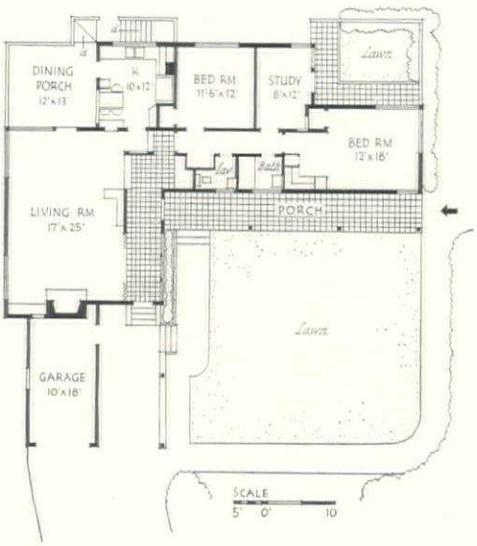


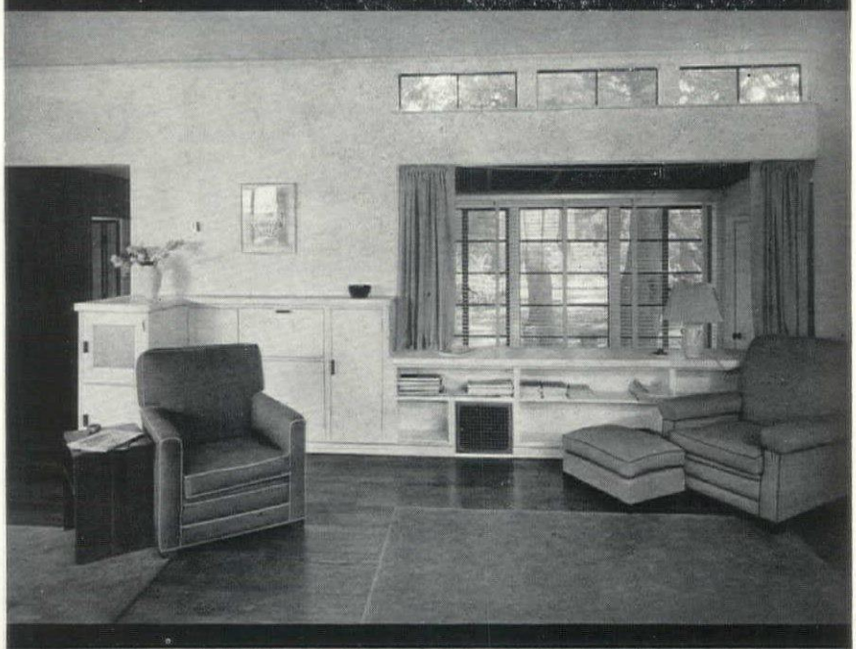


HOUSE OF TRAVERSE CLEMENTS, LOS GATOS, CALIFORNIA

MICHAEL GOODMAN, ARCHITECT







The plan of this house was controlled by the owner's desire to take full advantage of the view overlooking fine rolling vineyard country. It is situated on the top of a hill on the site of a former ranch house. The living room is raised to overlook an orchard. Exterior walls are of redwood boards and battens over Oregon pine sheathing and studding. Plank oak floor in living room and pine in bedrooms. Trim and shelving are white pine. Cabinets and doors of Oregon pine veneer

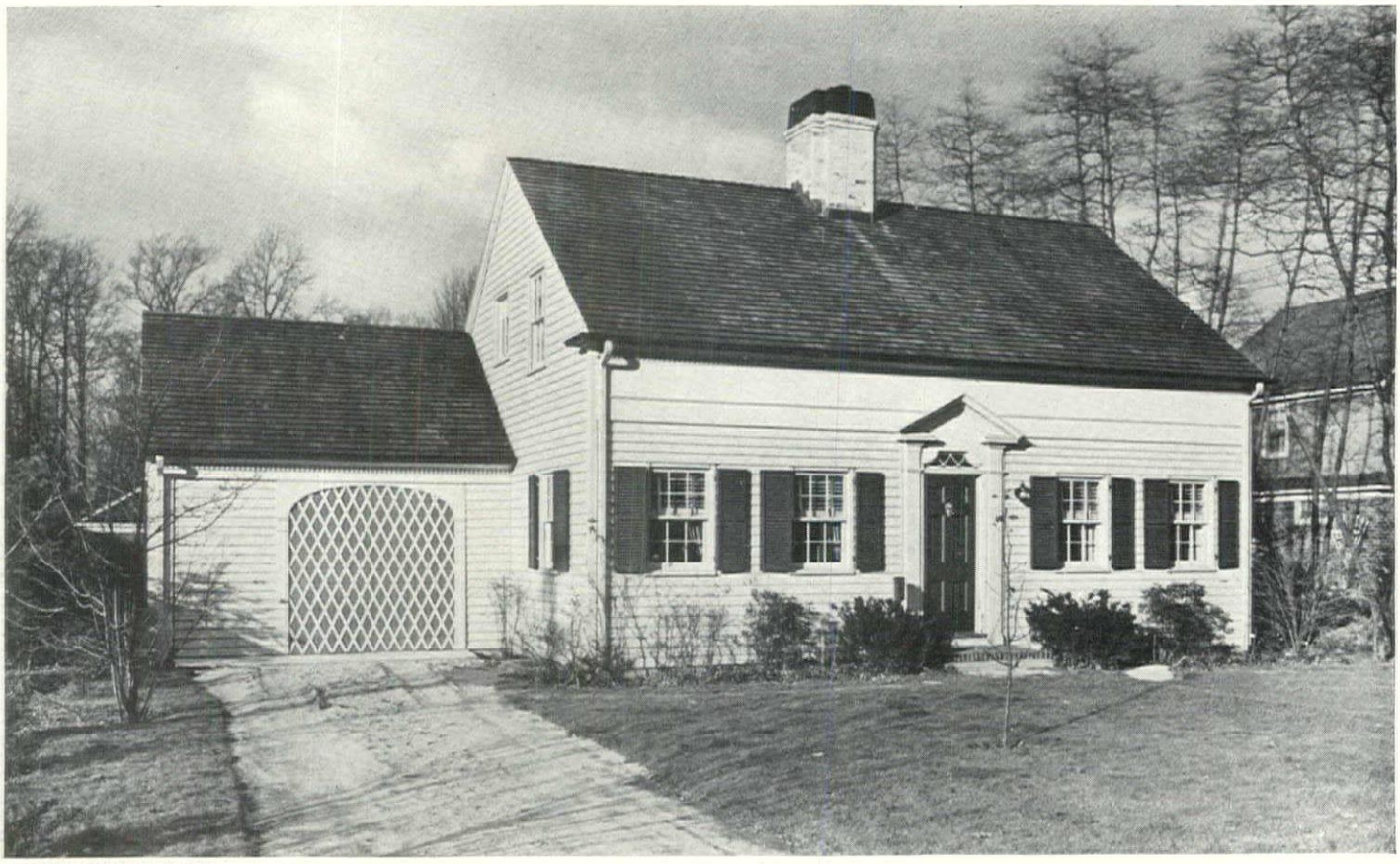


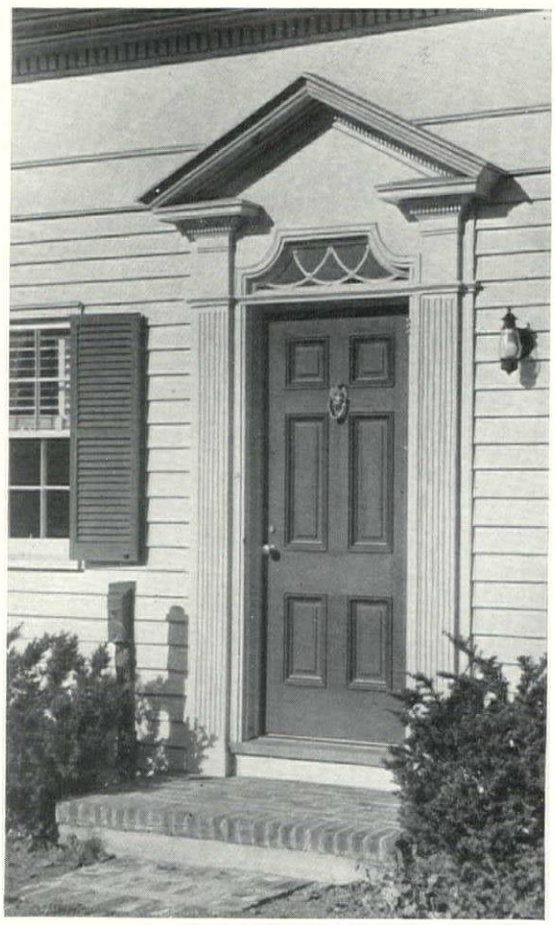
PHOTO: MURRAY M. PETERS

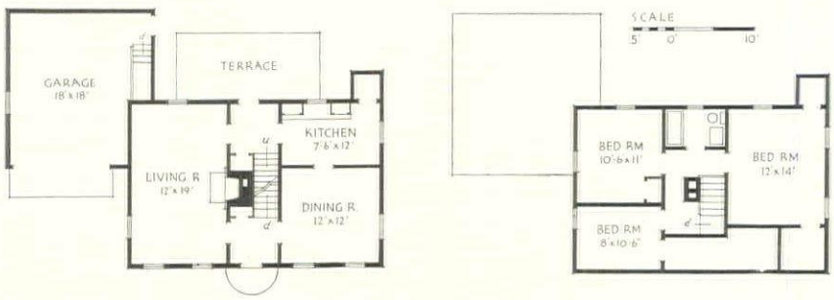
HOUSE OF BRADFORD SHERMAN

PORT WASHINGTON, NEW YORK

PAUL ARNOLD FRANKLIN, ARCHITECT

A model house sponsored by the local Chamber of Commerce, it was built in 1935 at a cost of about 30c per cubic foot. This included nationally known products and complete insulation. Narrow red cedar clapboards typical of the Cape Cod style of house are painted white



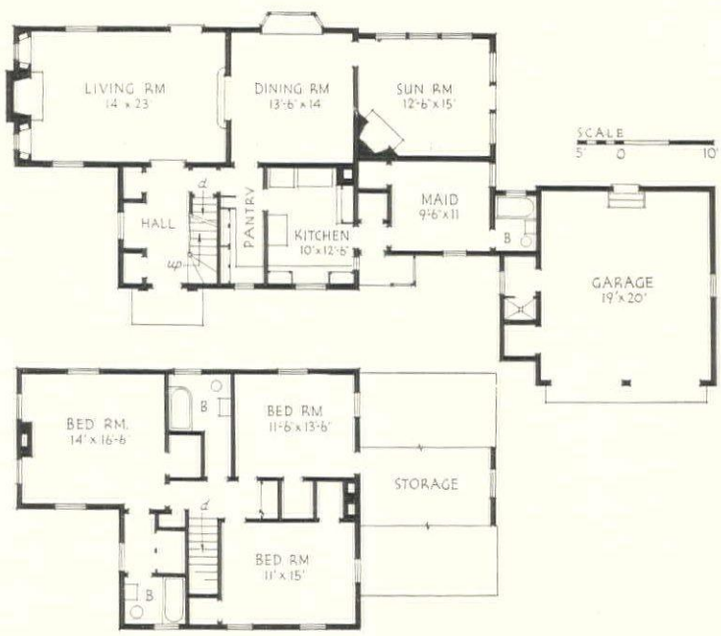


PHOTOS: GEORGE H. VAN ANDA

HOUSE OF COLIN C. S. LOCKE

WESTPORT, CONNECTICUT

BURTON ASHFORD BUGBEE, ARCHITECT



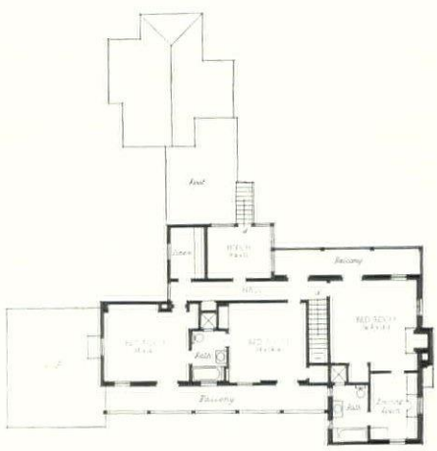
An unusal treatment recalling early 18th Century forms. Both walls and roof of cedar shingles. Those on the walls are painted white and those on the roof are stained black. Interior trim, including paneling and mantels, painted white pine

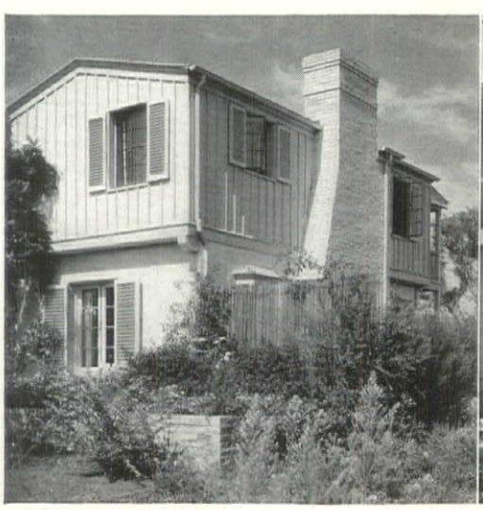
PHOTOS: MOTT STUDIOS

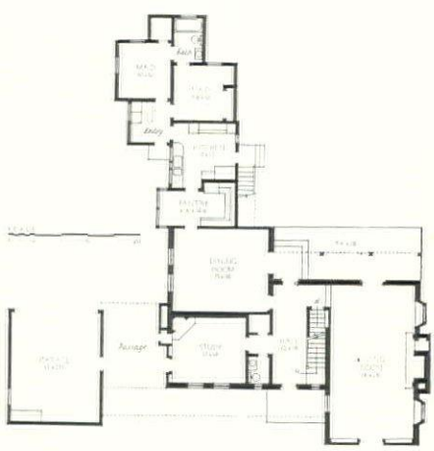
HOUSE OF J. DERRY KERR, BRENTWOOD PARK, CALIFORNIA

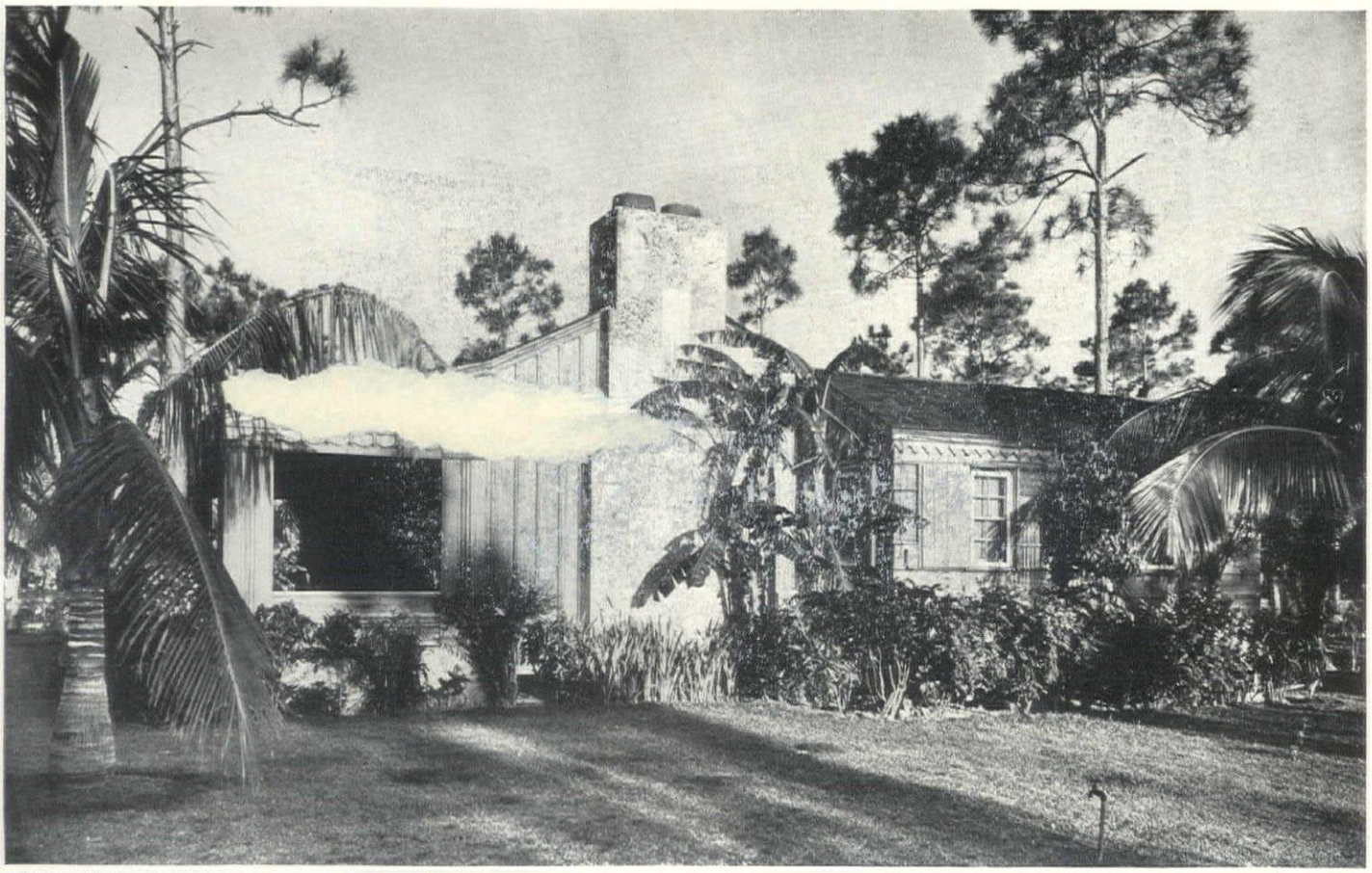
JOHN BYERS, ARCHITECT

Exterior woodwork is painted vertical siding of select common Oregon pine with moulded battens. . . . Roof of red cedar shingles. . . . Knotty Idaho pine paneling in main hall and den. . . . Oak floors in main downstairs rooms and pine for second floor





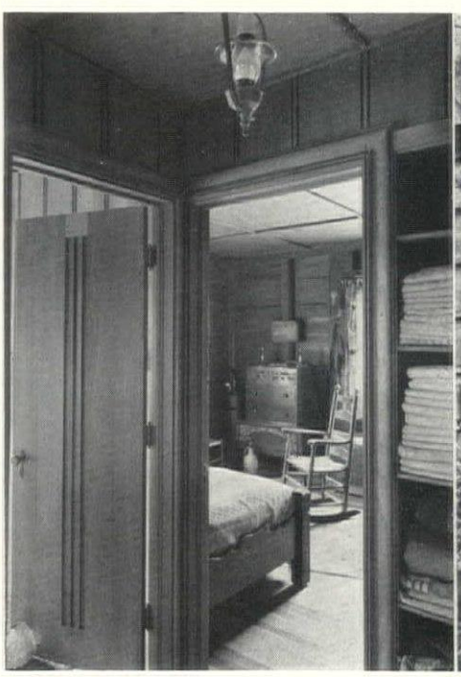


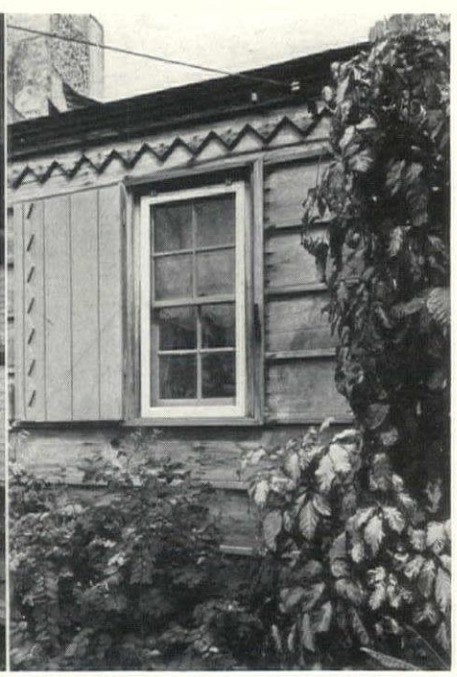


PHOTOS: SAMUEL H. GOTTSCHO

HOUSE OF HAYES THOMAS, SOUTH MIAMI, FLORIDA

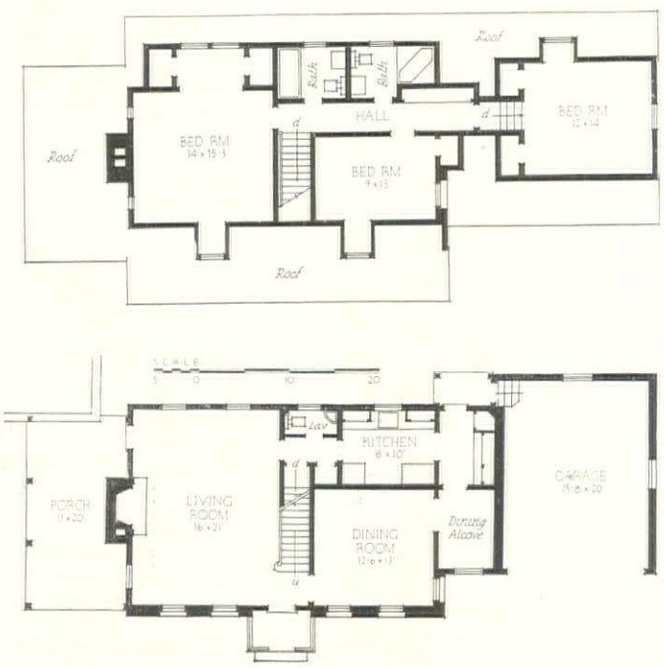
ROBERT FITCH SMITH, ARCHITECT





All framing is long leaf yellow pine, termite proofed with creosote below floor. Exterior and interior sheathing and trim of red tidewater cypress stained brown. Cypress shingles on roof; ceilings of plywood. Floors of select grade yellow pine; living room floor random red oak

PHOTOS: GUSTAV ANDERSON



HOUSE IN YONKERS, NEW YORK

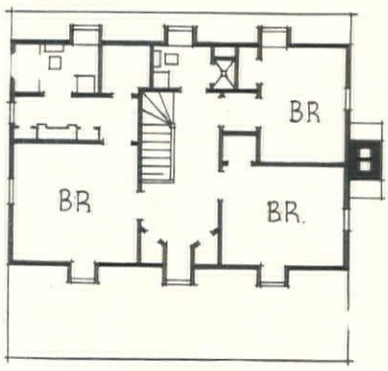
RANDOLPH EVANS, ARCHITECT

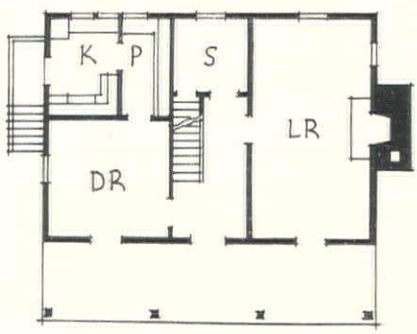
The Dutch Colonial style is typified by the combination of stone and shingles. Cedar shingles, trim and brick chimney are painted white. The roof shingles are also of cedar. Interior woodwork includes select red oak floors, white pine trim and birch stair railings

HOUSE OF RICHARD B. ENGLISH

BELLE HAVEN, ALEXANDRIA, VIRGINIA

MILTON L. GRIGG, ARCHITECT



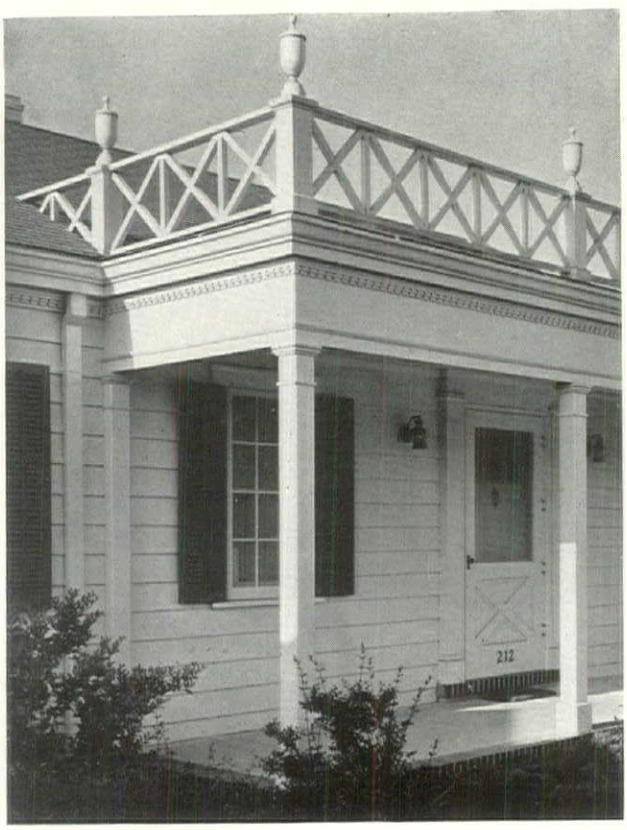


Designed in the 18th Century Virginia style, this house has a typical gambrel roof, oversized chimney and clapboard and shingle walls. Trim in the living room follows local Colonial precedent and is waxed natural redwood. Cost about 30c per cubic foot. Recreation room, hobby room, laundry and air conditioning room are in the basement

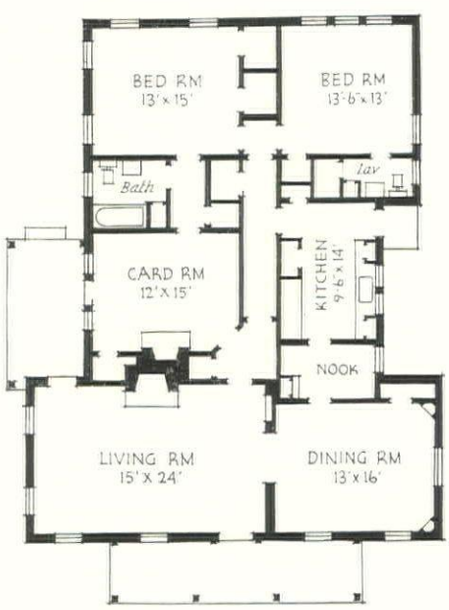
PHOTO: ZINGRAFF

HOUSE OF J. E. LOFTIS, SAN ANTONIO, TEXAS

BARTLETT COCKE, ARCHITECT



Seldom is so formal an architectural style used for a bungalow. The exterior surface is yellow pine siding with white pine doors and windows. Interior woodwork is yellow pine painted



PORTFOLIO OF SELF-SUPPORTING STAIRWAYS

NUMBER 116 IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

PORTFOLIOS IN PREPARATION

WINDOW HEADS (INTERIOR) . . . July
GARDEN ENCLOSURES . . . . . August
CHURCH LIGHTING FIXTURES September
ORIEL WINDOWS . . . . . October

PREVIOUS PORTFOLIOS, published in ARCHITECTURE

1926
DORMER WINDOWS
SHUTTERS AND BLINDS

1927
ENGLISH PANELING
GEORGIAN STAIRWAYS
STONE MASONRY TEXTURES
ENGLISH CHIMNEYS
FANLIGHTS AND OVERDOORS
TEXTURES OF BRICKWORK
IRON RAILINGS
DOOR HARDWARE
PALLADIAN MOTIVES
GABLE ENDS
COLONIAL TOP-RAILINGS
CIRCULAR AND OVAL WINDOWS

1928
BUILT-IN BOOKCASES
CHIMNEY TOPS
DOOR HOODS
BAY WINDOWS
CUPOLAS
GARDEN GATES
STAIR ENDS
BALCONIES
GARDEN WALLS
ARCADES
PLASTER CEILINGS
CORNICES OF WOOD

1929
DOORWAY LIGHTING
ENGLISH FIREPLACES

1929—*Continued*
GATE-POST TOPS
GARDEN STEPS
RAIN LEADER HEADS
GARDEN POOLS
QUOINS
INTERIOR PAVING
BELT COURSES
KEYSTONES
AIDS TO FENESTRATION
BALUSTRADES

1930
SPANDRELS
CHANCEL FURNITURE
BUSINESS BUILDING ENTRANCES
GARDEN SHELTERS
ELEVATOR DOORS
ENTRANCE PORCHES
PATIOS
TREILLAGE
FLAGPOLE HOLDERS
CASEMENT WINDOWS
FENCES OF WOOD
GOTHIC DOORWAYS

1931
BANKING-ROOM CHECK DESKS
SECOND-STORY PORCHES
TOWER CLOCKS
ALTARS
GARAGE DOORS
MAIL-CHUTE BOXES
WEATHER VANES
BANK ENTRANCES

1931—*Continued*
URNS
WINDOW GRILLES
CHINA CUPBOARDS
PARAPETS*

1932
RADIATOR ENCLOSURES
INTERIOR CLOCKS*
OUTSIDE STAIRWAYS*
LEADED GLASS MEDALLIONS
EXTERIOR DOORS OF WOOD
METAL FENCES
HANGING SIGNS*
WOOD CEILINGS*
MARQUISES*
WALL SHEATHING
FRENCH STONEWORK
OVER-MANTEL TREATMENTS*

1933
BANK SCREENS
INTERIOR DOORS
METAL STAIR RAILINGS*
VERANDAS
THE EAGLE IN SCULPTURE*
EAVES RETURNS ON MASONRY GABLES
EXTERIOR LETTERING
ENTRANCE DRIVEWAYS
CORBELS
PEW ENDS
GOTHIC NICHES
CURTAIN TREATMENT AT WINDOWS

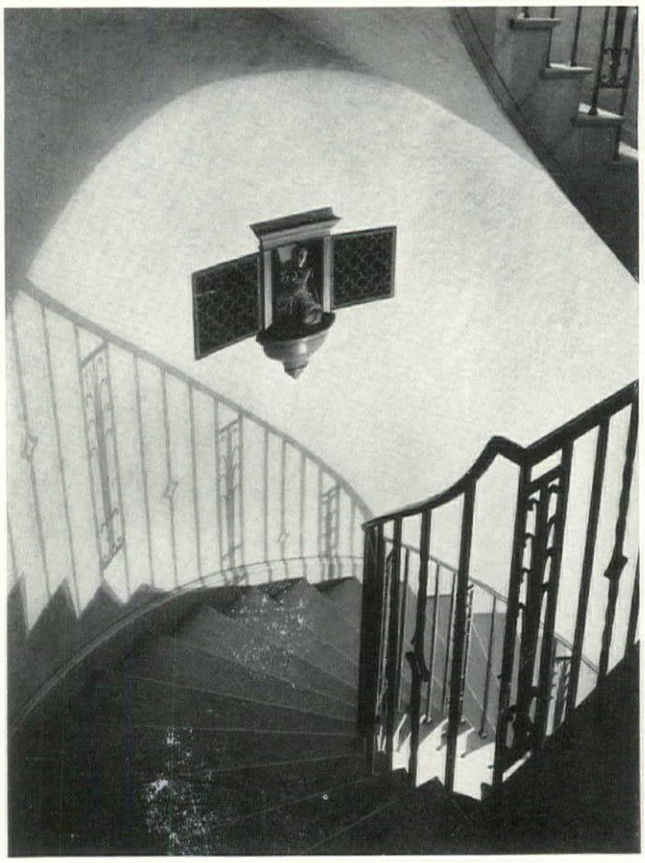
1934
EXTERIOR PLASTERWORK
CHURCH DOORS
FOUNTAINS*
MODERN ORNAMENT
RUSTICATION*
ORGAN CASES*
GARDEN FURNITURE
WINDOW HEADS, EXTERIOR
SPIRES*
BUSINESS BUILDING LOBBIES*
ROOF TRUSSES*
MODERN LIGHTING FIXTURES*

1935
CIRCULAR WINDOWS (Gothic and Romanesque)
TILE ROOFS*
MOULDED BRICK*
DORMER WINDOWS*
ENTRANCE SEATS*
OVERDOORS, INTERIOR*
BRICK CORNICES*
SIGNS*
CHIMNEY OFFSETS*
WINDOW HEADS* (Exterior, Arched)
UNUSUAL BRICKWORK*
SHUTTERS AND BLINDS*

1936
FIREPLACES* (Mediterranean Types)
PEDIMENTS* (Exterior)
BALCONY RAILING* (Interior)
GOTHIC BUTTRESSES*
CORNER WINDOWS*

Note: Only those subjects marked with an asterisk are still available to subscribers, and will be sent postpaid at 25 cents each.

