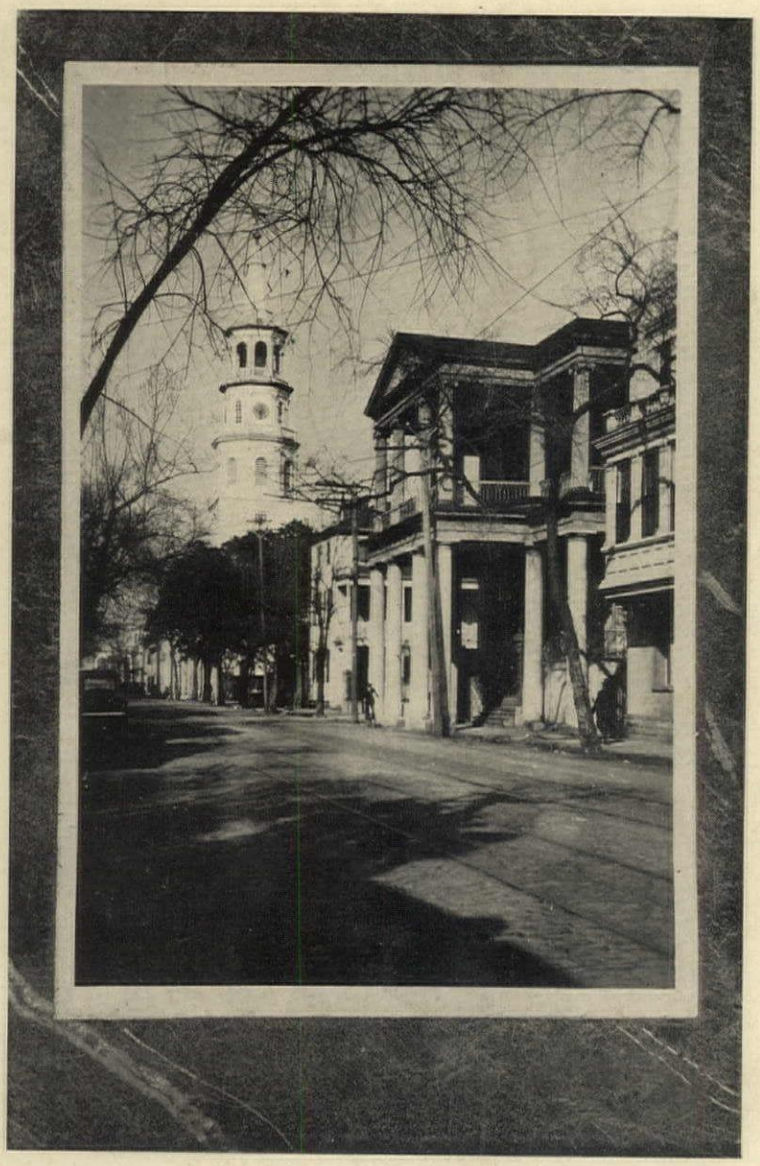
THE FEDERAL ARCHITECT



Published by
THE ASSOCIATION OF FEDERAL ARCHITECTS

October-1937

VOLUME 8, NO. 2

FORMICA DEAL PLATES and DESK TOPS for Post Offices

IN a very large number of the new Post Offices built during the past few years, Formica has been used for lobby desk tops, deal plates, in windows and similar uses. In Court Houses it has been used for desk tops in the Clerk of Courts offices, baseboard, and similar purposes.

Formica is a durable material which does not spot, and in the cigarette-proof grade is immune to injury by lighted cigarettes. There is a wide range of colors and inlays in color and metal are possible. It has also been widely used for table tops in the restaurants of federal buildings and for doors.

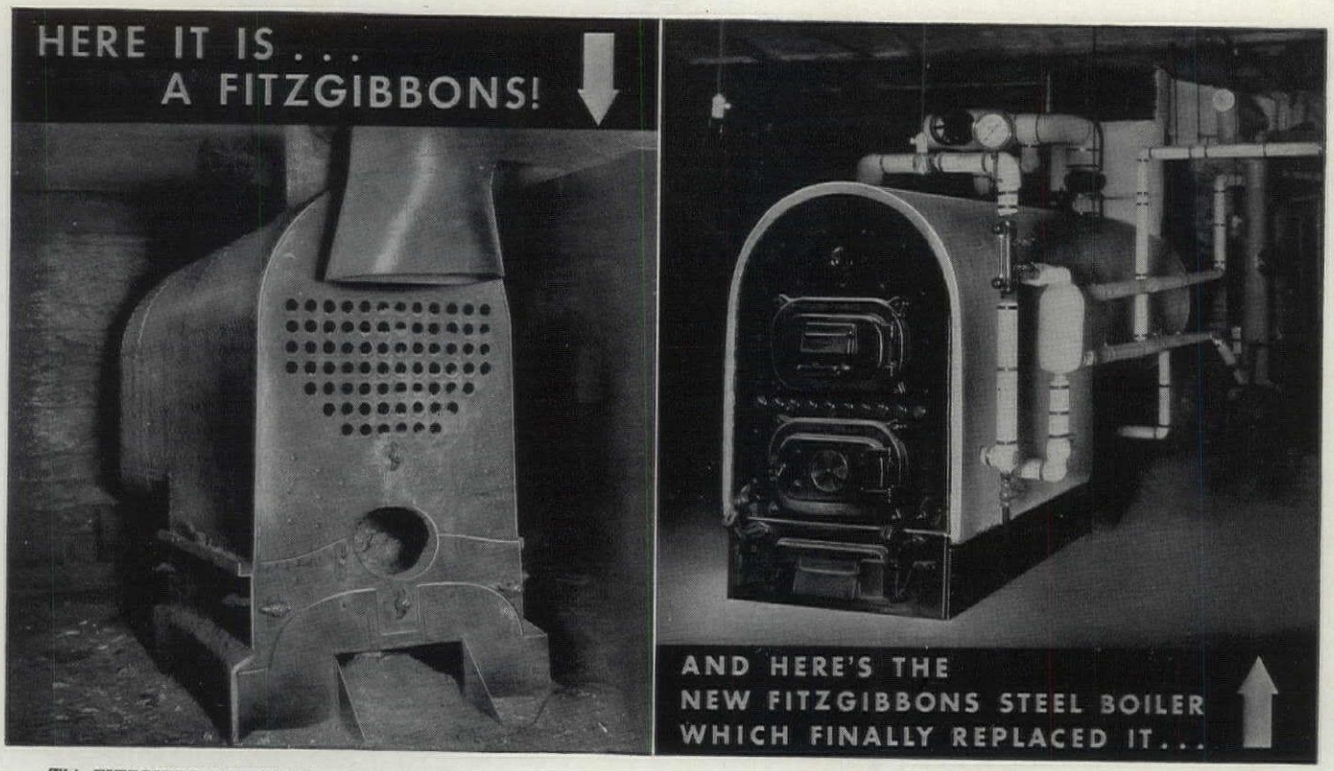
Literature on Formica wainscot and counter and table tops containing many color suggestions is available. Send for it.

THE FORMICA INSULATION COMPANY, 4622 SPRING GROVE AVE., CINCINNATI, OHIO

FORMICA

FOR BUILDING PURPOSES FURNITURE AND FIXTURES

Ever Hear of A HEATING BOILER which STOOD THE GAFF for 46 YEARS?



This FITZGIBBONS STEEL BOILER was installed at the Post Office in Oswego, N. Y., when Grover Cleveland started his first term as President. For 46 years it provided outstanding heating service . . . finally was replaced by the modern FITZGIBBONS STEEL BOILER shown on the right—one of the "FS" series.

Specify DURABLE, FUEL-SAVING FITZGIBBONS STEEL BOILERS FOR YOUR BUILDINGS—*Large or Small*

FITZGIBBONS STEEL BOILERS not only *endure* but provide important economies in fuel and in maintenance. That's why FITZGIBBONS big boilers have been specified for large buildings for more than half a century.

Today they give outstanding service in post offices, schools, armories, office buildings, hospitals and other large buildings requiring all the way up to 36,000 sq. ft. steam radiation.

FITZGIBBONS small steel boilers for residential heating get the benefit of the same sound engineering design, the same rugged construction, as the big boilers. No wonder they're the leaders in residential steel boiler sales!

FITZGIBBONS STEEL BOILERS will meet any heating problem, for any fuel or firing method. There's a FITZGIBBONS heating engineer near you to help select the correct boiler.

Get full details about FITZGIBBONS STEEL BOILERS. *Write for catalogs—now.*

MOST ECONOMICAL IN FUEL — 1886 — THE FITZGIBBONS BOILER

Fitzgibbons Boiler Company, Inc.

General Offices:
ARCHITECTS BLDG., 101 PARK AVE., NEW YORK, N. Y.
Works: OSWEGO, N. Y.
Branches and Representatives in Principal Cities

FOR FURTHER INFORMATION
SEE OUR CATALOG IN SWEET'S

ARCHITECTURALLY SPEAKING

by

OTIS ELEVATOR COMPANY

Sometimes we take it for granted that all we have to do is mention the name of a product and everybody understands what we're talking about. But, if we'd just stop to consider for a moment, we'd realize that new developments and new names come so fast they can be very confusing.

For instance, there are two important types of apartment house elevators—by name, Single-Call Push-button Control, and Collective Control. Maybe it would be well to go over their outstanding differences and indicate where each would serve best.

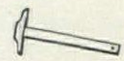
First, to classify Single-Call Push-button Control. In a nutshell, it gives one-call-at-a-time service. In other words, the car answers calls singly and must complete the transportation needs of one passenger before it gives heed to the call of the next passenger. Obviously, satisfactory service by this type of elevator is limited to buildings housing comparatively few tenants.

And now Collective Control. This type of elevator answers *all up* calls on its *up* trip and *all down* calls on its *down* trip. This means—less passenger waiting, less trips for the elevator, which in turn means less wear and tear, and less power consumption. A Collective Control elevator can serve many more tenants than a Single-Call Push-button elevator.

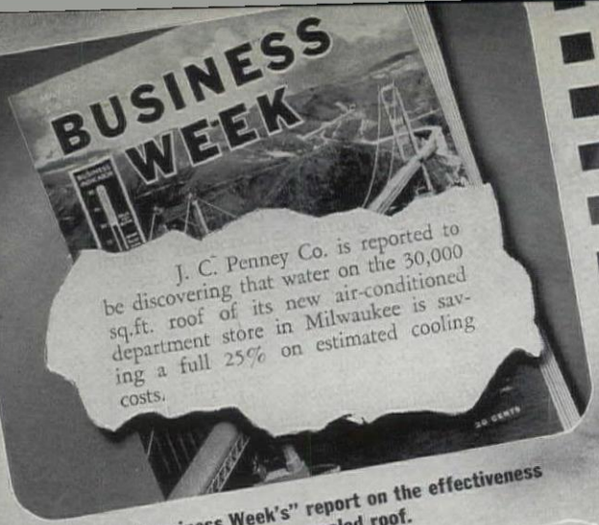
Collective Control elevators can be arranged for "home stations" to which they automatically return when all current calls have been answered. The "home station" may be at the top of the building in the morning when most traffic is down. At night, when the traffic is up, the system can be reversed, with the "home station" at the bottom. This means a further saving in time and operation cost.

Newest feature of Collective Control is automatic door operation especially adapted for this type of equipment where passengers usually operate the car. This is also an advantage where a part-time operator is employed. During the day when traffic is light and the operator may be assigned other tasks in the building, the elevator is completely automatic and the passenger becomes the operator.

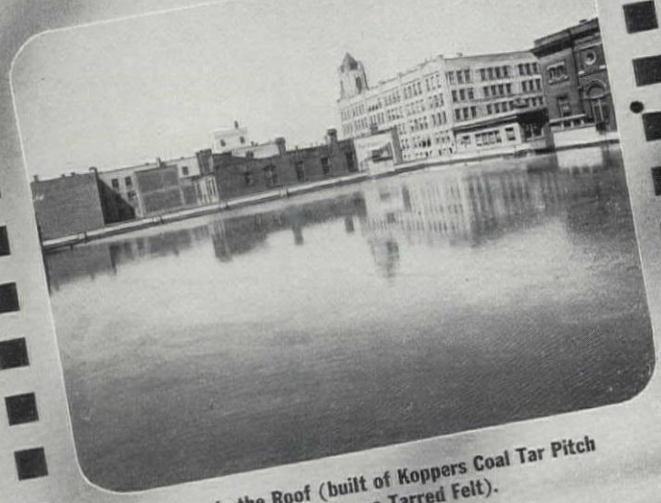
Still another feature is *Duplex* Collective Control (another name, but we'll explain). Duplex provides automatic operation for the building which must have the service of more than one elevator at times of peak demand, and where "serve yourself" service is desirable. Duplex Collective Control is co-ordinated automatic operation on two or more elevators working together as a unit.



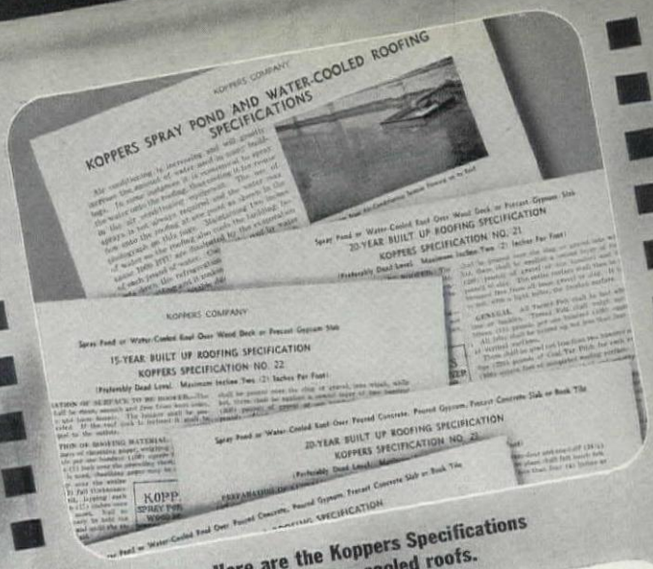
Installation of Collective Control has been given added popularity in recent years by the nation-wide availability of manufacturer maintenance. Otis maintenance is available for all types of elevators. It is especially useful to the moderate-size apartment building where elevator service is so important to the tenant's satisfaction, and engineering and mechanical staffs are limited.



Here is "Business Week's" report on the effectiveness of a water-cooled roof.



Here is the Roof (built of Koppers Coal Tar Pitch and Koppers Tarred Felt).



Here are the Koppers Specifications for water-cooled roofs.

FA-10

KOPPERS COMPANY,
Pittsburgh, Pa.

Send me your roofing specifications which include water-cooled roofs.

Your Name_____

Address_____

Here is a coupon which will bring you these specifications.

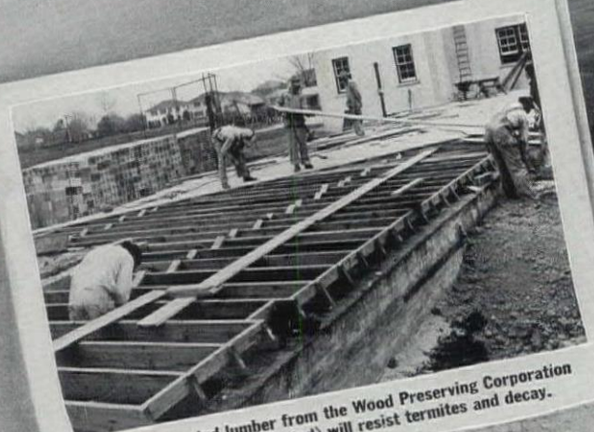
KOPPERS ROOF CUTS AIR CONDITIONING COSTS

KOPPERS ALSO PROVIDES

KOPPERS DIVISIONS SUBSIDIARIES AND AFFILIATES

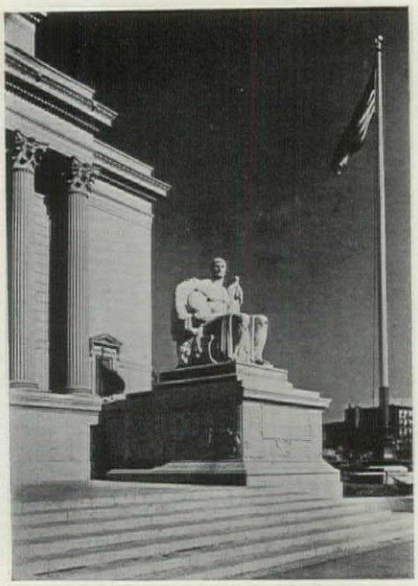
American Hammered Piston Ring Division
Bartlett Hayward Division
Engineering and Construction Division
Gas and Coke Division
Tar and Chemical Division
Western Gas Division
Boston Towboat Company
Eastern Gas and Fuel Associates
The Koppers Coal Company
Koppers-Rheolaveur Company
The Maryland Drydock Company
Mystic Iron Works
Mystic Steamship Company
National Lumber & Creosoting Company
New England Coal and Coke Co.
The White Tar Company of New Jersey, Inc.
The Wood Preserving Corporation

Tarmac road tars for paving private drives, walks, tennis courts, playgrounds, etc.



Pressure-treated lumber from the Wood Preserving Corporation (creosoted or salt-treated) will resist termites and decay.

Lumino (bituminous-base aluminum paint) to make masonry and concrete dampproof and to stop "spalling" of concrete.