House, Englewood, N. J.
Eric Kebbon



House, New York City
Howard & Frenaye

House, Westbury, N. Y.
Henry R. Sedgwick

House, Middletown, R. I.
Harrie T. Lindeberg

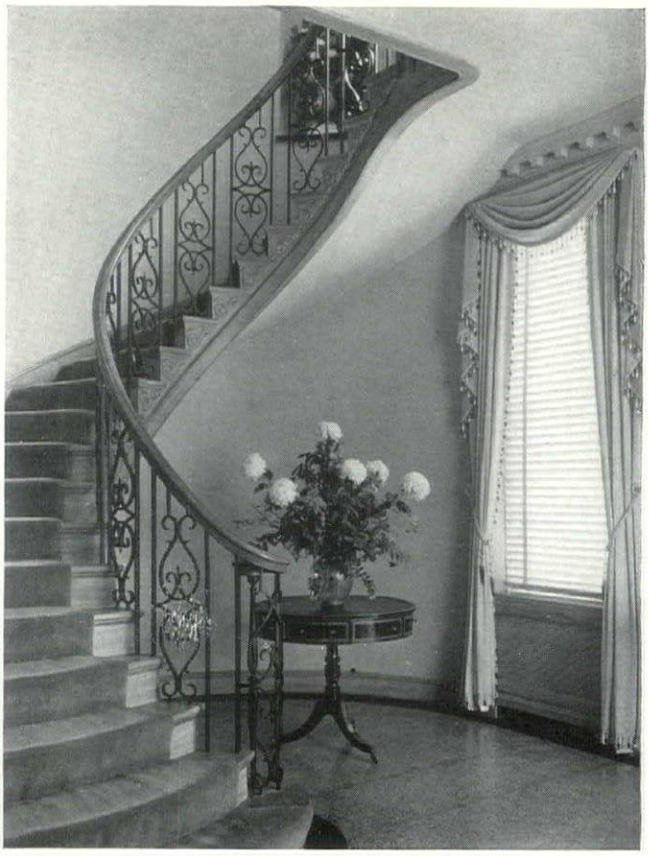
House, Scarsdale, N. Y.
Julius Gregory

House, Red Bank, N. J.
Office of John Russell Pope

House, Lehman Township, Pa.
Francis A. Nelson

House, Old Westbury, N. Y.
Noel & Miller

House, Far Hills, N. J.
Office of John Russell Pope



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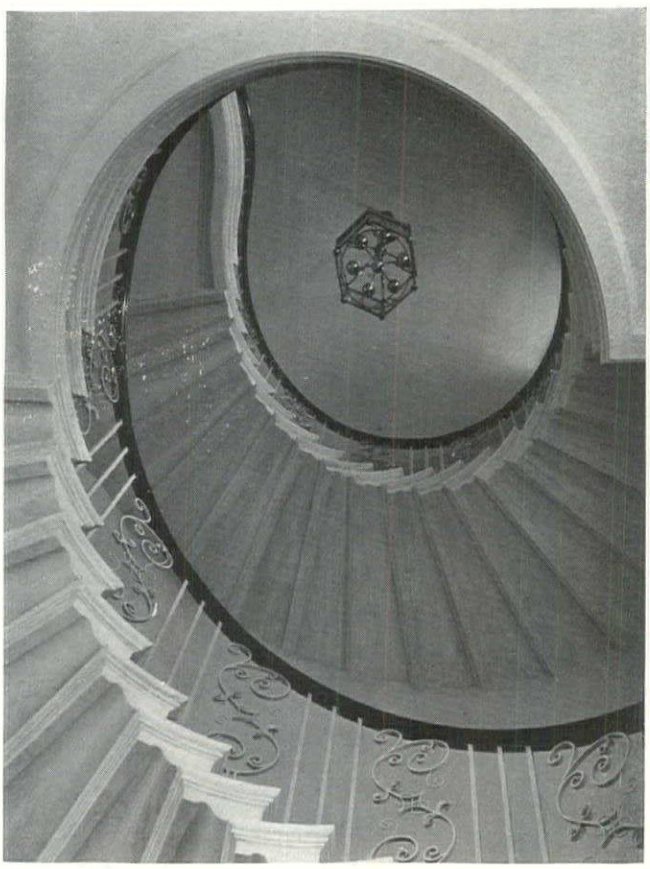
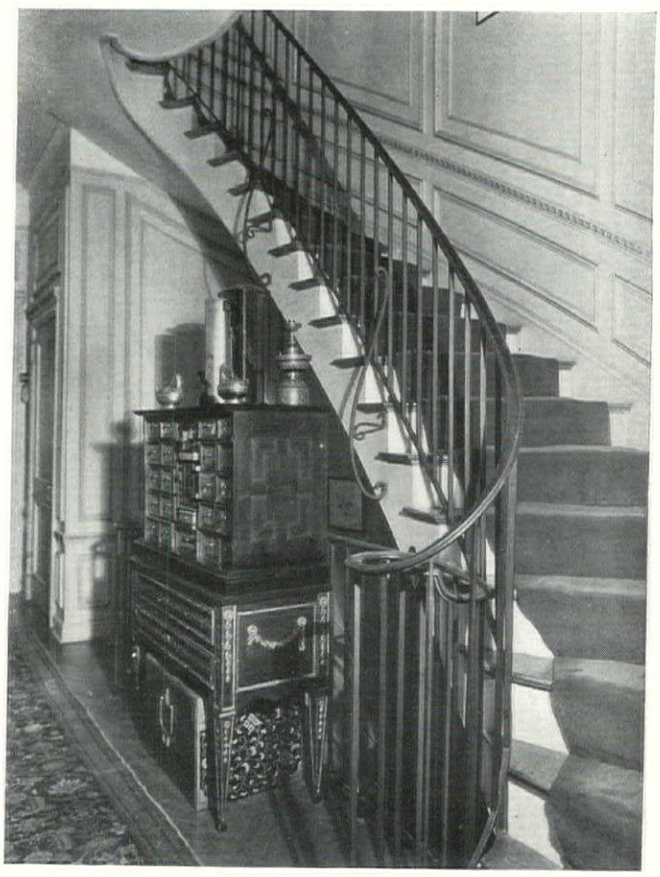
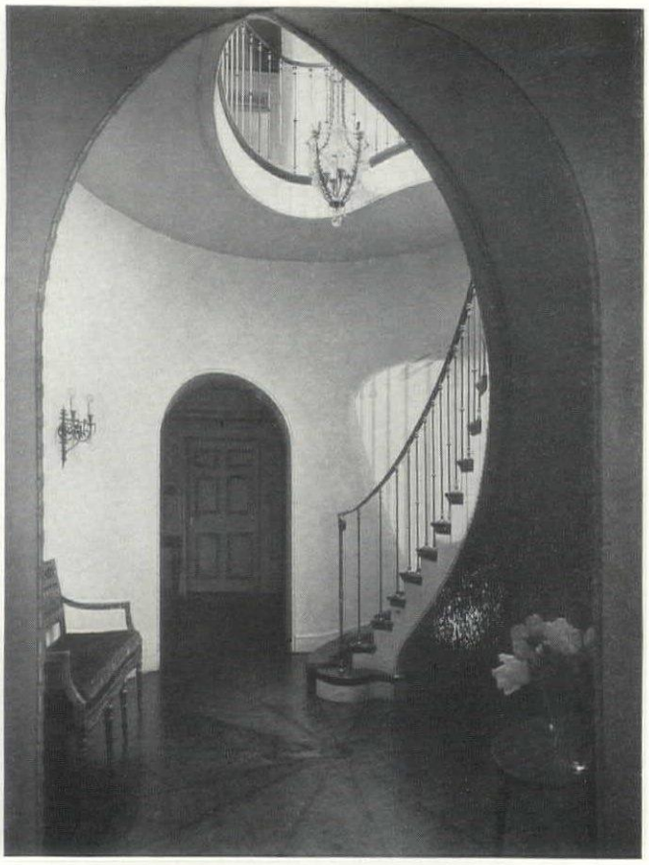
Henry Corse



House, Warrenton, Va.
Walcott & Work



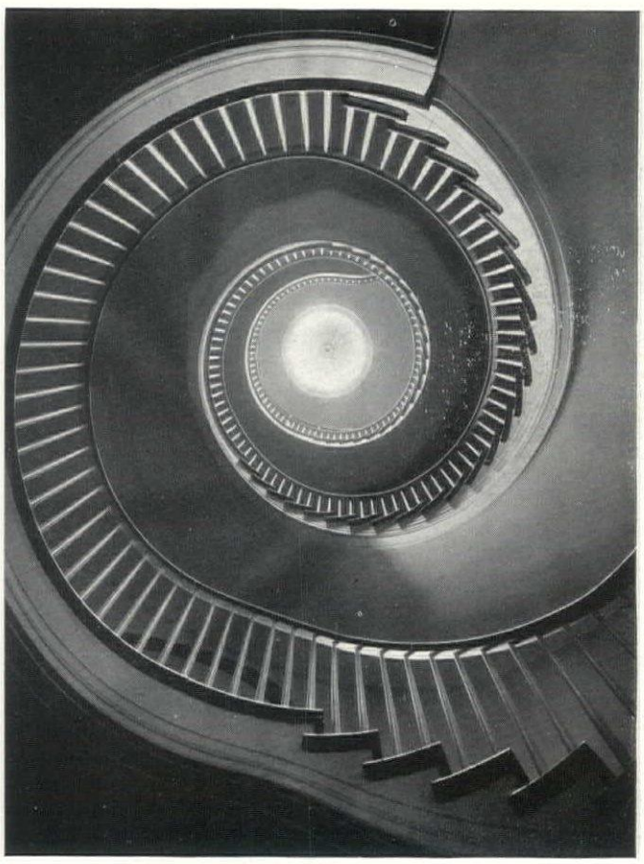
House, New York City
William F. Dominick



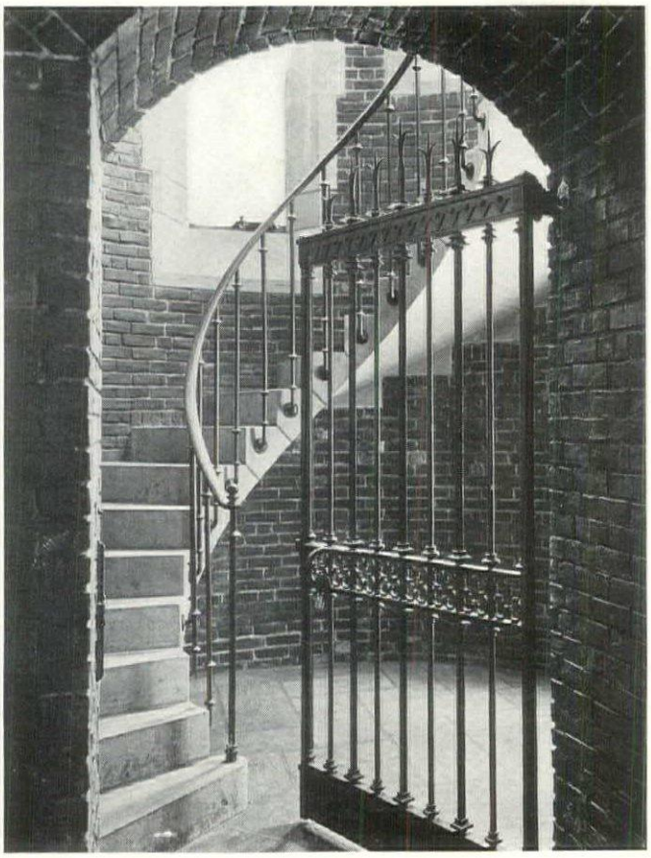
House, New York City
Harrie T. Lindeberg

Carter Hall, Millewood, Va.
Harrie T. Lindeberg

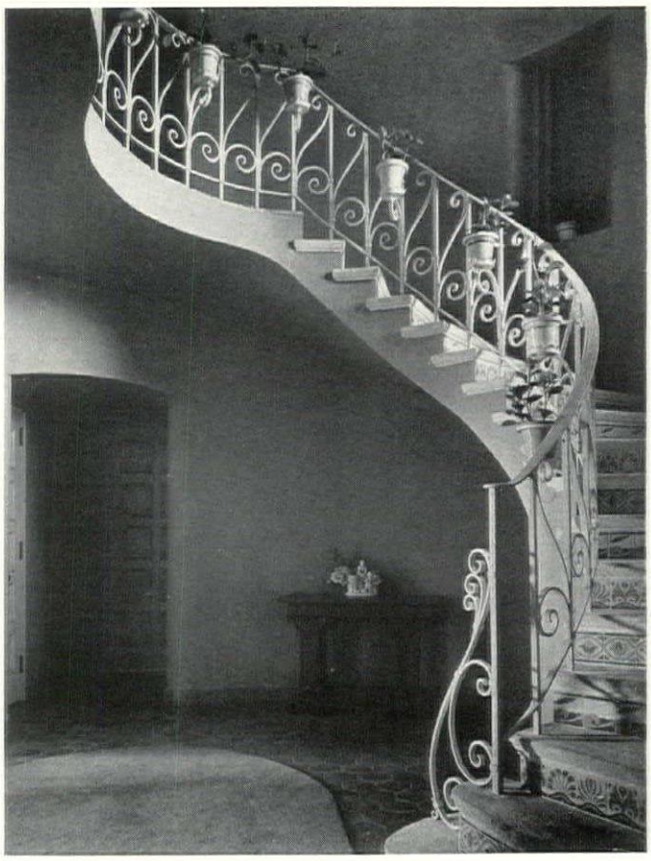
House, Red Bank, N. J.
Howard & Frenaye



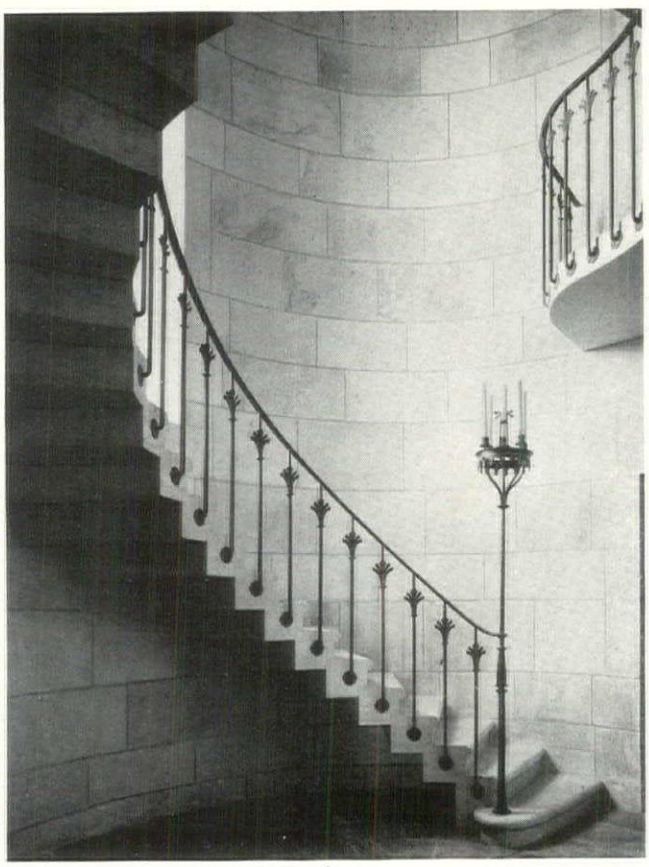
House, New York City
Rogers & Poor



Yale University, New Haven, Conn.
Egerton Swartwout



House, Miami Beach, Fla.
Russell T. Pancoast



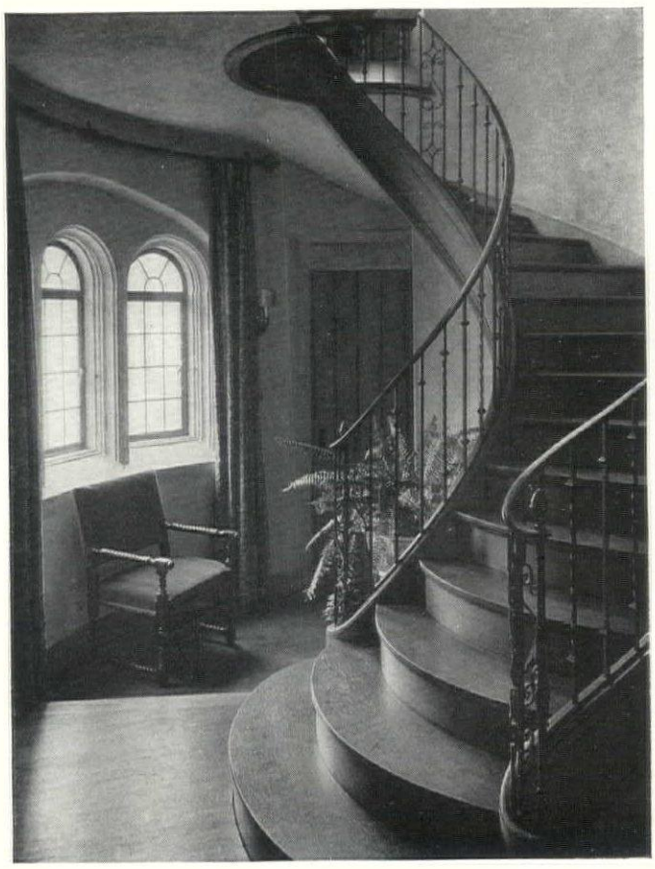
House, Chestnut Hill, Pa.
Tilden, Register & Pepper

Civic Auditorium, Kalamazoo, Mich.
Aymar Embury II

Town Hall, Milford, Conn.
Tracy & Swartwout

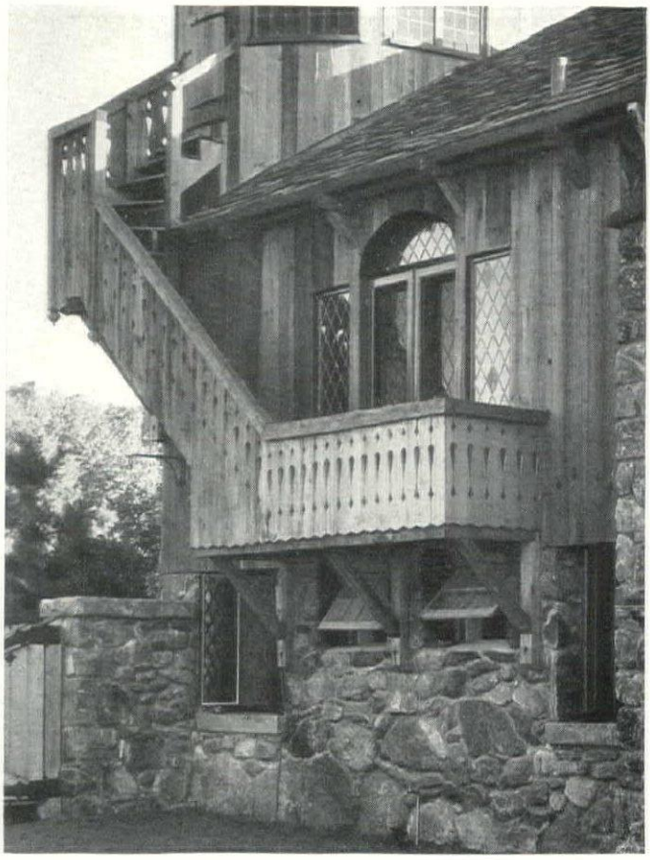
House, Sterling, N. Y.
Office of John Russell Pope

House, Greenwich, Conn.
William F. Dominick

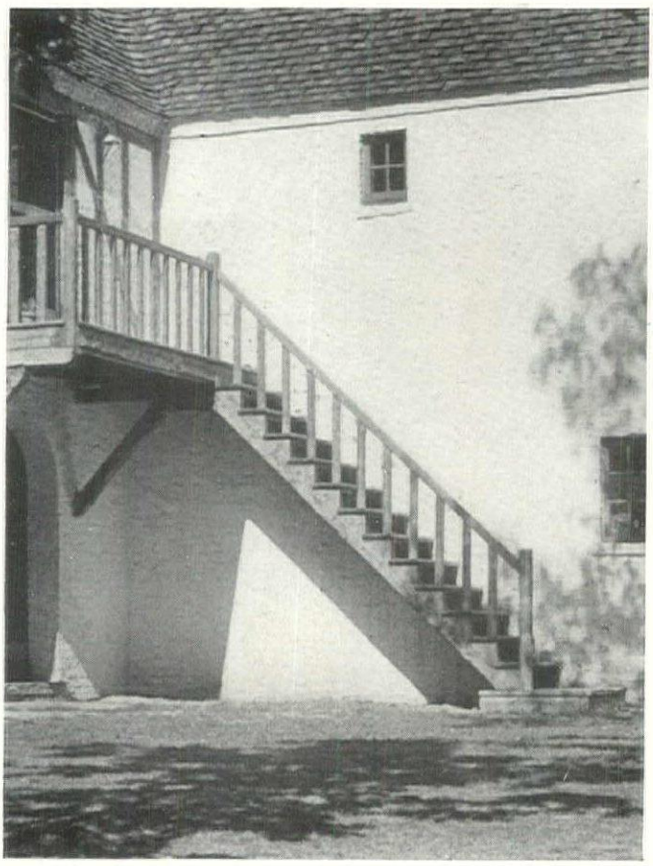


House, Greenwich, Conn.
William F. Dominick

House, Palm Springs, Calif.
Marshall P. Wilkinson

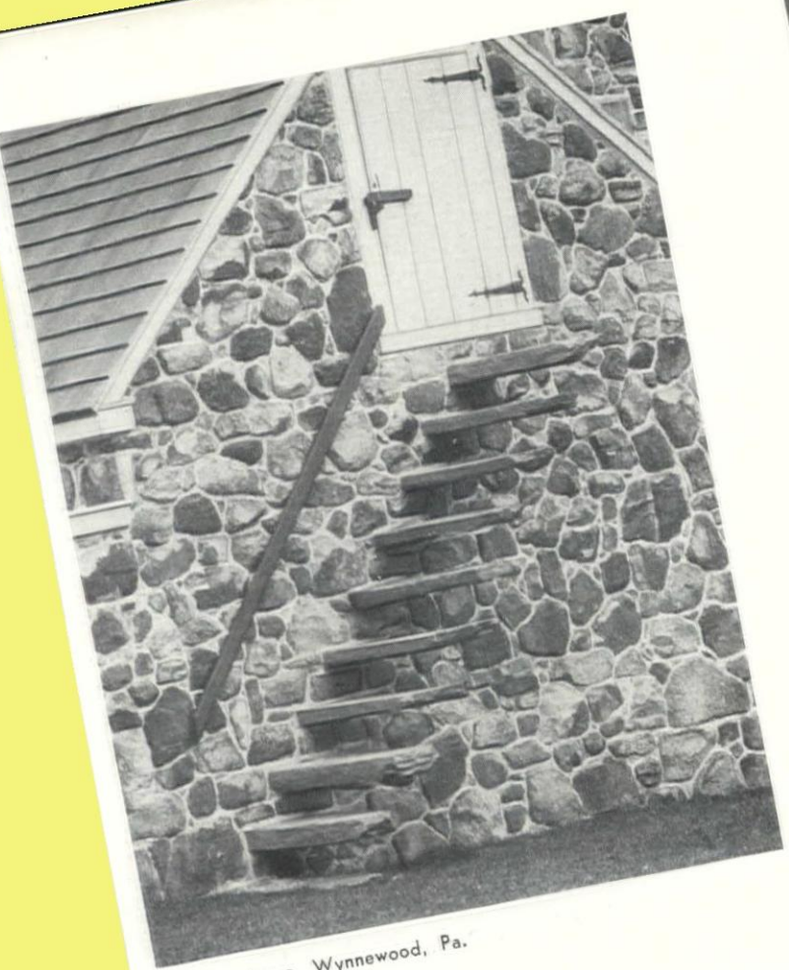


House, Norfolk, Conn.
Taylor & Levi



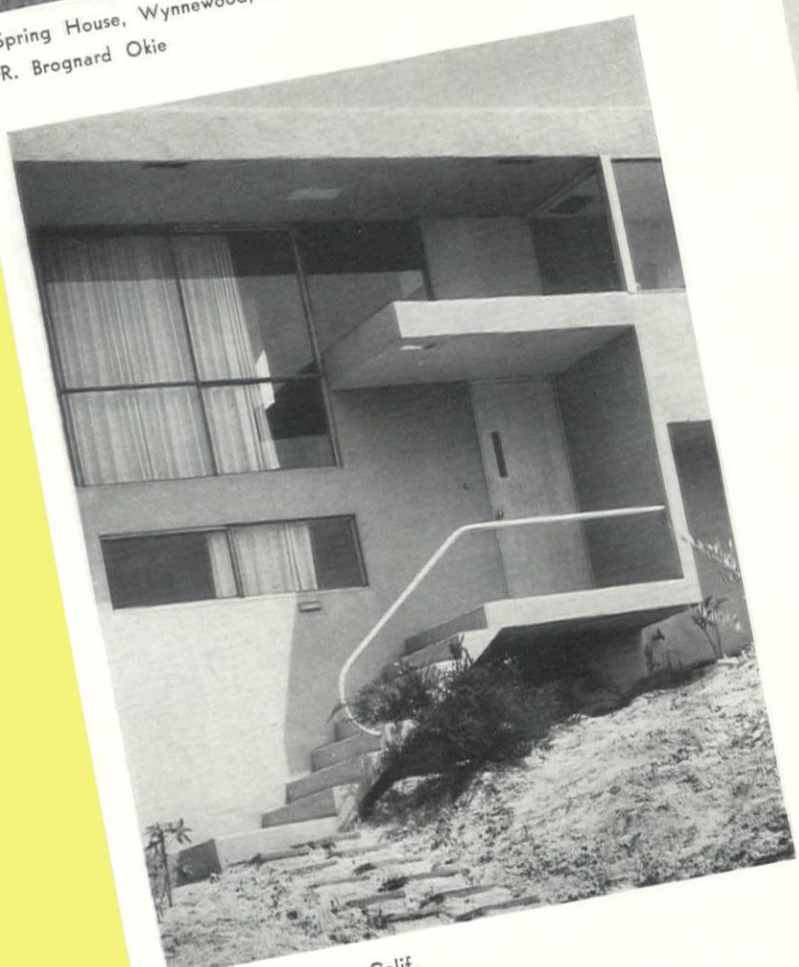
House, Harrison, N. Y.
Frank J. Forster

Van Nelle Factory, Rotterdam, Holland
J. A. Brinkman & L. C. van der Vlugt



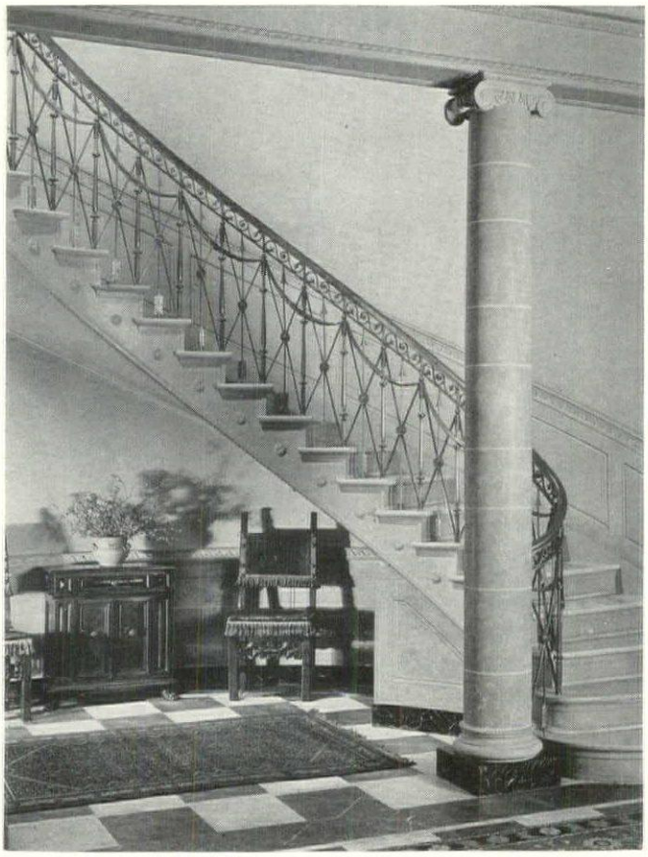
Spring House, Wynnewood, Pa.
R. Brognard Okie

House, Oyster Bay, N. Y.
Pennington & Lewis



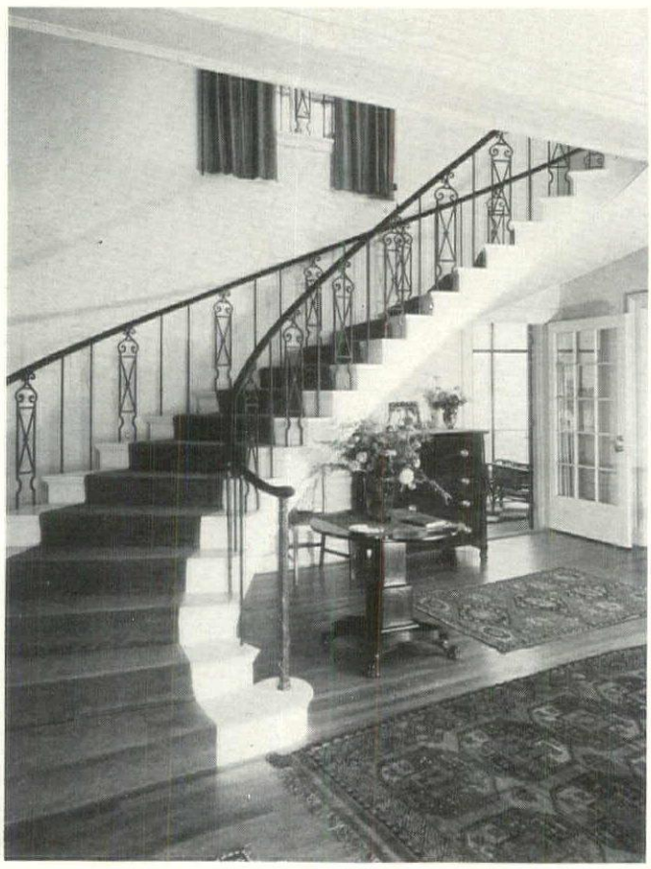
House, Los Angeles, Calif.
R. M. Schindler

Monticello, Va.
Thomas Jefferson

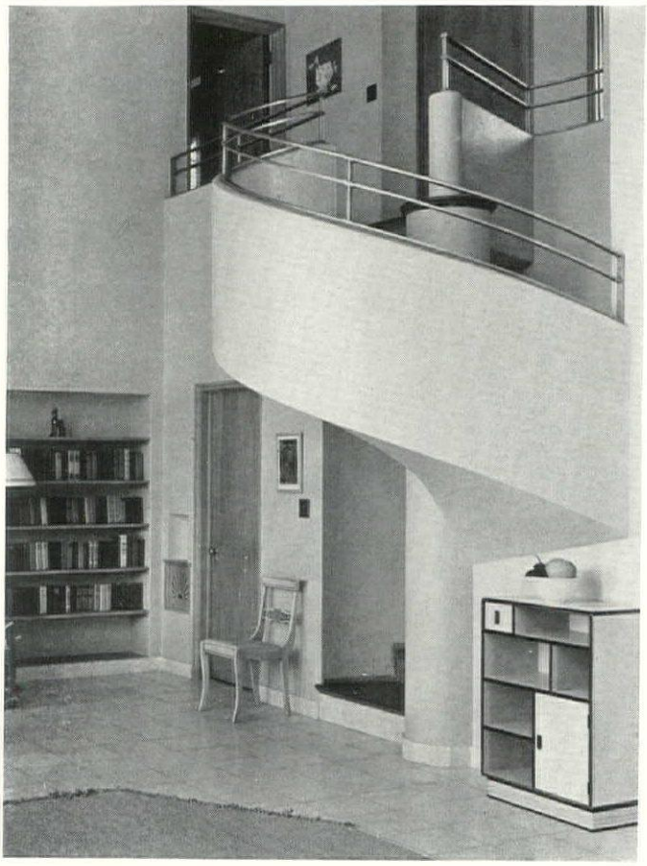


House, New York City
Aymar Embury II

Yale University, New Haven, Conn.
Egerton Swartwout



House, Pasadena, Calif.
Marston & Maybury



House, Miami Beach, Fla.
J. & C. Skinner

Cosmopolitan Club, New York City
Thomas Harlan Ellett

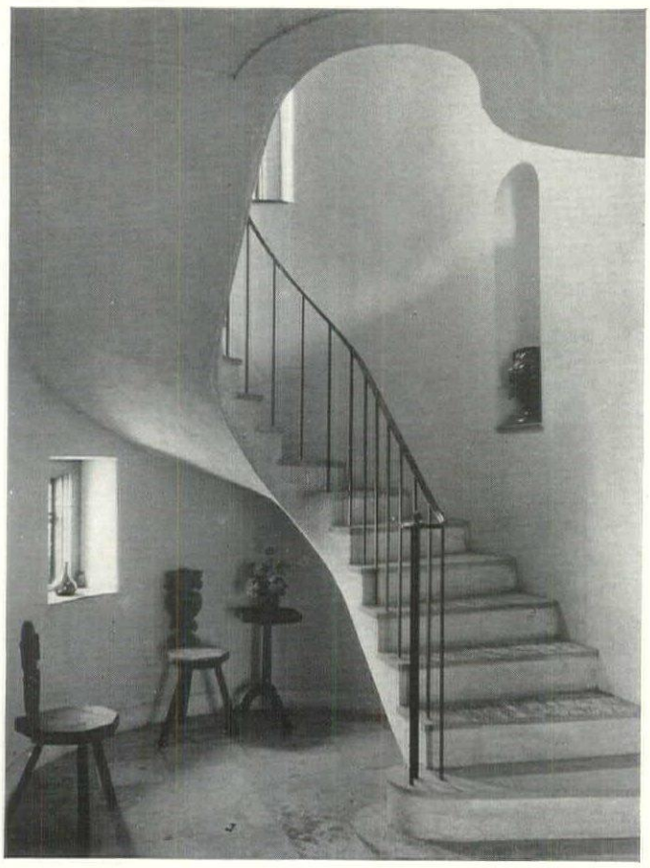
House, New York City
William F. Dominick

Department Store, Portland, Ore.
DeYoung, Moscowitz & Rosenberg

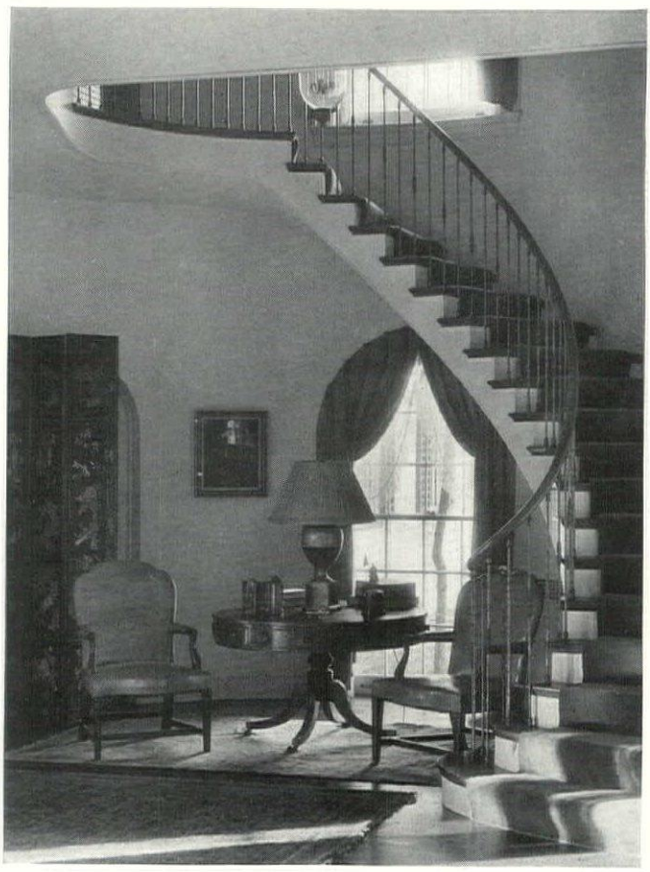
House, Syosset, N. Y.
Philip L. Goodwin

House, Golden's Bridge, N. Y.
Lewis Bowman

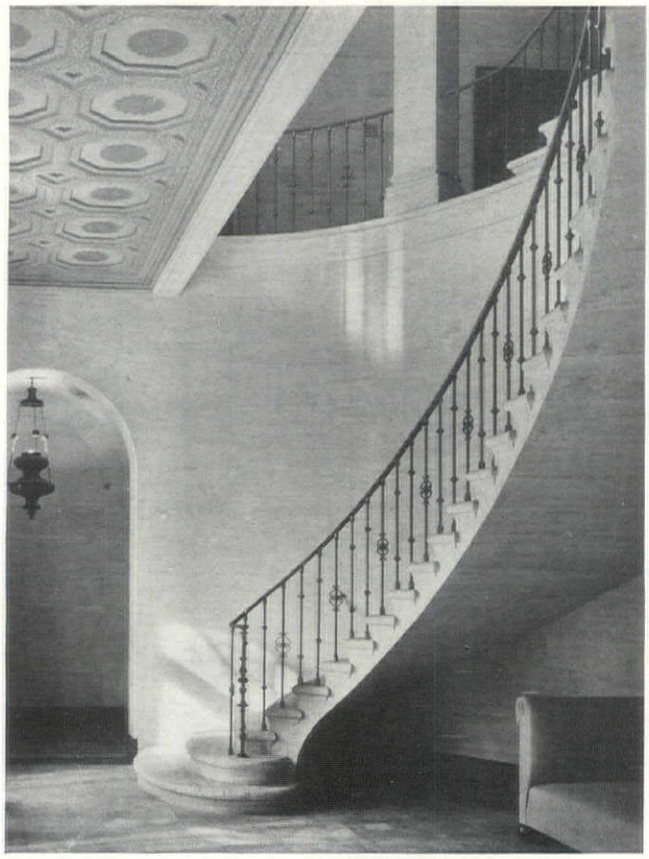
House, Wilmette, Ill.
Philip B. Maher



House, Fishers Island, N. Y.
Eric Kebbon



House, Locust Valley, N. Y.
J. Bradley Delehanty



House, New York City
Frederick Sterner

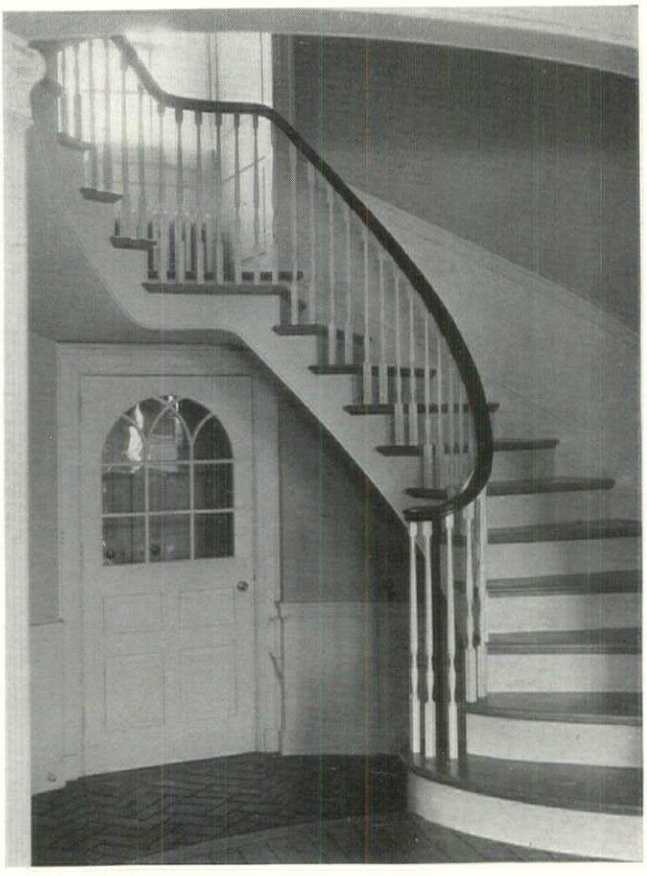
House, Boston, Mass.
Little & Browne

Museum of the City of New York
Joseph H. Freedlander

House, Palm Beach, Fla.
Marion Sims Wyeth

House, Scarsdale, N. Y.
Dwight James Baum

House, Pelham, N. Y.
Pliny Rogers



House, Bedford Village, N. Y.
Godwin, Thompson & Patterson

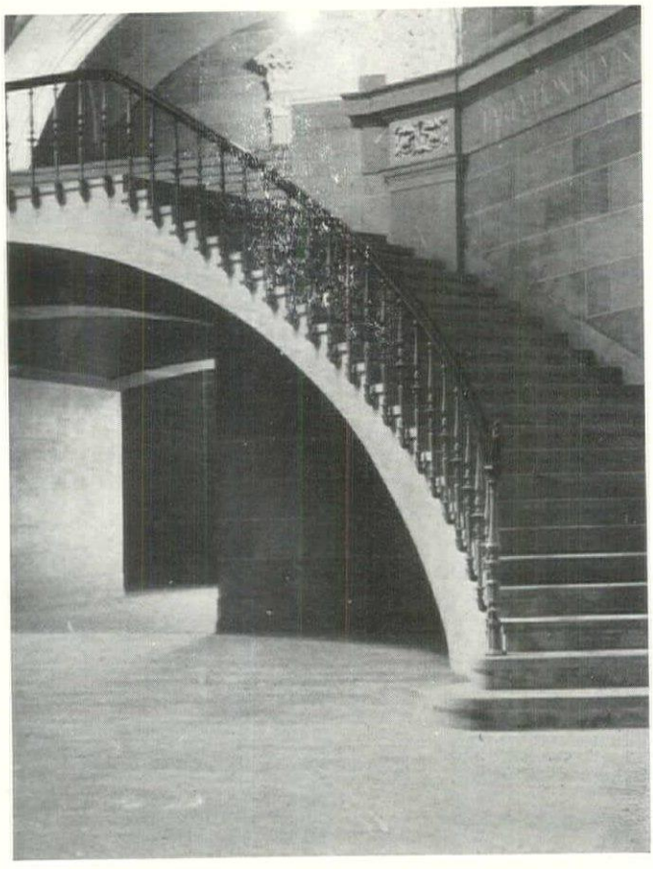
House, Portland, Ore.
Herman Brookman

House, Atlanta, Ga.
Hentz, Reid & Adler

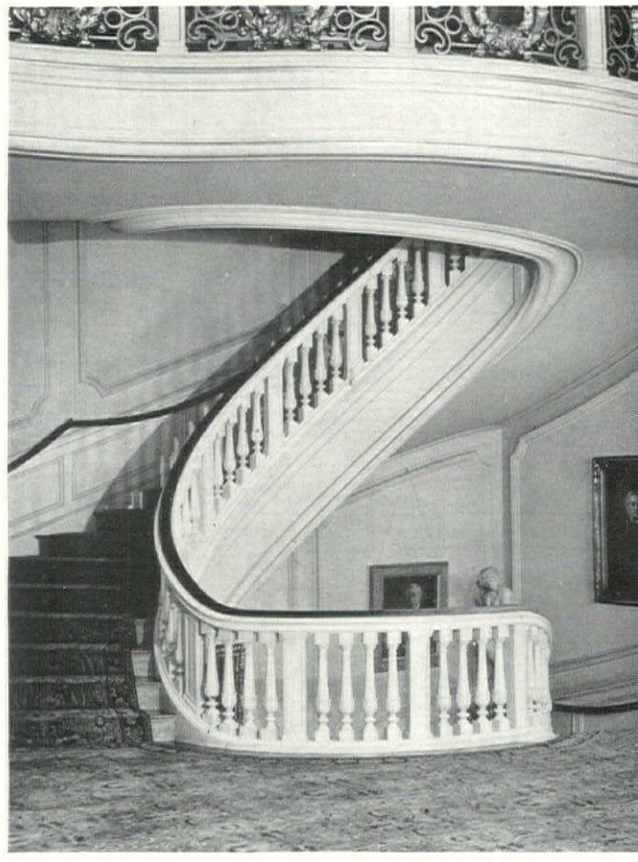
House, Bedford Village, N. Y.
Godwin, Thompson & Patterson

Everglades Club, Palm Beach, Fla.
Addison Mizner

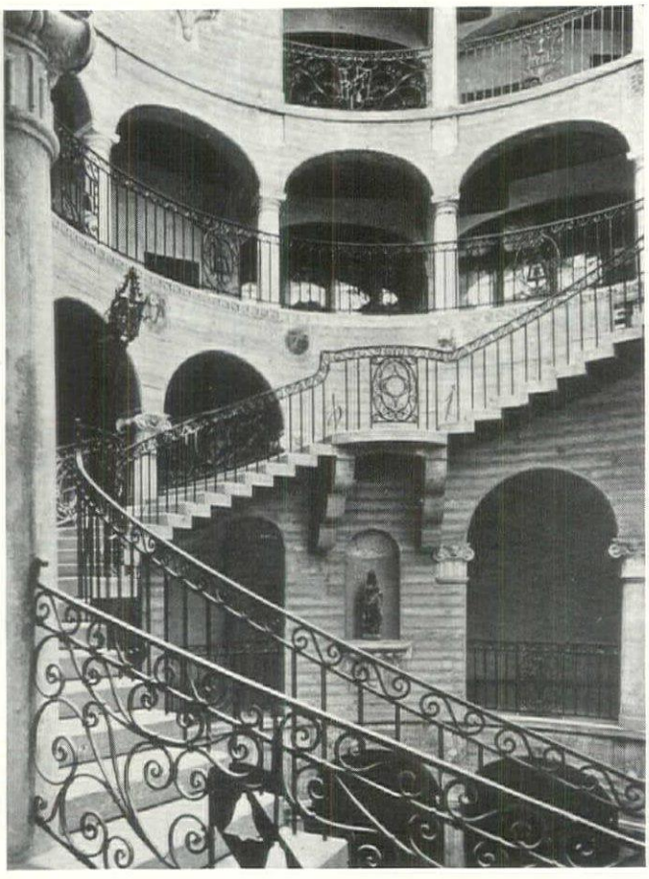
House, New York City
William F. Dominick



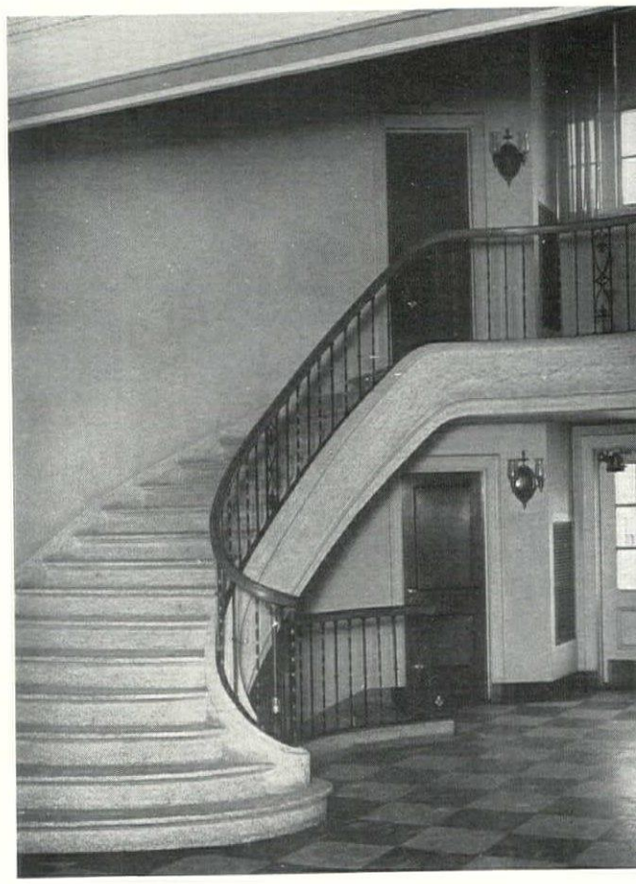
Missouri State Capitol
Tracy & Swartwout



National Democratic Club, New York City
C. P. H. Gilbert



Mission Inn, Riverside, Calif.
G. Stanley Wilson



Municipal Building, White Plains, N. Y.
Joseph H. Freedlander

MODERN PLUMBING PRACTICES

Number Twenty-two in the series of Reference Data. Material for this article and for the Time-Saver Standards Sheets which accompany it has been gathered from authoritative technical sources and prepared in consultation with August E. Hansen, Member of the American Society of Sanitary Engineering, the American Public Health Association and formerly a member of the Subcommittee on Plumbing of the U. S. Department of Commerce Building Code Committee

BY ROGER WADE SHERMAN

Technical Editor, American Architect and Architecture

PROPER DEFINITION of the "plumbing" of a building is more inclusive than generally realized. It includes the means within a structure for supplying, distributing and using the water supply as well as the means for removing waste water and sewage from the points of origin to some disposal agency outside the building.

Conveyance of water is a function common to every part of any plumbing system. Drains are needed to carry away used water; and a water supply is necessary to cleanse fixtures and transport solid wastes. Systems for water supply and for drainage are thus mutually dependent. Because this is so, faulty design or operation of one may induce within the other a disturbance of normal function constituting an insanitary menace to the health of the building's occupants or even to the community as a whole.

Therefore, the proper design and installation of plumbing is one of the most important of all the technical matters that concern an architect. It has been legally recognized as such in the plumbing sections of all building codes. But in these codes details of mandatory technical procedure appear so complicated as to sometimes obscure the principles that govern good plumbing practice.

Design and installation of the plumbing system of a building often involves a concern with technical problems that demand for solution the utmost of engineering ingenuity and resourcefulness. In certain instances modern plumbing practices deemed highly efficient have proved inadequate. In others they appear to be wasteful from several points of view. Again, the force of local conditions may necessitate a departure from currently accepted practice and the development of new means for overcoming technical difficulties to preserve present standards of individual and social sanitation.

In view of all this the architect should avail himself of the engineer's specialized knowledge and experience for the design, specification and supervision of any plumbing system involving complicated technical conditions. However, to assure the co-ordination of factors necessary in all building, basic technical information is as essential to the architect as an appreciation of the importance of design is to the engineer. This article, together with the related Time-Saver Standards Sheets presents that information. It has been divided, for greater clarity into two parts. The first, Drainage Systems, is published herewith; the second, Water Supply System, will appear in the July issue of this magazine.

PART I—DRAINAGE SYSTEMS

INCLUDED in the general category of a drainage system are all normal facilities designed for the disposal of liquid wastes and water-borne solids within a building. This involves the piping system from the various plumbing fixtures to an outside sewer connection and also the means for rain water disposal which are installed within the structure and which normally constitute a part of the plumbing installation.

Plumbing fixtures themselves need no detailed consideration here. But upon the number, type and location of fixtures depend the extent and layout of the entire plumbing system. Fixtures are terminal points of water supply lines. They constitute also the beginnings of drainage lines. The manner in which they are linked to each branch of the plumbing system—and therefore with one another—determines largely the mechanical efficiency of the system.

Mechanical efficiency, however, is no more important than the maintenance of completely sanitary operation throughout the life of the plumbing system—which today, implies the useful life of the structure itself. This operation is primarily controlled by the drainage system. The nature of drainage implies intermittent use. Such use implies further a schematic design based upon frequency of use and extent of service. Obviously within these categories exists a virtually unlimited number of possible variations. Each must be anticipated and provided for in practice. And provision for them must take into account the physical laws governing the flow of liquids and gases and their reaction to possible variations of atmospheric pressures and temperatures.

SCHEMATICS OF DRAINAGE

Essentially any drainage system is composed of three elements.

First: A means of removing wastes. When used for general drainage alone this is a waste line, or stack. For disposal of fecal matter as well as liquids it becomes a soil stack.

DEFINITIONS OF DRAINAGE TERMS

BRANCH—Lateral run of pipe from a main soil or waste stack that receives fixture outlets which is not directly connected with the main.

BRANCH INTERVAL—A section of stack not more than 8 feet in length to which are connected one or more soil or waste branches on one floor level.

DEAD END—Branch terminated at a developed length of 2 feet by a fitting which is not used for admitting liquids to the pipe.

DEVELOPED LENGTH—Length of a pipe along center line of pipe and fittings.

FIXTURE UNIT—A measure of the rate of discharge from plumbing fixtures in terms of gallons per minute based upon the average discharge of washbasin with a 1¼ inch trap and waste pipe.

HOUSE DRAIN—The part of the lowest piping of a house drainage system which receives the discharge from waste or soil stacks and conveys it by gravity to the house sewer. The house drain ends outside the building wall.

HOUSE SEWER—Pipe line connecting terminal of the house drain with the city sewer.

MAIN—That part of a piping system to which fixtures are connected directly or through branch pipes.

SOIL PIPE—Any pipe which conveys to a house drain the discharge of water closets and other fixtures containing fecal matter.

WASTE PIPE—A pipe which conveys the discharge of any plumbing fixture except water closets and other fixtures receiving fecal matter to waste or soil stacks or the house drain. An indirect waste pipe is one that does not connect directly with a stack or house drain.

STACK—Any vertical line of waste, soil or vent piping.

VENT—Any pipe provided to ventilate a house drainage system and thus equalizing air pressures in soil and waste pipes to seals.

Bow Vent—Adaptation of individual venting to avoid installation of vent stack to free-standing fixtures. The vent line is brought over the fixtures and down again to connect with the main vent stack below floor line.

Circuit Vent—A system of venting in which the upper end of a branch line is connected above the fixtures to a main vent stack on the side of the branch opposite to the main stack.

Loop Vent—A system of venting in which the upper end of a branch line is connected above the fixtures to a main vent stack adjacent to the main stack.

Wet Vent—A vent pipe that is used also as a waste or soil pipe.

Yoke Vent—A method of increasing the efficiency of any venting system by connecting the main vent and soil stacks in any branch interval. Connection to the vent stack is always above the soil stack connection.

Second: A means of providing a continuing non-mechanical seal between waste and soil lines and the open outlets of plumbing fixtures. This is obviously necessary to prevent escape of sewer air and is accomplished by traps, so designed as to retain an amount of drained liquid sufficient to seal the line. Any type of mechanical seal is susceptible to damage, constitutes a menace to sanitary conditions and should never be used in the drainage system.

Third: Means of maintaining a constant atmospheric pressure and free air circulation in all drainage lines. This is accomplished by proper venting of soil and waste lines. Without adequate venting, changes of air pressure within drainage pipes may break trap seals, thus allowing escape of toxic air or even sewage. What is still more dangerous, negative—and sometimes positive—pressures in soil, waste and water supply lines may induce conditions that will result in contamination of the water supply. This danger is ever present in systems that have been improperly trapped or where the type of fixture or piping develops a cross connection between the drainage and supply systems.

Mechanical efficiency and the maintenance of sanitary drainage conditions result when these three elements are combined to dispose of waste and sewage at velocities sufficient to minimize the danger of pipe fouling, or clogging. In addition, the possibility of leakage—one of the most common defects of drainage systems—must be obviated by use of materials adequate to resist corrosion, properly connected, and installed to avoid damage due to possible settlement or vibration of the building or radical changes in temperature.

SIZES OF DRAINAGE PIPES

Hydraulic and sanitary engineers are well aware that many factors govern the sizing of drainage pipes. Architects, however, too seldom realize that the rate of fixture discharge, the number of fixtures served, the length of stack, the pitch and length of horizontal runs and even the type of fittings all have an important bearing upon stack sizes. In addition the design of the drainage system itself may become a factor since the velocities of flow in vertical pipes and the flow of air from vents are two important influences upon safe and efficient performance.

Fixture Units: The primary basis upon which all other details of the drainage system rest is the extent of drainage requirements. In order to arrive at a constant method of determining such requirements there has been established a unit rate of fixture discharge. This involves both time and volume and has been set at 1 cubic foot of water per minute, a figure that closely approximates the 7.5 gallons per minute discharged from an ordinary wash basin having a 1¼ inch outlet, trap and waste line. The maximum rate of discharge of other fixtures may be expressed in terms of this fixture unit. Minor details of fixture design may change the rate of discharge. As pipe capacities must be determined from the discharge of fixtures rating of all fixtures should be known.

In Table I of Time-Saver Standards Sheet Serial No. 47 that accompanies this article are given the average fixture unit ratings of fixtures most commonly used, together with the minimum trap diameter and the minimum size of individual drains. These data are recommendations of the subcommittee on plumbing of the U. S. Department of Commerce Building Code Committee. These fixture unit ratings have been determined experimentally and can be safely used in establishing the probable peak load that, to a great extent, fixes the limits of use for stacks and drains.

Probable peak load in an ordinary dwelling can be regarded as the total number of fixture units in the system. But in larger buildings capacities of pipes need be only such as to care for the greatest probable number of fixture units discharged at any one time. Determination of this often requires careful engineering analysis. It must take into account the probable frequency of coincidental discharges in view of the type of fixtures and the type, size, location and use of the building in which they are installed.

These factors indicate that peak loads can only be approximated. In many instances the approximation has been made by a rule-of-thumb procedure based upon personal experience adjusted to local conditions. But competent engineering procedure now applies the mathematics of probabilities to determine peak loads of plumbing systems that involve any departure from well-proved current practices.

Pipe sizes must be regulated in view of other considerations that are variable and sometimes conflicting. For example, "scouring" within pipes is essential to prevent dangerous clogging of traps, stacks and vents or accumulation of material within pipes that may decrease carrying capacities. But if pipes are sized to scour well under conditions of minimum use, they may prove too small to care adequately for the peak load. In such an instance, pipes may run full, thus creating pressures which the venting system will prove inadequate to relieve. The result is to increase the danger of siphoning traps on the higher portion of the system and blowing traps on the lower portion.

Drainage pipes can be divided into distinct classifications: A, the house sewer and house drain; B, vertical stacks; C, horizontal branch drains; and D, fittings, or connections between lateral drains and stacks.

House drains can be of three types: 1, solely for conveying storm water; 2, solely for conveying discharge of soil and waste pipes; or 3, to convey discharges of both soil stacks and leaders to a combined house sewer. In any case size and pitch are two of the most important factors of design.

Size is naturally a result of requirements developed by the extent of the system. Tables of sizes for sanitary and storm drains and charts giving capacities for combined drains appear on Time-Saver Standards Sheet No. 48. Sizes for sanitary and combined drains are based on pipes flowing half full. This constitutes a factor of safety and prevents development of a head extending up vertical stacks, a condition that develops pressure variations in the system with detrimental effects, and which is difficult and often impossible to prevent by any system of venting.

Capacities for storm drains are figured on the basis of a maximum rainfall rate of 4" per hour. Obviously the required capacity of a storm drain varies with the intensity of the rainfall. Thus the table may be modified to meet local conditions by multiplying each given roof area by $\frac{4}{x}$ where x is the local rainfall rate in inches per hour.

Pitch of any house drain ordinarily should not be less than ¼" to the foot. Velocities of flow at ⅛" to the foot are usually not sufficient to scour a house drain. Consequently, in the event of obstruction from any cause, complete stoppage may result. When house drains are very short, the ⅛" pitch can be used, as the entrance velocity from the stack will give the necessary scouring action.

Connection to sewer. The depth, slope and drainage area of a city sewer or any other may have an important bearing upon the location and design of the house drain. If the crown of the street sewer is well below the level of the house sewer, gravity house drains can safely be designed with the fall per foot noted in the tables. Sanitary house drains and sewers should not be designed to flow under pressure. Therefore, if the street sewer is above or level with the house sewer, a sewage pump of some sort will be necessary. In areas of high water gradient where sewers may temporarily become flooded, a back-water valve is an essential safeguard to the building plumbing system. This should be installed, for automatic operation, at the sewer end of the house drain. However, if flooding is a prevalent condition, the house drain should be raised above normal and a sewage pump installed as noted.

Most street sewers are well below the level of the ordinary house basement floor. Where conditions of topography bring them above the basement level, house drains can often be run along the wall to avoid installation of a sewage pump, provided that no plumbing fixture or floor drain is installed in the basement. If fixtures are included in the basement layout, a sewage pump or ejector is necessary.

HORIZONTAL BRANCHES

Economical use of material in plumbing drainage systems indicates that sizes of both horizontal and vertical pipes should be such as to maintain the same carrying capacities in all sections. Actually this is impractical due first to variations in discharges from certain fixtures and second to the limitations of commercially available pipe sizes. The system should be designed, therefore, in terms of the nearest pipe size above requirements.

Size of lateral branch drains is more directly dependent upon the actual discharge rating of fixtures than any other part of the system, for at all times it must be capable of taking the total discharge of all fixtures connected to it. Again, since the system should be such that no static head will develop within pipes, the limit of carrying capacity will first be encountered in lateral branches.

Tables on Time-Saver Standards Sheets No. 47 and 48 have taken these facts into consideration. Table I on Sheet 47 includes minimum drain sizes for individual fixtures. But when more than one fixture will be connected to a lateral branch, minimum sizes in view of fixture unit requirements should be selected from Table B (for horizontal drains) on Sheet 48. No lateral branch should be less than 3" to carry the discharge of a water closet. (*Continued on page* 110)

AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Serial No. 47
JUNE 1936

PLUMBING—Fixture Ratings & Stack Sizes

PURPOSE

Necessary data for the design of a plumbing drainage system in any building include discharge ratings of individual fixtures as a basis for estimating the probable load which the system must carry. Equally essential is a knowledge of safe limits in the carrying capacities of stacks and vents, gutters and leaders, house drains and horizontal branches.

Tabulated on this sheet are the discharge ratings for a number of the most commonly used plumbing fixtures (Table I); the limiting carrying capacities of soil and waste stacks (Table II); the maximum lengths of vents in relation to safe carrying capacities of soil and waste pipes (Table III); and sizes of gutters and leaders in relation to areas to be drained (Table IV). Data on the capacities of storm, sanitary and combined house drains and of horizontal branches of soil and waste lines are given on T-S.S. Serial No. 48, June, 1936.

GENERAL

Information on this sheet and on T-S.S. Serial No. 48, June, 1936, has been adapted from the revised edition of "Recommended Minimum Requirements for Plumbing" developed by the Subcommittee on Plumbing of the U. S. Department of Commerce Building Code Committee. Values given in the tables do not agree with all current building codes in all comparative particulars. Where differences exist, local requirements should, of course, govern. But data given here can be safely used to establish limiting requirements applicable generally as a basis for drainage system design.