THE FEDERAL ARCHITECT

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Address all communications
to and make checks in favor
of The FEDERAL ARCHITECT

Vol. 8
No. 2

OCTOBER, 1937

EDWIN B. MORRIS, *Editor*

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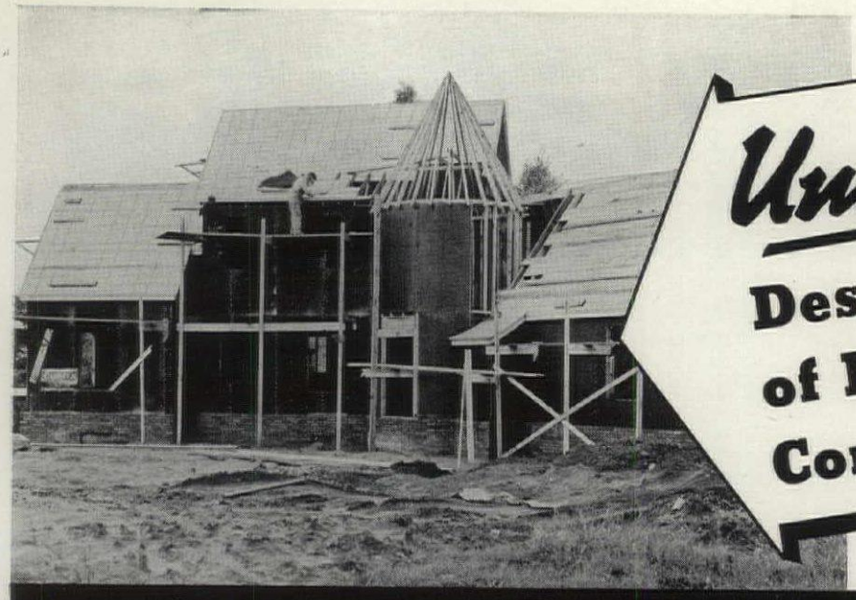
Cover: Charleston Street
Photograph by H. J. Kelly

Entered as second class matter at the postoffice in Washington, D. C., July 1936; additional entry Baltimore, Md., under act of March 3, 1879. Published quarterly by the Association of Federal Architects, 1700 Eye Street, N. W., Washington, D. C. Subscription price $1.00 per year.



Unharmed

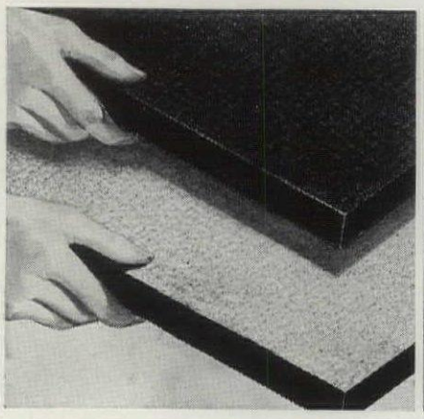
Despite 4 Inches of Rain During Construction!

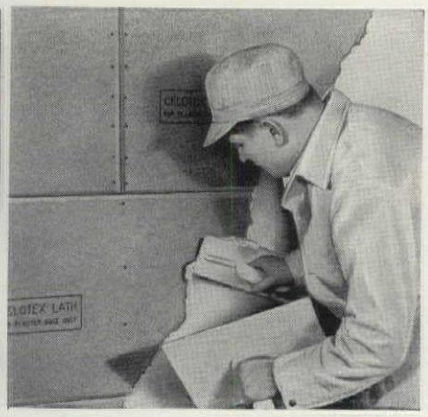
CELOTEX VAPOR-SEAL

REG. U. S. PAT. OFF.

INSULATING SHEATHING

Sheds Water "... like the proverbial Duck's Back," says A. Berg, Des Moines, Iowa builder. "Exposed to nearly 4 inches of rain ... and I cannot see any change or swelling!"





Weather Side: Vapor-seal is waterproofed Celotex—sealed on both sides and all edges by a continuous coating of special asphalt. It looks *right* on the building ... sheds water "like the proverbial Duck's Back"!

Framework Side: The framework side is coated at the factory with a special aluminum coating as a further seal against vapor. Moisture can't affect Vapor-seal's original Celotex insulating properties!

Celotex Insulating Lath: Replaces ordinary lath. Nails direct to framework in large sheets that go up fast. Provides a strong, unbroken plaster foundation securely locked by patented beveled and shiplapped joints. Bonds plaster securely. Guards against cracks and permanently prevents lath marks. Assures beautiful walls and ceilings and provides a second wall of insulation. Protected against termites and dry rot by the patented Ferox Process.

Guaranteed in Writing for the Life of the Building

Superior for These 7 Reasons

1. *It is integrally waterproofed, then sealed in asphalt on both sides and all edges, and finally coated with a special aluminum compound on the inside for a further seal against vapor!*
2. *Original Celotex insulating value is maintained because the 2 seals are on the surface!*
3. *Vapor-seal Insulating Sheathing is strong and stiff—provides great bracing strength!*
4. *Not an "extra"—replaces ordinary materials of the same thickness—25/32". Large sheets!*
5. *Marked for nailing to assure proper application and fast installation—fits tight and stops wind infiltration, even in pulley pockets!*
6. *Protected against termites and dry rot by the exclusive, patented Ferox Process!*
7. *Only Celotex is backed by the Celotex Written Life-of-Building Guarantee!**

**The Celotex Written Life-of-Building Guarantee applies only within Continental United States.*

THE CELOTEX CORPORATION FA 10-37
World's Largest Manufacturer of Structural Insulation
919 N. Michigan Ave., Chicago, Ill.
Please send me a sample of Vapor-seal Insulating Sheathing and full particulars about it.

Name.....

Address.....

City.....

County.....*State*.....

Here's NEW *flexibility* IN AIR CONDITIONING

One "Freon" air conditioning plant serves separate tenants; each tenant pays a proportionate share of operating cost.

•

Liquid refrigerant is successfully metered for first time.

THE Lincoln Theatre Building, Miami Beach, Florida, is an outstanding example of the flexibility of modern air conditioning.

The system includes three forty-ton Carrier Brunswick compressors using "Freon"* refrigerant. The liquid refrigerant is metered and sold on a unit basis. Operating costs are divided between the main individual tenant, the 1300-seat theatre, and the rest of the refrigeration load.

Because of their safety and efficiency, "Freon" refrigerants are used in most outstanding air conditioning installations. "Freon" refrigerants are non-poisonous, non-flammable, non-explosive. They are odorless when mixed with air up to 20% by volume. They have been tested by the U. S. Bureau of Mines, and meet all the specifications set by the Underwriters' Laboratories of Chicago.

Human life and property demand maximum protection under any circumstances. "Freon" refrigerants, because of their unusual safety and efficiency, provide that protection in thousands of air conditioning installations. They are used today in practically all mechanically cooled railway trains, in factories and office buildings, restaurants, schools, hospitals and ships, in mines deep under the earth, in submarines, department stores, and homes.

Be sure that your air conditioning system provides the maximum degree of safety. Specify "Freon" refrigerants.

**"Freon" is Kinetic's registered trade mark for its fluorine refrigerants.*

KINETIC

FREON

REG. U. S. PAT. OFF.

safe refrigerants

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

Roof of Dept. of Justice Building

Federal "Triangle Group," Washington, D. C.

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BY

LUDOWICI-CELADON COMPANY

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NEW YORK
65 Fifth Avenue

CLEVELAND
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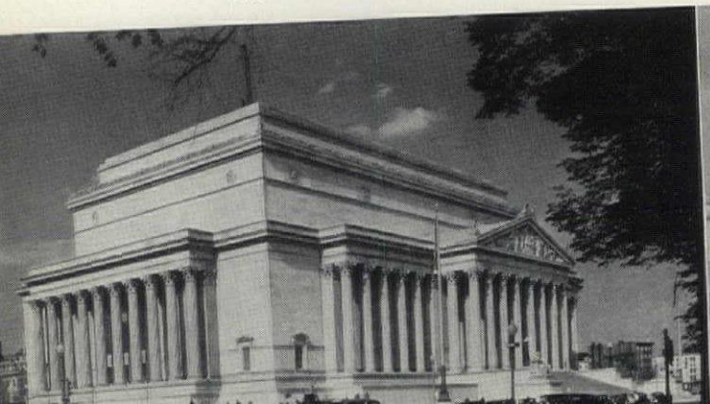
WASHINGTON
740 Fifteenth Street, N.W.

OKLAHOMA CITY
Ramsey Tower

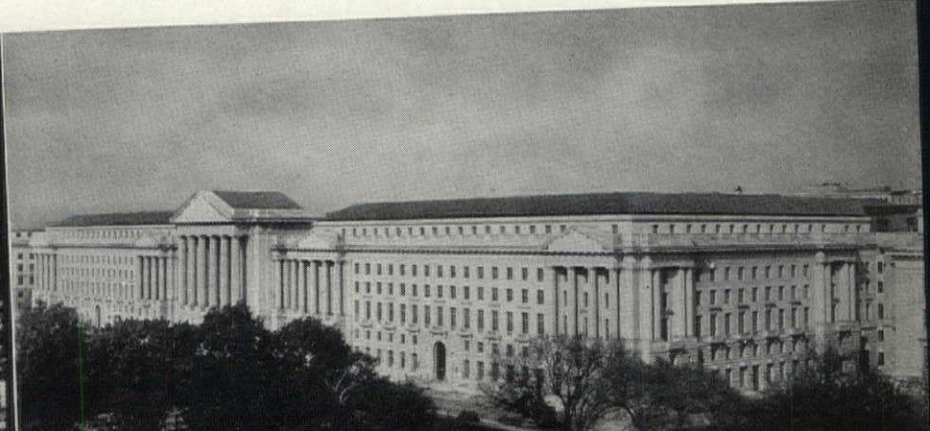
ROOFING TILES • TILE SLABS FOR FLAT ROOFS • CHIMNEY POTS

and LUDOWICI WOOL FOR INSULATION

Archives Building



I.C.C. and Dept. of Labor Building



LETTERS

MR. WADDY WOOD'S INTERIOR BUILDING

August 16, 1937.

Mr. Edwin Morris, Editor,
THE FEDERAL ARCHITECT,
Washington, D. C.
Dear Mr. Morris:

Since my correspondence with you relative to the erroneous captions of the two pictures of the new Department of the Interior Building published in the April, 1937, issue of your magazine, I have received a letter dated August 12 from Mr. Simon, Supervising Architect of the Treasury Department, correcting a similar error in the August, 1937, number of the *Architectural Record,* a copy of which is enclosed herewith.

I think the best solution of the whole matter would be for you to publish a copy of this letter in your magazine.

Yours very truly,
WADDY B. WOOD.

The letter above referred to follows:

August 12, 1937.

Mr. A. Lawrence Kocher, Editor,
The Architectural Record,
115 West 40th Street,
New York City.
Dear Sir:

In the August number of *The Architectural Record* there is an article entitled "America's Outgrowing Imitation of Greek Architecture." Among the illustrations is one marked "Department of the Interior Building, Louis A. Simon, Architect."

The design of the Interior Department Building illustrated in the article was created by Mr. Waddy B. Wood, architect of this city, and the working drawings and specifications were prepared in the Office of the Supervising Architect in close cooperation with Mr. Wood who personally collaborated in every detail of the building.

It is a matter of great regret to me that the authorship of the design should have been ascribed to the Supervising Architect's Office and it would be very much appreciated if in your next number you would give prominence to a statement in correction of the previous error.

Very truly yours,
L. A. SIMON,
Supervising Architect.

Coral Gables, Fla.
Sept. 18, 1937.

Dear Morris:

Bob Mayo sailed into this port a week ago today and when I say sailed I mean sailed. He had some inspection work to do at the post office building, and in order that he might start the day right Mrs. Wetmore and I turned out early and motored down to the pier to meet the steamer at 7 o'clock; took him out to our shack for breakfast, then for a drive around Miami and environs; took him to dinner and landed him near the post office with plenty of time on his hands to do his inspection work and catch his boat. On my return home I found your telegram asking for a picture of Bob and me if possible. It *would* have been possible if the message had reached me in time. Sorry to disappoint you. What did you want to use it for? Are you running a comic strip in the FEDERAL ARCHITECT?

Sorry Bob couldn't remain here longer as I could have got a chance for him to play the Biltmore golf course. Bob was a member of the old foursome that I used to play with there. He was probably its most polite member. Why, I remember on one occasion Joe Garber, another member, asked him how his game was going, and in his Chesterfieldian manner Bob replied: "None of your d——d business, and if you weren't a friend of mine I wouldn't tell you that much." Fore ! !

With kind regards to the "old guard" I am,
Sincerely,
"THE JUDGE."

Washington, D. C.
September 18, 1937.

Mr. Edwin B. Morris, Editor,
THE FEDERAL ARCHITECT.
Dear Mr. Morris:

In the July issue of THE FEDERAL ARCHITECT, I read with interest the reprint of the testimony of L. B. Holland before a Congressional Committee, regarding the extension of the U. S. Capitol in 1853. The reasons for the rejection of the designs of Robert Mills, originally drafted for this work, and accepted by the President, appear to have been a mystery at that time, as the enclosed letter by Robert Mills to Senator Pendleton proves.

I might add that in all the correspondence of this architect which I have seen, he has never complained of any injustice done him in his public life, except this one time, two years before his death. Many reasons have been ascribed why Mills' plans were not finally adopted, such as his advanced age, political influences, or the personal taste of President Fillmore. The enclosed letter seeks to ascertain the true reason, and at the same time adds proof that the architect was free from selfish ambition and to the end of his life concerned chiefly in following and upholding the ideals of his profession.

Very truly yours,
RICHARD X. EVANS.

My dear Pendleton

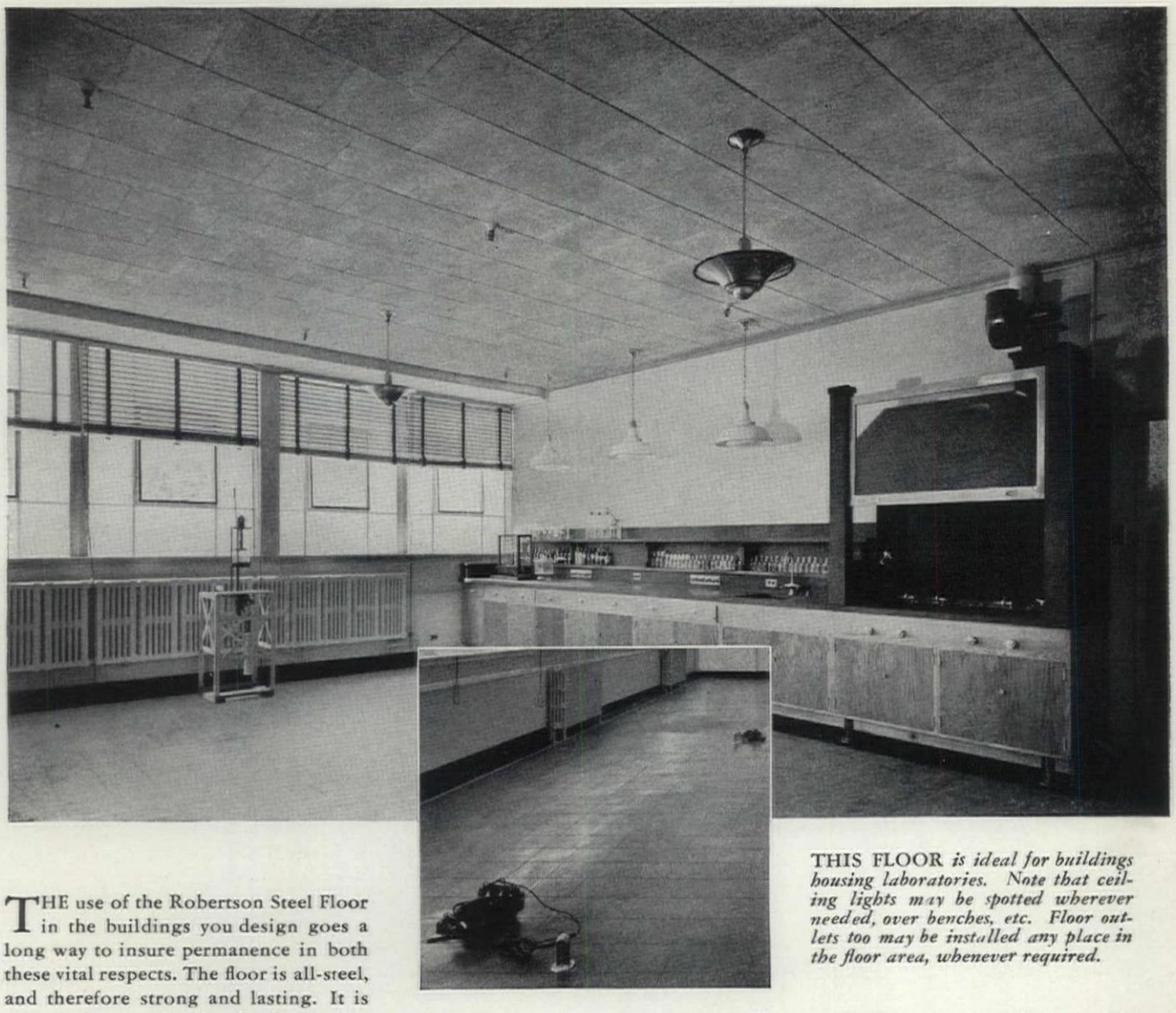
There is no knowing the malevolence of those who defeated me at first when the appointment of the Architect of the Capitol was made, to endeavor again to make an impression upon the Pres't Elect unfavorably to my appointment, and I would ask you to ascertain if possible, whether such influences are at work, and put our friends upon the guard. From a *higher source* influences *may be* brought to bear against my appointment in order to sustain their unjust act in

(*Continued on page* 48)

BUILD FOR PERMANENCE . . .

Electrically

AS WELL AS STRUCTURALLY!



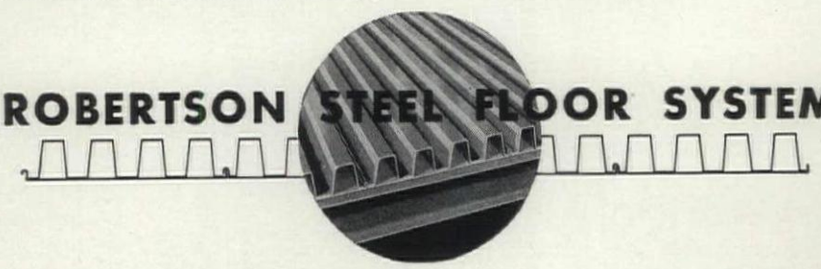
THIS FLOOR *is ideal for buildings housing laboratories. Note that ceiling lights may be spotted wherever needed, over benches, etc. Floor outlets too may be installed any place in the floor area, whenever required.*

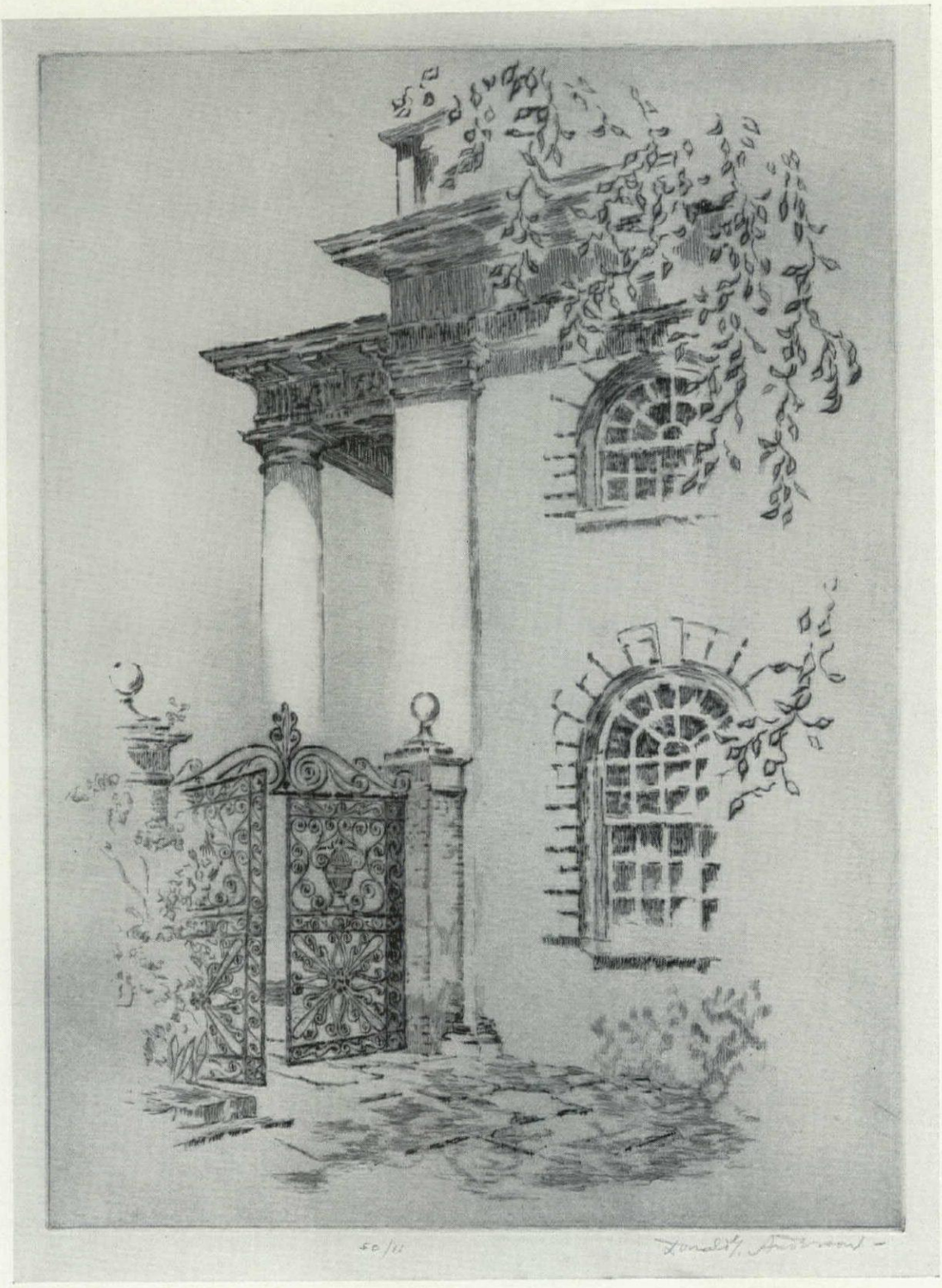
THE use of the Robertson Steel Floor in the buildings you design goes a long way to insure permanence in both these vital respects. The floor is all-steel, and therefore strong and lasting. It is remarkable for its live load capacity, and its lack of excess dead weight. And electrically, it offers an availability and flexibility that will prove invaluable in servicing your buildings adequately, no matter what electrical needs the future may bring.

Each hollow steel cell of the floor may serve as a protected wireway of generous capacity for wiring distribution. New outlets may be cut in a Robertson Floor surface at any place desired, quickly and economically. For buildings constructed to house electrified statistical services, for example, the electrical availability of the Robertson Floor is an advantage that cannot be overemphasized.

In addition to the features mentioned, the Robertson Floor provides quick, easy installation, savings in construction time and money, elimination of floor forms and temporary planking on the job, reduction of fire and accident hazards during construction. Whatever type of building you are designing, investigate the Robertson Steel Floor. Write us today for our booklets "New Life for Buildings" and "Wiring Robertson Cellular Steel Floor." They are free. H. H. Robertson Co., 2008 Grant Building, Pittsburgh, Pennsylvania.

ROBERTSON STEEL FLOOR SYSTEM





PORTICO AND GATES OF ST. MICHAEL'S, CHARLESTON, S. C.

from an etching by Donald G. Anderson

THE FEDERAL ARCHITECT

Published by the Association of Federal Architects
1700 Eye St., Washington, D. C.

AWHILE ago we read a newspaper paragraph attributed to Dean Hudnut of the Harvard School of Architecture, which says in part:

"What is the justification for the cumbersome, monumental office buildings recently built in Washington, inefficient in layout, dark, loaded with wedding-cake columns and Greco-Roman ornament which has no connection with either modern times nor the early days of the American Republic?"

Usually, when a man asks a question in print he does not expect to have it answered. We are not answering the question, but we like to muse and generalize on the subject. We have many times been in the cumbersome, monumental buildings recently erected in Washington, which take their design scheme directly from good old Robert Mill's Treasury Building, which has some connection with the early days of the Republic. We could perhaps make our way blindfolded through them—and we have not observed therein inefficient layouts, and the dark spaces.

It is strange how one will miss entirely things like that.

But then we have lived a long while in Washington and perhaps become a bit provincial. Perhaps what seems to our simple tastes a well-lighted, efficiently planned office with properly arranged appurtenances would be, to the dweller in a great city like Boston or New York, awfully primitive and lacking in the finer luxuries. Yet, granting our innocence, we still think anyone who would lift a contemptuous nose at the accommodations furnished in the recent Washington buildings, would be quite too hard to satisfy, too effete, too softened by an overly pampered existence.

There is anyway a strange yearning by latter day thinkers for things impossibly complete—for things of super-newness, of super-luxuriousness, of super-perfection. Nothing already accomplished is good enough. It has to be thrown from the crib like this morning's toy and a loud voice raised for something new for the afternoon.

Why is just newness so near to the Throne of Perfection?

THE problem of automobile parking is one that gives acute concern to city fathers all over the country, in that the length of the downtown curb space is never anywhere near equal to the aggregate length of the cars of all the people who would like to drive to work.

We have a suggestion which is so simple and efficacious that we entertain some doubt as to whether it will ever be adopted. We have designed, mentally, a Drive-to-Work vehicle, in which is embodied a cure for all the disadvantages of the present automobiles for down town use.

The main disadvantage of the present automobile for such use is that it takes up a large area and in many instances carries but one passenger.

The outstanding feature of the motor-car we have designed, mentally, is the incredibly small ground area it occupies. It has three small wheels and the engine placed between them on a chassis thirty inches wide by thirty inches long. The seat is above this, protected by a light enclosure.

The advantages of this at once spring to

light. It can be driven head-on into a parking space, the curb thus accommodating seven or eight cars where formerly but one could be accommodated

The objection has been made that it would be top-heavy but this has been controverted by the fact that the engine is very low-hung, bringing the center of gravity extremely close to the ground.

The thought has also been advanced that this would also simplify the problem of after-theatre parking in that, while these cars are designed as one-man automobiles, still the young man driving his girl to the theatre could seat her on his lap, thus increasing the interest in the outing while decreasing the net parking area. This, however, is a social, rather than a transportation sub-problem of the main issue and could be neither advocated nor denied by us, who in this instance are acting solely in the capacity of automotive engineer.

Due to the small ground area required for parking and for manœuvering of this unique vehicle, the further possibility is presented of a parking strip at each side of the streets shielded from the main roadway, and entered at intervals, so that views of notable pieces of architecture would not consist mainly of a string of automobiles at the curb with the building as a secondary exhibit in the background.

We have submitted this idea to many persons of sound judgment and while they compliment us (perhaps unduly) for ingenuity and thoughtful concentration, they believe the solution fantastic. And there you are. But then all great strides toward progress are in the beginning invariably spoken of as fantastic. At any rate we wish to give our readers the advantage of this preview.

■ A FRIEND told us the other day he had read somewhere that a physician had stated that bad murals and other bad art products were the results of astigmatism.

Without stopping to comment on the fact that this makes an awful lot of astigmatism, it appears to us that some art might possibly be the result of bad liver, or hives or poison ivy.

The big thought that occurs to us is that it would be well to have a commission of doctors to classify works of art. They could label them, "Easel picture of the Thrombosis School," or, "Marine Showing Jaundice," or "Portrait — (earache)," or "Still Life — (dyspepsia)," as the case might be.

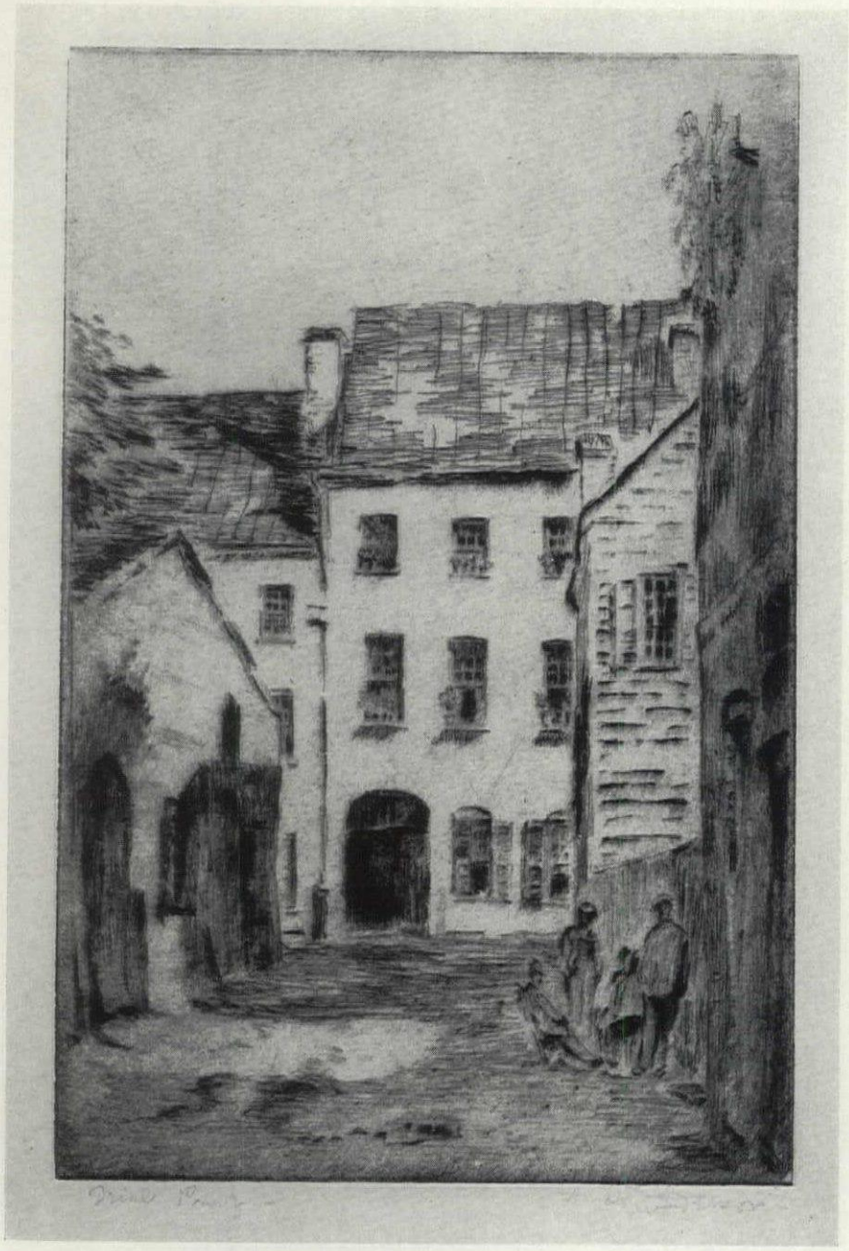
This would be so educational. It would give the beholder the mood. If one could realize that the inspiration of entry 625 was autointoxication, it might explain all. The beholder would approach the offering understandingly, ready to forgive and condone, and kill the fatted calf. Whereas, not knowing the circumstances, he might be apt to criticize.

What a boon to art such a medical classification would be!

■ GENE GOODWIN, a mechanical engineer in the Procurement Division, was endeavoring to reply to a question as to how hot it was driving through the great southwest, on a recent trip. "I didn't have a thermometer, so I can't give it to you in degrees," he remarked, "but I can explain it like this. I drove up over the brow of a hill and saw a coyote chasing a jack-rabbit. And they were both *walking.*"

■ THE State Department is planning, among other construction work, to build a legation at Monrovia, Liberia. Fritz Larkin, the new chief of the State Department's Foreign Building Division, being equipped with a sly sense of humor, made suggestion to a certain Government structural engineer that consideration was being given to sending this engineer to Liberia for the duration of the project to make certain that everything would be properly carried out. Now, Monrovia is not what might be mentioned as an ideal resort at any season of the year, what with torrential rains, mosquitoes, bugs, flies, fever and underdeveloped sanitary lines, so that the structural engineer began to be very uneasy, very uneasy indeed, bringing forth all the reasons why he was poorly equipped to carry such an important project to a successful issue. At length, in desperation he exclaimed, "Why, I don't even speak their language." That convinced Larkin. He withdrew, saying, "I hadn't thought of that. Of course you don't. It's English."

(*Continued on page* 49)



BREDON'S ALLEY, CHARLESTON, S. C. from an etching by Donald G. Anderson

"THE CITY" CHARLESTON, S. C.