FIXTURE UNIT RATINGS (Table I)

Carrying capacities of drainage pipe are listed in terms of units of fixture discharge that indicate the rate of flow in cubic feet per minute. The unit of discharge flow is called a "fixture unit" and is equivalent to a flow of one cubic foot per minute, the rate of discharge of an ordinary washbasin having a nominal 1¼ in. outlet, trap and waste.

Discharge ratings may vary according to the design and use of plumbing fixtures. For this reason Table I lists ratings for three classes of installations.

Class I (private) applies to fixtures in residences and apartments and to those in private bathrooms of hotels and similar installations intended for the use of an individual or a family.

Class II (semi-public) applies to fixtures in office buildings, factories, dormitories and similar installations where the fixtures are intended for general use of the occupants of the building.

TABLE I - FIXTURE UNIT RATINGS

FIXTURE TYPE	FIXTURE UNIT RATING for TYPE of INSTALLATION			MIN. NOMINAL DIAMETER of TRAP and DRAIN		
	Class			Class		
	1	2	3	1	2	3
BATH						
Foot-bath	2	2	2	1½	1½	1½
Infant slab bath	0.5	0.5	0.5	1¼	1¼	1¼
Gang Showers, Each head	5	5	5			
Shower Stalls, Head only	2	3	3	1½	2	2
Shower Stalls, Multiple spray	4	6	6	2	3	3
Sitz-bath	2	2	2	1½	1½	1½
Tub-bath	3	4	4	1½	2	2
BATHROOM						
Group A (Including 1 lav., 1 w-c, 1 tub with or without shower or 1 lav., 1 w-c, 1 shower stall)	6					
Group B (Including 1 lav., 1 w-c, 1 tub, 1 shower stall)	7					
BIDET	3	3	3	1¼	1¼	1¼
COMBINATION (1 sink and 1 laundry tray)	3	3	3	1½	1½	1½
DENTAL CUSPIDOR	0.5	0.5	0.5	1¼	1¼	1¼
DRINKING FOUNTAIN	0.5	0.5	0.5	1¼	1¼	1¼
***FLOOR DRAIN,** Ordinary	1	1	1	2	2	2
***FLOOR DRAIN,** Flush rim	3	3	3	2	2	2
LAUNDRY TRAY	3	3		1½	1½	
LAVATORY	1	2	2	1¼	1¼	1¼
SINK						
Domestic, kitchen or pantry	3			1½		
Hospital, or bedpan washer		6	6		3	3
Laboratory or medical	1.5	1.5	1.5	1½	1½	1½
Lunch bar		6	6		2	2
Restaurant, pot		8	8		3	3
Restaurant, silver and glass		3	3		1½	1½
Restaurant, vegetable		6	6		2	2
Slop, ordinary	3	3	3	2	2	2
Slop, flush rim	6	6	6	3	3	3
Soda Fountain	1.5	1.5	1.5	1¼	1¼	1¼
STERILIZER, Bedpan		6	6		6	6
STERILIZER, Utensil	0.5	0.5	0.5	1¼	1¼	1¼
URINAL						
Lip, or each 2 ft. of trough		2	2		1½	1½
Stall, wall hung, with tank or flush valve	4	4	4	2	2	2
Pedestal, blowout	5	5	5	3	3	3
WATER-CLOSET	3	5	6	3	3	3
SEWAGE EJECTOR	50 Fixture Units for each 25 gals. per min. discharge capacity					

*Each floor drain receiving tank overflow or discharge from unrated fixtures should be rated on estimated max. flow, 2 fixture units per gal. per min. Any floor drain receiving regular or intermittent discharge from fixtures should be rated as the total of fixtures drained into it

AMERICAN ARCHITECT
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PLUMBING—Fixture Ratings & Stack Sizes

Serial No. 47
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TABLE II - MAX. FIXTURE UNITS ON ONE STACK

Diam. of Pipe (Inches)	With "Sanitary T" Inlets		With All 45° Y or Comb. Y & ⅛ Bend Inlets		Max. Length, Inc. Extension as Vent (Feet)
	In One Branch Interval *	On Any One Stack	In One Branch Interval *	On Any One Stack	
1¼	1	1	1	1	50
1½	2	8	4	12	65
2	9	16	15	36	85
3	24	48	45	72	212
4	144	256	240	384	300
5	324	680	540	1,020	390
6	672	1,380	1,122	2,070	510
8	2,088	3,600	3,480	5,400	750

* "Branch interval" designates a vertical length of stack, not less than 8 feet in length, within which a branch or branches are connected

TABLE III - MAX. LENGTHS OF VENTS (feet)

Diam. Soil or Waste (Inches)	Number of Fixture Units	Diameter of Vent (Inches)									
		1¼	1½	2	2½	3	4	5	6	8	10
1¼	1	45									
1½	Up to 8	35	60								
2	Up to 18	30	50	90							
2½	Up to 36	25	45	75	105						
3	12		34	120	180	212					
3	18		18	70	180	212					
3	24		12	50	130	212					
3	36		8	35	93	212					
3	48		7	32	80	212					
3	72		6	25	65	212					
4	24			25	110	200	300	340			
4	48			16	65	115	300	340			
4	96			12	45	84	300	340			
4	144			9	36	72	300	340			
4	192			8	30	64	282	340			
4	264			7	20	56	245	340			
4	384			5	18	47	206	340			
5	72				40	65	250	390	440		
5	144				30	47	180	390	440		
5	288				20	32	124	390	440		
5	432				16	24	94	320	440		
5	720				10	16	70	225	440		
5	1,020				8	13	58	180	440		
6	144					27	108	340	510		
6	288					15	70	220	510	630	
6	576					10	43	150	425	630	
6	864					7	33	125	320	630	
6	1,296					6	25	92	240	630	
6	2,070					4	21	75	186	630	
8	320						42	144	400	750	900
8	640						30	86	260	750	900
8	960						22	60	190	750	900
8	1,600						16	40	120	525	900
8	2,500						12	28	90	370	900
8	4,160						7	22	62	252	840
8	5,400						5	17	52	212	705

TABLE IV - SIZES OF GUTTERS AND LEADERS

Area of Roof (Sq. Ft.)	Width of Gutter* (Inches)	Diameter of Leader (Inches)	
		Inside	Outside
Up to 90	3	1½	2
91 to 270	4	2	3
271 to 810	4	3	4
811 to 1800	5	3	4
1801 to 3600	6	4	5
3601 to 5500	8	5	6
5501 to 9600	10	6	8

* Gutter sizes are based on semi-circular sheet metal shapes, leaders circular. Other shapes should be equal to these in sectional area

Class III (public) applies to fixtures in general toilet rooms of schools, gymnasiums, hotels, railroad stations, public comfort stations and other installations (whether pay or free) where a number of fixtures are installed so that their use is similarly restricted.

STACK CAPACITIES (Table II)

The type of fitting used to connect fixtures or horizontal branches to waste and soil stacks has an important influence on the practical capacity of the stack. A stack will take the capacity discharge of two branches of the same diameter as the stack if the fitting is a double 45° Y or a combination Y-&-⅛ bend. Through "sanitary T" fittings, stack capacities are lessened.

Limitations of discharge within an 8 ft. section of stack—a branch interval—are rarely significant in residential work, but constitute a desirable factor of safety in more extensive installations. In no case should the discharge through 45° Y or combination Y-&-⅛ bends exceed, within any branch interval, 2½ times the number of fixture units permissible on any one branch of the same diameter as the stack, pitched ¼ in. to the foot. Comparable limits for sanitary T fittings in a branch interval are 1½ times the fixture units on a branch of similar size and pitch.

Base fittings which connect lower ends of soil stacks with the house drain may be a size larger than the stack to reduce the possibilities of back pressure that exist even in small installations. In the larger systems, when the house drain is more than one size larger than a stack, fittings of intermediate size are advisable. Example: in a small system with a 3 in. stack and 4 in. house drain use a 4 in. fitting; in a larger system with a 3 in. stack and a 5 in. house drain use at least a 4 in. fitting. Base fittings may be long sweep; ¼ bends with reducing hubs, two Y fittings or combination Y-&-⅛ bend. Sanitary T fittings should not be used as base fittings.

VENT REQUIREMENTS (Table III)

Size and length of vent pipes are directly dependent upon the size of soil and waste pipes and upon the volume of discharge for which the latter were designed. Unless adequate venting is assured, the flow of fixture discharges through soil and waste stacks will produce pressure variations in branches that may damage seals of fixture traps—"blowing" them because of positive, or back pressure in lower parts of the system and siphoning them because of negative pressure in upper parts.

Table III lists permissible sizes and lengths of vent stacks and branch vents necessary to insure the proper functioning of a drainage system in view of stack sizes and capacities set forth in Table II.

AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Serial No. 48
JUNE 1936

PLUMBING—Size of House & Branch Drains

PURPOSE

Tabular data on this sheet list limiting capacities for sanitary house drains, for horizontal branches and for storm drains for slopes of ⅛ in., ¼ in. and ½ in. to the foot. On the chart are graphed limiting capacities for combined sanitary and storm house drains and house sewers in terms of the sanitary load in fixture units and the drainage area in square feet.

GENERAL

Both table and chart are complementary to tabular information given on T-S.S. Serial No. 47, June, 1936. Data on both these sheets were adapted from those contained in the revised edition of "Recommended Minimum Requirements for Plumbing" developed by the Subcommittee on Plumbing of the U. S. Department of Commerce Building Code Committee. This material may not conform to some detailed provisions of various local building codes. However, it is generally applicable as a basis for preliminary estimation in establishing safe limitations for drainage system design.

CAPACITIES OF HOUSE DRAINS

The actual capacities of pipes used as house drains or as horizontal branches at any one of the three slopes indicated need not be read directly from either the tabular data or the chart. Pipe capacities have been taken into account in determining the allowable maximum drainage loads. These loads have been established in terms of fixture units to allow also for the probabilities of coincident and overlapping discharges of plumbing fixtures based on mathematical calculation applied to documented experience.

HOUSE DRAINS, SANITARY ONLY

The required size of a sanitary house drain for a given drainage load can be read directly from Table I, A.

Rule 1. Determine total drainage requirements in terms of fixture units (total discharge in cubic feet per minute) based upon values in Table I, T-S.S. Serial No. 47, "Fixture Ratings & Stack Sizes."

Rule 2. Establish pitch of drain. Preferred minimum pitch is ¼ in. to the foot, particularly in small installations. A lesser pitch increases possibility of fouling.

Rule 3. Read across table and select required pipe diameter. Sizes of a sanitary house sewer and a branch of the sanitary house drain not receiving the discharge from fixtures on the same floor or level as the branch can be similarly determined from Table I, A.

This table is based on gravity flow in drains one-half full, since full practical capacity is reached at approximately that point because of trapped air.

HORIZONTAL BRANCHES, SANITARY ONLY

From Table I, B can be selected the required size of sloping sanitary drains receiving the discharge from fixtures on the same floor or level as the drain itself. Such drains are termed horizontal branches. Rules for size determination are similar to those applying to sanitary house drains except that the drainage load refers only to the total number of fixture units connected within the horizontal branch.

STORM DRAINS ONLY

Table I, C for storm drains only is based upon gravity flow in a full pipe and a maximum rate of rainfall of 4 in. per hour. Required size can be read directly from the table.

Rule 1. Determine drainage requirements in square feet of the horizontal projection of the area to be drained.

Rule 2. Select pitch of drain.

Rule 3. Read across table and determine required pipe diameter.

Rule 4. To modify table when necessary to meet local conditions of rainfall, multiply each given drained area by $\frac{4}{x}$ where x is the prevailing rate of rainfall in inches per hour.

COMBINED HOUSE DRAINS OR HOUSE SEWERS

By reference to the chart, sizes of combined sanitary and storm house drains, house sewers and their branches can be determined.

Rule 1. Determine the horizontal projection of the drained area and the number of fixture units to be carried by the drain.

Rule 2. Establish pitch of drain. Preferred Minimum is ¼ in. to the foot.

Rule 3. Find the required minimum diameter of the combined drain where the selected pitch curves through or next above the co-ordinate point corresponding to the drained area and the fixture units carried by the drain.

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PLUMBING—Size of House & Branch Drains

Serial No. 48
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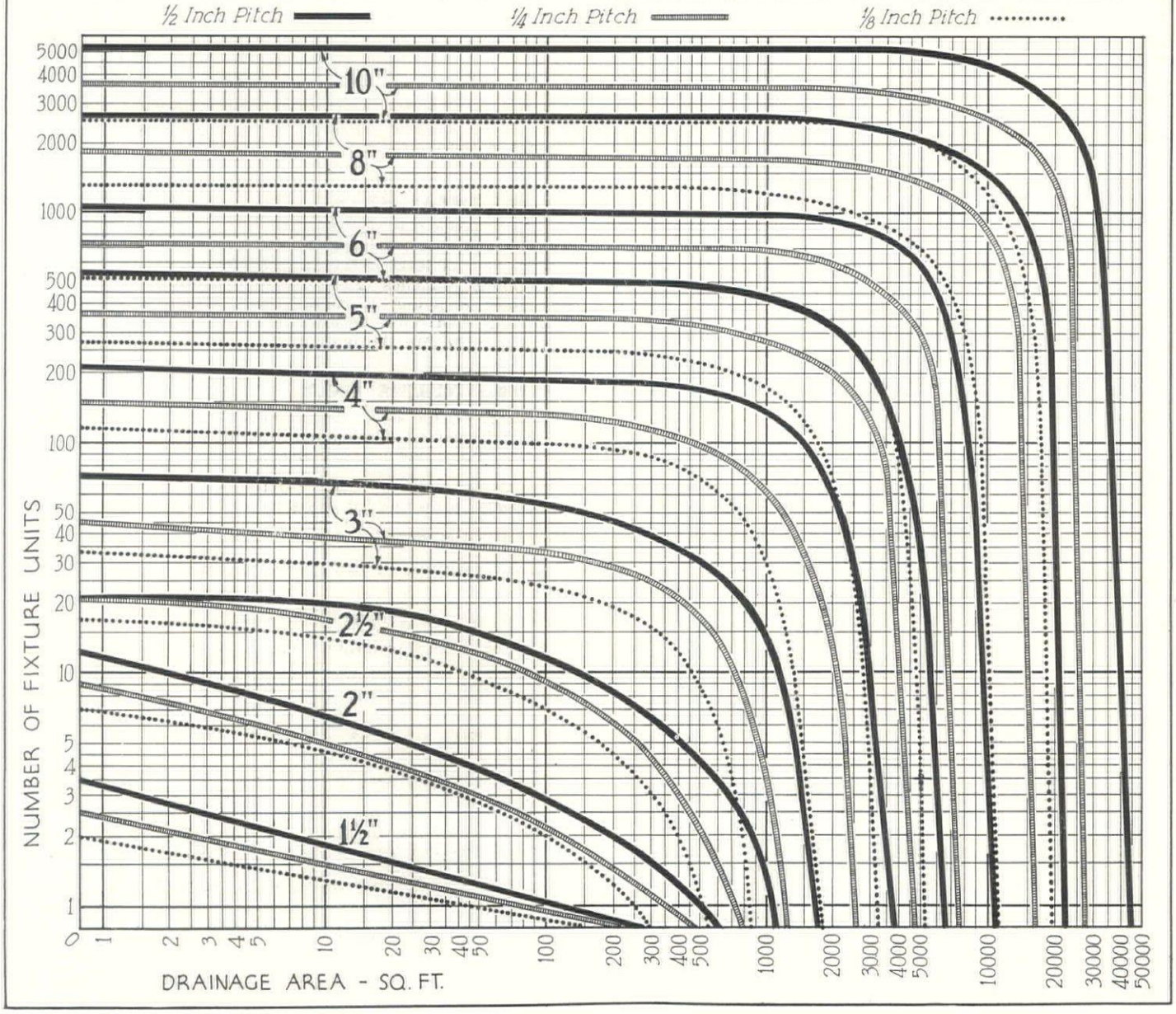
TABLE I INDEPENDENT SANITARY OR STORM DRAINAGE

DIAMETER OF PIPE Inches	A HOUSE DRAINS *Sanitary Only* Max. Fixture Units for Pitch of			B HORIZONTAL BRANCHES *Sanit. Only* Max. Fixture Units for Pitch of			C STORM DRAINS *Only* Max. Drained Area in *SQ.FT.* for Pitch of			DIAMETER OF PIPE Inches
	⅛" Per Foot	*¼"*	*½"*	*⅛"*	*¼"*	*½"*	*⅛"*	*¼"*	*½"*	
⊕ 1¼				1	1	1	90	130	185	⊕ 1¼"
⊕ 1½				2	2	3	140	210	290	⊕ 1½
⊕ 2	7	9	12	5	6	8	300	440	620	⊕ 2
⊕ 2½	17	21	27	12	15	18	545	790	1100	⊕ 2½
* 3	33	45	72	24	27	36	865	1250	1750	* 3
** 3	27	36	48	15	18	21	865	1250	1750	** 3
4	114	150	210	84	96	114	1860	2650	3800	4
5	270	370	540	180	234	280	3300	4700	6650	5
6	510	720	1050	330	440	580	5250	7500	10700	6
8	1290	1860	2640	870	1150	1680	11000	16000	22200	8
10	2520	3600	5250				19500	27500	40000	10

⊕ *No Water-closet should discharge into a drain less than 3" in diameter, and no main house drain or sewer receiving discharges from water-closets should be less than 4" in diameter.*

* *No Water-closets* ** *Not more than two water-closets*

COMBINED SANITARY & STORM HOUSE DRAINS & HOUSE SEWERS



AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Serial No. 49
JUNE 1936

PLUMBING—Drainage System Sections

PURPOSE

Diagrams on this sheet illustrate various types of plumbing details applicable to both residential and commercial buildings. They were developed in part from data in "Recommended Minimum Requirements for Plumbing" compiled by the Subcommittee on Plumbing of the U. S. Department of Commerce Building Code Committee and partly also from the proposed revisions to the New York City Plumbing Code. Because of the wide variance in plumbing regulations throughout the country, some of these diagrammatic details may be prohibited in certain localities. Elsewhere, other details may indicate methods far in excess of mandatory requirements. All of them, however, reflect solutions to typical drainage problems by methods that constitute generally good plumbing practice.

RESIDENTIAL DRAINAGE SYSTEMS

Pipe sizes shown in the sections below will meet every requirement usually encountered in residential work. A 3 in. main soil stack is adequate for residential use in the opinion of many authorities. A 4 in. main soil is mandatory in some localities. Main house drains should never be less than 4 in. Where house sewers are connected to a septic tank of a private sewage disposal system, no house trap or fresh air inlet is necessary.

COMMERCIAL DRAINAGE SYSTEMS

This section is a composite of drainage problems encountered in a wide range of commercial and industrial work and is not typical for any specific kind of building. As for the house sections, soil and waste lines are shown solid; vent lines are broken.

Group A. Bathroom unit rated at 6 fixture units, individually vented and connected by preferred methods to main soil and vent stacks.

Group B. Bathroom unit rated at 7 fixture units, individually vented and connected by preferred method to a horizontal soil branch.

Loop vent, A, and Circuit vent, B, are both types of venting in which the branch drain is a "double-duty" pipe carrying both air and discharge. This constitutes "wet-venting," prohibited by some codes. It is generally not a desirable method of venting. When used, circuit or loop vents should not be connected to a series of more than eight fixtures in a series. In a loop vent a continuation of the branch runs up and over fixtures to connect with the vent stack adjacent to the main soil. In a circuit vent the connection is to a main vent stack opposite the main soil stack.

Yoke vent, C, connects the main soil and waste stacks, the soil at the lower end of the yoke. It adds greatly to the safe capacity of soil stacks when fixtures are connected as shown at C. This type of connection can be made to both bathroom units in residential as well as commercial work.

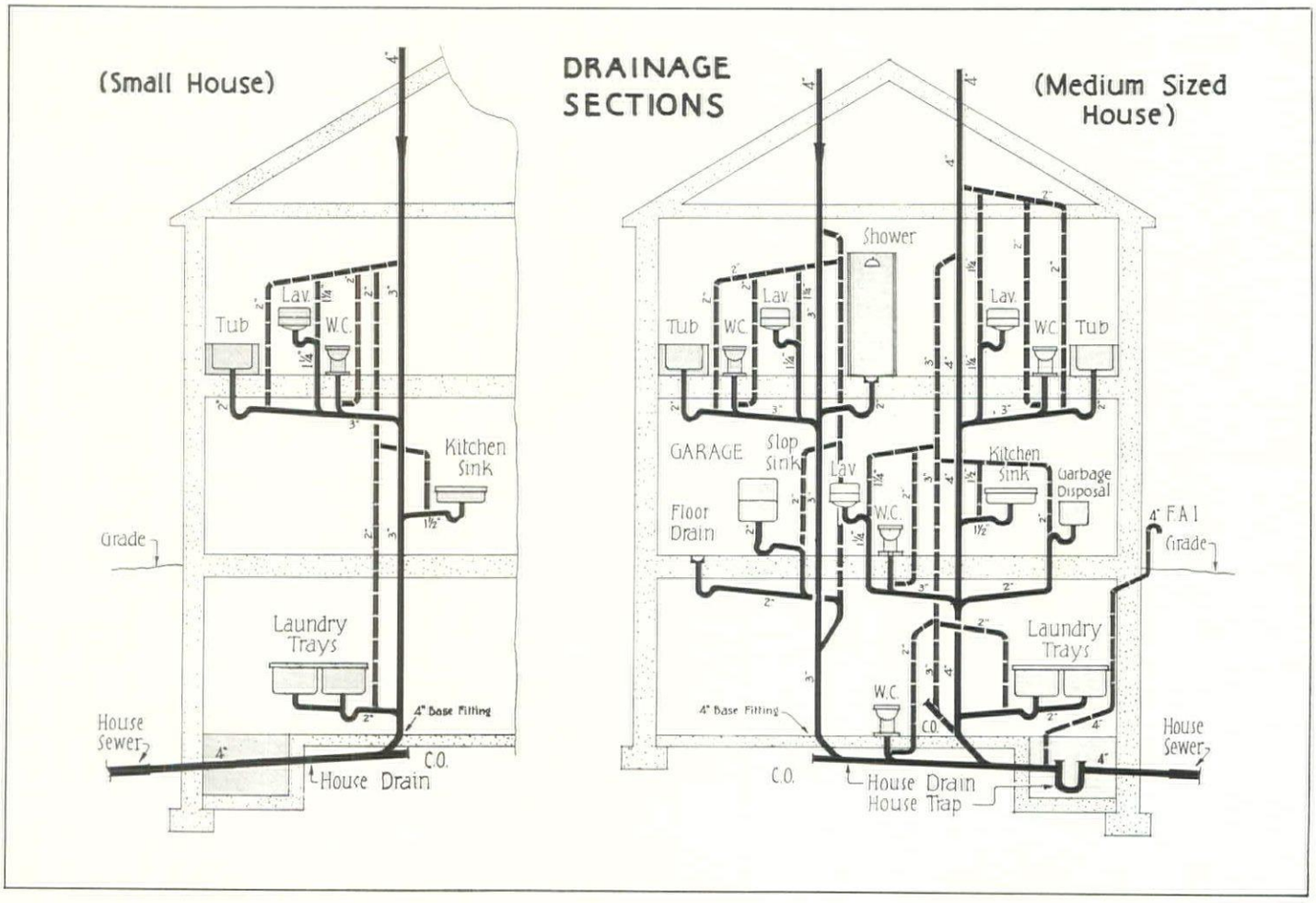
Bow vent, D, can be used under conditions of light discharge loads to avoid installation of an additional vent stack.

Stacks 1 and 2 indicate ne for separate venting of sewage ejector and oil separator fro ins. Vent from sewage ejector should not be her pipe below a height of three stories.

Stack 3 is the vent from an indirect waste line discharging into a C.I. sink which itself must be trapped and vented to prevent fixture contamination through siphonage or back pressure.

Stacks 4, 5 and 6. Vents should be connected into stacks at lower ends so that discharge will scour connection and thus prevent fouling.

Stack 10 applies to special purpose type of installation. Corrosive wastes require acid-proof pipe for waste, soil and vent lines, for fittings and for the house drain up to the base fitting of the next main soil stack.



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PLUMBING—Drainage System Sections

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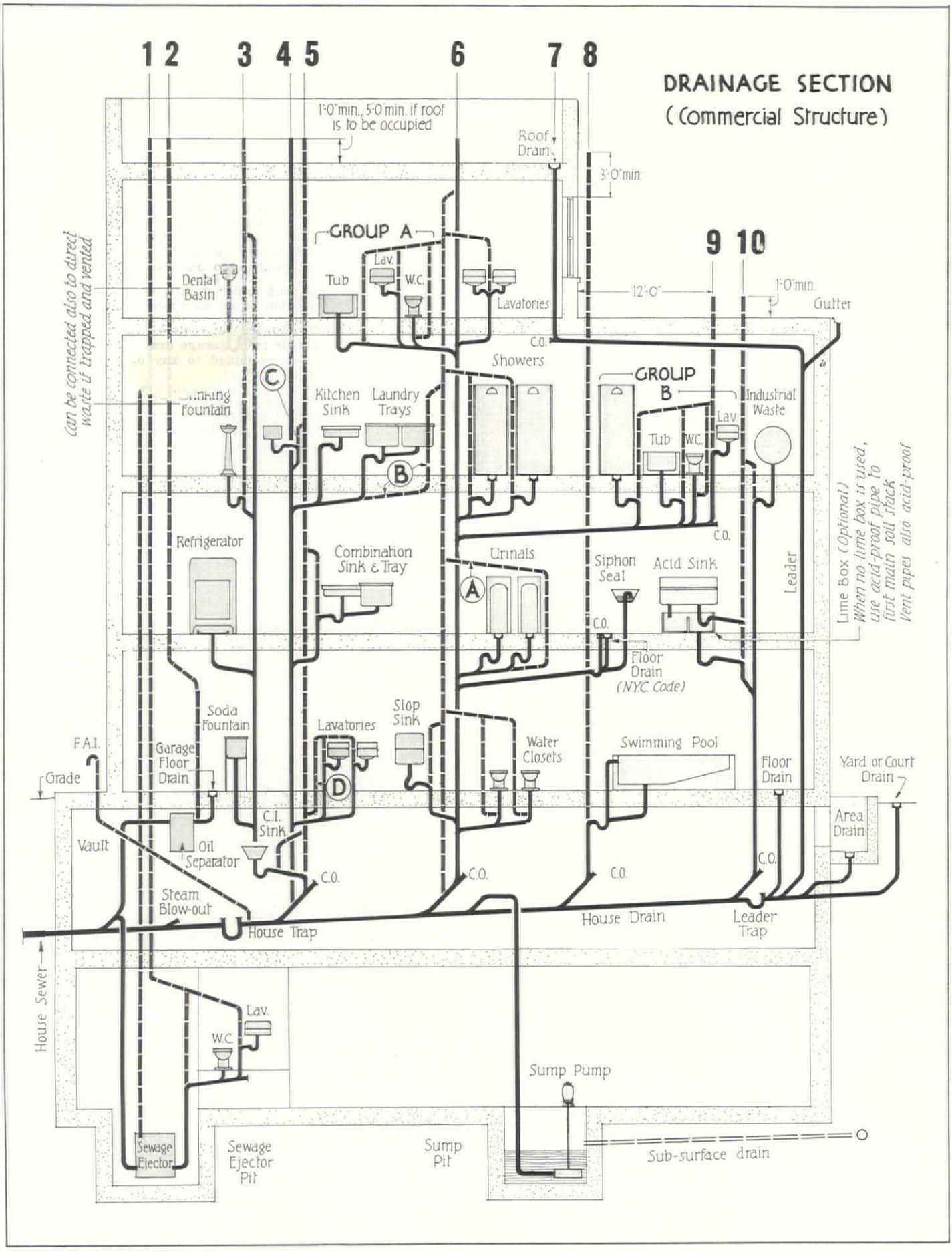

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Serial No. 50
JUNE 1936

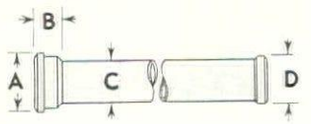
PLUMBING—Size of C. I. Fittings

PURPOSE

Data on this sheet indicate limiting dimensions of cast-iron or malleable iron fittings most commonly employed in building drainage systems. Clearances necessary for concealed cast-iron fittings determine largely the depth of floors, walls or furred spaces in which they are housed. Therefore, these dimensions are safe maxima when space for pipe installations is a factor governing design.

Hub and spigot fittings are used with cast or wrought iron pipe and require a lead caulked joint. Recessed threaded fittings should be used preferably with wrought iron or steel pipe, although threaded cast iron is now being used for vertical soil and vent lines. Data on this sheet reflect commercial practice and have been adapted from documents issued by the American Standards Association.