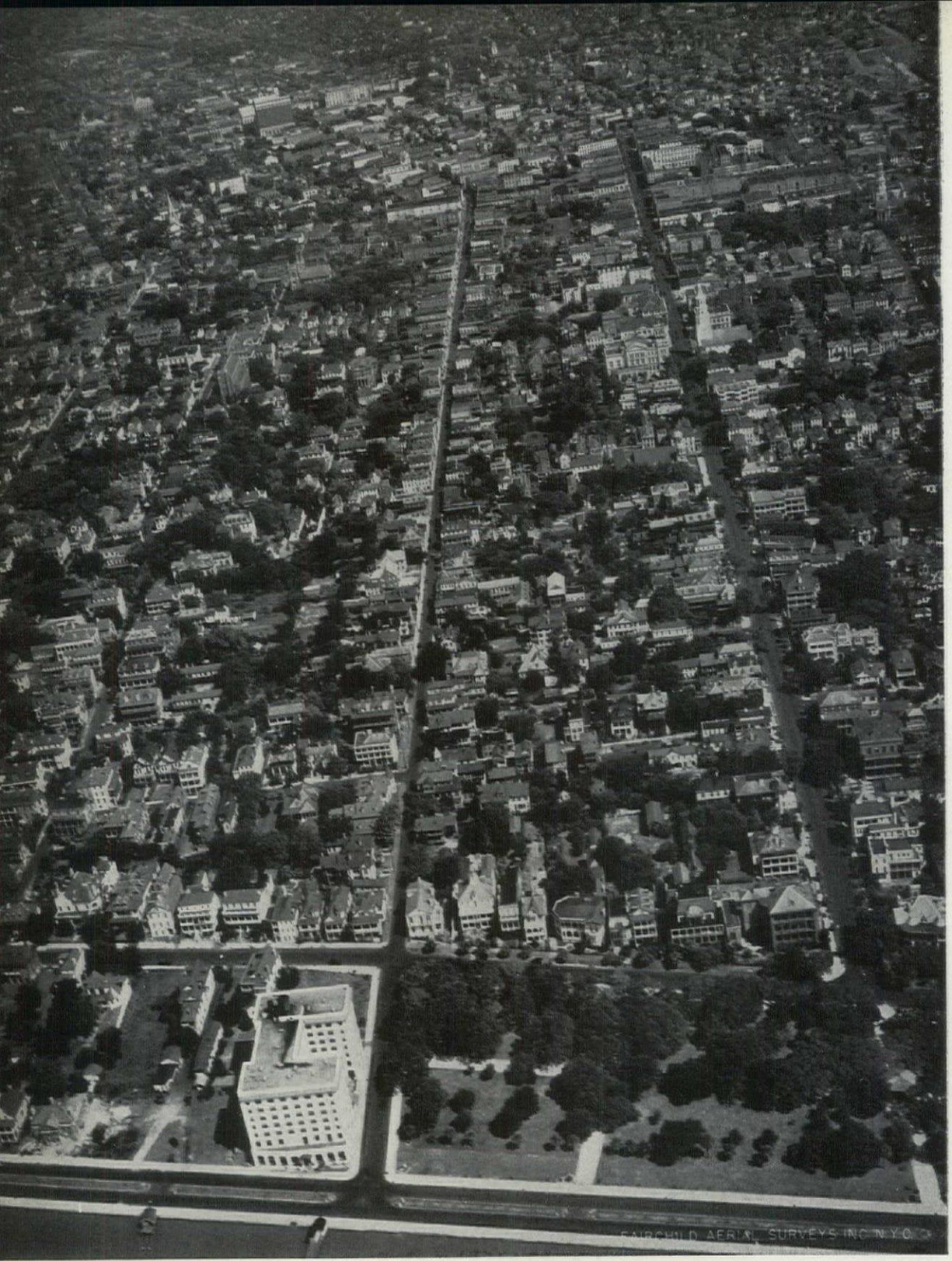
A man met a darkey on the Savannah River a few miles above Savannah and asked:

"John, how far is it to the city?"

"Ninety-five miles, suh."

"What! Ninety-five miles to Savannah. Surely not."

"Nussuh. It ent but five miles to Savannah, but it's ninety-five miles tuh de city."



Photograph by Fairchild Aerial Surveys

This air view shows the "city," the traditional centre and focus of this part of the world. By the upper margin is a touch of the shore of the Cooper River; at the lower, is the Ashley. The street that runs toward the lower right corner is Meeting Street, touched by the graceful landmark, St. Michael's. That to the left is King Street and the next is Legare. Note the large blocks, with trees in the inner courts.

Hidden in the cluster of buildings near St. Michael's, is the Robert Mills Hall of Records. About a quarter way down the picture and a third from the left are two churches. The further one is the picturesque St. John's Lutheran Church.

Somewhat below the centre a tree breaks across the straight rectilinearity of King Street. Opposite this is the Pringle House with its slave quarters facing the street.

A little better than hole-high with this and just below the point where trees flow out over Legare Street can be seen on the right side of the street, the porticos of the Smythe house.

About the middle point of the right margin is the spot where in the early Colonial days, amidst great rejoicing and a huge procession preceded by the silver oar that was the symbol of pirate execution, some thirty buccaneers who had been the scourge of Carolina shipping, were hanged.

Photograph by Fairchild Aerial Surveys

CHARLESTON was established as an English colony in 1670. It was greatly increased in numbers during the years following 1685 when came many Huguenots, driven from France.

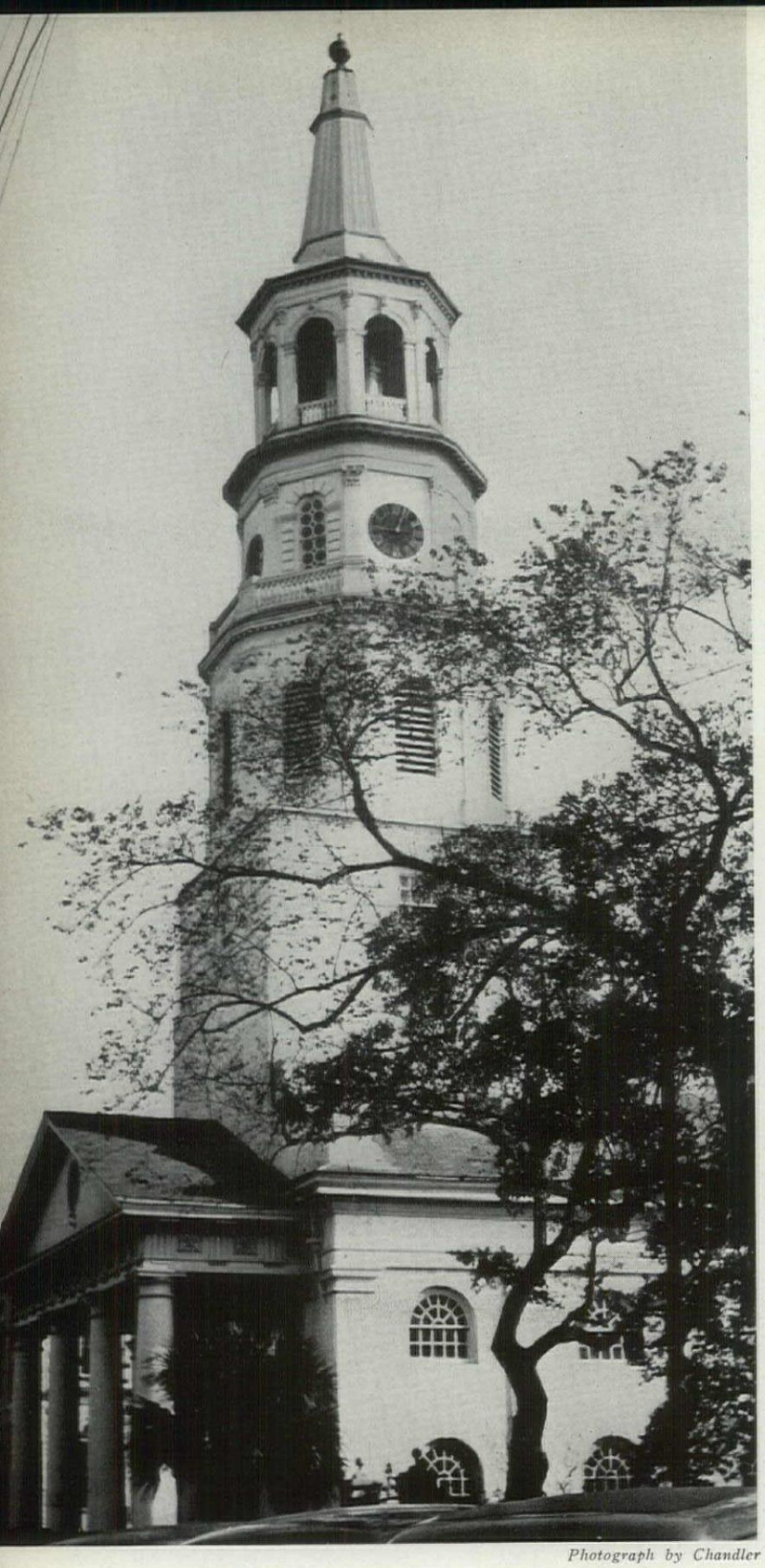
The site of the city, as will be seen from the air view, is not unlike that of New York. The upper body of water is the Cooper river, the lower, the Ashley. They join at a rounded point just out of the picture which, as in New York, is called the Battery.

The beautiful white spire is the spire of St. Michael's. Beyond is St. Philip's. The street which runs in front of St. Michael's down to the middle right-hand margin is Meeting Street. Beyond it and parallel to it is Church Street which quaintly curves around St. Philip's.

At right angles to these streets, running past St. Michael's to the Cooper River, is historic Broad Street, which was the main street when Charleston, because of a series of early misunderstandings with the Spaniards in St. Augustine, was a walled city.

The old wall ran just this side of St. Michael's, to a point about half-way between the church and the Battery and then made over to the Cooper River. The wall at the far side turned at a point somewhat beyond St. Philip's and ran to the river.

In the upper left corner can be seen dimly a part of the great Cooper River bridge, a high curving structure that connects the city to the highways to the North.



Photograph by Chandler

FAMOUS St. Michael's Church dates back to 1752. The architect probably was James Gibbs, architect of St. Martin's-in-the-Fields, in London. It has borne a very dramatic part in American history. During the Revolution, its tower was painted black lest it prove to be a guiding beacon for the British fleet—a concealing strategy that would possibly not have the approval of modern *camoufluers*. Its lead roof was melted up for bullets.

It's beautiful bells have made five trips across the Atlantic. Cast in London in 1757, they were confiscated by the British troops during the Revolution and sold in London. A Charleston merchant then resident in England, bought them and sent them back.

During the Civil War, they were again taken from the belfry, to be melted into ammunition. Before this could be done, they were captured by Sherman's army and smashed into small pieces.

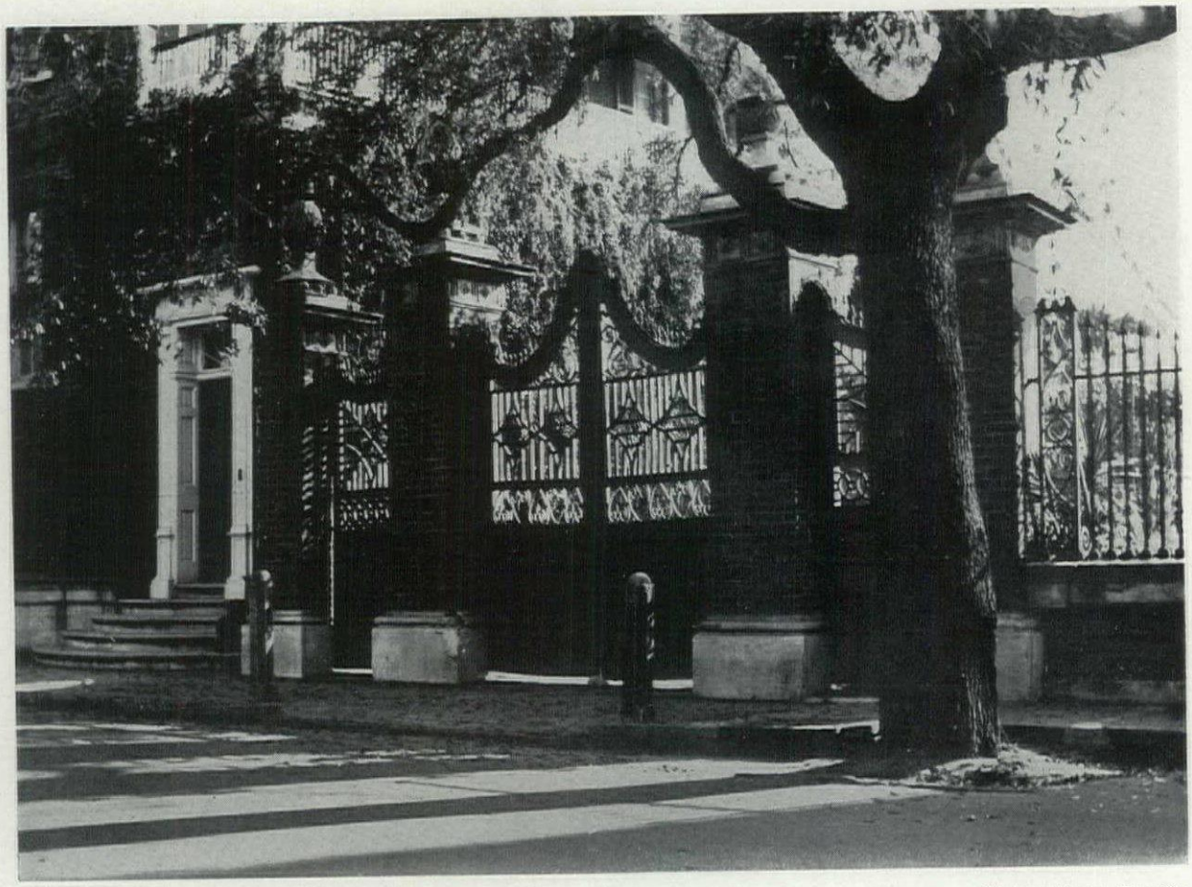
A certain Mr. Prioleau in London, hearing of this, made a search and found the company which had cast the original bells, in whose storehouses were found the original patterns for them. The bell fragments were, thereupon, sent to England, melted and cast in moulds from the original patterns. Since then brought back to Charleston they hang in their original place in the belfry, and are to Charleston what the Westminster chimes are to London.

In 1865, a shot from Federal batteries struck the church, tore through the chancel and did considerable damage. Later the church was looted by Northern soldiers. The device, "I.H.S." inlaid in ivory in the pulpit was taken away. It was later returned by a Yankee clergyman, who is said to have given the explanation that there was no place for it in his church.

ST. PHILIP'S, the "Westminster of South Carolina," was the first Church of England established in South Carolina. The present building, erected in 1836, is the third structure which has housed this congregation and is a replica of the original building. Until 1797, St. Michael's was a chapel of St. Philip's, a curious circumstance in view of the fact that the two places of worship are so close.

Few if any churchyards in this country contain the graves of so many distinguished Americans as does St. Philip's. Therein are buried John C. Calhoun, William Moultrie, Thomas Pinckney, and many other distinguished men.

Architecturally, it has a compelling charm which is enhanced by the quaint device of curving Church Street around the fore part of the edifice, so that the tower is on axis with the thoroughfare and offers for its entire length a fine and glorious vista.



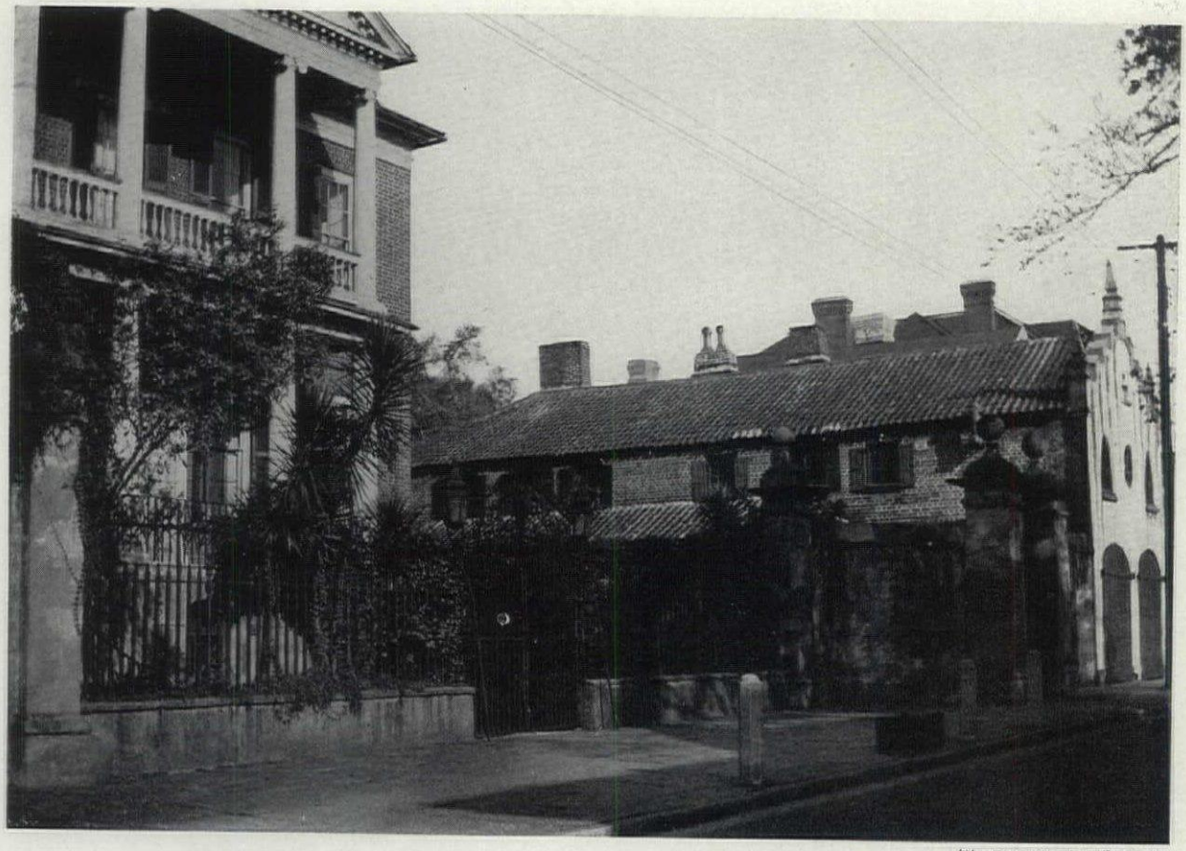
THE PINEAPPLE GATES

Photograph by Chandler

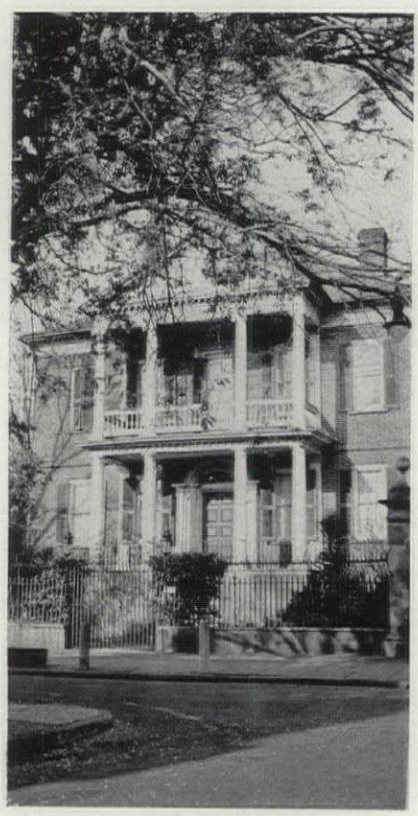
THESE are the famous pineapple gates of the Smythe house on Legare Street. The wrought iron work was imported from England and became a model for other gates in Charleston. In these gates, the artesan had worked his initials into the design, after which there were many gates in Charleston with initials.