DIMENSIONS - CAST-IRON SOIL PIPE (In Inches)



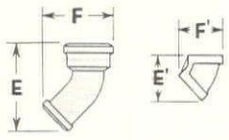
HUB & SPIGOT TYPE — RECESSED THREADED TYPE

SIZE	A	B	C	D	A'	B'	C'
2	4	2¾	2⅜	2¾	3¼	1	2⅜
3	5¼	3⅛	3½	3⅞	4⅝	1⅛	3½
4	6¼	3⅜	4½	4⅞	5¾	1¼	4½
5	7¼	3⅜	5½	5⅞	6⅞	1⅜	5½
6	8¼	3⅜	6½	6⅞	8¼	1½	6½
8	10⅞	4	8⅝	9	10¼	1⅝	8⅝
10	13⅛	4	10¾	11⅛	13	1¾	10¾

DIMENSIONS - TYPICAL CAST-IRON SOIL FITTINGS (In Inches)

* Consult Manufacturer for dimensions

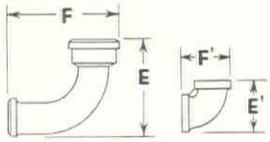
⅛ BEND



HUB & SPIGOT — RECESSED THREADED

SIZE	E	F	E'	F'
2	7¾	6½	4	4
3	9¼	7½	5⅛	5⅛
4	10¼	8⅝	6⅛	6⅛
5	10½	8⅞	7¼	7¼
6	11	9	8½	8½
8	14¾	12	10½	10½
10	15¼	12¾	13⅛	13⅛

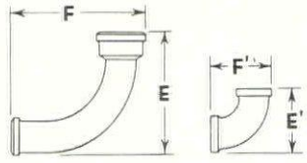
SHORT SWEEP



HUB & SPIGOT — RECESSED THREADED

SIZE	E	F	E'	F'
2	9⅛	10	4¾	4¾
3	10¾	11⅝	6½	6½
4	12	13⅛	8⅛	8⅛
5	13	14⅛	9⅝	9⅝
6	14	15⅛	11¼	11¼
8	16⅝	19	14⅛	14⅛
10	18¾	21⅛	17½	17½

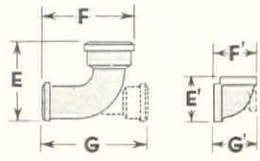
LONG SWEEP



HUB & SPIGOT — RECESSED THREADED

SIZE	E	F	E'	F'
2	12⅛	13	5⅝	5⅝
3	13¾	14⅝	7⅜	7⅜
4	15	16⅛	9⅜	9⅜
5	16	17⅛	11	11
6	17	18⅛	13⅛	13⅛
8	19⅝	22	16⅞	16⅞
10	21¾	24⅛	21	21

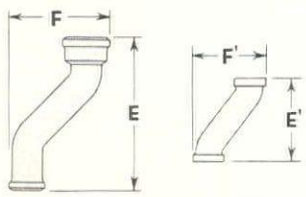
¼ BEND — With or without Heel Inlet



HUB & SPIGOT — RECESSED THREADED

MAIN	BRANCH	E	F	G	E'	F'	G'
2	–	7⅛	8	–	4	4	3¾
3	2	8¾	9⅝	11½	5½	5½	5
4	2	10	11⅛	13	6¾	6¾	6
	3	10	11⅛	13¼	*	*	*
5	2	11	12⅛	14¼	8	8	7
	3	11	12⅛	14½	*	*	*
	4	11	12⅛	14¾	*	*	*
6	2	12	13⅛	15	9⅜	9⅜	8¼
	3	12	13⅛	15¼	*	*	*
	4	12	13⅛	15½	*	*	*
8	–	14⅝	17	–	11⅝	11⅝	*
10	–	16¾	19⅛	–	14	14	*

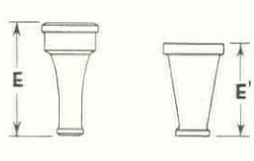
⅛ BEND OFFSET



HUB & SPIGOT — RECESSED THREADED

MAIN	BRANCH	E	F	E'	F'
2	2	9¾	5⅜	7½-13½	7¼-13¼
	4	11¾	8½	*	*
3	2	11¼	6	*	*
	3	*	*	8¾-14¾	8⅝-14⅝
	4	13¼	9⅛	*	*
4	4	14	9⅝	9¾-17¾	9¾-17¾
	6	16	12⅝	*	*
5	4	14½	10⅛	*	*
	5	*	*	12⅝-18⅝	12⅞-18⅞
	6	16½	13⅛	*	*
6	4	15	10⅝	*	*
	6	17	13⅝	13⅝-19⅝	14¼-20¼
	8	19	16⅝	*	*

INCREASER



HUB & SPIGOT — RECESSED THREADED

MAIN	BRANCH	E	E'
2	3	11¾	9
	4		
3	4		
	5	12	
4	5		
	6		
5	6	12	
	8		
6	8	15½	
	10		
8	10		

AMERICAN ARCHITECT
TIME-SAVER STANDARDS

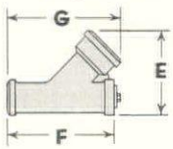
PLUMBING—Size of C. I. Fittings

Serial No. 50
JUNE 1936

DIMENSIONS - TYPICAL CAST-IRON SOIL FITTINGS (Continued)

* Consult Manufacturer for dimensions

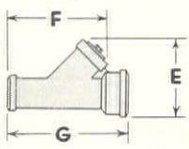
CLEANOUT - "Y" BRANCH with Plug on Main



Hub & Spigot type shown: for Threaded type see Y Branch

SIZE	E	F	G
2	7½	9¼	10¼
3	9⅜	11⅝	13
4	10½	13⅛	14½
5	12½	14⅝	15¾
6	13	16⅛	17½

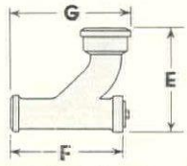
CLEANOUT - "Y" BRANCH with Plug on Branch



Hub & Spigot type shown: for Threaded type see Y Branch

SIZE	E	F	G
2	6⅜	9½	10½
3	8	12	13¼
4	9	13½	15
5	9⅞	14¾	16½
6	11	15½	18

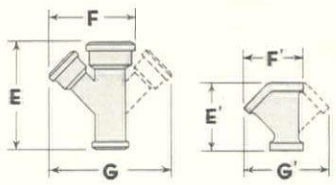
CLEANOUT - COMBINATION "Y" and ⅛ Bend



Hub & Spigot type shown: for Threaded type see Comb. Y & ⅛ Bend

SIZE	E	F	G
2	9⅜	9¼	10
3	10½	11⅝	12½
4	15⅛	13⅛	14⅜
5	17⅛	14⅝	16
6	20	16⅛	17½

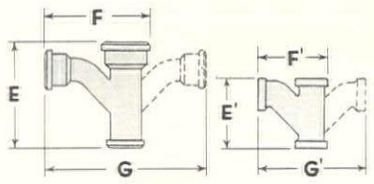
"Y" BRANCH - Single or Double



HUB & SPIGOT RECESSED THREADED

MAIN	BRANCH	E	F	G	E'	F'	G'
2	2	10½	8⅞	13⅛	6½	6	8⅜
3	2	11¾	9⅞	14⅝	*	*	*
	3	13¼	11⅛	16⅝	9	7¾	11¼
4	2	12	10⅛	15	*	*	*
	3	13½	11⅜	16⅞	*	*	*
	4	15	12⅝	18¾	10⅞	9¼	13⅝
5	2	12	10⅛	15	*	*	*
	3	13½	11⅜	16⅞	*	*	*
	4	15	12⅝	18¾	*	*	*
	5	16½	13⅞	20⅝	13	11¼	16¼
6	2	12	10⅛	15	*	*	*
	3	13½	11⅜	16⅞	*	*	*
	4	15	12⅝	18¾	*	*	*
	5	16½	13⅞	20⅝	*	*	*
	6	18	15⅛	22½	14¾	12¼	18⅝

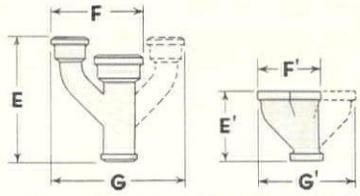
COMB. "Y" & ⅛ BEND - Single or Double



HUB & SPIGOT RECESSED THREADED

MAIN	BRANCH	E	F	G	E'	F'	G'
2	2	10½	9⅜	14¾	7⅛	7⅛	10⅞
3	2	11¾	10¼	16½	*	*	*
	3	13¼	12⅜	19½	9⅞	9⅜	15
4	2	12	11⅞	17½	*	*	*
	3	13½	13⅜	20½	*	*	*
	4	15	15⅛	24	13¾	12¾	19¾
5	2	12	11⅞	18½	*	*	*
	3	13½	13⅜	21½	*	*	*
	4	15	15⅛	25	*	*	*
	5	16½	17⅝	28	15¾	15¾	24½
6	2	12	13⅞	19½	*	*	*
	3	13½	15⅜	22½	*	*	*
	4	15	17⅛	26	*	*	*
	5	16½	18⅝	29	*	*	*
	6	18	20	31¾	18¾	18¾	29⅛

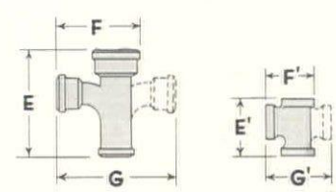
UPRIGHT "Y" - Single or Double



HUB & SPIGOT RECESSED THREADED

MAIN	BRANCH	E	F	G	E'	F'	G'
2	2	10½	8½	12½	7	6½	9¾
3	2	11¾	9⅝	13½	*	*	*
	3	13¼	10¾	15¼	9¾	9¼	13⅞
4	2	12	10⅝	13½	*	*	*
	3	13½	11¾	15¼	*	*	*
	4	15	12¾	17	11¾	11⅝	17⅜
5	2	12	11⅝	13½	*	*	*
	3	13½	12¾	15¼	*	*	*
	4	15	13¾	17	*	*	*
	5	16½	14¾	18½	13¾	13⅞	20¾
6	2	12	12⅝	13½	*	*	*
	3	13½	13¾	15¼	*	*	*
	4	15	14¾	17	*	*	*
	5	16½	15¾	18½	*	*	*
	6	18	16¾	19⅞	*	*	*

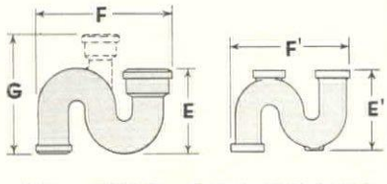
"T" BRANCH - Single or Double



HUB & SPIGOT RECESSED THREADED

MAIN	BRANCH	E	F	G	E'	F'	G'
2	2	10½	7¼	10½	5¼	4¾	6⅛
3	2	11¾	9⅛	13	*	*	*
	3	12¾	9⅜	13½	7¼	6⅝	8½
4	2	12	10⅛	14	*	*	*
	3	13	10⅜	14½	*	*	*
	4	14	10⅝	15	8¾	8¾	10⅜
5	4	14	11⅝	16	*	*	*
	5	15	11⅝	16	10⅜	9⅝	12¼
6	4	14	12⅝	17	*	*	*
	5	15	12⅝	17	*	*	*
	6	16	12⅝	17	12	11¼	14¼

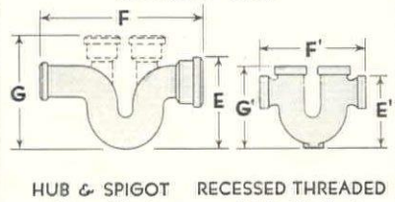
"S" TRAP



HUB & SPIGOT with or without Vent — RECESSED THREADED with Vent only

MAIN	VENT	E	F	G	E'	F'
2	2	6¾	11⅜	10	8	11½
3	2	8⅞	14⅝	12	*	*
	3	9⅛	14⅝	12¼	11¼	15⅜
4	2	10⅞	17⅝	14	*	*
	3	10⅞	17⅝	14¼	*	*
	4	10⅞	17⅝	14½	13¾	19⅞
5	4	12⅞	20⅝	16½	16⅞	23⅝
	5	12⅞	20⅝	16½	*	*
6	4	14⅞	23⅝	18½	19¾	28½
	6	14⅞	23⅝	18½	*	*

RUNNING TRAP



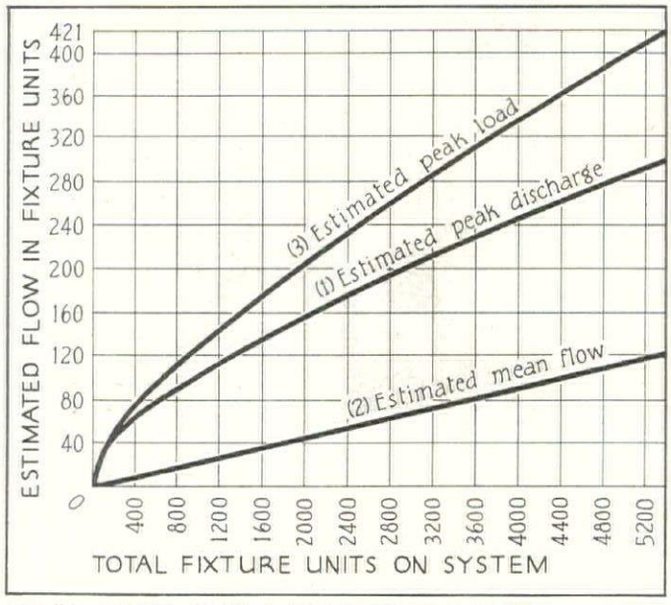
HUB & SPIGOT with or without Single or Double Vent — RECESSED THREADED with Double Vent only

MAIN	VENT	E	F	G	E'	F'	G'
2	2	6⅞	14½	8½	6⅞	10⅛	7¾
3	2	9¼	17¾	10½	*	*	*
	3	9¼	17¾	10¾	7½	13¼	10⅝
4	2	11¼	20½	12	*	*	*
	3	11¼	20½	12¼	*	*	*
	4	11¼	20½	12½	12¼	17¼	13⅝
5	4	13¼	22½	14	14⅞	20½	16⅛
	5	13¼	22½	14	*	*	*
6	4	15¼	24½	15½	17⅝	23¼	19
	6	15¼	24½	15½	*	*	*

Pitch should be ¼" to the foot. A slope of ⅛" to the foot has been used, but is too slight to be safely efficient. In addition, the greater slope can nearly always be designed if the location of fixtures is planned with reference to drainage efficiency as well as spatial convenience. If fixtures are so grouped that they can be connected almost directly to a stack, efficiency will be raised and costs lessened.

SOIL AND WASTE STACKS

Experiments have shown that the height of vertical stacks need not be limited so far as the velocities of discharge are concerned. But diameters are limited in practice by the estimated peak load, by the type of fittings employed to connect lateral branches and by the number of fixture units discharged into a "branch interval" or maximum vertical stack.



FROM "RECOMMENDED MINIMUM REQUIREMENTS FOR PLUMBING"

Relation of peak load to total number of fixture units. Estimated flow, or capacities in stacks and drains, can be approximated by reading from the total load to the estimated flow intersected by the curve of estimated peak load

Estimated peak load can be approximated for purposes of preliminary design from the accompanying chart. The load curve indicates the probable load which must be carried in stacks when estimated peak discharges are added to the estimated average flow. According to the law of probability the estimated peak load will decrease as a percentage of the total load as the number of fixtures of a system increases. It is evident from the table that up to about 12 fixture units, the peak load is the total discharge of all fixtures on the system. But the percentage lessens progressively until it is less than 8 per cent of a total of 5400 fixture units.

Type of fitting is to a great degree a controlling factor of pipe capacities. Vertical pipes have large capacities under test conditions. A 4" stack, for example, carries 2,870 gal. per minute flowing full and 550 gal. per minute flowing one-third full. But these are not safe values in practice when inlets from lateral branches may discharge any load from zero to the peak on one floor. Experiments with various types of inlets have established the fact that the use of Y or combination Y-and-⅛ bend fittings in place of the sanitary T fitting doubles the stack capacities. Further, experiments with carrying capacities of vertical stacks produced the following safe flow tables for stacks with fixtures connected direct through Y fittings at one floor level.

Diameter of stack	Capacities in fixture units
2	12
3	26.7
4	48
5	74.7
6	108
8	192

With sanitary-T fittings only half of these capacities would be allowable.

A "branch interval" is a unit of vertical stack 8 ft. in length within which lateral branch connections are made. The allowable number of fixture units for any branch interval should not exceed two and one-half times the permissible number on one branch having the same diameter as the stack and a pitch of ¼ inch to the foot if a Y fitting is used and only one and one-half times if sanitary-T units are used.

The actual capacities are shown on Table II on Time-Saver Standards Sheet No. 47. This table indicates that a 3" soil stack with Y fittings can carry 72 fixture units on a stack length of 212 ft. This rating for a 3" soil is not accepted by all authorities. Tests and computations conducted by the subcommittee on plumbing of the U. S. Department of Commerce Building Code Committee tend to show that 3" stacks are adequate in all respects for the capacities noted and can be used in many instances where 4" stacks would customarily be installed.

However, other competent experts have pointed out that practical experience with 3" soil stacks has thus far been largely confined to small residences. They maintain that its use should be confined to residences and that no more than two water closets should be connected to any 3" soil stack.

The table allows a total capacity that is vastly greater. For example, an apartment house bathroom is rated at six fixture units. The stack capacity is 72 fixture units. Thus it might be assumed that each stack could carry the simultaneous discharge of 12 bathrooms, which, in a 4-story building would imply three bathrooms per floor. Such allowances are held to be excessive in some codes.

The 3" soil stack has the undeniable advantage of lesser cost of material and labor of installation. It also fits into the standard 4" stud partition.

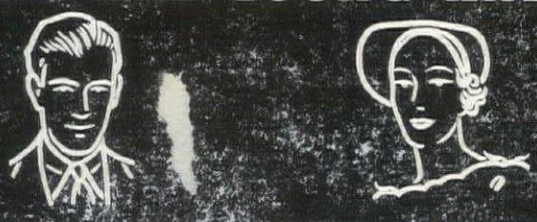
THE VENTING SYSTEM

A column of water falling in a vertical soil or waste stack pushes the air ahead of itself, causing air pressure, and sucks air in behind it, causing a vacuum. As it passes branches, pressure in the stack is increased, then decreased from the

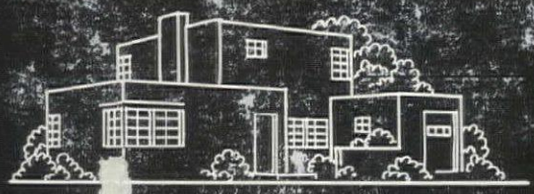
(*Continued on page* 120)

PROBLEM
No. 2

THE ELTONS ARE YOUNG AND MODERN



THEY WANT A LIVABLE, MODERN HOME

LIKE  THIS

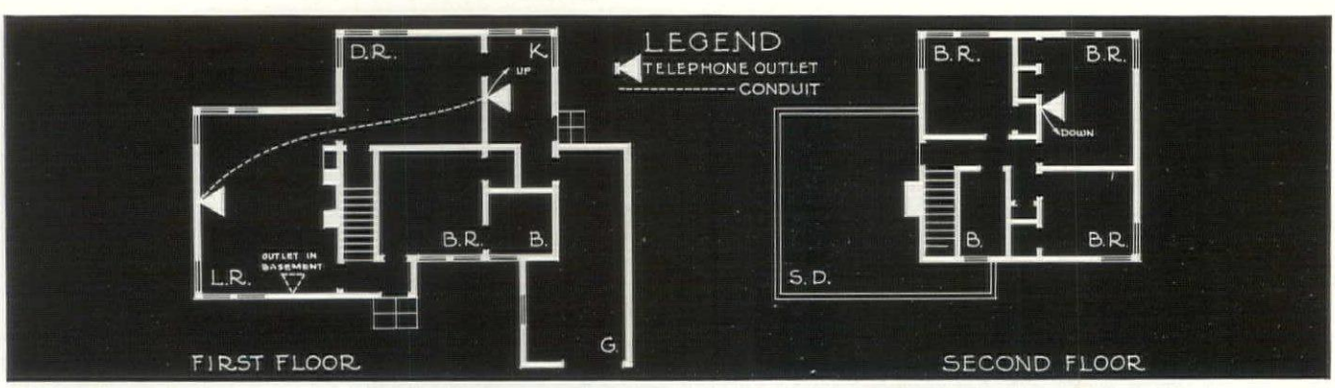
WHAT TELEPHONE ARRANGEMENTS WILL YOU PROVIDE FOR THEM?

WALLY ELTON'S going places in business. Helen still does fashion drawings. They want a very modern, very livable home — complete with air-conditioning, sun deck and maid. They've approved the tentative plans on this page. *What about the telephone arrangements?*

Built-in conduit becomes *doubly* important here. New type structural materials — steel, concrete, glass, asbestos — make it more difficult to install telephones unless conduit has been included in walls and floors, with outlets at strategic points.

For the busy, active Eltons, there should be at least four outlets. Master bedroom. Living-room. Kitchen. Basement recreation room. All four need not be immediately connected, but they're *ready* when wanted. The complete layout costs little, adds neatness, service protection, and *lots* of living-comfort.

• *This is a suggested approach to a typical problem. Telephone engineers will help you custom-tailor efficient, economical conduit layouts for any of your projects. Just call your local Telephone Office and ask for "Architects' and Builders' Service."*



FOR FURTHER INFORMATION ON BELL SYSTEM TELEPHONE SERVICES AND EQUIPMENT, SEE SWEET'S CATALOGUE FILE

MODERN HOMES MUST

CUT AWAY DRAWING SHOWING THE UNIQUE DESIGN, ADEQUACY, AND CONVENIENCE OF THE G-E RADIAL WIRING SYSTEM.

ADVANTAGES TO HOME OWNERS OF RADIAL WIRING SYSTEM

1. Flickering or dimming of lights encountered with improper wiring is eliminated.
2. Appliances operate more efficiently and economically.
3. Voltage losses are reduced to a minimum.
4. Service can be conveniently, safely and easily restored at the circuit breaker.
5. Circuit breakers may be operated as switches for full circuit control.
6. The circuit breaker is non-tamperable. It cannot be disassembled and therefore the circuit cannot be over or under fused.
7. Circuit protection at most convenient points throughout the house.

BE ADEQUATELY WIRED

Specify

THE NEW G-E RADIAL WIRING SYSTEM

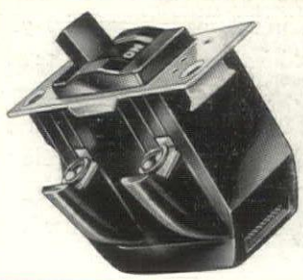
The exterior of a modern automobile may look beautiful, but the car's usefulness depends upon the efficiency of its electrical equipment. In the same way, the usefulness of a modern home depends on the efficiency of its electrical equipment, not on the grace of its exterior design. The day is gone when electricity was used only for lighting and a few table appliances. Today electricity operates the furnace, the air conditioning system, the refrigerator, the range, and literally hundreds of other appliances.

Adequate wiring for this equipment is absolutely essential. The number of outlets, only, does not constitute electrical adequacy. Wire sizes must be ample, and circuits must be efficiently arranged. Realizing this need, General Electric engineers developed a unique new wiring system for homes that is completely adequate — called the Radial Wiring System. Principles never before drawn upon in house wiring were employed to provide home owners with new efficiency in the operation of electrical equipment, and new convenience in the control of lights, appliances and switches.

The heart of the Radial Wiring System is the new branch-circuit circuit breaker which enables heavy wire to be run right up to the load center spots about the house. This heavy wire terminates at the circuit breakers from which branch circuits or radial wires fan out to outlets in the immediate vicinity of the circuit breaker. Fixed lighting outlets are on their own circuits separate from the circuits that serve convenience outlets.

The Radial Wiring System is abreast of the times—capable of serving all modern home electrical equipment efficiently and permanently. It makes modern electrical living possible.

Complete information about the General Electric Radial Wiring System may be found in American Architect's Time Saver Sheets, Sweet's 1936 Architectural Catalog or in a Manual for Architects prepared by the General Electric Co. This Manual makes it easy for you to specify the Radial Wiring System and to check it during installation. Clip the coupon and mail it today to receive a copy of this handy, easy-to-use Manual on the Radial Wiring System.



This Branch-circuit Circuit Breaker, the heart of the Radial Wiring System, provides localized control and protection to circuits at convenient points throughout the house.

Section CDW-906,
Appliance and Merchandise Dept.,
General Electric Co., Bridgeport, Conn.

Please send me the Reference Manual for Architects on the G-E Radial Wiring System.

Name.....

Address.....

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

GENERAL ELECTRIC

APPLIANCE AND MERCHANDISE DEPT., GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONN.

American Steel & Wire Company

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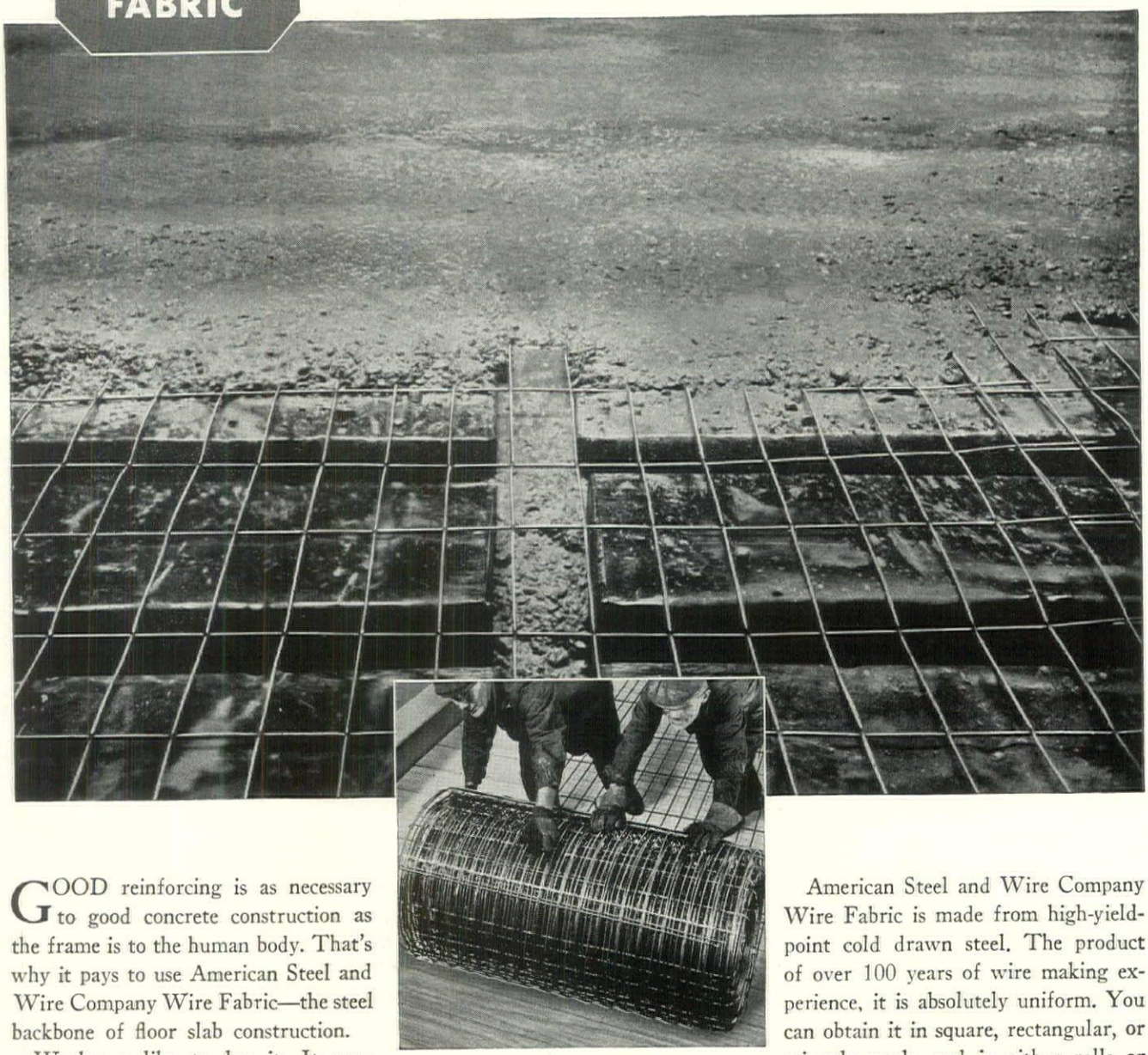

GOOD reinforcing is as necessary to good concrete construction as the frame is to the human body. That's why it pays to use American Steel and Wire Company Wire Fabric—the steel backbone of floor slab construction.

Workmen like to lay it. It goes down easily and lies flat. Because less labor is necessary, construction time and costs are cut. The dollars saved will look good to you. You can take pride in the job's permanence.

We'd hesitate to say how many thousands of acres of concrete flooring owe their permanence to the tough, lasting qualities this time-tested Wire Fabric provides. But there are enough to prove that most discriminating builders have learned its merit. If *you* have not tried it, do so on your next job.

American Steel and Wire Company Wire Fabric is made from high-yield-point cold drawn steel. The product of over 100 years of wire making experience, it is absolutely uniform. You can obtain it in square, rectangular, or triangle mesh, and in either rolls or sheets depending upon your need.

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Science Building for Hollywood High School. Marsh, Smith & Powell, architects; R. H. Annin, supervising engineer; Sarver and Zoss, contractors—all of Los Angeles. Frame, walls and floors, as well as sculptured panel, grilles and other detail cast integrally in concrete of rigidly-controlled quality.

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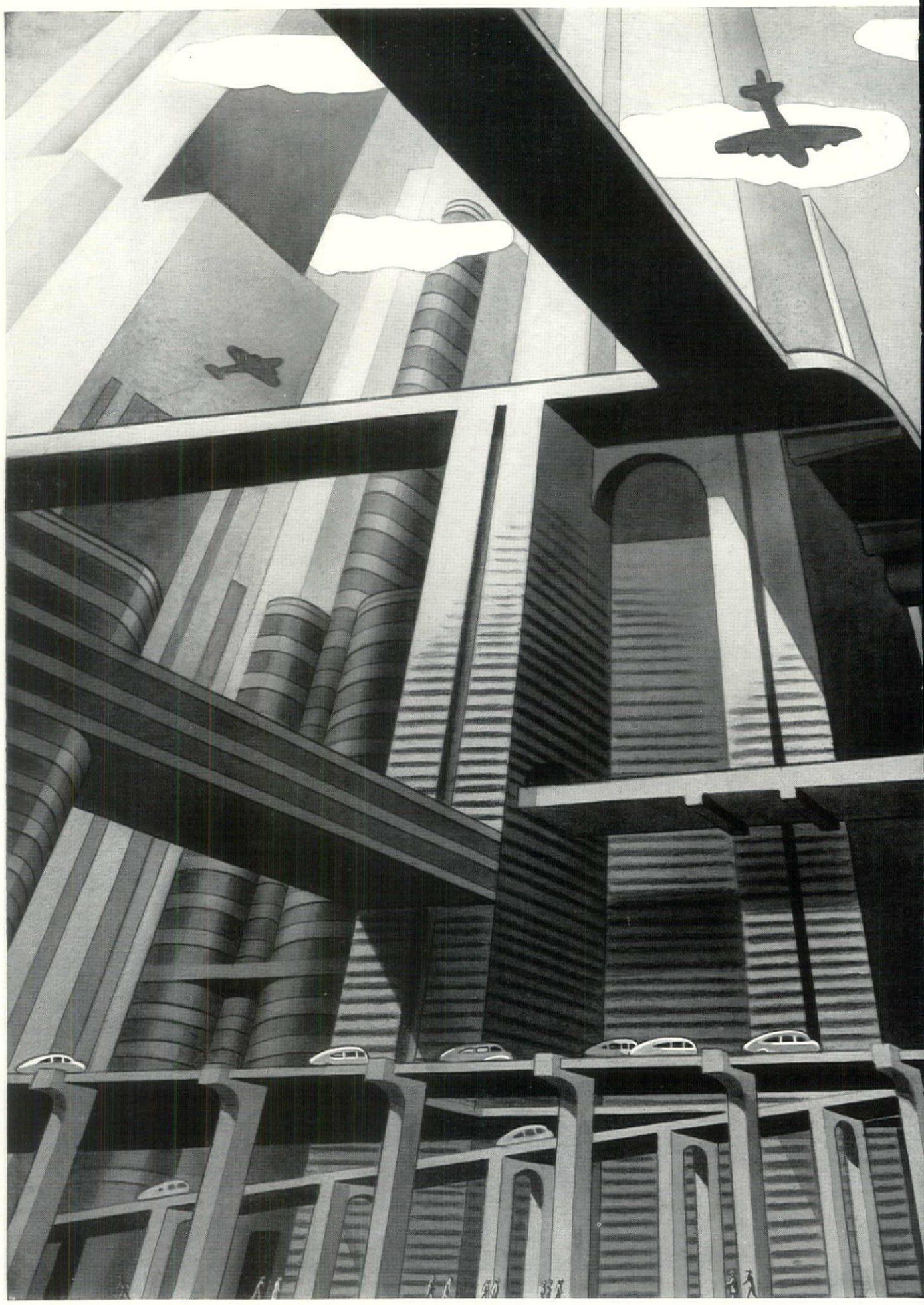

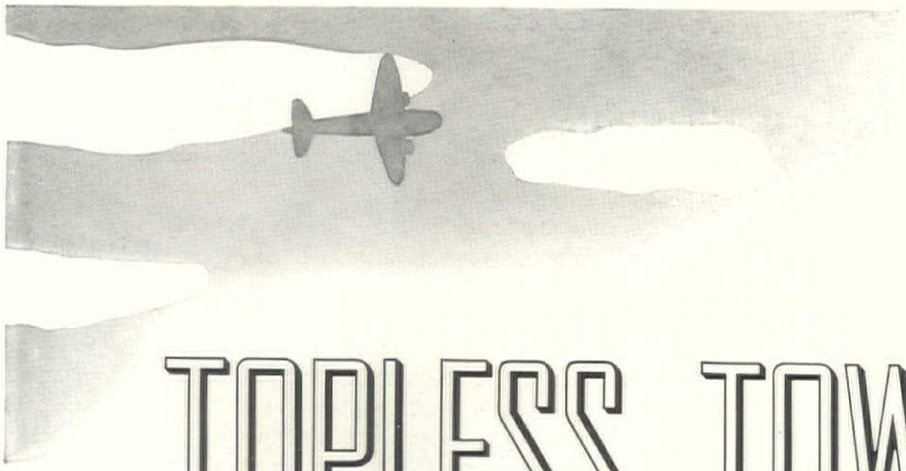

TOPLESS TOWERS

WHEN Marlowe wrote of the "Topless Towers of Ilium" he could not foresee the soaring skyscrapers we accept as a matter of course. And when the Norsemen told of the mighty bridge stretching from heaven to earth, they thought only the gods could rear such stupendous structures. To them, a man-built bridge like the one spanning the Golden Gate would be a miracle.