The Smythe house shows a residential scheme characteristic of Charleston. There is the carriage driveway, the servants gateways and the main entrance beyond. The main entrance surprisingly enters, not upon indoors but upon the open verandah. The short side of the house faces the street and the long side, the inclosed garden.

The location of the Smythe house is noted in the text under one of the air views.



Photographs by Chandler

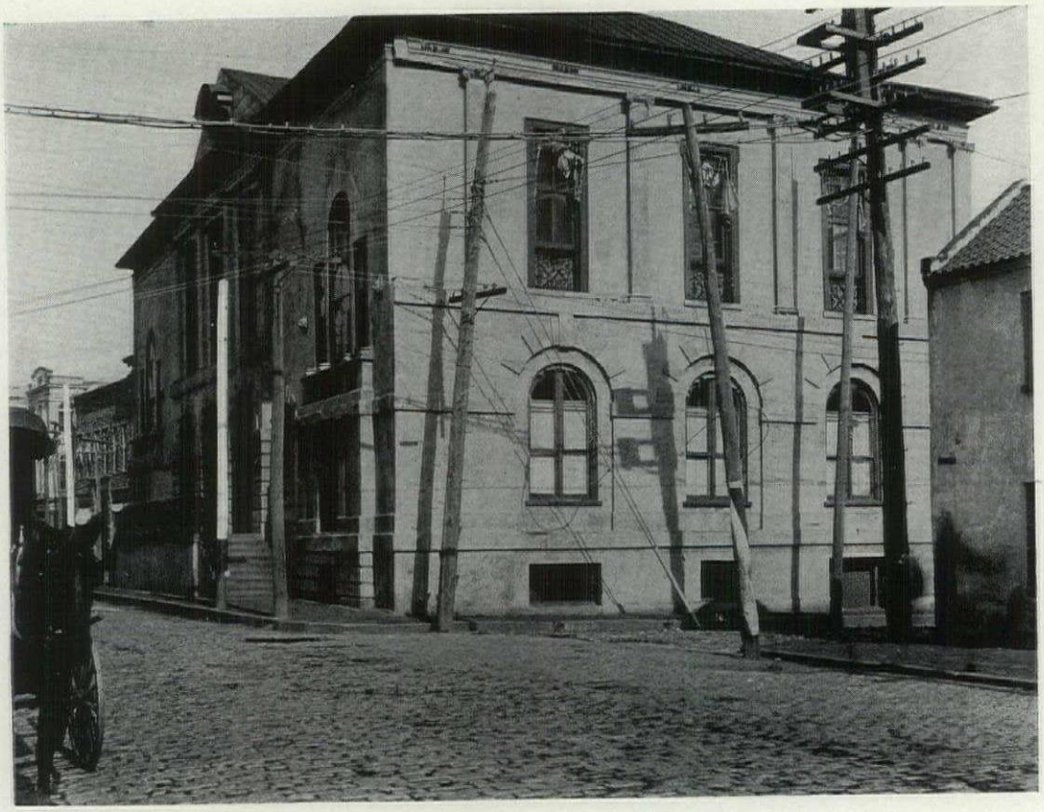


THE picture is of the Miles Brewton house—now called the Pringle house—with its slave quarters. It was built in 1760 by Miles Brewton who, with his family, was shortly thereafter lost at sea. His sister, Mrs. Motte, who then took over the house, became a very important figure in Revolutionary affairs.

It is said that after the capitulation of Charleston, she entertained both the British and American officers at her table, a strange *tour de force* but one that resulted in Charleston emerging from the occupation by the enemy with less damage than might have been expected.

The house is of the sumptuous type loved by the Cavaliers, who were a strong influence in early Charleston. It is beautiful as to its Colonial detail and its second-story drawing room is a priceless heritage of the period, with its high wainscot and coved ceiling, its beautiful mantel and its exquisite crystal chandelier. Several pages of the Georgian period are devoted to the house. There is a strange contrast between the Dutch architecture of the slave quarters and the Georgian of the house.

The location of this house is indicated in the text under the air-photograph on a preceding page.



OLD POSTOFFICE, CHARLESTON

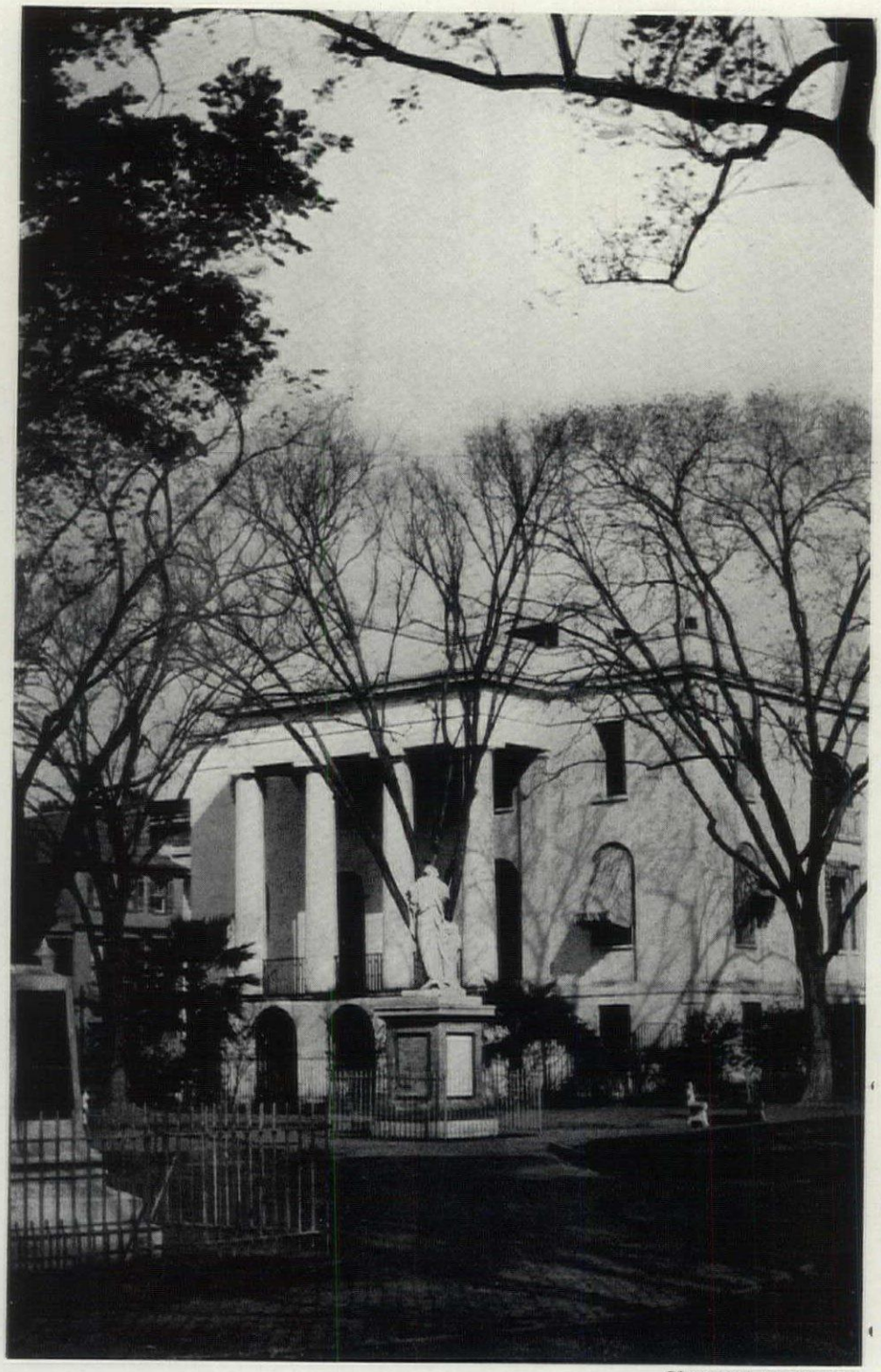
THIS building was constructed under authority of an act of the colonial assembly of South Carolina, 1767, which appropriated 60,000 pounds for the erection of an "Exchange and customhouse." It is of brick with stone trimmings, most of the material having been brought from England. It is located on East Bay Street at the end of Broad Street.

In 1818, the United States secured the building from South Carolina, for the sum of $60,000.

During the siege of Charleston by the British, 1780, General Moultrie placed his principal magazine (10,000 pounds of powder) in the northeast corner of the basement of this building, and had the doors and windows bricked up. When the British took possession of Charleston they occupied this building, and used the apartment adjoining where the powder was stored as a "provost" for the incarceration of suspected citizens. When General Moultrie returned to Charleston the powder remained, undiscovered by the British. General Washington visited Charleston in 1791 and one of the handsomest entertainments given in his honor was a concert and ball at the Exchange.

The house at the right is the French tavern said to have the date 1707 and to be the oldest house in Charleston. A tunnel running from this structure to the river was formerly used for bringing wine from the ships.

It was a tradition that Madeira wine shipped by way of the West Indies to Charleston and there stored, took on a mellow bouquet and flavor. The climatic heat of this journey combined with the motion of the vessel gave the material its proper start, and ageing in the steady warmth of the Charleston winters and summers, completed the process in a particularly outstanding manner, so that wine thus produced had a preciousness that made it highly prized.



Photograph by Chandler

THE Record building was built in 1822. Robert Mills, impressed with the necessity for fireproof structures, designed here the most completely fireproof building that up to that time had been built in the United States. The erection some fifteen years later of the United States Treasury Building in Washington, also from Mills' design, as a fireproof building fixed in the public mind the necessity for endeavoring to establish fireproof buildings for places of public assembly and for storage of public records.

Photograph by Chandler

PINEAPPLE GATES—SMYTHE HOUSE

"Charleston . . . the languid, lovely, tired old town was a city brave and gay, with Mediterranean manners and Caribbean ways.

The perfume of ten thousand flowers drifted upon the winds, which came and went over a thousand gardens, ebbing and flowing like the tide.

Clouds of snowy gold and roses rolled across the sky, like the vast rotundas of a city builded of colored ivory.

Rare flowers bloomed and rare fruits ripened—pomegranites, oranges, medlars, figs, jujubes and the purple Indian peach. Through the green-hedged close, women, beautiful and stately, paced the shade.

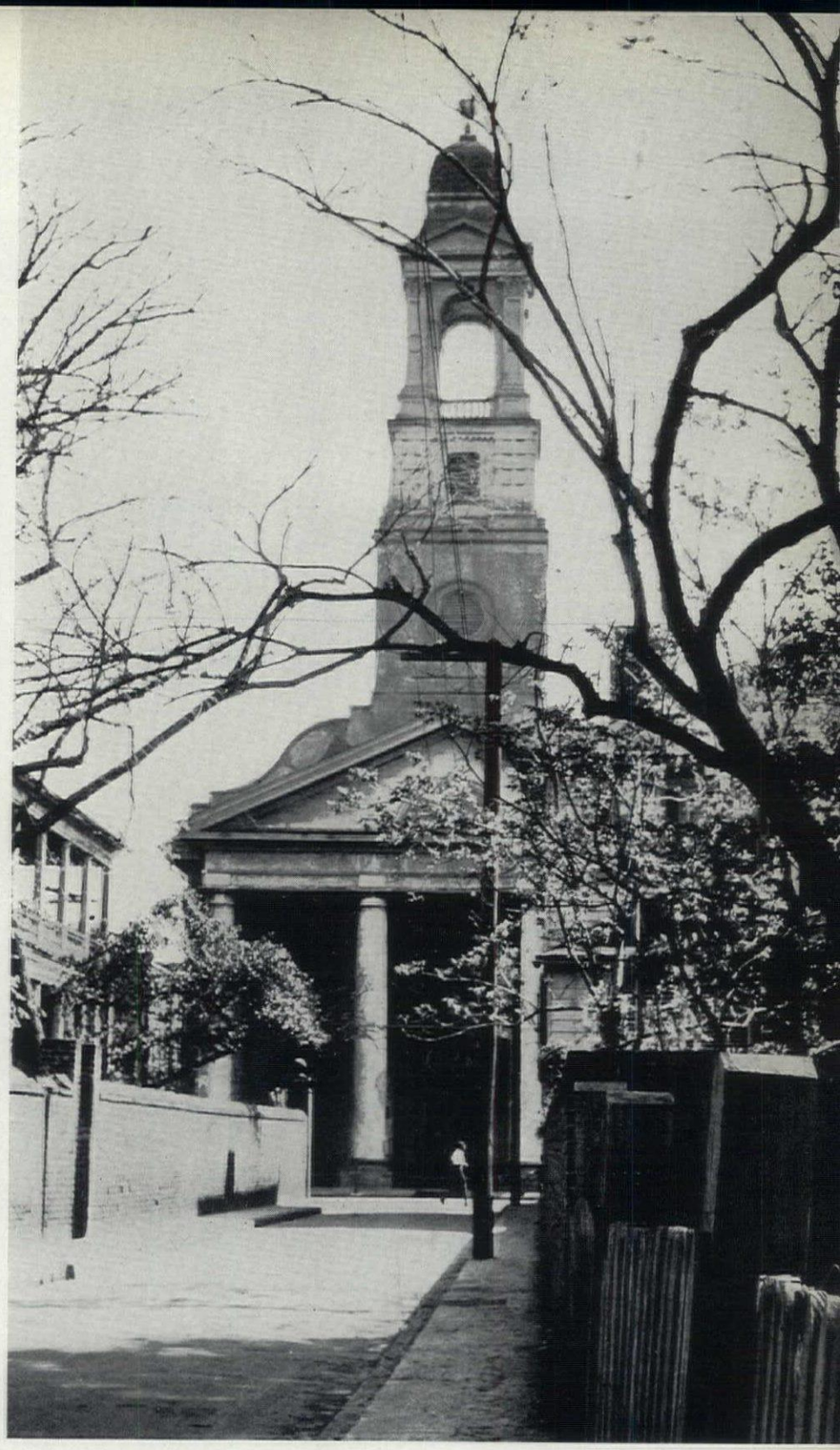
Those were charmed days indeed. The world seems to have grown weary and gray and the hearts of men bitter. The young were younger then; the old not so sorry for everything as they have been since."

Madam Margot by John Bennett

John Bennett, the novelist, lives within a stone's throw of the Pineapple gates

St. John's Lutheran Church
(from Magazine Street)

Photograph by Chandler



SOME years ago a great lady of Charleston was being regaled by her grandchildren concerning the sights they had seen in Paris, in particular their visit to the Louvre and the knot of people always found in rapt contemplation before Whistler's *Mother*. The old lady listened attentively and when they paused for breath she inquired with all imaginable sweetness, "But why? After all, she was only a MacNeill of North Carolina."

Dixon Wector, The Saga of American Society
(Through Reader's Digest)

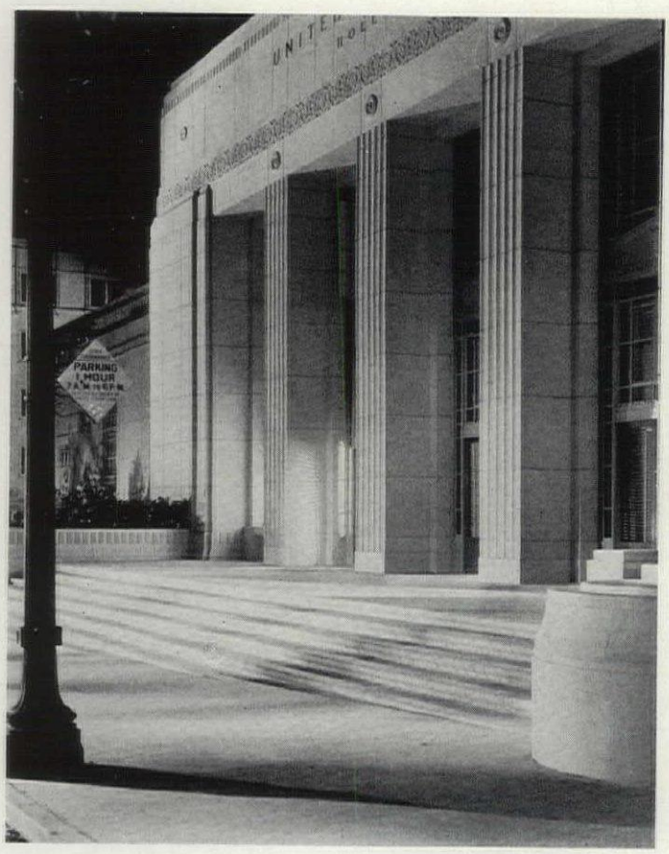
Drawn by E. B. Morris, Jr.

PORTFOLIO OF BUILDINGS THE GOVERNMENT WILL NOT BUILD THIS YEAR

1. A factory for the manufacture of popular-priced machine-guns.

The PLACING OF CONSTRUCTION MATERIALS

A Handbook of Best Practice Compiled in the Procurement Division



HOLLYWOOD, CAL., POST OFFICE. ALL CONCRETE BLDG.

The Public Buildings Branch of the Procurement Division is now compiling a book covering the placing of materials used in building construction. The purpose of the book is to describe for field use accepted practice in connection with such operations.

The various chapters of the book are being prepared but naturally require much compiling and editorial work to put them in publication form, so that some time will elapse before the work is complete.

In order that the finished portions may be immediately available for field use, the FEDERAL ARCHITECT, through the courtesy of the Procurement Division, will print in advance portions of the book as they are available. The chapter on Concrete is printed herewith.

CONCRETE

Fundamental Conception.

THE universal utilization of concrete in architectural and engineering construction has inspired in the general public and in a considerable portion of the followers of the construction industry, the belief that concrete is a strong and durable product which results from the combination of cement, sand, and coarse aggregate with water. The apparent simplicity of concreting operations which tends to confirm this belief arises out of the efforts of engineers, manufacturers of equipment and producers of materials to overcome difficulties inherent in actual conditions encountered in the field. The seemingly simple operations are in reality but steps in a complicated manufacturing process which converts raw materials into a finished product.

Concrete, as a building product, is unique in the list of structural materials. It is the only major material which is delivered to the site of the work in its constituent parts, which undergoes the processes of manufacture at the site, and which first appears as a finished product in its position in the structure. It is likewise the one material which is not subject to inspection in its finished state until after it is incorporated into the structure but which is dependent upon inspection of constituent materials and applied methods for the procurement of suitable and satisfactory results.

The conception of concreting operations as a complicated manufacturing process is fundamental to a comprehensive understanding of the whole subject of concrete construction. Like other complicated manufacturing operations, the manufacture of concrete is resolved into a series of very simple steps. Each step is accomplished through the provision of equipment, controls and methods which often represent the application of principles established after years of research and experience but so simplified in their application as to lend themselves readily to field methods under restricted and often unfavorable conditions. The employment of available manufacturing processes and the intelligent application of established safeguards may be expected to yield a finished product that will be sound, satisfactory and dependable. The accomplishment of these results devolves upon the field personnel which is directly responsible for the establishment and operation of the processes of manufacture.

Definition of Concrete.

In general and fundamentally, concrete is a material produced by artificially and uniformly mixing definitely related portions of a fine aggregate of inert material, such as sand, and of a coarse aggregate of inert material, such as gravel or crushed stone, with a properly related amount of a paste of cement and water so as to form a uniform mixture which becomes hardened and consolidated into a solid mass during a comparatively short period of time as a result of the chemical reaction between the cement and water. The resulting product is a stonelike material with a structure resembling a conglomerate rock and possessing strength and characteristics largely controlled by the characteristics and relative proportions of the constituent materials.

For purposes of obtaining special characteristics such as increased impermeability or color or other quality, special ingredients of inert materials may be introduced into the mixture as admixtures, or, as in instances where a lightweight concrete is desired, lightweight aggregates may be used. All such instances, however, are but variations in the utilization of available constituent materials to procure a manufactured stonelike product having definite characteristics.

Requirements.

There are four major requirements for hardened concrete which require consideration: namely, strength, durability, economy and workability. In general, the construction personnel is concerned with the production of a product which will meet the requirements of the designing agency as described in the plans and specifications. The durability of the material and the economy of its use are matters of little concern to the field man who is primarily interested in execution of work for which these factors have been determined by the designing agency. The minimum strength of the concrete is his vital interest. The workability is closely related to the strength and to the appearance of the finished work and, therefore, demands mature consideration.

Constituent Materials.

The specifications designate the requirements with which constituent materials must comply.

Portland cement is a highly standardized product and is manufactured under controlled conditions which practically assure the delivery to the site of material which will be satisfactory. Precautions must be taken to properly store it in such manner as to protect it from moisture which is about the only source of damage to it. Stocks of cement on hand should be limited to the requirements of approximately thirty days in order to avoid possible deterioration by "air-setting" which is brought about by absorption of atmospheric moisture. The use of any cement from a bag that has "air set" is to be avoided in practically all concrete. The use of unset cement from "air set" bags in mass sections or non-structural sections such as floor fill may be expected to yield satisfactory results provided all lumps are screened out. In rejecting "air set" cement care must be exercised not to confuse "air set" with hard packing which may be found in the bottom bags which have been subjected to the pressure due to the weight of a high pile of stored cement.

Fine and coarse aggregates available in the several States have been generally thoroughly investigated by the highway departments of the respective States. These departments have adopted standards for grading of available materials which the producers habitually supplying the requirements for the respective States can furnish readily. In general, State highway department specification materials may be expected to meet Government specifications. If materials for the concrete upon a building job are procured from a producer who regularly supplies materials for state highway work, little difficulty should be anticipated with respect to dependability or uniformity of materials. If, on the other hand, materials obtained from local sources are utilized, closer supervision of the qualities of delivered materials is necessary and greater attention to assured deliveries in sufficient quantities for uninterrupted operation is required. The presence of unsuitable materials and irregularities in grading may be expected to be found to greater extent in materials obtained from local sources.

Water used for mixing concrete must be fresh, clean and free from alkali or other injurious matter. In general, water that is fit for human drinking purposes may be used without special test for the determination of its fitness.

Proportioning of Concrete Mixtures.

Exhaustive research into the qualities of concrete has established a definite relationship between the stiffness of the plastic paste and the strength, watertightness and durability of the hardened concrete. The results of research have been expressed in the water content law which states:

"For plastic mixtures, using sound and clean aggregates, the strength and other desirable properties of concrete under given job conditions are governed by the net quantity of mixing water used per sack of cement."

This law is applied to a conception of concrete as a material which is composed of a mixture of fine and coarse aggregates which possess no cohesive qualities, with a paste of cement and water which coats all of the particles of the aggregates and fills the voids between them while in the plastic state following which the chemical action between the cement and water causes the paste to harden

and thus form a hard and permanent bond between the various particles in such manner as to constitute a solid mass.

The limitations of strength and the character of the resulting product are imposed by four factors: first, the strengths and characteristics of the respective aggregates; second, the strength of the cement paste; third, the strength of the bond between the paste and the aggregates; and, fourth the relative proportions of paste to the respective aggregates. In practice, the governing specifications may be expected to provide means for procuring results desired by the designing agency through requirements as to character and grading of aggregates, as to the amount of mixing water to be used for each sack of cement, as to the character of mixing equipment and manner of handling the plastic mass, and, as to the proportions of constituent materials to be employed.

Compliance with specification requirements with respect to constituent materials, proportioning of mixes and time and manner of mixing and placing may not insure the production of the best possible concrete obtainable under the provisions of the specifications. The effect of the amount of mixing water is of the greatest possible importance in determining the character of the product. The establishing of the maximum amount of water that may be used in a specified class of concrete does not imply that the use of the full designated amount of water is mandatory nor that the strongest mixture obtainable with the specified proportions will be obtained with that quantity of water. Rather, such a figure indicates that the use of a greater amount of water will result in a product which is considered to be unsatisfactory. The fact is that the stiffest mixture that is plastic and workable enough to be properly placed in the work by the best available workmen will yield the strongest, densest, most durable and most impervious concrete obtainable under the governing job conditions.

Workability is the term designed to describe the facility with which the plastic concrete mass can be placed in its final position. In effect, it is a measure of the labor required to work the freshly mixed concrete into corners, around reinforcing bars, against exposed surfaces and generally to consolidate the plastic mass in order that a satisfactory product will result. Workability of concrete is the principal requirement imposed upon the mass by field operations which, due to the quantities to be handled and the facilities available for the purpose, prevent the use of mixtures that develop greatest strength in laboratory methods. It imposes conditions to suit which the theoretically most desirable mixtures are modified in order to obtain the best possible results in the field.

Workability is affected by numerous factors including the grading of the fine and large aggregates, respectively; the proportions employed in the mix; and the consistency of the cement paste. Specification requirements for the grading of aggregates are necessarily quite broad which results in a corresponding range in workability when different aggregates, all of which meet specification requirements, are used. The cement paste serves as a lubricant in the plastic mass and its efficiency as such depends upon its consistency and upon the qualities of the particular aggregates with which it is mixed. On account of these conditions, the same quantity of cement paste of a definite consistency when mixed in a fixed proportion with fine and coarse aggregates will yield mixtures of different degrees of workability varying with the different gradations and characteristics of the respective aggregates. Field practice, however, has established approximate guides as to the degrees of workability of the plastic mass which yield satisfactory results under operating conditions. In general, field experience has proven that much stiffer mixtures can be satisfactorily placed in heavy sections and in mass work than in light sections. This practice has led to the development of a field test which is designed to indicate the workability of the plastic mass as a whole. This test, commonly known as the slump test, has been tentatively standardized by the American Society for Testing Materials under the title "Tentative Method of Test for Consistency of Portland Cement Concrete," Serial Designation: D 138-32T.

Current practice is to use the stiffest mixture that can be satisfactorily placed within the ranges of amount of slump and with sizes of coarse aggregates indicated in the following table:

Portion of Structure	*Slump*		*Max. Size of Coarse Aggregate*
	Max. Inches	*Min. Inches*	*Inches*
Reinforced foundation walls and footings	5	2	1½
Plain footings, caissons and substructure walls	4	1	2
Slabs, beams and reinforced walls	6	3	1
Building columns	6	3	1
Pavements	3	2	2
Heavy mass construction	3	1	3 to 6*

*In making slump test, all aggregate larger than 2 inches should be screened out of the mixture.

WATER CONTENT

In the determination of the amounts of slump that are to be used for a particular job and for the several parts of the job, those slumps should be selected within the designated ranges which are the lowest that will yield a plastic mass which can be satisfactorily placed in the work. The limitations of slump range are usually set out in the specifications in which case the construction man should be governed by those provisions.

Under operating conditions, the amount of water that must be used in the cement paste for purposes of obtaining necessary workability is in excess of the amount required to complete the chemical processes incidental to the hardening of the cement. This excess of water must remain as small particles distributed throughout the concrete mass. In course of time these small particles evaporate as the concrete hardens and dries out. The evaporation leaves small air pockets which reduce the density of the hardened product. Obviously, the densest, most impervious and most durable product will be that in which the amount of excess water is a minimum. In recognition of this fact and in consideration of the limits of density which appear to be desirable for conditions to which the finished product is to be exposed, the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete included in its Progress Report for 1937 a statement of the water content of the cement paste which is deemed to be suitable for various conditions of exposure. The statement is included in the table reproduced below. Attention must be directed to the fact that the quantities of water as set out in the table are those desirable in the paste regardless of the amounts or characters of the aggregates. This requires that the proportions of the aggregates must be determined

so that the resulting plastic mass shall have a degree of workability which will be suitable for its proper placing, or, in cases where the proportions are determined in the specifications, the amount of the water content must be selected as that quantity which is a minimum that will produce proper workability but not in excess of the quantity stated in the table. The table is:

Water Contents Suitable for Various Conditions of Exposure (gal. per sack of cement).

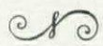
Type or Location of Structure	*Severe or Moderate Climate, Wide Range of Temperatures, Rain and Long Spells or Frequent Freezing and Thawing.*					*Mild Climate, Rain or Semi-And, Rarely Snor or Frost.*				
	Thin Sects.		*Moderate Sects.*		*Heavy & Mass*	*Thin Sects.*		*Moderate Sects.*		*Heavy & Mass*
	Reinf.	*Plain*	*Reinf.*	*Plain*	*Sects.*	*Reinf.*	*Plain*	*Reinf.*	*Plain*	*Sects.*
A. At the waterline in hydraulic or waterfront structures or portions of such structures where complete saturation or intermittent saturation is possible, but not where structure is continuously submerged:										
in sea water	5	5½	5½	6	6	5	5½	5½	6	6
in fresh water	5½	6	6	6½	6½	5½	6	6	6½	6½
B. Portions of hydraulic or waterfront structures same distance from the waterline, but subject to frequent wetting:										
by sea water	5½	6	6	6	6	5½	6½	6½	7	7
by fresh water	6	6½	6½	6½	6½	6	7	7	7½	7½
C. Ordinary exposed structures, buildings and portions of bridges not coming under above groups	6	6½	6½	7	7	6	7	7	7½	7½
D. Complete continuous submergence:										
in sea water	6	6½	6½	7	7	6	6½	6½	7	7
in fresh water	6½	7	7	7½	7½	6½	7	7	7½	7½
E. Concrete deposited through water	*	*	5½	5½	5½	*	*	5½	5½	5½
F. Pavement slabs directly on ground:										
wearing slabs	5½	6	*	*	*	6	6½	*	*	*
base slabs	6½	7	*	*	*	7	7½	*	*	*

G. Special Cases.

(a) For concrete exposed to strong sulfate ground waters, or other corrosive liquids or salts, the maximum water content should not exceed 5 gal. per sack of cement.

(b) For concrete not exposed to the weather, such as the interior of buildings or portions of structures entirely below ground, no exposure hazard is involved and the water content should be selected on the basis of the strength and workability requirements.

*These sections are not practicable for the purpose indicated.



STRENGTHS OBTAINED WITH NORMAL PORTLAND CEMENT AND VARYING WATER CONTENT

For aggregates generally employed in concrete construction, the strengths currently obtained with normal portland cement and varying water content are indicated by the following table:

Maximum Allowable Net Water Content Per Sack of Cement	*Probable Minimum Allowable Compressive Strength at 28 days*
5½ gal.	3750 lbs. sq. in.
6½ gal.	3000 lbs. sq. in.
7¼ gal.	2500 lbs. sq. in.
8 gal.	2000 lbs. sq. in.
8½ gal.	1500 lbs. sq. in.

As a guide to the strength of concretes which may be expected to be produced with normal portland cement and aggregates of qualities and gradations generally obtainable combined with water in various quantities per sack of cement, the following table has been included in the 1937 Progress Report of the Joint Committee. The quantities shown in the table are approximate. A sufficiently accurate rule that may be followed in the event that the slump of the resulting mixtures is desired to be modified without change of strength is: For each one inch difference in slump, change the amount of cement ⅛ sack per cubic yard, increasing it for slumps greater than 4 inches and reducing it for slumps less than 4 inches. The table follows:

Max. Size Coarse Aggregate in.	*Estimated 28 day Comp. Str. lbs. sq. in.*	*Cement Factor Sacks per cu. yd. Freshly Mixed Concrete*	*Max. Water per Sack Cement Gal.*	*Fine Agg. % Total Agg. by Weight (Range)*	*Approx. Wts. Saturated, Surface-Dry Aggregate per Sack of Cement (See Note Below)*		
					Total	*Fine Agg.*	*Coarse Agg.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	2250	4.9	8	40-46	660	280	380
2	2250	4.5	8	37-43	740	300	440
3	2250	4.1	8	34-40	840	310	530
1	2750	5.6	7	39-45	570	240	330
2	2750	5.1	7	36-42	640	250	390
3	2750	4.7	7	33-39	720	260	460
1	3000	6.0	6½	38-44	520	210	310
2	3000	5.5	6½	36-42	590	230	360
3	3000	5.1	6½	34-40	660	240	420
1	3300	6.5	6	37-43	470	190	280
2	3300	6.0	6	35-41	530	200	330
3	3300	5.5	6	33-39	600	120	380
1	3700	7.2	5½	36-42	420	160	260
2	3700	6.7	5½	34-40	470	170	300
3	3700	6.2	5½	32-38	530	180	350
1	4250	8.0	5	35-41	370	140	230
2	4250	7.4	5	33-39	420	150	270
3	4250	6.8	5	31-37	470	160	310

Note:—The approximate weight in columns (6), (7) and (8) are based on a bulk specific gravity of 2.65 in a saturated surface-dry condition.

CONCRETE PROPORTIONS

Concrete proportions, often including maximum allowable water content, for various classes of concrete which the designing agency desires to use in various portions of the work are embraced by the specifications. The manner of stating the proportions may be either by volumetric measure or by weight. In either case, the quantities are to be measured free of surface moisture. In the latter case, the class of aggregate assumed, or its specific gravity, is required to be stated in order to designate the basis of the specification.

Cement content is universally based upon the bag or barrel. In the United States, a bag weighing 94 pounds and containing one cubic foot is standard. A barrel contains four bags.

Water, when specified, is universally stated as a number of gallons per bag of cement.

Aggregates, in their job conditions, always contain some amount of surface moisture. Particularly in the case of sand, does this moisture affect the volume of the material. A relatively small percentage of water, less than 6 per cent, will cause loose sand to swell in volume as much as 20 per cent or more. It is imperative, therefore, that the relations between dry materials and the same materials in the job condition be determined in order to establish the proper amounts of job materials to utilize in the mixtures of the various classes of concrete.