Perhaps the Golden Gate Bridge is a miracle—a miracle of persistence and achievement. Yet it is only one of many modern structural miracles, each of which is possible only with steel. The bridges which withstand the deep scouring freshets of western rivers rest firmly on steel. The colossal dams which help bring fertility to the desert are cored with steel. Steel forms the backbone of the tallest buildings the world has ever known. Steel plays an increasingly important part in the construction of homes of today.

And there is a Bethlehem Steel member especially designed to meet each of these widely varied structural requirements—to aid in simplifying problems of design.

BETHLEHEM STEEL FOR MAJOR STRUCTURES

Bethlehem Wide-Flange Sections are too well known and too generally employed to require any special mention. Their introduction twenty-nine years ago paved the way for decisive economies in structural work and aided in simplifying problems of design. They have since been supplemented by Bethlehem Light Sections.

Bethlehem Light Sections allow close spacing of structural members where the loading will not utilize the full strength of regular heavy sections. They are especially well suited for floor beams where loads are relatively light and are in many cases the most economical members to use for ceiling beams, purlins in roof construction, columns in upper stories and for struts between columns.

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Clients today consider the home they buy more in the light of an investment than merely as a place to live. For this reason the use of steel in dwelling construction merits the earnest consideration of the architect. Bethlehem Steel Company has kept pace with this growing acceptance of steel in dwelling construction and has perfected two steel members which are especially designed for use in homes and other light occupancy structures.

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A second new Bethlehem steel product for homes of today is the Bethlehem Steel Stud. This light-weight, open-web member is particularly suited for exterior walls and interior bearing walls of dwellings. It is almost limitless in its applications and opens up new vistas in the design of rigid frame homes which are protected against obsolescence and are a definite investment in security. Of special appeal to architect and client alike is the fact that the use of Bethlehem Steel Studs and Open-Web Joists in no way affects the appearance of the home or tends to make it conform to any particular style.

The economies in every type of structure afforded by Bethlehem Steel Structural Members and the many ways in which they aid in solving difficult problems of design and construction have made them definite assets of the architect. They provide a full and complete range of structural members upon which to draw for every requirement.

BETHLEHEM STEEL PRODUCTS FOR BUILDING CONSTRUCTION

Bethlehem Wide-Flange Structural Shapes, Bethlehem Light Sections, Bethlehem Steel Studs, Bethlehem Open-Web Steel Joists, Beth-Cu-Loy Galvanized Sheets, Bethlehem Steel Pipe, Steel Door Frames, Kalmantrim, Metal Lath, Bethlehem Insulating Wool, Reinforcing Bars, Steel H-Piling, Steel Sheet Piling, Bolts and Nuts, Rivets.

BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa. *District Offices:* Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

Modern Plumbing Practices

(Continued from page 110)

normal. When the stack is connected by a bend to a horizontal drain positive air pressures in the lower reaches of the stack increase materially, because the air, pushed by the descending column of water, is impeded by the bend. Pressures in a stack may vary as much as 20" of mercury column or more, above or below normal. Furthermore, the zones of pressure and intensity are continually shifting within stacks, depending on the heights and diameters of vertical pipes. Locations of branches also influence pressure variation as well as the volumes of sewage discharged into stacks. All air pressures, whether positive or negative, must be promptly relieved to prevent blowing of the fixture traps by positive and trap siphonage by negative pressures. In addition air circulation throughout the drainage system is necessary to prevent decomposition of organic matter on pipe walls. An adequate venting system is therefore a necessary part of any properly designed plumbing drainage system.

METHODS OF VENTING

There are four basic types of systems to ventilate the drainage system and to maintain equal pressures in all its parts. They are: 1. the individual vent system, 2. the loop vent system, 3. the circuit vent system, and, 4. the yoke vent system. Authorities are in disagreement regarding the relative efficiency of these systems in practice. In certain instances all have proved satisfactory. But there are cases when the installation of the circuit and loop vents would prove dangerous. Moreover, some authorities claim that they are no more saving of material and no easier to install.

Individual venting implies the existence of a separate vent for each fixture trap. Toward constant maintenance of trap seals and a free air circulation throughout the system no other method of venting is more effective. However, certain practices must be avoided to prevent clogging of vent connections which would destroy the efficiency of the system.

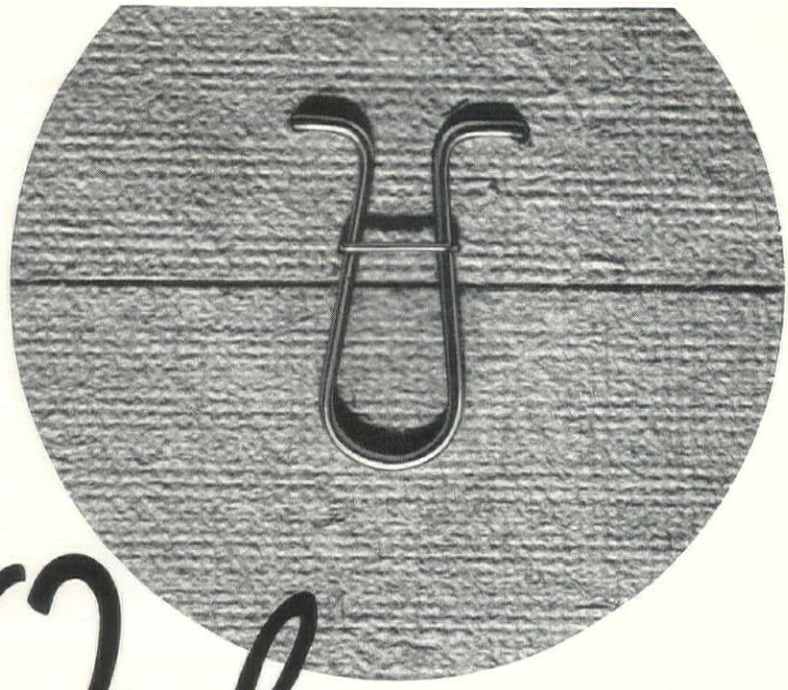
Vent connection to trap crowns or to the tops of waste lines should never be allowed. The former is rarely encountered now and is prohibited in codes, but top connections are still made, particularly in cases where traps of floor-set fixtures, such as water-closets and bathtubs, are within the fixture, in ceilings or in furred spaces.

A design principle of vent connection should involve scouring of the vent fitting. Practically, this means that every fixture vent connection should be made to a vertical waste or soil pipe. Designated as the "continuous waste and vent" connection this renders very remote the possibility of vent clogging and assures the best venting system yet devised. (See Time-Saver Standards Sheet No. 49.)

Provision for individual venting requires co-ordinated planning on the part of both engineer and architect. Such connections may require additional stacks, furring of ceilings, and relocation of plumbing fixtures themselves if plans have not allowed for necessary clearances of such connections.

A bow vent is an expedient sometimes used to vent free standing fixtures by the individual system when their location makes the presence of an exposed vent stack undesirable. Individual continuous wastes and vents are joined above the fixture by a vent pipe that descends to the floor and is there connected to the main vent stack.

(*Continued on page* 122)



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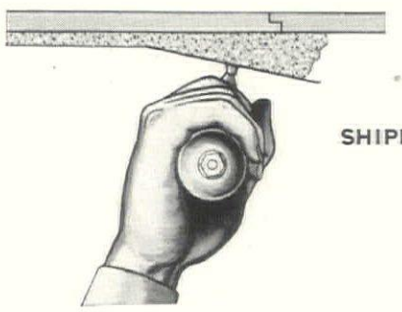

As the trowel approaches the shiplap joint of ordinary lath the sheet being worked over is supported at the joint by the underlapping lip of the adjacent sheet.

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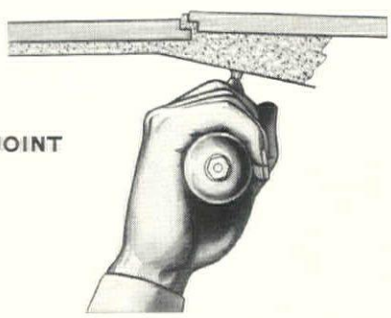

Passing beyond the joint the trowel pressure is transferred to the unsupported sheet causing the joint to spring open and permitting plaster to work into it.

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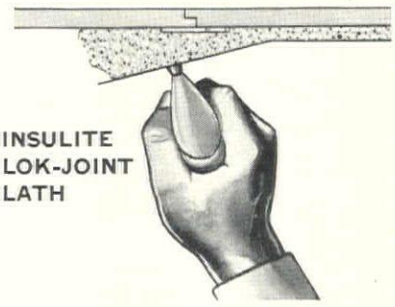

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Loop venting is an attempt to simplify piping installations by extending the upper end of a waste or soil branch above the fixture level and connecting it to a main vent stack adjacent to the main soil stack. The waste or soil line thus connected has the double duty of carrying both air and fixture discharges. This constitutes "wet venting" which is subject to three objections.

First, any stoppage in the branch between the main soil and the last fixture on the branch utterly destroys the vent for every fixture on the branch.

Second, the lack of free air circulation tends to decompose deposits on pipes and develop a dangerous toxic condition within the system. When vents are clogged, siphoning of fixture traps will occur all along the branch and sewer air will enter rooms from fixture outlets.

Third, as decomposition of deposits reduces the internal diameter of pipes, the venting efficiency is reduced even if no stoppage takes place. Air cannot enter the system in sufficient quantities to prevent pressure changes and the danger of trap siphonage or trap blowing is consequently increased.

The system of loop venting can be applied to batteries of fixtures that discharge only liquids if drains are oversized, pitched at least ¼" to the foot and connected to the main soil with a Y or combination Y- and-⅛ bend fitting. Application should be limited to lightly loaded branches and the system should not be considered as adequate in itself.

Circuit venting is similar in principle, design, and operation to loop venting. Vent and soil stacks, however, are on opposite ends of the branch to which fixtures are connected. The system contains the same objectionable features as loop venting and its installation should have the same limitations.

Yoke venting involves a connection of the soil or waste stack with an adjacent vent stack on each floor. It can be applied to any of the three foregoing systems of venting and invariably increases the efficiency of the installation. It should be considered almost a necessary adjunct to loop and circuit venting systems and is a practical expedient to relieve pressure conditions that may develop due to complications in the design of an individually vented drainage system.

Omission of vents for individual traps is permissible in some instances. Thus the highest fixture on a stack need not be separately vented provided the trap is not more than 4 ft. from the stack. This is usually a safe distance. It varies, however, in some codes. But in a drain much exceeding this distance, and sloping ¼ inch to the foot, pressure may develop sufficient to siphon small traps.

A separate vent stack for each trap is not always essential. The possibility of loop-venting a battery of fixtures on a short branch has been noted; and it is commonly accepted as good practice in hotel and apartment house work to vent all fixtures of adjoining bathrooms through a single outlet into a main vent stack. The criteria of design are free circulation of air, avoidance of "wet-venting" and installation to produce constant self-cleaning of vent connections. The means of accomplishing these are subject to wide variations of design and code control.

Sizes and lengths of vent stacks are functions of the sizes and extent of soil and waste stacks. The limits of soil stacks for venting purposes are given in Time-Saver Standards Sheet No. 47, Table II. Limits of vent extensions in terms of fixture unit loads and soil and waste pipe sizes are on the same sheet, Table III.

(*Continued on page* 124)

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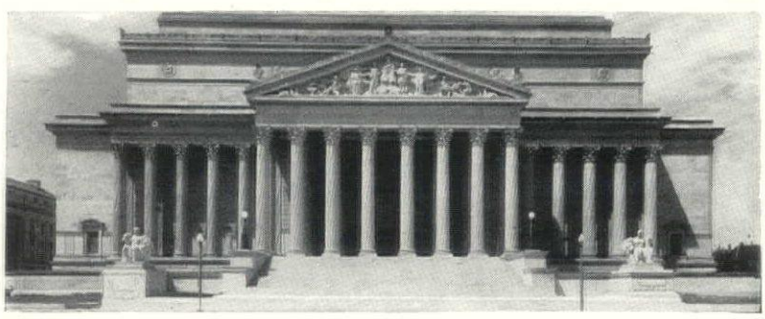
U. S. DEPARTMENT OF JUSTICE
Zantzinger, Borie and Medary, architects, Philadelphia, Pa.



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These are only three examples of many Johnson installations in U. S. Government Buildings in Washington, not to mention a variety of Johnson-controlled governmental buildings elsewhere . . . Post Offices, Court Houses, Office Buildings, Appraisers' Stores . . . new and old. Many of them are equipped with Johnson Zone Control systems, commanded by the Johnson *"Duo-Stat,"* the automatic control engineer who never sleeps but sits with one hand on the radiator, the other outdoors and his foot on the throttle of the heating system.

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Roof extension of main vents should be at least 4" in diameter in all climates subject to frost conditions at any time.

CONNECTIONS AND CLEANOUTS

Fittings largely control the efficiency of the drainage system. Branch and soil connections already mentioned illustrate the principle that all bends in soil and waste stacks should be gradual. No connection should be made with an angle greater than 45 degrees and where turns are essential, fittings should be "long sweeps" not short radius bends.

Vent stack connections at upper ends can be made with ¼" bends since pipes carry air only. But all horizontal vents should pitch at least ⅛" to allow condensation to drain. Vent stacks should when possible be connected to their soil stacks at the lower ends so that the vents are straight and the soils branch into them so that discharges will scour the fitting.

Base fittings, whereby soil and waste lines join the house drain are particularly important since they must carry large flows at maximum velocities with no danger of clogging. Sanitary T's should be avoided and base fittings restricted to the use of Y's or combination Y- and-⅛ bends. Types and relative clearances of connections are indicated on Time-Saver Standards Sheet No. 50.

Cleanouts should be installed at the base fitting on every soil stack, at ends of each lateral branch, and at such other locations that every foot of the drainage lines can be reached by a plumber's "snake" not over 50 ft. in length. However, cleanouts should be as few as possible in number. They are at best a mechanical safety factor and add nothing to the drainage efficiency of the system.

TRAPS

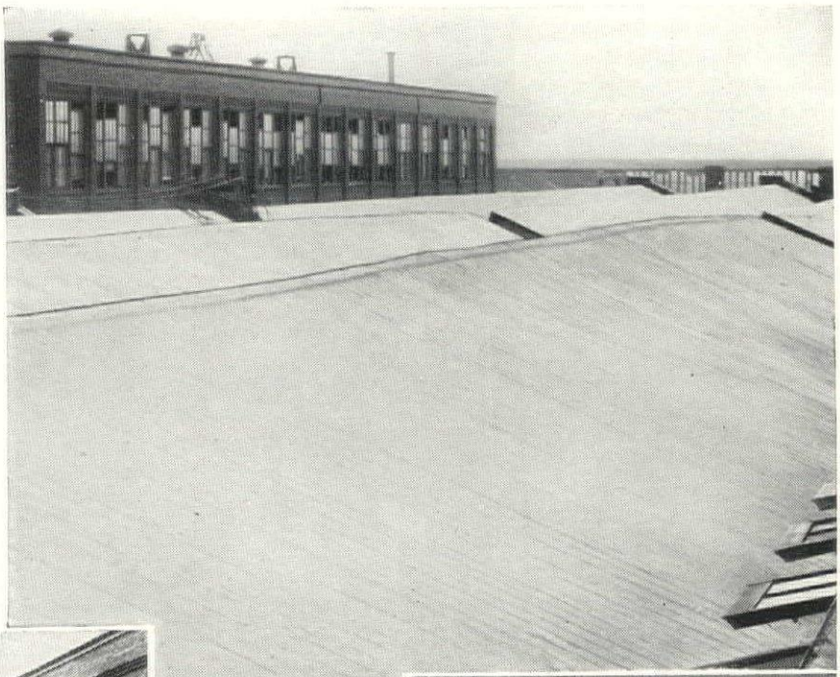
Every plumbing fixture should be installed with a trap. The depth of the trap seal should be at least 2 in. but not over 4 in. except on trapped floor drains where the minimum should be 3 in. These are average safe requirements that may vary somewhat in various codes. On all fixtures S or P traps are simple, effective and safe.

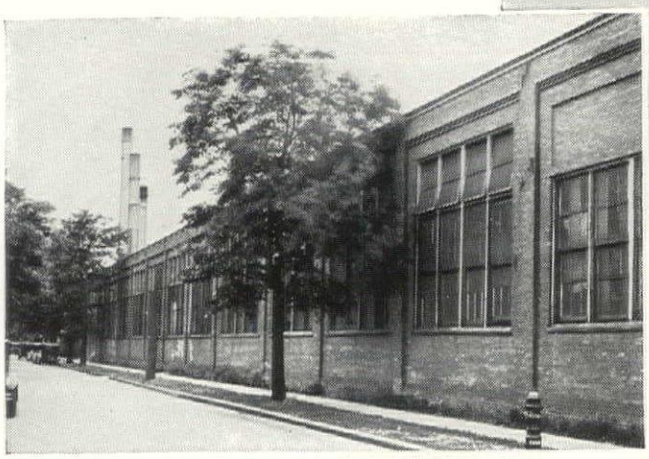
Anti-siphon or re-sealing traps are designed primarily to resist the effects of pressures within soil and waste lines tending to break trap seals. In principle they contain an enlarged chamber, projecting caps, tortuous passages or a mechanical arrangement which operates as a closure in the event of pressure changes. Expedient use of them tends to improve drainage efficiency in a system that provides inadequate venting if they are continually kept clean. In any drainage layout, however, dangers to trap seals from both positive and negative pressures can be eliminated through proper sizing of soil waste and vent stacks in relation to a previously determined peak load in terms of fixture units. In such a case the best trap is that which offers no impediment to smooth discharge flow by internal mechanical devices or changes in pipe size.

House trap and fresh air inlets are required in many cities and excluded in others. Modern practice increasingly frowns upon their use except in localities where extremely cold weather prevails. Cold weather tends to form hoar frost

(*Continued on page* 126)

26 YEARS Of Proof





26 YEARS of proof at South Bend, Ind. This J-M Smooth-Surfaced Asbestos Roof has been protecting the Oliver Farm Equipment Co., factory since 1910... and is still on the job!

J-M Smooth-Surfaced Asbestos Roofs Provide a Lasting Solution to One of Your Major Investment Problems

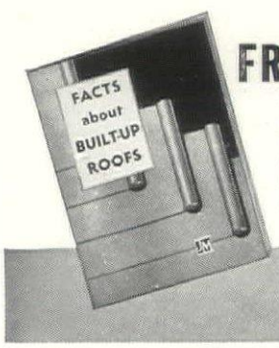
A ROOF is a major investment. All the more important because you buy it to protect other investments... materials, merchandise, equipment . . .

Which means you want lasting protection. The factory shown here offers 26 years of proof that J-M Smooth-Surfaced Asbestos Roofs can and do provide such protection.

And the case is *not* an isolated one—as proved by the partial list of long-lived roofs shown at the right. Many J-M Roofs . . . in prime condition . . . are nearing or have passed the quarter-century mark . . . thanks to this same protective value they all have in common:

They were built up of felts made of *ASBESTOS* . . . the fireproof, rotproof *PERMANENT MINERAL.*

Asbestos fibres are solid, non-capillary by nature. Thus, J-M Roofing Felts form a *positive barrier* against evaporation of the lighter oils in the asphalt, preserving their waterproofing qualities indefinitely *despite* the intense drying-out action of the sun. Hence, there is minimum maintenance on weatherproof J-M Asbestos Roofs throughout their long lives.



FREE "Facts about Built-Up Roofs"—a valuable handbook giving data on roofing problems and complete information on all J-M Roofs. Explains construction and flashing problems. Tells how roof insulation saves money on fuel and air-conditioning costs; protects roofs from damage caused by contraction or expansion. For your free copy write to Johns-Manville, 22 E. 40th St., N. Y. C.

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BONDED ASBESTOS ROOFS

Typical examples of the many J-M Roofs still in excellent condition after passing the 20-YEAR MARK

22 YEARS old at Seattle, Wash.
(Port of Seattle, Bell St. Dock)
36 YEARS old at Newark, N. J.
(General Leather Co., Bldg. No. 4)
25 YEARS old at Cincinnati, Ohio
(American Valve & Meter Co.)
23 YEARS old at Chicago, Ill.
(Sears, Roebuck & Co., Grocery Bldg.)
24 YEARS old at Louisville, Ky.
(American Medicinal Spirits Co.)
24 YEARS old at Kansas City, Mo.
(Kansas City Star)
26 YEARS old at Beech Grove, Ind.
(Big Four Railroad Shops)
24 YEARS old at Detroit, Mich.
(Detroit Baseball Club, Navin Park)

at vent roof terminals due to warm air in the drainage system. Upon closure, seals of fixture traps will be destroyed due to negative pressures created by fixture discharges. House traps tend to prevent emanation of moist, warm air from city sewers and a fresh air inlet provides thorough ventilation of the house system thus decreasing the danger of frost closure of vent openings. Thus their chief advantage is an additional safeguard against loss of trap seals.

But most experts agree that elimination is advantageous for the following reasons:

1. Cost of the house system is reduced.
2. Flow in house drains is not impeded. This is a factor of importance, for impeded flow may cause a static head in soil and waste traps resulting in back pressure and consequent danger to trap seals on the lower part of the system.
3. Natural draft and ventilation from street sewer through each stack is increased.
4. Odors from fresh air inlets are eliminated.

Installation should not even be considered when the house sewer is connected directly to a private disposal plant. In all septic tanks gases are generated that produce pressures which should be relieved through plumbing stacks.

Grease traps should be installed subject to local code control. Usually they are not an essential part of a small dwelling drainage system. They are, however, necessary as a safety factor on most larger installations. (See Time-Saver Standards Serial No. 19, November, 1935.)

"Back-Siphonage" and "Cross Connections" are terms that seem to imply an improper design and installation of the drainage system. Actually, however, they refer to conditions in water supply lines. Briefly, back-siphonage results from negative pressure in water lines sufficient to suck the contents of fixture traps into the water supply system. Cross connections may occur when water lines are connected to fixtures in such a manner that fixture operation establishes a link between water supply and drainage systems. Causes and cures of both conditions are under investigation by the Bureau of Standards in Washington, the U. S. Public Health Service, and independent research agencies and will be reported in available detail in Part II of this article.

MATERIALS

Wide differences of opinion exist regarding choice of material for the various portions of the drainage system. In part authorities differ regarding the relative capacities of pipe materials to resist corrosion and in part upon the systems by which pipes are connected.

Normal corrosion in soil and waste stacks and branches and in house drains ordinarily appears too slight to be a matter of importance in choosing pipes for these parts of the drainage system. A coating quickly forms on pipe walls in most cases. This tends to inhibit rapid corrosion. And the thickness of all commonly used drainage pipe is such that under normal conditions of use in a properly designed system, house drains, soil and waste pipes will have a useful life as long as the building stands.

Vent stacks and roof leaders, however, are subject constantly to conditions involving corrosion. The former are not protected by coatings as are soil and waste lines, and are constantly subject to dampness due to condensation. In addition they are exposed to the atmosphere and must, therefore, withstand the most adverse conditions. Leader pipes

(*Continue on page* 128)

Architectural Drawing

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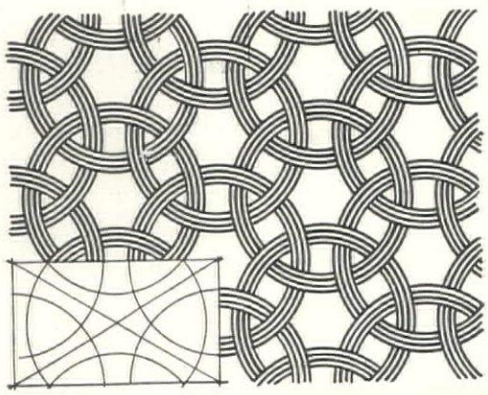

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are not always wet. But rain water may corrode them excessively in localities where industrial plants fill air with fumes deposited as chemically active soot on roofs. When dry, leaders must be resistant to atmospheric corrosion to a greater degree than any of the other drainage pipes.

Systems of connections can generally be divided into those involving "hand made" joints and those employing largely "machine made" joints. In the first, caulked joints are used with cast-iron bell-and-spigot pipe for main soil and vent stacks and for the larger vertical branch lines. Wiped joints with lead pipe are used for fixture connections, and, to join lead bends to waste or vent lines or lead waste and vent lines to main soil and vent stacks.

In the second system recessed and threaded connections are largely used for most branch connections, for vents and even for soil and waste lines, according to the Durham system for eliminating internal shoulders that impede flow.

Relative merits of these two connection systems depend largely upon local conditions that involve the time, cost and labor of installation as well as the type and extent of the drainage requirements. Both have proven satisfactory in a large number of installations. Also the kinds of pipe used in each have many times given excellent service. Failures can be pointed out in both categories and the architect should select drainage pipe in view of, first, the broad characteristics of the material, second, the possible economies of space, labor and material cost that can be effected and, third, the restrictions of the local regulation of building plumbing.

Copper and brass pipes are rarely installed in drainage systems. Copper and its alloys tend to corrode in the presence of ammonia and hydrogen sulphide. These gases are present to some degree in drainage discharges but so far as is known, there has yet been little conclusive research indicating this to be a dangerous condition tending to abnormal corrosion of copper and brass pipe installed in iron pipe sizes for soil, waste and vent stacks.

Lead has the advantage of relative permanence. It has also the advantage of adaptability to unusual conditions of installation. Due to its flexibility it is adjustable to the distorting effect of building settlement or vibration. But its weight makes it necessary to support lead pipes throughout their length when used as waste branches and at intervals of 3 feet when used vertically as waste or vent stacks.

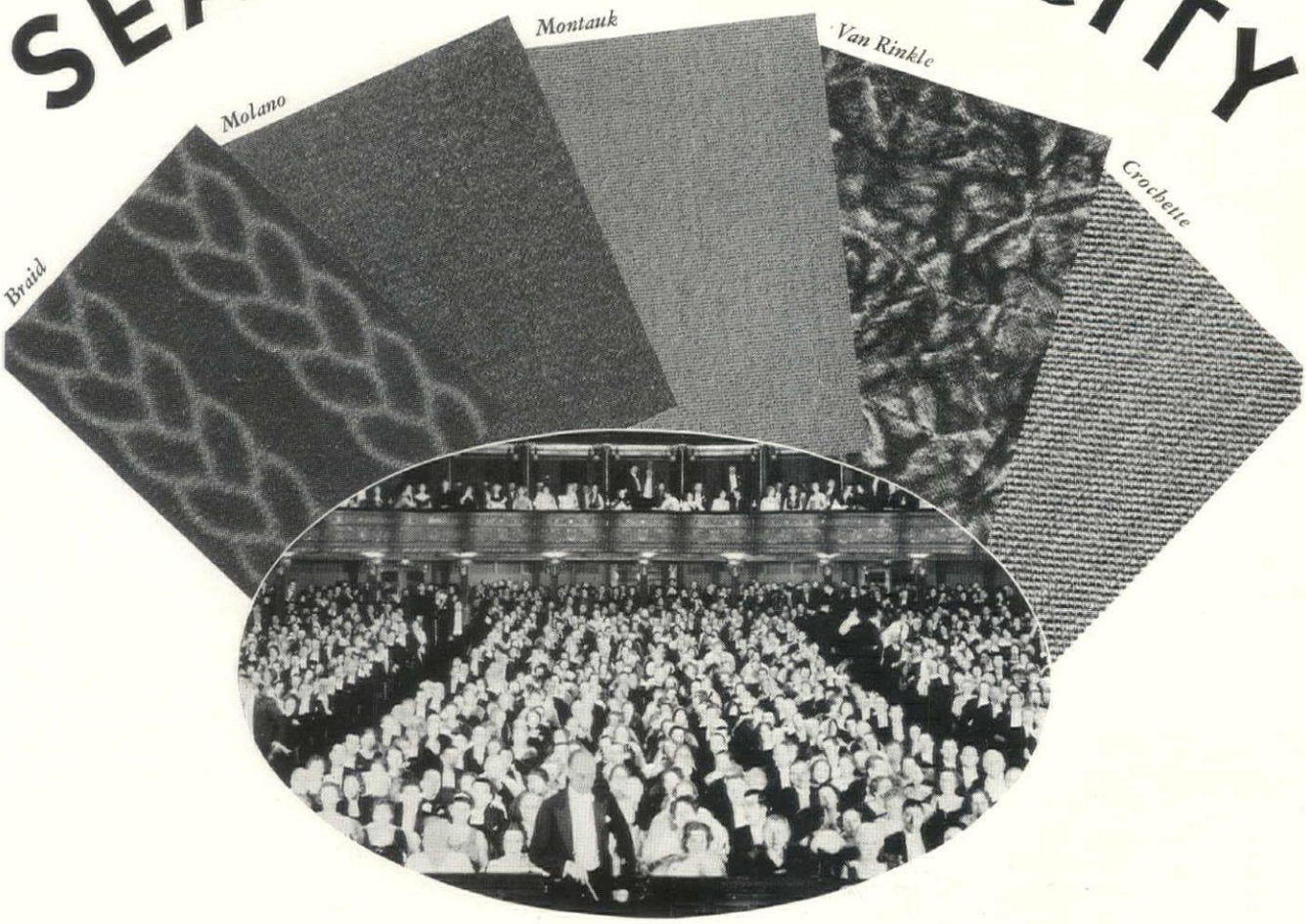
Cast iron is highly resistant to corrosion. But the crystalline structure that makes it so also makes it extremely brittle and likely to fracture from distortion. However, its compressive strength is high. The pipe is now available with recessed joints for screwed connections in addition to the familiar hub-and-spigot type. Some authorities place no height limit to the use of cast iron for soil, waste or vent stacks. Others think cast-iron stacks should be limited to 100 feet since the material is subject to failure as a result of excessive expansion and contraction. Most agree that it should not be used to any extent in lateral branches.

Galvanized wrought iron is sufficiently resistant to corrosive agents present in all ordinary building drainage to be usable for most parts of the system. However, most codes prohibit installation of this material as underground house drains. It is not brittle pipe. It is more expensive than cast iron, but is far tougher and can easily be joined by welding.

Galvanized steel corrodes more readily than most pipes, but

(*Continued on page* 130)

SEATING CAPACITY



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is less expensive than wrought iron and more adaptable than cast iron for use in the drainage system. In the opinion of qualified experts there exists little advantage of wrought iron over galvanized steel so far as its use for soil and waste stacks and branches is concerned. Opinion differs regarding the advantages of copper-bearing steel pipe over ordinary steel pipe in drainage systems. Evidence shows that when exposed to air ordinary steel pipe corrodes more quickly than the copper-bearing type. But this advantage appears to be negligible in the case of soil and waste lines.

Material problems of the drainage system are not the same as those of the water supply lines. Research tests and practical experience have proven the following to be recommendations generally safe in all sections of the country.

The house drain in the majority of cases can be most economically installed with cast-iron bell-and-spigot soil pipe. It should be extra heavy weight. Galvanized wrought iron or steel can also be used if house drains are exposed. But vitrified clay pipe should not be used for house drains because of a susceptibility to leakage and because of the difficulty of making joints permanently leak-tight.