Field observations sufficiently accurate for all practical purposes can be made by simple means. The required equipment embraces a set of scales of not less than ten pound capacity capable of weighing to single ounces, a set of scales of one hundred pounds capacity and a box of one cubic foot capacity and not less than one foot in depth. From the interior of stock piles, obtain samples of the materials in their natural conditions. The tests are made as follows:

1. Select a sample of damp material weighing about six pounds.
2. Weigh it and record the weight.
3. Thoroughly dry the sample in an oven.
4. Reweigh the dried sample and record the weight.
5. Weight of water is Item 2 minus Item 4.
6. Percentage of total moisture in dry aggregates is—(Item 5 times 100 divided by Item 4).
7. Percentage of absorbed moisture, assume 1%.
8. Percentage of surface moisture; Item 6 minus Item 7.
9. Weigh the box, empty; and record the weight in pounds.
10. Fill the box with loose, damp material.
11. Weigh the box filled with loose, damp material and record the weight in pounds.
12. Weight of one cubic foot of loose damp material in pounds is Item 11 minus Item 9.
13. Weight of surface dry aggregate in one cubic foot of damp loose material in pounds is—Item 12 times 100 divided by (100 plus Item 8).
14. Weight of water in one cubic foot of damp loose material in pounds is Item 12 minus Item 13.
15. Dry the one cubic foot sample thoroughly.
16. Pour the dry sample back in the box and compact it by lightly ramming in layers about three inches thick.
17. Measure the distance that surface of compacted material is below the top of the box.
18. Calculate the volume of dried material in the box in cubic feet.
19. Weigh box and dried sample.
20. Deduct weight of box to obtain net weight of dried aggregate.
21. Add 1% of Item 20 to that Item to obtain weight of surface dried material.
22. Divide Item 21 by Item 18 to obtain weight one cubic foot of surface dry aggregate.

23. Bulking factor is Item 22 divided by Item 13.

Application of the data procured during the test is simply made. For the aggregates, the amounts of damp, loose materials to be used in volumetric quantities are obtained by simple transformation of the statement of proportions for the various classes of concrete from dry volume to damp volume. This transformation is accomplished by multiplying the specified dry volume of the aggregates by their respective values of Item 23. The amount of mixing water, if specified, must also be corrected in order to give effect to the surface moisture carried by the aggregates. This is accomplished by multiplying the total weight of each of the aggregates used with one bag of cement by the corresponding percentage of moisture (Item 8) in the respective aggregates; adding the weights of the surface moisture thus obtained and dividing by 8⅓ to obtain the number of gallons of water in the surface moisture. The net water to be added is the total specified amount minus the volume of surface water thus calculated.

Following the determination of the data with respect to the aggregates, the proportions can be determined either in volumetric or weighed terms as will be applicable to the mixing equipment available for use upon the project.

An alternate method of determining characteristics of fine and coarse aggregates by volumetric measurements has been devised which is somewhat simpler in application and requires less equipment than the one described above. This method is predicated upon the relationship that 1 cubic foot equals 7.5 U. S. Gallons.

The equipment consists of two glass tubes for both fine and coarse aggregates. The tubes for fine aggregates should be from 2 inches to 3 inches in diameter and approximately twelve inches long. Those for coarse aggregates should be from 5 inches to 6 inches in diameter and approximately twelve inches long. The bottoms of the tubes are to be closed with watertight rubber caps or fused glass bottoms. Non-absorbent water-tight covers are to be provided.

The full heights of the tubes are to be divided into 15 equal parts with the main graduations and fractional graduations marked upon the tubes. These graduations shall read zero at the middle of the tube, 7.5 at the top and 7.5 at the bottom. For permanent tubes, the graduations should be etched upon the glass with acid. For tubes to be used temporarily, the graduations may be made upon celluloid or heavy paper glued to the tube and protected with shellac. It is important that both tubes for either aggregate shall be alike in all respects.

The methods of determining desired information by the use of the graduated tubes as above described will be outlined in their application to fine aggregate (sand). Application to coarse aggregate is the same except that the larger sized tubes are to be used.

a. Determination of Voids

1. Select a representative sample of sand weighing about 5 pounds by quartering.
2. Dry the sample to remove surface moisture. This may be accomplished in air or in sunlight. No attempt should be made to remove absorbed moisture. Drying should be done in thin layers until the sand flows freely through the fingers.
3. Fill one tube to zero line with water.
4. Pour in the dry sand until it reaches the zero line. During the pouring, agitate the sand with a glass or metal rod to release entrained air.
5. As the sand is poured into the tube, the water level rises from 0 to a level having a reading A.
6. The void ratio is:

$$\frac{7.5-A}{7.5}$$

7. For check purposes, the determination should be repeated three or four times.

b. Determination of Bulking Ratio

1. Fill one tube to zero line with undried sand.
2. Fill the other tube to zero line with water.
3. Pour the sand into the water; stirring with metal or glass rod to remove entrained air.
4. Top of sand in water will stand at reading B below zero.
5. Bulking ratio is:

$$\frac{7.5}{7.5-B}$$

c. Determination of Surface Moisture

1. Determine reading A as described for the determination of voids using previously dry sand.
2. Fill one tube with water to zero level.
3. Pour undried sand into the tube with the water until sand stands at zero level.
4. Top of water will stand at reading C.
5. Surface moisture in gallons per cubic foot of sand is:

$$C-A$$

d. Determination of Absorption

1. Determine reading A as described for the determination of voids using previously dry sand.
2. Cover top of tube tightly to exclude air.
3. Let covered tube stand one hour.
4. Read water level reading at the end of one hour. Call this reading, D.
5. Water absorbed in gallons per cubic foot of sand is:

$$A-D$$

e. Approximate Grading

1. Fill tube with sand to zero level.
2. Add water also to zero level.
3. Place cover on tube.
4. Shake thoroughly.
5. Allow to settle; during settling the heavier and lighter particles will arrange themselves in successive layers from bottom to top. Approximate grading and silt content may be obtained from an interpretation of the readings of the graduated scale.

In practice, exceptional conditions arise due to circumstances peculiar to the job. When the results appear to be inconsistent with those anticipated, supplementary studies must be made to ascertain the causes of the discrepancies and proper adjustments made to correct them. Examples of such conditions may be cited as: in Florida it was found that the especially porous and dry coarse aggregate contained so little moisture that it absorbed a considerable portion of the mixing water and resulted in too stiff a plastic mass which condition required the addition of sufficient water to supply the amount absorbed by the aggregate; in the case of heated materials mixed at a central mixing plant and hauled at low temperatures to the job, the loss of moisture by evaporation in transit required that the loss be compensated for by the addition of a corresponding amount of water at the mixing plant so that the proper consistency was obtained upon arrival of the concrete at the job.

Mixing Concrete.

Mixing of concrete embraces the operations required to take the constituent materials from storage piles and convert them into a plastic mass. It embraces the measurement of cement, aggregates and water, their conversion into a mass of proper consistency and discharge of the mass into vehicles or means of transportation to the forms.

The use of mixing machines is so general as to be almost universal. The use of mechanical mixers has been brought about through the development of dependable machines which are available in any size commensurate with construction needs. The modern machines are provided with built-in automatic devices to control the minimum mixing time and the addition of the predetermined amount of mixing water. The adjusting of these regulatory devices should be done to the satisfaction of the inspector after which they should be sealed or marked in such manner that the adjustments may not be changed without his knowledge upon casual examination of the control mechanisms. The use of such devices greatly simplifies the work of the inspector by relieving him of constantly watching the mixer and leaving more of his time available for supervision of other operations. The trend of modern specifications is to require the provision of automatic timing and water measur-

ing devices upon all concrete mixers. The enforcement of this provision should be waived under no circumstances. In specifications which embody no such provision, the inspector will save himself considerable effort and procure a more uniform job of concrete work if he can prevail upon the contractor to utilize a mixer so equipped.

For concreting operations of the usual magnitude, cement is delivered to the mixer in bags. The size of the batch invariably should be based upon the utilization of a fixed number of full bags per batch. Under no circumstances should batches requiring the use of fractional bags be permitted. For ready-mix plants and those employed upon large operations bulk cement is often used. In such cases, automatic weighing devices are generally employed for proportioning of the cement content. The setting and sealing of these devices should be inspected and verified by the inspector immediately prior to and occasionally during the mixing of any concrete scheduled for delivery to the project under his jurisdiction.

The amount of concrete in projects requiring only a few hundred yards of concrete, often at irregular intervals over several months, does not justify the contractor in providing equipment for automatically measuring fine and coarse aggregates. Wheelbarrow or measuring box methods are usually all that are warranted under such conditions. The verification of the quantities of aggregates to be used in each batch is a duty of the inspector. The required amounts of aggregates to be used in each batch having been determined by analysis hereinbefore described and the selection of the number of bags of cement to be used per batch, the inspector should supervise the marking of wheelbarrows or measuring boxes so that all containers for the respective aggregates are loaded alike and as nearly full as possible.

For projects requiring larger quantities of concrete, the contractor will often find it desirable to install automatic measuring hoppers for fine and coarse aggregates. Such hoppers are universally utilized at ready-mix plants. The older measuring devices generally provided automatic volumetric measurement while the later devices generally provide weighed measurement. In either case, the quantities of aggregates are determined automatically. In the utilization of such equipment, the inspector is called upon to verify the setting and sealing of the automatic or adjustable features in order to insure proper amounts of aggregates in the individual batches.

The inspector will quickly become familiar with the appearance of properly proportioned and adequately mixed concrete of the classes required for the work under his jurisdiction and produced from the materials available for that work. Variations in the amounts of mixing water arising from changes in moisture content of the aggregates, particularly the sand, or from other causes will be quickly apparent to an experienced inspector as will also variations in the quantities of cement and coarse aggregate. The observance of changes in the physical appearance of the plastic mixture should be notice to the inspector to check the operations at the mixer as promptly as possible in order to ascertain the causes of the observed variation and to institute corrective measures when such are required. There is an old feeling among practical construction men that there is no substitute for a practiced eye in concrete work. The advanced developments in concrete practice and equipment have not entirely removed the need for a well trained eye and quick comprehension on the part of the inspector.

The period of mixing has a very marked effect upon the strength of the resulting concrete. Tests indicate that the effect of the mixing time upon the strength of concrete of fixed proportions at various ages is approximately represented by the values of the following table in which the compressive strength of 28 day old concrete mixed for two minutes is used as a base of 100.

Specifications often limit the minimum permissible mixing time. In no event, even with the most efficient mixers, should the minimum be less than 1½ minutes. Authorities generally agree that mixing in excess of 2 or 2½ minutes adds little to strength although it may improve workability.

AGE AT TEST

Mixing Time	*7 days*	*28 days*	*3 mos.*	*1 year*
0 min. 15 sec.	28	74	133	181
0 " 30 "	30	81	137	188
1 " 0 "	35	88	144	194
2 " 0 "	42	100	158	207
3 " 0 "	49	107	168	216
4 " 0 "	53	112	172	221
5 " 0 "	57	114	176	223
10 " 0 "	70	123	184	228

Thorough mixing has a marked effect in improving the workability of the concrete and also in producing a denser and more watertight mass. For structures exposed to severe weather or requiring watertightness, better results may be expected to ensue from the use of mixing times longer than normally employed where strength alone is a factor.

Transporting of Concrete.

The primary consideration in the transportation of freshly mixed concrete from the mixer or from the point of its delivery to the site in cases where ready-mix concrete is used, is the depositing of the plastic mixture in the forms in as nearly the condition in which it was discharged from the mixer as possible. The principal unfavorable influence upon the quality of the finished concrete which may be expected to follow improper transportation of freshly mixed concrete is segregation in the mass as a result of which large aggregate is deposited in the work in pockets which are deficient in mortar to properly bond it together. By this means, the uniformity of the finished mass is lost and its strength and watertightness are greatly impaired. When such pockets appear against the forms, the appearance of the finished surfaces is unsatisfactory and considerable expense must be incurred in patching or otherwise making good the deficiency.

The means used in the transportation of freshly mixed concrete is determined almost entirely by the contractor's decision concerning the most advantageous and economical method which will meet the requirements of the particular project. In many cases, the utilization of equipment already owned may prove of greater advantage to him than the use of new equipment by which labor costs might be reduced or the work more expeditiously handled, for the reason that purchase of the new equipment would involve an outlay of additional capital which could not be recovered out of the operations immediately in prospect upon which it could be used. In general, the means of transport utilized is not a matter for determination by the inspector whose interest should be restricted to the results of the utilization of the means of transportation employed as they appear in the condition of the mass delivered at the forms. Any method which causes segregation or other injurious influence upon the freshly mixed concrete to be placed in the work should be condemned and a method which will yield satisfactory results should be insisted upon.

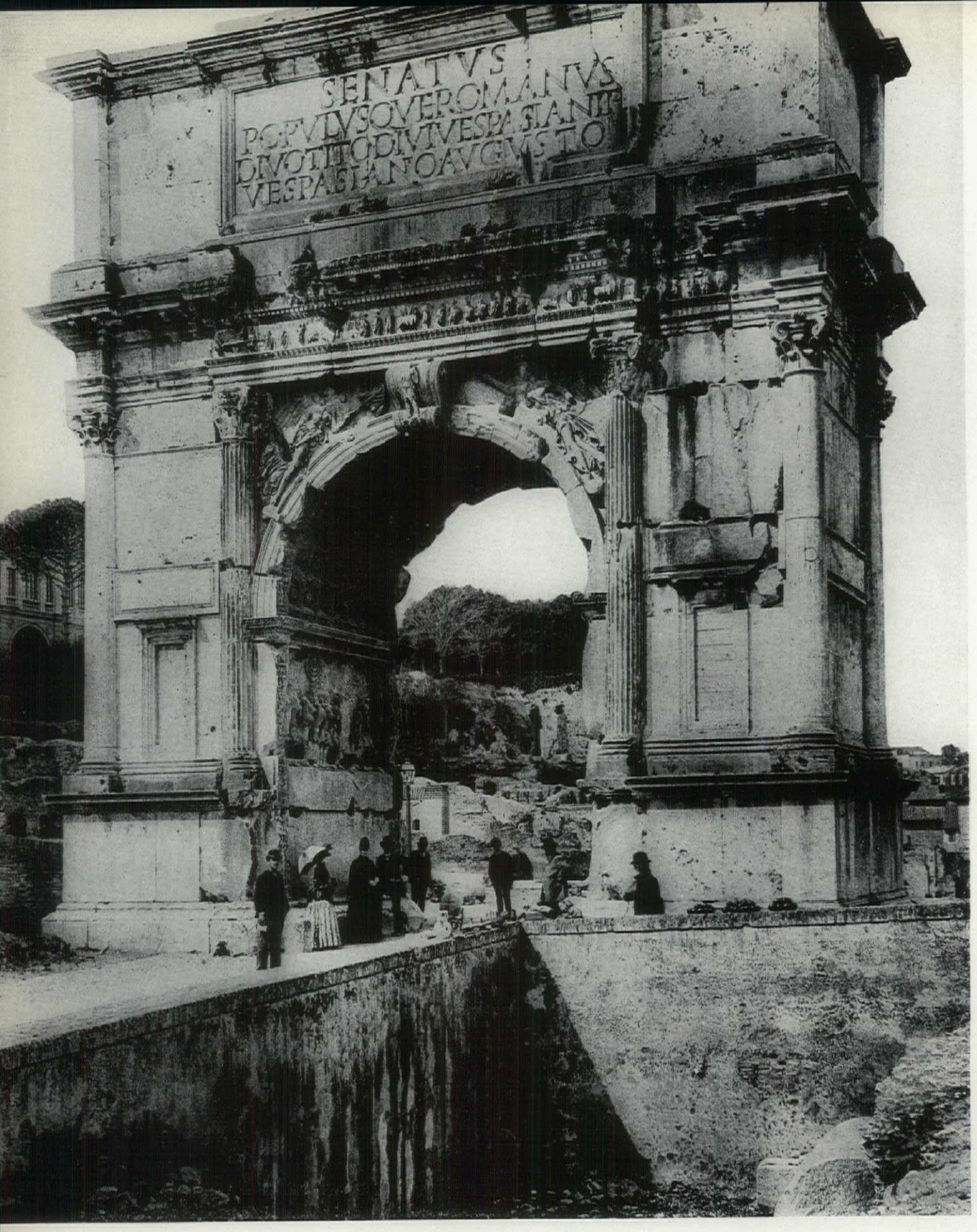
Upon small projects, the usual means of trasporting concrete is by the use of wheelbarrows or buggies. Hauling over rough runways or long hauls over any runways will have a tendency to cause segregation.

Upon larger projects, chuting plants may be utilized. The maximum slope of chutes should be one vertical to two horizontal; the minimum, one vertical to three horizontal. The consistency of the plastic mass should be such that it will flow slowly and smoothly from the receiving hopper along the chute to a hopper without segregation whence it should be distributed by buggies or wheelbarrows.

When ready-mix concrete is delivered in trucks to the site, it should generally be dumped into hoppers and rehandled into the work. A possible exception may be made in instances where truck mixers are used for delivery of the concrete to the site and where heavy foundation footings or mats are being placed. In these instances, it may be permissible to chute the fresh mass directly to its position provided that the operations can be performed within the limits prescribed for the use of chutes.

Stiff mixes are less susceptible to segregation than

(*Continued on page* 42)



One of the reasons for the celebration described on the following pages was the acquiring of permanent quarters for the American Academy at Rome, so that young America might view heritages of the past like the Arch of Titus, for such value as it might be to them.

A HISTORIC ARCHITECTURAL GATHERING

The Meeting of the American Institute of Architects to Celebrate Two Great Architectural Events

AWHILE ago, the process of cleaning old archives brought to light a printed transcript of a meeting of the American Institute of Architects held in Washington on January 11, 1905.