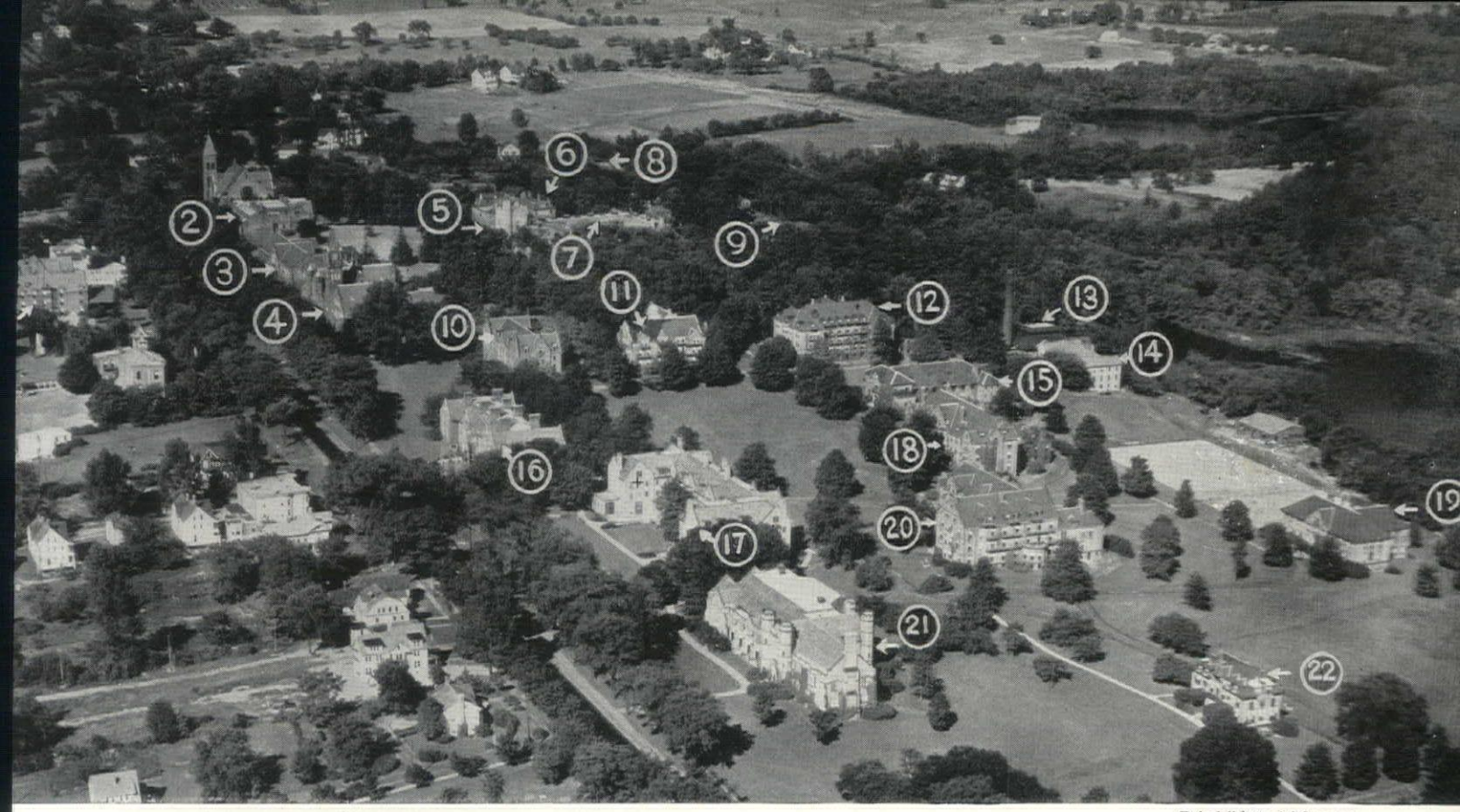
Soil and waste stacks can be extra-heavy weight bell-and-spigot cast iron. Some authorities consider it satisfactory to use standard-weight cast iron in buildings under 8 stories in height. Joints should be caulked with oakum and lead, a combination which compensates somewhat for movement due to vibration or settlement. Galvanized wrought iron or steel can also be used with recessed and threaded connections. Where there will be corrosive discharges lead, lead-lined, or acid-proof ferrous alloy pipe should be used.

Branches for soil and waste lines should not be cast iron. Building settlement is often the cause of damage to lateral drainage branches. Due to greater toughness and elasticity, galvanized wrought iron or steel is usually economical for branches. However, many codes allow lead pipe for all concealed horizontal wastes.

Vents and leaders should be galvanized wrought iron or copper bearing steel in all usual installations. Ordinary steel should not be installed in localities where the air contains much smoke or fumes from manufacturing plants, for it will quickly corrode under the action of the chemicals present. Cast iron also can be used for vents within the same limits noted for stacks; and for vents up to 2 in. lead can often be installed.

Fittings with lead, cast or wrought iron or steel pipe are usually cast-iron, although malleable iron fittings are available in the same shapes and sizes. Malleable iron is considerably less resistant to corrosion than cast iron, but is tougher, less subject to damage from impact, vibration or the slight distortion due to building settlement. Fittings for brass and copper pipe should be the same as the pipe material. Otherwise pipe corrosion will be accelerated due to galvanic action between pipe and fitting.

Connections of all pipes and fittings in the drainage should be such as to avoid shoulders or any obstruction to impede the smooth flow of discharges. Caulked joints of bell-and-spigot pipes should be used only when the supports of the pipe line is so solid that movement sufficient to damage the joint is virtually impossible. Such joints can be made on covered house drains and vertical cast-iron stacks. Other connections are best made with the recessed type of screw connection or, in the case of lead pipes, with wiped joints.



MOUNT HOLYOKE COLLEGE

Fairchild Aerial Surveys

CENTRAL HEAT CONTROL FOR 22 COLLEGE BUILDINGS

Webster Moderator System at Mount Holyoke First Large Installation of its Kind

CONTROL-BY-THE-WEATHER

In 1934, Mount Holyoke College, South Hadley, Mass., completed an extensive modernization of steam using facilities, including a Webster Moderator System for central heat control of 22 existing buildings of various age and equipment, many one-pipe, some two-pipe and two hot water installations.

"Control-by-the-Weather" is provided by automatic Outdoor Thermostats, supplemented by a central control (shown at right) including (a) lights to indicate functioning of control valves and accumulation of water in key radiators, (b) switches for remote shut-off, (c) Variators to increase or decrease steam delivery to any zone. This central control eliminates "cruising" of the campus by the operating force and permits observance of a definite operating schedule for each building.

A test demonstrated that the control system provides adequate facilities for effecting a 25 per cent reduction in heating expense. Further experience during 1935-36 has proved the value of the Webster Moderator System in effecting minimum steam consumption with minimum operating force and adequate heating.

While Webster Moderator Control has been employed for smaller groups of buildings, this is the first large installation of its kind. It has been inspected and commented on by many leading engineers and operators. Results warrant the prediction that coordinated central control of the heating of large institutional groups will rapidly supplant past methods of uncoordinated control of separate buildings.

The control contract was executed by Warren Webster & Company, under the direction of Clyde W. Colby and the Office of Hollis French, associated consulting engineers for the college authorities. Fred T. Ley & Co., Inc., was the general contractor. Steam fitting was done by Holyoke Valve and Hydrant Company, prominent Massachusetts heating contractors.

The installation was described recently in HEATING AND VENTILATING, leading technical publication, in an article entitled "Economy of Unique Control System Demonstrated at Mt. Holyoke College Plant." Reprints of this informative article will be furnished gladly to anyone interested in further details.

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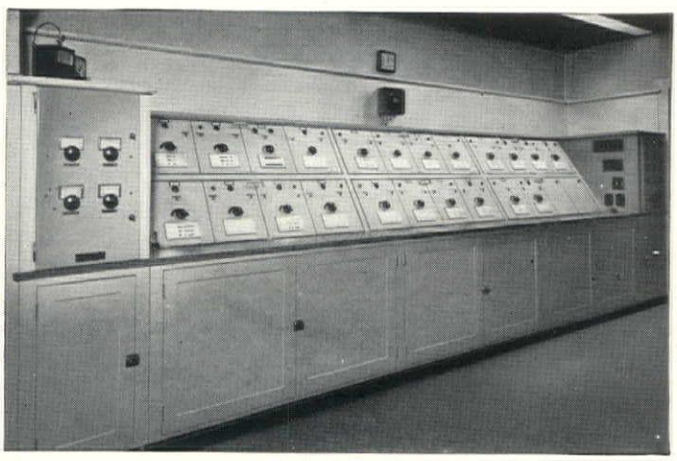


CENTRAL HEATING CONTROL

OREGON COMPETITION AWARD

The recent competition for the design of Oregon's new State House was won by Goodhue Livingston of New York in association with Francis Keally, also of New York. This architectural contract carries a fee of $132,000. The winning design was a three-story structure with circular tower.

The runners-up will receive $1,500 each. They are Wesley Sherwood Bessell of New York, deYoung & Moscowitz of New York, John A. Thompson & Gerald A. Holmes of New York, Walter T. Karcher & Livingston Smith of Philadelphia. There were 123 designs submitted.

Mr. Livingston is a graduate of Columbia University and a member of the firm of Trowbridge & Livingston. Among buildings designed by his firm are the Bankers Trust Building, the J. P. Morgan Building, the Stock Exchange addition, the Equitable Trust Building, and the Mellon National Bank.

Mr. Keally is a graduate of the University of Pennsylvania. He had previously won a competition for the design of the pioneer monument in Harrodsburg, Ky.

The prize-winning designs will appear in the July issue of AMERICAN ARCHITECT AND ARCHITECTURE.

PRATT INSTITUTE AWARD

Since 1924, the Brooklyn Chapter of the American Institute of Architects has held an annual architectural competition for the senior students in the School of Fine and Applied Arts of Pratt Institute. The prize consists of $50 to be used by the student toward his tuition fee in further architectural study. In case the winning student does not purpose to continue his architectural education, the money goes to the second prize-winner, etc. This year Grant Edmonds of Brooklyn won with his solution to the problem of modernizing two brown stone front dwellings which were to be combined and converted into a small apartment house. Second place was won by George Fuos of Long Island City. Honorable mentions were awarded to Edwin D. Chamberlain of Chester, N. Y.; Henry H. Moger, Jr., of Mount Kisco, N. Y.; Jerome Sheffield of Baldwin, L. I., and Herbert K. Hopp of Yonkers, N. Y.

UPJOHN REELECTED

Hobart B. Upjohn was reelected President of the New York Chapter of the American Institute of Architects at its recent annual meeting at the Architectural League Building in New York. Cornelius J. White was chosen Treasurer to succeed Daniel P. Higgins.

Also reelected were Gerald A. Holmes, Vice-President; Frederick G. Frost, Secretary; and Harvey Stevenson, Recorder. James Kellum Smith and Alfred E. Poor were named to the executive committee.

The jury for the Chapter's medal of honor will be composed of Louis Ayres, William Gehron, Eric Gugler, and William F. Lamb. Julian Clarence Levi and Wallace K. Harrison will serve on the Committee on Professional Practice, of which Robert B. O'Connor is chairman. Robert D. Kohn will head the Committee on Nominations, which also includes James C. Mackenzie and Frederick J. Woodbridge. Thomas H. Ellett and Arthur L. Harmon were elected members of the Committee on Fellows for a period of three years.

Mr. Upjohn attended the Polytechnic Institute. He is a member of the commission on architecture and the allied arts of the Protestant Episcopal Church of America, and of the committee on educational buildings of the Church's Council.

ANNOUNCEMENTS

Cass Gilbert, Inc., architects, announce the removal of their offices to 41 East 42nd Street, New York City.

Edward Shepard Hewitt, architect, announces the removal of his office to 32 East 57th Street, New York City.

Irving Brown, architect, announces the opening of offices at the following places: Federal Trust Building, Newark, N. J.; 248 Center Street, Nutley, N. J., and P.O. Box 1033, Monroe, Orange County, N. Y. He requests that manufacturers' catalogs be sent him.

Arthur R. Cook announces the removal of his offices to 50½ Waldo Street, Pontiac, Michigan, and requests that manufacturers' literature be sent him.

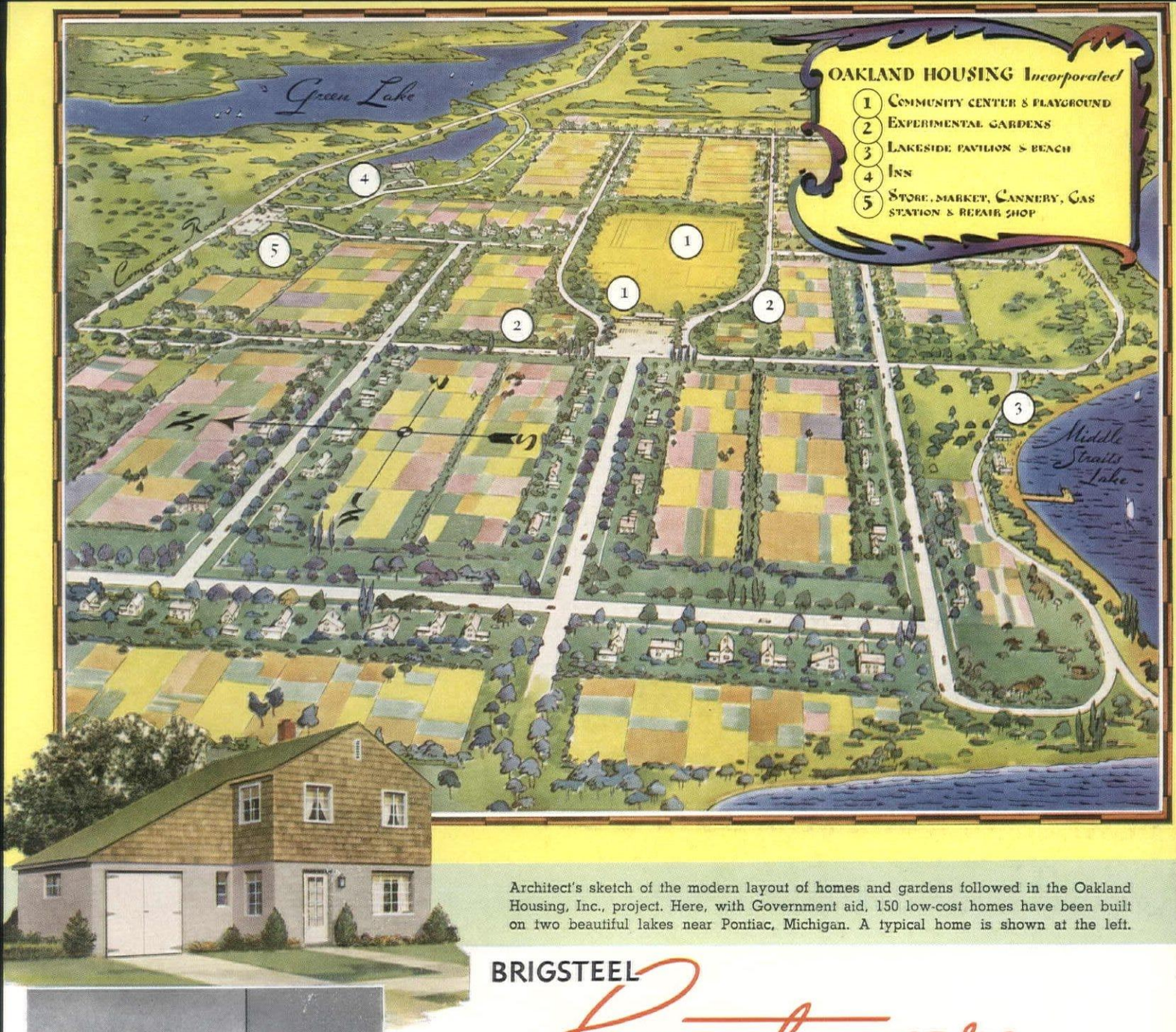
Frank E. Patterson III, Landscape architect, announces the removal of his offices to 105 East Cary Street, Richmond, Virginia.

General Houses, Inc., announces the removal of its general offices to the Decorative Arts Building, 620 North Michigan Avenue, Chicago, Illinois.

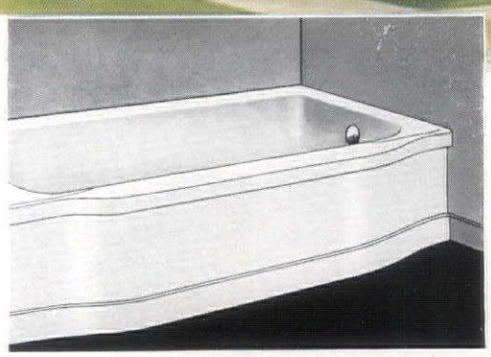
DEATHS

Julian Frank, a former partner in the firm of Maynicke & Frank, died recently in New York. After graduation from City College, Mr. Frank gained his first practical architectural experience in the office of George B. Post. Later he went to Paris and studied under Redon at the Beaux Arts, and on his return to America in 1895, formed a partnership with the late Robert Maynicke. During the partnership, their firm designed more than 100 commercial buildings throughout New York City. Following the death of Mr. Maynicke in 1914, Mr. Frank continued in business until 1926, when he retired to devote his time to landscape painting in the Bavarian Alps. Mr. Frank designed the building occupied by the Heckscher Foundation for Children; the Concourse Plaza Hotel; the Fifth Avenue Office Building, and the Home of Jacob Ruppert in Garrison, New York. He was a member of the American Institute of Architects, a former chairman of its Committee on Admissions; and as a member of the Joint Committee of the organization, he helped to draft the present New York Building Code.

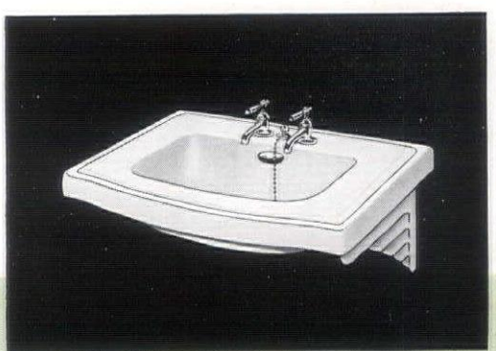
Albert Buchman, retired architect, died recently in New York. Born in Cincinnati 76 years ago, Mr. Buchman studied architecture at Cornell University. After leaving college, he became associated with Herman J. Schwarzmann and soon became his partner. In 1890 he became a partner in the firm of Buchman and Deisler. In 1900 Mr. Buchman and Mortimer J. Fox organized the firm of Buchman and Fox. During this partnership, Mr. Buchman was associated in the design of numerous New York landmarks, including the Times Annex, the World's Tower Building, several New York Edison Company structures, and department store buildings for Bloomingdale Bros., Saks & Co., Oppenheim, Collins and Bonwit Teller. In 1917, Ely Jacques Kahn succeeded Mr. Fox as Mr. Buchman's partner and the firm became known as Buchman & Kahn. The firm of Buchman & Kahn designed many New York buildings including 2 Park Avenue, the Hospital for Joint Diseases, the Furniture Exchange Building and two buildings for Oppenheim, Collins. Five years ago Mr. Buchman retired from architectural practice because of ill health, and Mr. Kahn formed the firm bearing his name.



Architect's sketch of the modern layout of homes and gardens followed in the Oakland Housing, Inc., project. Here, with Government aid, 150 low-cost homes have been built on two beautiful lakes near Pontiac, Michigan. A typical home is shown at the left.



Modern, roomy, Brigsteel Beautyware recessed tubs, with Safety Rim Seats, were specified—with substantial savings in cost over any other make.



This type of Brigsteel Beautyware wall bracket, 20" x 24", flat slab lavatory was installed in each of the Oakland Housing, Inc., Michigan homes.

BRIGSTEEL *Beautyware*

A beautiful, new residential district has been developed in West Bloomfield Township, Oakland County, Michigan. One hundred and fifty lots of an acre each have been laid out around a central commons. Upon each lot an attractive, well constructed home with single garage has been built with money loaned by the F. E. R. A.

This development is one of the outstanding efforts of the Government to stimulate low-cost housing design and construction. In these homes nothing but the best was used and all materials were necessarily approved by the Federal Housing Administration. Brigsteel Beautyware plumbing fixtures were installed in every home. Below, Mr. Barton P. Jenks, Jr., the Government architect and manager of the project, explains why. Note his statement.

Eames & Brown, plumbing contractors of Pontiac, Michigan, who installed Beautyware in the 150 homes, say it required only one-third the time to uncrate, set and connect a Brigsteel Beautyware tub, that it takes to perform the same operations with a cast iron tub. Those interested in more details in regard to this noteworthy project may secure a copy of the official printed report by writing Brigsteel, Detroit.

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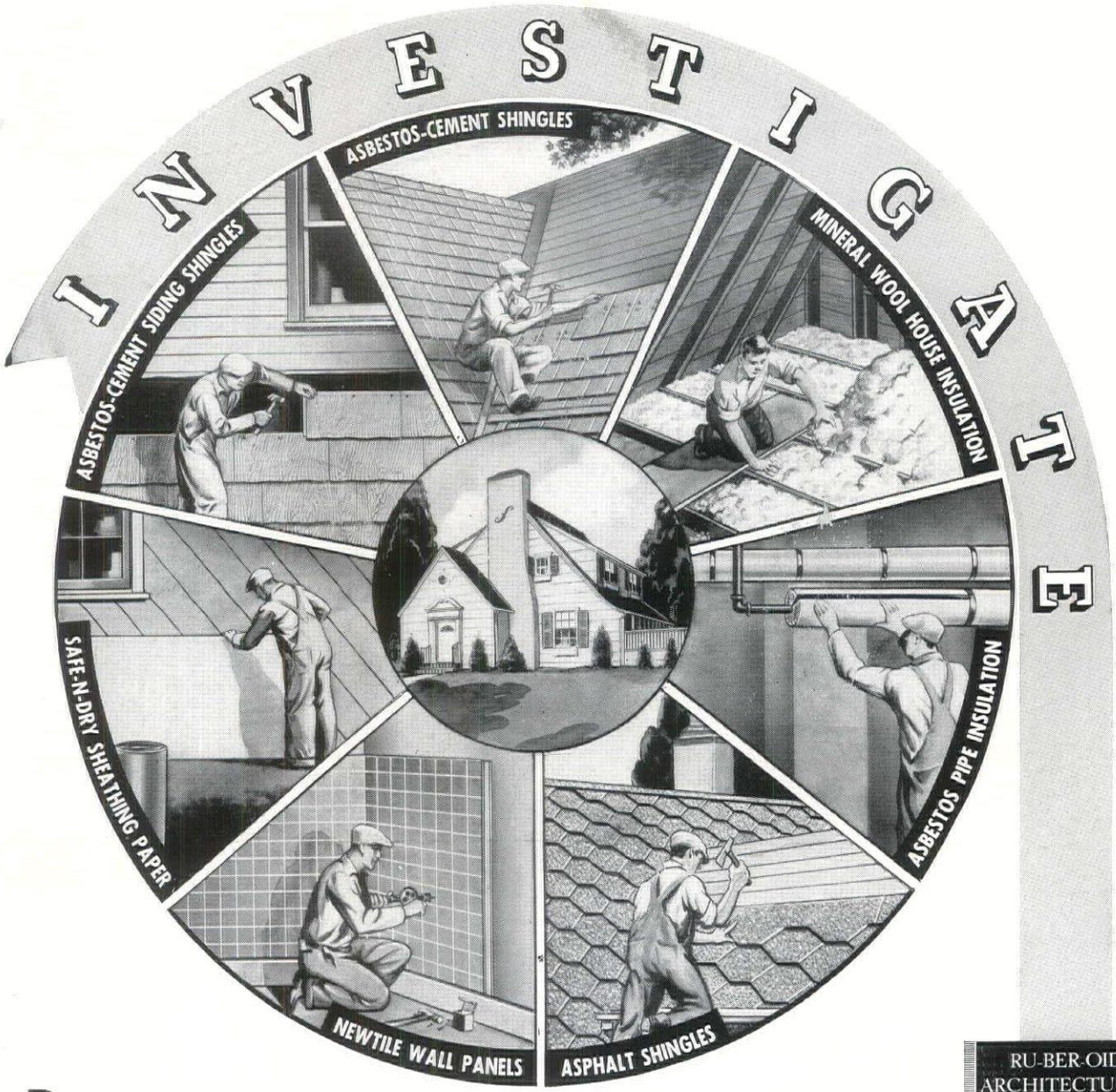
Brigsteel Beautyware formed metal plumbing fixtures were selected for the group of 150 low-cost homes of Oakland Housing, Inc., because we believe they provide a new beauty and utility at a new low cost. Their lighter weight and other exclusive features of design simplify installation problems and materially reduce attendant costs, particularly in such a large multiple-dwelling project.

Barton P. Jenks



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BOOKS

GARDEN DESIGN OF TODAY. By Percy S. Cane. 221 pages, 7 by 8½ inches. Illustrations from drawings and photographs. Printed in Great Britain. New York: 1936: Charles Scribner's Sons. $4.50.

As differentiated from the rapidly increasing literature on applied horticulture, the present volume deals rather with form and with examples of its successful development. The illustrations, largely from the more elaborate gardens of England, are particularly fine.

BEGINNING MECHANICAL DRAWING UNITS: By William E. Roberts. 142 pages, 6 by 9 inches. Illustrations from line drawings. Paper binding. Peoria, Ill.: 1936: The Manual Arts Press. 88 cents.

Elementary text book for use in junior and senior high schools and vocational schools.

MOATED HOUSES OF ENGLAND. By R. Thurston Hopkins. 236 pages, 6 by 9 inches. Illustrations from photographs. Printed in Great Britain. New York: 1936: Charles Scribner's Sons. $4.50.

The glory of English country houses has surely had no lack of presentation in photographs, drawings, and plans, for all the world to see. The field is so rich, however, that greater and greater specialization is inevitable. If you are interested in the English country house because it has a moat, this will serve as your exemplar. Naturally, behind the architecture, there is in these moated houses a rich background of romance and legend.

THE ENGLISH ABBEY. Its Life and Work in the Middle Ages. By F. H. Crossley. Foreword by W. Ormsby-Gore. 114 pages, 5½ by 8½ inches. Illustrations from drawings, plans, and photographs, some in color. Printed in Great Britain. New York: 1936: Charles Scribner's Sons. $2.75.

A new volume in the English Countryside series, illustrated, as the others have been, with superb photographic illustrations. Here, in what remains of the monastic institutions, will be found a rich portion of our art heritage.

CONTINUITY IN CONCRETE BUILDING FRAMES. Practical Analysis for Vertical Load and Wind Pressure. 62 pages, 6 by 9 inches. Illustrations from diagrams and graphs. Pamphlet binding. Chicago: 1935: Portland Cement Association, 33 West Grand Avenue.

It seems a pity that no author receives any credit for such an obviously able analysis of modern methods. The assumption is that it is a skilful adaptation of methods culled from the works listed in two rather extensive bibliographies at the end of the pamphlet: one on Vertical Load Analysis, the other on Wind Stress Analysis.

DOUGLAS FIR USE BOOK—Structural Data and Design Tables. 209 pages, 8¼ by 10¾ inches. Seattle, Wash.: 1935: West Coast Lumbermen's Association, 364 Stuart Building. $1.

A particularly comprehensive handbook for architects and engineers, containing load tables, formulae, and other structural and design data in readily accessible form.

MIRRORS IN THE NEW AMERICAN HOME. 28 pages, 9 by 12 inches. Illustrations from photographs. Pamphlet binding. Chicago: 1936: Mirror Manufacturing Association. 25 cents.

ARCHITECTURE IN THE BALANCE. An Approach to the Art of Scientific Humanism. By Frederic Towndrow. 182 pages, 5¼ by 7¾ inches. Illustrations from photographs. Printed in Great Britain. New York: 1936: Frederick A. Stokes Company. $2.50.

The author, who is a teacher and architectural critic of the London *Observer*, attempts the weighing of our present efforts toward a rational architecture. The book is designed mainly for laymen, but is certainly not without interest and profit to the architect. The author's philosophy with regard to the association of functionalism and beauty is perhaps best expressed in his contention that man has been given a sense

(*Continued on page* 138)

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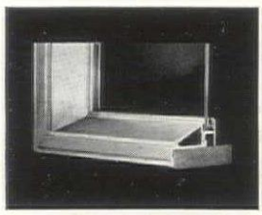
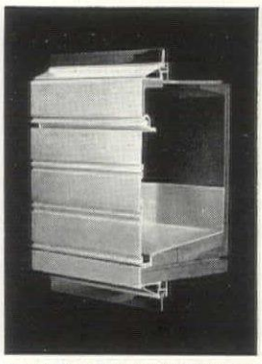


A-1 SASH



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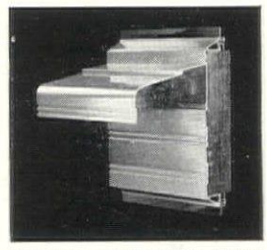

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ADDRESS

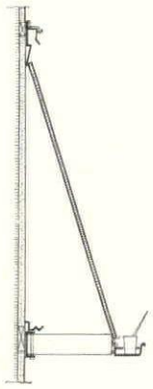
of beauty largely for the purpose of testing a creation as to whether it is efficient in its service to mankind. He contends that the creative artist never seeks primarily the gratification of this sense, but uses it rather as a method of detecting an efficient solution which he cannot detect by facts and formulae.

SIX ARCHITECTS. By Sir Reginald Blomfield. 198 pages, 4¾ by 7¼ inches. Illustrated with portraits. Printed in Great Britain. New York: 1935: The Macmillan Company. $2.75.

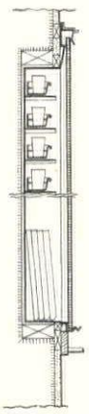
Sir Reginald has compiled in this book the substance of six lectures in which his object has been to place the six men in proper relation to their time. There is no attempt to cover their works, which, however, may be learned by references to an appendix of authorities. The six architects are Palladio, Bernini, Inigo Jones, Mansart, Gabriel, and Wren.

HELLENISTIC ARCHITECTURE. An Introductory Study. By Theodore Fyfe. 247 pages, 6¼ by 9 inches. Illustrations from photographs and line drawings. Printed in Great Britain. New York: 1936: The Macmillan Company. $6.

The author, a lecturer on architecture at the University of Cambridge, writes mainly for students, but without going over the head of the interested layman. In this analytical review of work belonging to the third and second centuries B.C., there is no effort to present a record of ultimate accuracy in the works themselves. Such a work, it is hoped, may eventually be produced after the historical research now in progress, has been carried further. The author, also, has been careful to avoid the repetition of illustrations which have already appeared in publications well known to architectural students, such as Professor Robertson's works, and those of Anderson, Spiers and Dinsmoor.



Light weight panels, faced with cork-board on one side, blackboard on the other, may be brought into easel position on folding brackets as shown. Each leaf is independently adjustable and reversible.



Where construction permits, some of the leaves conceal recessed cabinets for storing work boards and paint trays when not in use. Austral Multi-Use Blackboard fixtures may be used in old buildings as well as new.

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BLACKBOARDS

Modern educational programs have so diversified class room activities that up-to-date school rooms must be adaptable to many uses. The Austral Multi-Use Blackboard Fixture increases the functions of any classroom, new or old, by making it instantly convertible for art, music, nature study, craft, exhibition or special study purposes. Reversible panels, corkboard on one side, blackboard on the other, and accessory work boards, paint trays and easel brackets, give utmost flexibility in the use of wall space. Complete information, including working details and specifications, may be had on request.

AUSTRAL SALES CORP.

101 PARK AVENUE, NEW YORK CITY

TECHNIQUES

METHODS • MATERIALS • RESEARCH • PRACTICES

STRUCTURE

STEEL SCAFFOLDING

The introduction of a new type of seamless tube scaffolding has been announced by Uecker Equipment Company, Wauwatosa, Wis. The hollow seamless tubes used are welded together to form end frames five feet high. Cross braces of the tubes are made seven feet wide and are attached to the end frames by means of large screws. These sections are erected at the site on which scaffolding is to be used. One section fits into another in telescope fashion through couplings. Detachable steel ladders and a hoist which can be used with the scaffolding are also available. 630M

LIGHT

COLORED LIGHT

A new kind of lamp changes invisible ultra-violet radiations into visible light of all the rainbow colors. The phenomenon of fluorescence, by which invisible radiations of short wavelengths are transformed into visible light, is the secret of this development. A small globule of metallic mercury is vaporized by electricity until it fills a long, slender tube with a dull glow which is rich in ultra-violet radiations. Profuse ultra-violet radiations from this arc strike the inside surface of the tube where a coating of chemical powder transforms them into visible colored light, in a sense producing secondhand light. Color is governed by the characteristics of the powdered chemical substance used on the inside of the glass tube. It was developed by the research laboratories of Westinghouse Lamp Co., Bloomfield, N. J. 631M

NON-INTERLOCKING LIGHT DIMMER

A new pressed steel Vitrohm Non-interlocking Dimmer for the control of lighting in auditoriums and small theatres has been introduced by Ward Leonard Electric Company, Mt. Vernon, New York. These dimmers employ a light-weight, pressed steel plate to

support the resistance element, the contacts and contact lever, and are designed for continuous duty at their rated loads. All rotating parts are keyed and locked into slots milled across each end of the steel shaft. The functions of current carrying and contact pressure are entirely separate. An oilless center bearing, in conjunction with self-lubricating contact shoes, is said to provide smooth and quiet operation, and to eliminate the necessity of any oiling. 632M

FINISHING MATERIALS

NEW FLOOR COVERING

A new floor covering, developed especially to meet the demand for a covering

(*Continued on page* 142)

FIRST CAME STEEL ... THEN COP-R-LOY

Photograph by NESMITH

● Great structures crowding metropolitan space reflect the creative and practical genius of the architect. Expert in the appraisal of materials and their adaptation to his needs, he is a pacemaker to industry. ● First came steel—then COP-R-LOY came to meet his rising standards, first for sheet metal, later for pipe, for boiler tubes, for conduit, for lath and for many other necessities. ● Today COP-R-LOY Pipe, specified for power, heating, air conditioning, plumbing, sprinkler systems and other purposes, enjoys a leadership among modern materials for equipping the modern building. COP-R-LOY in pipe assures greater than average service and economy—from the day of installation onward. COP-R-LOY Pipe is sold by progressive distributors everywhere. It's Wheeling Steel.

COP-R-LOY

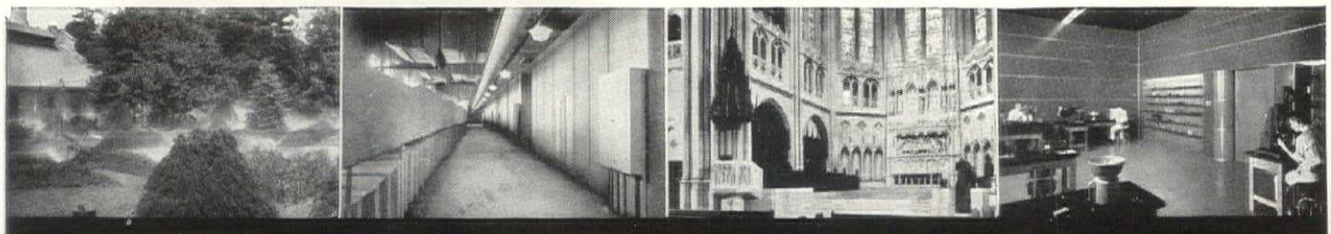
Reg. U. S. Pat. Off.

For lawn-sprinkling systems, leading makers use COP-R-LOY. It's Wheeling Steel.

For air conditioning systems, manufacturers use galvanized COP-R-LOY. It's Wheeling Steel.

For plastered walls in this modern church, lath of COP-R-LOY is the base. It's Wheeling Steel.

For walls of this modern laboratory, Porcelain Enamel on sheet steel. It's Wheeling Steel.

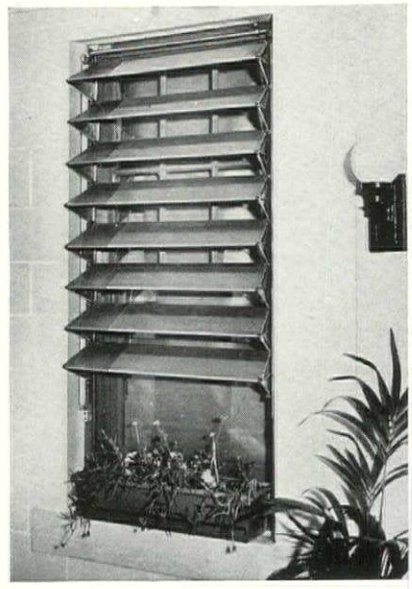


IT'S WHEELING STEEL

for low class commercial and industrial floor areas, where reasonable durability and low cost are of first importance, consists of a calendered mastic mix on a backing of tough saturated felt. One of the advantages claimed for this flooring, to be known as Mastic Armoflor, is that it can be installed on grade level concrete floors in direct contact with the ground, except where an excessive moisture condition exists. On such installations the new covering is applied with a mastic cement. Mastic Armoflor is available in four colors—red, green, black and brown—and is supplied in rolls 36 inches wide. Offered in a price range between that of felt-base floor covering and linoleum, this mastic flooring is manufactured by Armstrong Cork Products Co., Lancaster, Pa. 633M

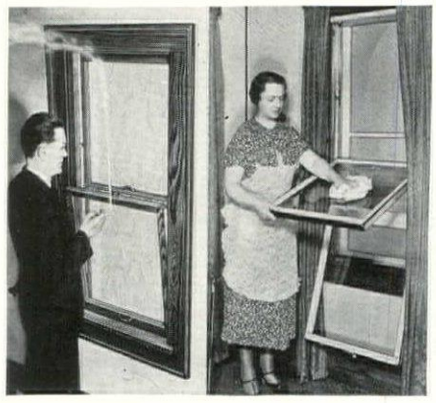
SHEATHING AND LATH

Two new products have been put into production by The Celotex Corporation, Chicago. One is Laminated Waterproofed 1″ Insulating Sheathing, surfaced two sides to 25/32″—the same thickness as standard wood sheathing. During its manufacture all the fibres of the material are waterproofed with a chemical treatment in solution. It is then surface treated as a final operation in order to increase its water resisting properties. The other new product is Insulating "Stiff-Lath," a lath made by a new manufacturing process which is said to increase its rigidity, and to provide a stronger, firmer plaster base. 634M



ALL-METAL AWNINGS

All-metal awnings of copper or aluminum for apartments, homes, office buildings, hotels and public institutions have been placed on the market by Bruns Metal-Lite Awnings, Inc., Brooklyn, N. Y. The awning raises or lowers, adjusts and locks itself into any desired position by a crank; no pulleys or ropes are used. The louvers fold and nest into each other so that when the awning is completely raised it extends only a few inches from the top of the window. The standard unit consists of 9 louvers but can be adapted to any height of window by adding on or leaving off louvers. In addition to the natural metal, colors may be had to fit any color scheme of decoration. 635M



NEW SAFETY WINDOW

Designed to permit air circulation without drafts, a new type window fixture permits the window to be swung into

(*Continued on page* 144)

various ventilating positions and, at the same time, is said to incorporate added safety features. The device, which may be attached to any standard window frame, permits the sash to be tilted inward at the top and at the midrail or to slide up and down. The flexibility of the window is attained through a metal shoe which supports the window sash. This shoe slides in a channel, the edges of which are weatherproofed with heavy automotive felt. Conventional sash weights are attached to the sliding shoe, rather than to the sash. A pivot pin at the bottom of the shoe permits the sash to be swung inward to the main ventilating position, a catch holding the sash so there is a 3-inch opening at the mid-rail. By a simple adjustment the window may be swung inward completely to permit both sides of the glass to be washed, or the window may be withdrawn entirely from the frame. The fixtures are being manufactured by Howard Safety Window Co., Inc., Milwaukee. 636M

SINGLE-PHASE INDUCTION MOTOR

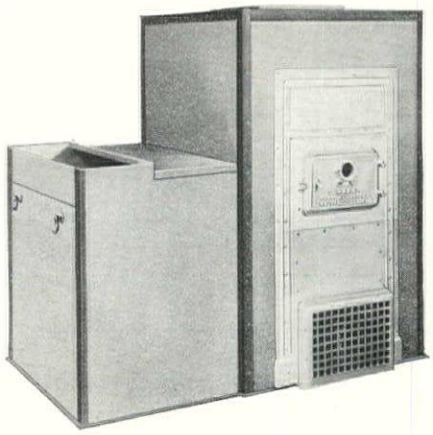
Especially designed for heavy industrial duty, a new single phase repulsion-start induction motor is announced by Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. The new Type CR motor has high starting and pull-in torques which make it particularly suitable for such applications as pumps, compressors (garage, refrigeration and other industrial types), automobile lifts, etc. It is available in a complete line of ratings, ¾ to 3 hp., 110/220 volts dual voltage for operation on all commercial frequencies. 637M

HEATING

AUTOMATIC COAL BURNER

Coal is fed direct from the coal bin into the firebox of the furnace or boiler by the new "Coal Flow" automatic coal burner. The fuel is conveyed by a long feed worm, which may be installed below the floor level, if desired. The motor, transmission and radial vane blower are installed at the back or side of the furnace, leaving unobstructed floor space between furnace and bin. With electric controls governing its operation, the machine is completely automatic. It may be installed in old or new homes and is adaptable to warm air furnaces, hot water, steam or vapor-vacuum boilers. This new automatic coal burner has been developed by Iron Fireman Manufacturing Company, Cleveland, Ohio. 638M

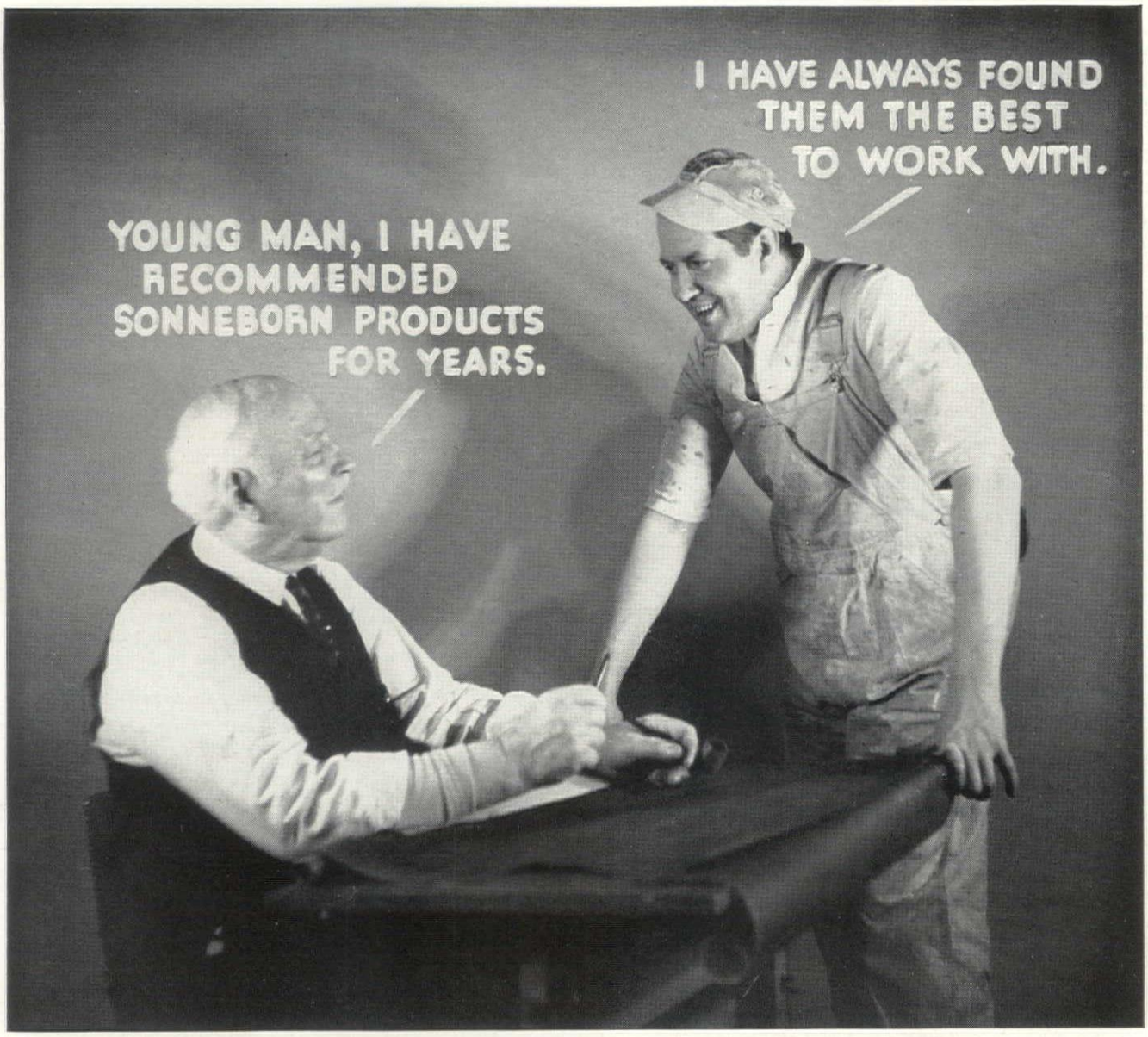
AIR CONDITIONING



AIR CONDITIONING UNIT

A new Sunbeam Air Conditioning Unit for small and average sized residences and buildings has been placed on the market. It heats, filters, humidifies,

(*Continued on page* 146)



They Agree on Sonneborn Quality

Leading architects, plant superintendents, builders, and painters, throughout the country, have recommended products made by SONNEBORN because they have used them successfully for years in homes, schools, and industrial buildings.

Over a quarter of a century of scientific research by competent laboratory technicians, keeping abreast of the times with every new development in the building field, have made SONNEBORN'S WATERPROOFING, DAMPPROOFING, and PAINT PRODUCTS the most reliable on the market.

This successful record of the proved efficiency of these products is your best assurance of satisfaction.

Write for literature of SONNEBORN'S tested products.

Sonneborn's Tested Products

LAPIDOLITH—The guaranteed method of securing dustproof concrete floors.

LIGNOPHOL—A scientific penetrating preservative and finish for wood floors.

HYDROCIDE COLORLESS — For exterior waterproofing of masonry walls.

KAUKIT— Non-shrinking waterproof caulking compound.

CEMCOAT—Light reflecting enamel for interiors; also waterproof coating for exteriors and floors; is outstandingly superior for masonry surfaces.

HYDROCIDE WATERPROOFING AND DAMPPROOFING —Integral admixtures; foundation and plasterbond coatings.

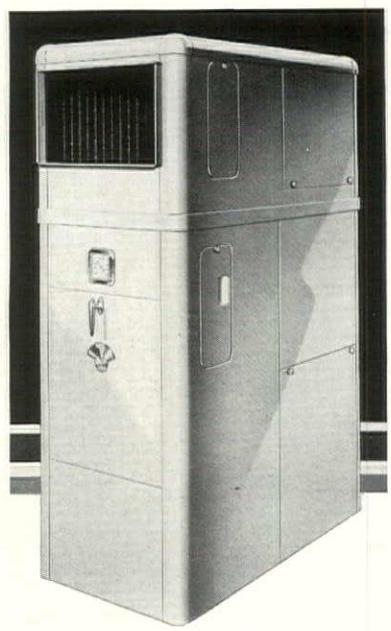
PAINT SPECIALTIES — Acid and alkaline resisting and technical paints.

L. SONNEBORN SONS, INC. 88 Lexington Ave., New York City

and circulates the air in winter and also provides cooling ventilation in summer. It is equipped with a rotary wall-flame type oil burner which is completely assembled at the factory ready to be connected to the oil and electric lines. There are two models finished in red and black crystalline enamel. The 720-R-10 model is for basement installations and the 720-R-9 for installation above the basement. The latter is made specially compact so that it can be installed in a small amount of space on the first floor. The arrangement of the blower compartment under the smoke pipe makes use of the space that must be provided for the smoke pipe elbow and outlet. The return air ducts can run under the floor and feed upward into the blower compartment. The unit is manufactured by Fox Furnace Company, Elyria, Ohio. 639M

OIL BURNING AIR CONDITIONING PLANT

Re-styled models of the Superfex Oil Burning Air Conditioning Heating Plants have been announced by the Furnace Division of Perfection Stove Company, Cleveland. The plants are complete in a compact unit, styled on modern lines, finished in orange-red and black "wrinkle" lacquer, with stainless steel and chrome trim. Combustion of the oil is obtained by the introduction of air currents into the flame, and by a balanced draft which results from bypassing air from the blower and adjustment of the automatic draft damper. Heat is thermostatically controlled, and the heated air is automatically humidified and circulated by a blower. The blower is the only machinery; therefore in case of the interruption of electric current it is said to be possible to operate these plants as an ordinary warm air furnace. Several models with heating capacities of 140,000 Btu. and 85,000 Btu. per hour are now available. 640M



BOILER-AIR CONDITIONER

The Fitzgibbons Boiler-Air Conditioner recently introduced incorporates within a single compact unit a steel oil-burning boiler, an instantaneous domestic hot water coil for tankless operation, and an air conditioner providing clean, circulated, humidified and tempered air. The new unit is of the split system type providing steam heat to radiators in strategically located points throughout the home, and conditioned air through ducts to those portions of the residence where that type of convertible heat is desired However, full capacity of the boiler may be devoted to heating by conditioned air if desired. Models are also available for stoker and gas-firing. In addition to the Boiler-Air Conditoner, four plenum chamber floor units, ranging in size from 100,000 to 400,000 Btu., are available for installation with any Fitzgibbons boiler. All units are manufactured by Fitzgibbons Boiler Co., Inc., New York. 641M

TRANSVERSE STRENGTH .	20% GREATER
RESISTANCE TO MOISTURE TAKE-UP (1 HOUR TEST)	23% BETTER
TENSILE STRENGTH . .	27% STRONGER
DEFLECTION	25% STIFFER
NAIL-HOLDING POWER .	57% GREATER

TWO NEW CELOTEX PRODUCTS that help you build extra insulation value—permanent insulation efficiency, greater bracing strength and a full measure of security, protection and quietness into homes at just one material cost.

New, Laminated, Waterproofed INSULATING SHEATHING

Two strong Celotex Insulating Boards are now joined inseparably to make a thicker, stiffer sheathing. It gives added bracing strength against building distortion—increased insulating values and is waterproofed in manufacturing to give greater protection against loss of insulation.

It's a more rigid, easier-to-handle sheathing—1″S2S to 25/32. Builds stronger as it insulates better.

Sales Distributors in Principal Cities Throughout the World

New, Insulating STIFF-LATH

Invites troweling pressure. No sharp edges or protruding parts around which plaster must be forced. Wide beveled edges on four sides gives stronger bonding—full one-half inch Ship-Lap Joints remain tightly closed. This superior plaster base provides protection against heat, cold, noise and destructive vibration.

See the new Celotex Laminated, Waterproofed Insulating Sheathing and the new Celotex Insulating Stiff-Lath at your Celotex lumber dealer. Or write for sample.

THE CELOTEX CORPORATION
919 N. Michigan Avenue Chicago, Illinois

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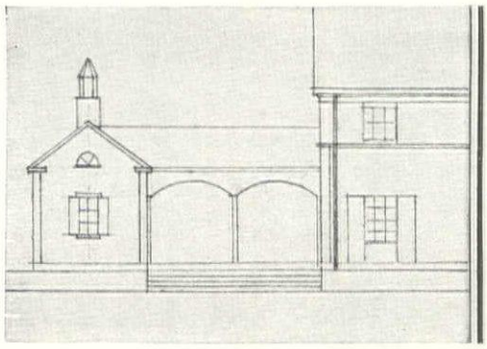
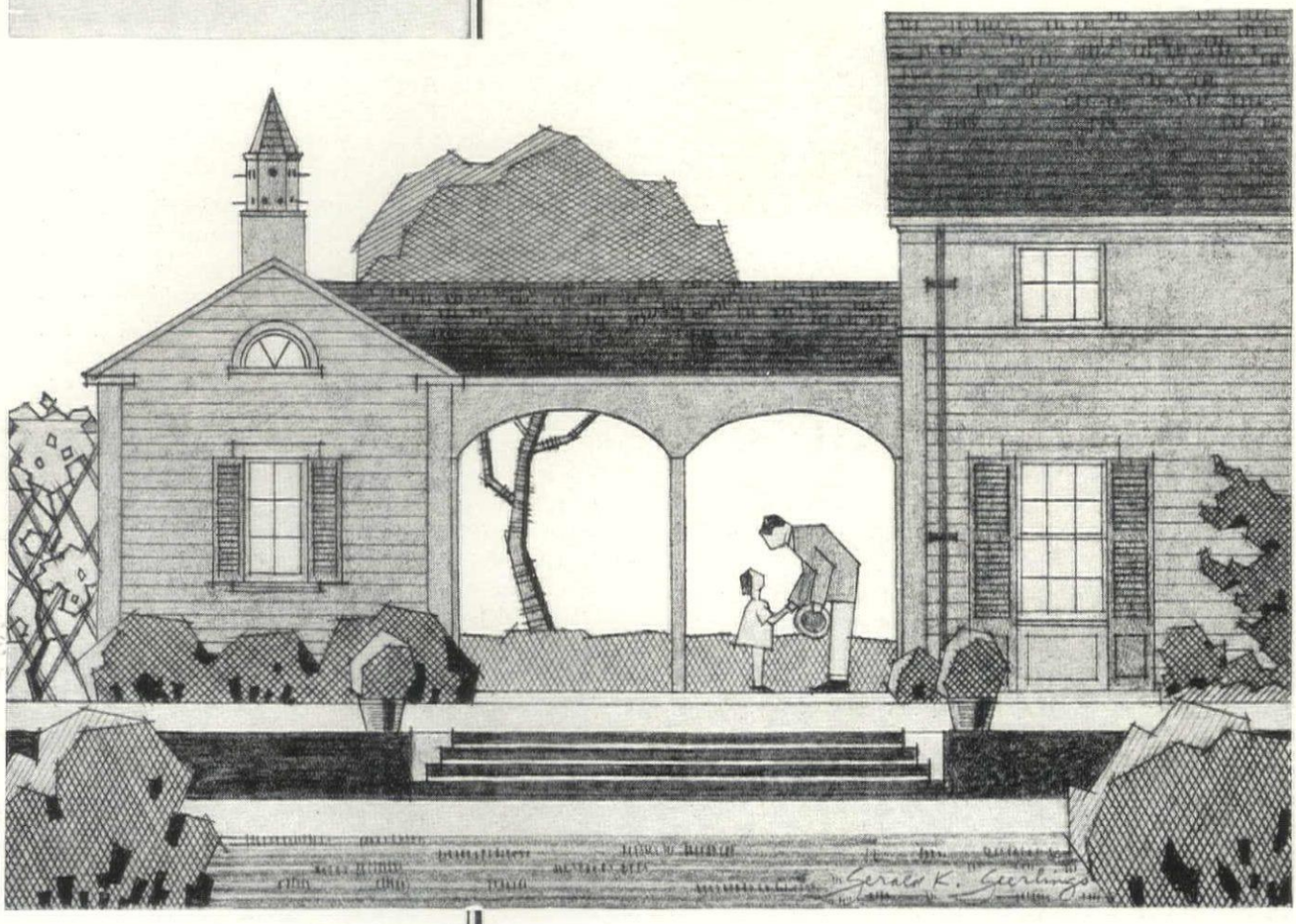


Line Drawing into Solid Facade



CRISS-CROSS FOLIAGE

"The chief difficulty experienced by a client in understanding a line elevation is that the building does not look solid and the setting must be visualized. This can be overcome, of course, by placing tracing paper over working drawings, then running a pencil 'wash' over all wall surfaces, and finally adding foliage. The building at once appears solid, and the panes of glass—being represented by white paper—bear the same relation to wall surfaces as they do on any actual façade which is not in direct sunlight. The addition of foliage is not always pleasing, however, partly because the draftsman interprets foliage as realistically as he can, but represents architecture in well defined conventional terms. Have you ever experimented with rendering foliage forms by straight lines only? Filling in the outlines with criss-cross lines (not necessarily all at 45°) will produce an effect consistent with the architecture, and one preferable to leaf forms drawn with uncertainty and indecision."

GERALD K. GEERLINGS.

The Beauty of Tile

plus—

THE PRACTICAL ADVANTAGES OF METAL

plus—

THE MILCOR TITELOCK DESIGN

ANACONDA
from mine to consumer
Pure Copper

MILCOR SPANISH COPPER TILE

With the new interest in home building there is a revived interest in the use of Milcor Spanish Tile. The unrivalled charm of that quaint, heavy ribbed tile of old Spain can now be obtained without the additional expense of heavy tile. . . .

MILCOR METAL TILE weighs only one-eighth as much as clay tile and therefore only requires a light supporting structure, permitting a substantial saving of time, labor and materials. It is easily finished in any desired color scheme. Furnished in pure Copper, it achieves an aristocratic individuality which cannot be imitated. . . . . .

Write for the Milcor Architectural Sheet Metal Guide, which gives installation details of this interesting material.

NO BETTER PLASTER BASE THAN METAL LATH—

NO BETTER METAL LATH THAN KUEHN'S SPECIALMESH

Here is why:

1. Scientifically Designed Mesh—Tests show this size mesh to give the most positive plaster grip.
2. Positive Rigidity—There are 16 ribs to a sheet of Kuehn's SpecialMesh, which are corrugated to make them doubly rigid.
3. Heat-Treated and Re-annealed—Heat-treating and re-annealing lengthens the life of the lath and makes for pliability—two very important factors in the efficiency of any metal lath.
4. No Plaster Waste—It is practically impossible to waste plaster by forcing an unnecessary amount through Kuehn's SpecialMesh.

KUEHN'S SPECIALMESH METAL LATH
Plain—For interior walls and ceilings in Better Homes
Corrugated—For exterior stucco walls.

ARMCO Ingot Iron — Save with Steel — Copperalloy Steel

MILCOR STEEL COMPANY

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Chicago, Ill. Kansas City, Mo. La Crosse, Wis.

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1429 Burnham St., Milwaukee, Wis.

Please send descriptive literature on Milcor Copper Tile and Kuehn's SpecialMesh.

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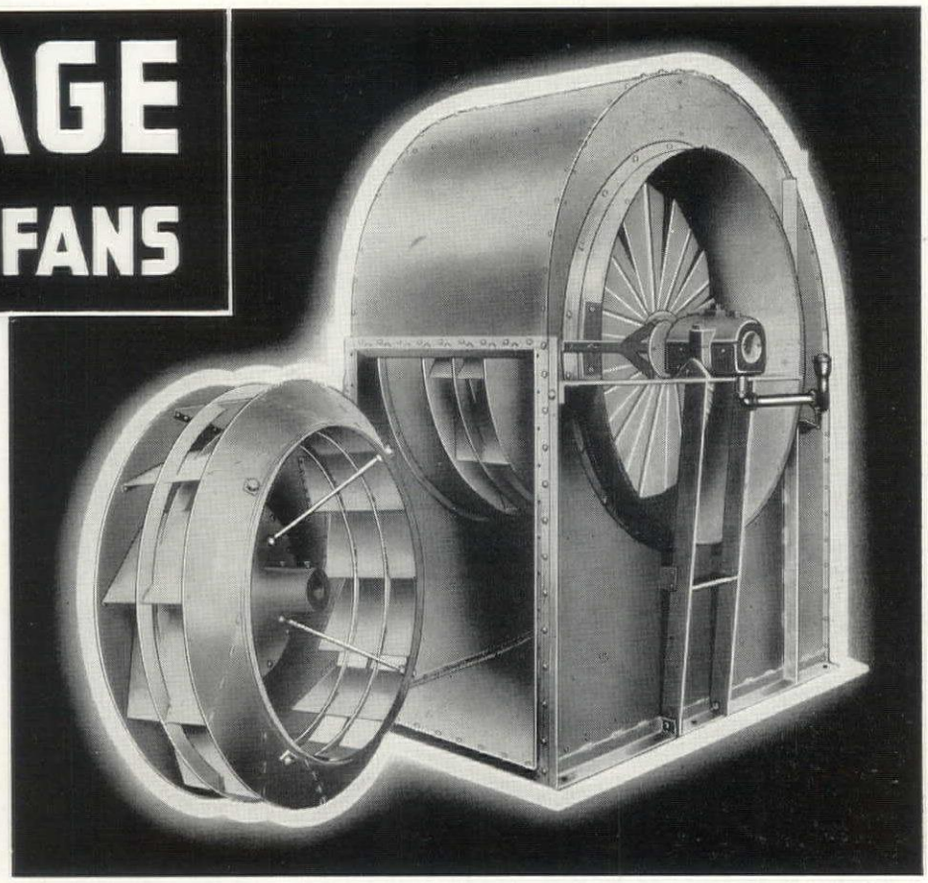
CLARAGE TYPE W FANS



(Right) Illustrating large Type W Fan equipped with Clarage Vortex Control (in fan inlet), and standard wheel. To assure smooth-running, all wheels are accurately balanced both statically and dynamically.

HIGH SPEED for LOW MOTOR COST

From the standpoint of economy Clarage Type W Fans are a *"natural"* for modern air conditioning services in schools, theatres, hospitals, office buildings and industrial plants.

First, because of higher operating speeds, Type W Fans can be driven by higher speed motors.

Second, because of exceptionally high efficiencies plus a *full* self-limiting horsepower characteristic, in many cases these fans can be driven by motors one size *smaller* than you would normally expect. And they operate quietly!

Thus, on practically every job, substantial savings in motor first cost are not only possible but very probable — and operating economies *always* the rule.

Any size of fan can be furnished with Clarage Vortex Control, a patented device as shown above. Automatically or manually operated, Vortex Control gives any desired capacity regulation, the fan operating at constant speed. It eliminates the need for an expensive variable speed motor and elaborate control equipment — a big saving.

Specify Clarage for:

- Complete Air Conditioning
- Ventilation
- Heating
- Cooling

WRITE FOR BULLETIN 112

covering this latest Clarage development. Once acquainted with this new fan equipment, we believe you will wish to specify and use it consistently, due to its very definite advantages.

CLARAGE FAN COMPANY - KALAMAZOO MICH.

Sales Engineering Offices In All Principal Cities

Moulding

meet John Kozak

your new client . . .

John is a foreman in the plant out near the edge of town, with two kids to bring up in the American manner. Pretty soon now he'll want to build or buy a home. He earns most of the time about $35 a week. John is very important to you and to us, because *there are about 15 million of him*—he builds and lives in the houses costing less than $5000 that represent 75 per cent of the residential market in any year.

And since these houses will be built anywhere and by oftentimes less than skilled labor, it follows that the available materials such as lumber must be reconsidered carefully to yield up their share of the necessary savings in low-cost house planning.

4-SQUARE Lumber, precision made in the Weyerhaeuser mills, offers much inducement for such study.

Micrometrically squared ends permit better, faster assembly, with some noticeable savings on the labor side in reducing the number of cuttings.

Exact specified lengths permit the full usage of stock sizes and more accurate spacing of members in actual assembly practice. 4-SQUARE end-matched lumber in various grades and species may be specified for sheathing and subflooring with the knowledge that substitution will be difficult because of the trade-marking that guarantees its uniformity.

Only Weyerhaeuser 4-SQUARE Lumber is so machined and so marked at the mills of origin—*at no* premium over ordinary lumber—a real contribution to our joint interest in giving more house for John Kozak's money.

WEYERHAEUSER SALES COMPANY

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Weyerhaeuser 4-SQUARE Lumber is made in the 6 principal species and various grades used in house construction. Sold by more than 3,000 lumber dealers from coast to coast.