A meeting which, attended as it was by cultured, talented, public-spirited and famous persons, was a very historic occasion.

Celebrating with a lavish exuberance the full flowering of American architecture, it marked the beginning of a Periclean age. The country was emerging from the experience of the Spanish War, the long depression of 1873 and the Civil War; and it seemed instinctively to feel that there was now before it an extended period of prosperity.

It was a meeting full of prophecy; for from that time prosperity, unbroken even by the World War, continued for twenty-four years. In that time came a studied if not always perfect architecture and great achievements that always go with good architecture. In this case, the achievements were far greater than in other exalted periods of history. They included the automobile, the airplane, the development of the telephone and of electric power, the movies and the miraculous radio.

As if sensing that they stood upon a Threshold, there assembled in Washington the almost full roll-call of American celebrities. It is scarcely conceivable that they could have been so assembled.

Risking being tedious, it is important to remind you of some of the people who were present there. Public office was represented by President and Mrs. Theodore Roosevelt, Uncle Joe Cannon, Ambassador Jusserand, Elihu Root, Justice Harlan, Whitelaw Reid, and scores of other great names. Business sent the elder J. P. Morgan and the great railroad captain, A. J. Cassatt. The Church sent the beloved Cardinal Gibbons and Bishop Satterlee.

Literature was represented by such names as Thomas Nelson Page, Henry James, Finley Peter Dunne, Norman Hapgood, Charles Emory Smith; the great field of letters by C. C. Harrison, Nicholas Murray Butler, Charles Moore and Charles L. Freer.

Art had John LaFarge, Daniel Chester French, Charles Dana Gibson, Augustus Saint Gaudens, Edwin H. Blashfield. Science had Simon Newcomb, S. P. Langley. The great names of Architecture were there: McKim, Post, Day, Cram, Tilton, and all that bright list of contemporary celebrities. Stanford White was there, for whom thereafter there remained but few festivities.

There were representatives besides of nearly every other walk of life. One finds in the list such unexpected names as the editor of the *Churchman*, a representative of the London *Times*, the Panama Canal Commissioner, the Commissioner of Indian Affairs, the Superintendent of West Point,—showing how widespread was the interest in this occasion.

The celebration was two-fold. As Charles Moore said, "The significance of the occasion lay not in the fact that it celebrated achievement; but rather because it anticipated the successful culmination of two great hopes and aims of the Institute."

The first of these was to celebrate the successful culmination of a long fight for the architecture of the City of Washington, ending in (again quoting Mr. Moore) "definite official approval to the idea that the day of unrelated buildings had passed and that the National Capital should be enlarged, extended and made beautiful in an orderly and systematic manner."

The second celebration was the fixing on a firm and permanent foundation of the American Academy of Rome by the purchase for its use of the famed Villa Miraviore. This structure cost a million dollars and gifts to pay the huge purchase price had been started by the donation of one-fifth of that amount by J. Pierpont Morgan.

The speeches were full of charm and interest. What could be more compelling than the naive words of the lovable Saint Gaudens, in his half-minute speech:

"Charles F. McKim has assured me that it is essential that I should speak tonight. This is as flattering as it is fallacious; for although I have doubts about many things in life, on one subject I have absolutely none; and that is the utterly hopeless and helpless limitations of my oratory. It is much more calculated to reduce listeners to tears than to contribute to their entertainment or instruction."

The audacious playboy, Uncle Joe Cannon, was at that time the idol of Washington. His undimmed youth was reflected in his much-quoted word that the trouble with the Capital was "there was nothing to do between midnight and bed-time."

He started his inimitable speech on this occasion by stating that he had not heard the subject upon which he was to speak but that he would follow the same method he used as a boy when he went shooting with a gun of wide spread in the hope that by extreme territorial coverage he would bag an "indolent squirrel."

"I hardly know what to say to architects," he confessed, "I suppose when you called on me, you must have felt like the Prohibition orators of the Middle West who never felt fully equipped without a bad example. What I don't know about Art and Architecture, Mr. Morgan (he turned to J. Pierpont), would make a library larger than all your wealth could buy."

His speech was full of the quaint financial statistics of which he was so fond. His comment on the

architecture of the Congressional Library was that, as he had been told, it cost the Government a dollar and sixty cents every time a book was lifted from its shelves.

In closing, with his unerring instinct, he expressed, perhaps without being actually aware of it, the underlying thought of everyone there present, "I have faith to believe that in time we shall present to the world the strongest and the best people and the highest civilization on earth."

Amidst such a galaxy of speakers it was inevitable that one (and perhaps there were more who did not mention it) who was caught in that not-infrequent oratorical jam which is the despair of all post-prandial speakers. Said John LaFarge, "The gentlemen who have spoken before me have said almost all that I could have wished to say."

And Representative McCleary, speaking at the close (upon the subject) "The Congress of the United States; the incarnate expression of the will of all the people," (which one newspaper on the following day printed with "inaccurate" for "incarnate") said in a mood not infrequent for speakers so placed: "A boy once defined 'appendix' as 'something near the end of the book which it is not necessary to read.' At this late hour I feel a good deal like the appendix."

He then went on to tell about a man who, unexpectedly called upon to respond to a toast, "The Ladies," stammered and said, "Why, Mr. Toastmaster, I am unaccustomed to public speaking, and I don't know why I should be called upon, but any man should be able to say something to such a toast. Women suggest beauty and grace, flowers and poetry. Having no appropriate thoughts of my own, I shall use the thoughts of another who expressed his thoughts in verse:

'Oh, woman, in our hours of ease,
Uncertain, coy, and hard to please—'

and then he forgot and scratched his head and thought. Then his face brightened, and unconsciously changing from Scott to Pope, he added,

'But seen too oft, familiar with its face,
We first endure, then pity, then embrace'."

Justice Harlan was asked to respond to a toast that was thirty years ahead of time, which he adroitly skated around. "I am asked," he remarked, "to say something suggested by the sentiment that 'There is a law higher than the Constitution.' Precisely what was in the mind of the gentleman who prepared that toast I do not know. It may be that he had in view the scale of fees adopted by the American Institute of Architects, and that he desired to express the thought that such a scale should be taken as a law higher than any constitution! Or, it may be that he had in mind that law of nature which gave Mr. McKim, Mr. Hornblower and myself (bald heads all) such fine suits of hair as to excite the envy of all architects."

Elihu Root said, "Tomorrow's sun will cast over the great Avenue that leads to this place the shadow of the Capitol wrought out of the work of Thornton, and Hallet, and Bullfinch, and Hadfield, the architects who gathered their inspiration not only from the classic works of art but from the love of country and the serene natures of Washington and Jefferson. The place is full of the associations and traditions of that day far past, a day back to which the people of our country are turning with ever more and more solicitous desire to gather the inspiration of the earlier time."

President Roosevelt, full of enthusiasm for the gathering and for the purpose which it represented, observed: "In this nation of ours, while there is very much in which we have succeeded marvelously, I do not think that if we look dispassionately at what we have done, we will say that beauty has been exactly the strong point of the nation! It rests largely with gatherings such as this, and with the note that is set by men such as those I am addressing tonight, to determine whether or not this shall be true of the future."

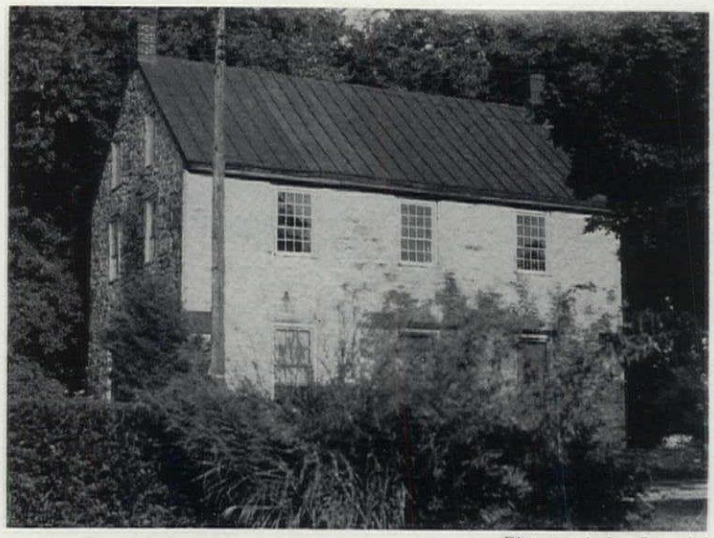
And then he exclaimed in words that might well be perpetuated to describe the great profession of architecture:

"We hear a great deal about true Americanism. Now, the real American, the American whom it is worth while to call such, is the man whose belief in work and work for America are not merely for the America of today, but for the America of the future. It is a comparatively easy thing to do work when the reward is to come in the present; but every great nation that has ever existed on this globe has been great because its sons had in them the capacity to work for the well-being of generations yet unborn. Such spirit is peculiarly necessary when the work we desire to have done is essentially work of a non-remunerative type—non-remunerative in more than one way, non-remunerative in money, and it may be in fame."

Charles Moore, in the foreword of the transcript of the speeches on this occasion, aptly summarizes:

"The virtual accomplishment of the two purposes which led the American Institute of Architects to plan and carry out their annual dinner on so impressive a scale, has seemed to justify the preparation of the report of that dinner in a manner in keeping, to some extent, with the importance of the event. And the permanent character of the addresses makes them worthy to be preserved as discussions of the substance of things hoped for and the evidence of things as yet not seen."

BROOKEVILLE ACADEMY



Photograph by Joannini

BROOKEVILLE, MARYLAND

ONE-DAY CAPITAL OF THE UNITED STATES

from historical data compiled by

Edith Brooke Green

WHEN the British sacked the city of Washington, August 25, 1814, President Madison and his wife Dolly were disturbed at dinner by the alarming news that the British were entering the city.

Stuffing her silver tea-spoons into her reticule, Dolly fled to Virginia, while President Madison mounting his horse and with papers of state tucked under his arm, rode at the terrific speed of eight miles an hour up the Brookeville road.

Arriving at the home of Caleb Bentley, at Brookeville he was afforded hospitality by that worthy friend and so for twenty-four hours the little town was the capital of the United States.

Brookeville had been founded in 1794 with the building of a grist mill by Richard Thomas, who named the town for his wife Deborah Brooke. Caleb Bentley set up a general store and it was at his house that Madison was entertained and housed for the night.

There follows a part of a letter by Mrs. Margaret Bayard Smith concerning the hegira to Brookeville:

"We received information that the British had debarked at Benedict. The alarm was such that on Monday a general removal from the city and Georgetown took place—We left by carriage and reached Brookeville in perfect health — received a warm, kind welcome from Mrs. Bentley and excellent accommodations.

"The appearance of the village is most romantic and beautiful. It is situated in a little valley, totally unobserved in woody hills with a stream flowing at the bottom on which are mills. In this secluded spot one might hope the noise or rumor of war would never reach. Here all seems security and peace—

"Our militia ordered to Baltimore, and every hour the weary, terrified men are passing the door. Mrs. Bentley kindly invited them in to rest—Her house is now overcrowded. I never saw more benevolent people—She says, 'It is against our principles to have anything to do with war but we receive and relieve all who come to us.'

"The President arrived at Mrs. Bentley's and spent the night. The scene in Brookeville has been novel and interesting—all hands went to work to prepare supper and lodging for him. He was tranquil as usual and though much distressed by the dreadful event which had taken place, not dispirited."

Photograph by Joannini

THE CALEB BENTLEY HOUSE WHERE MADISON STAYED

ON the wall of the house hangs a copy of the following letter written that night by Madison to his wife, Dolly:

"Brookeville, Maryland,
August 27, 1814.

My dearest—

"Finding that our army had left Montgomery Court House, we pushed on to this place, with a view to joining it, or proceed to the city as further information might prescribe. I have just received a line from Colonel Monroe saying that the enemy were out of Washington and on the retreat to their ships, and advising our immediate return to Washington. We shall accordingly set out thither immediately.

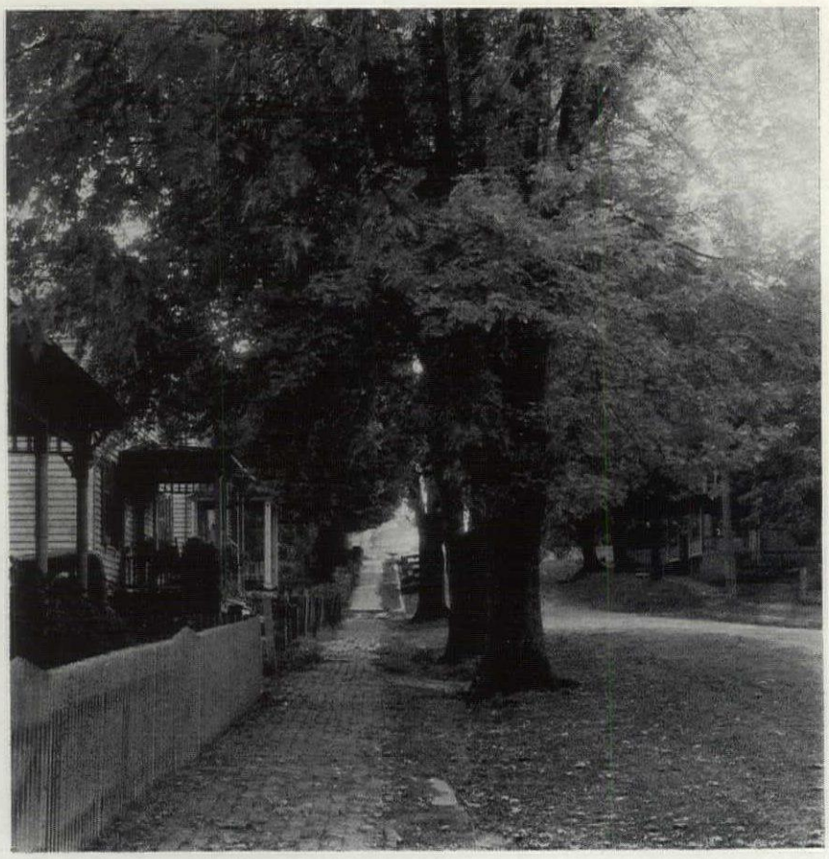
"You will all of course take the same resolution. I know not where we are, in the first instance to hide our heads, but shall look for a place on arrival. Mr. Rush offers his house in the six buildings and the offer claims attention. Perhaps I may fall in with Mr. Cutts and have the aid of his advice. I saw Mr. Bradley at Montgomery Court House who told me Mrs. Cutts was well.

"Janney will give you some particulars which I have not time to write.

Truly yours,
James Madison.

"Since the above it is found necessary to detain Janney and send a trooper."

It is interesting to note that the wife of a certain Samuel Harrison Smith, editor of the *National Intelligencer* who also took refuge at Brookeville wrote in her diary at that time, "It is not likely that Washington will ever again be the capital of our country."



THE picture on this page shows the pastoral serenity of Brookeville, which still endures. The streets, cool beneath the rows of great trees, have that appealing dignity as if still conscious of a former historic day.

To the extreme right is a building close to the sidewalk which is said to be the oldest house in the town. From its second-story window a gentleman named Pleasants launched the first aeronautical venture in this vicinity. He made a pair of wings which he put on his son and standing the boy on the sill, said, "Flap, Basil, flap." This Basil did and landed in the barnyard, proving practically nothing.

THE WASHINGTON MONUMENT IN BALTIMORE, ROBERT MILLS, ARCHITECT

BY RICHARD X. EVANS

Great, Great Grandson of Robert Mills

A historical account of the battle of Germantown during the Revolutionary War states:

"An interesting scene here took place. Washington, anxious to put an end to the brutal sacrifice of life consequent on this attack, turned to his Generals, and in a calm voice asked for an officer who would consent to bear a flag of truce to the enemy. A young and gallant officer of Lee's Rangers sprang from his horse—his name, Lieutenant Matthew Smith, of Virginia. He assumed the snow white flag held sacred by all the nations, and advanced to Chew's house, where the enemy was entrenched. In a short time he was lost to sight, amid the folds of the fog. A moment the firing ceased, and the young officer went steadily on and stood within thirty paces of the house, and waving his white flag on high rushed towards the hall door. Alas! he never reached it. He was cruelly shot down. A volley of fire blazed from every window, and the whole American army looked in vain for their messenger of peace. That flag was stained with blood—it was the warm blood flowing from the young Virginian's heart. His comrades wrapt his body within its folds and consigned it to the tomb."

This Matthew Smith was the brother of Gen. John Smith, of Hackwood Park, Va., who was the father-in-law of the great American architect Robert Mills. In all probability, it was this incident in the life of a member of his wife's family that endeared the Revolutionary scene to him and interested him in his two famous monuments to Washington, the first of which was erected in Baltimore in 1815.

The architect was 34 years old when he won the premium of $500 for the best design for this memorial to Washington, in competition with the foremost artists of the nation.

Washington, writing in 1791 in reference to a plan for a proposed monument to the American Revolution, expressed his approval of this type of memorial in the following words: "Among the means employed by the wisest and most virtuous people for nourishing and perpetuating the spirit of freedom and patriotism, monumental representations are known to be amongst the most ancient, and perhaps, not the least influential." It is fitting that the very conception which Washington approved for memorializing all the Revolutionary patriots should have been accorded to him alone a few years afterwards.

Rembrandt Peale, the artist, justly famed for his many portraits of Washington, tells in his reminiscences in "The Crayon, 1856" how he assisted Mills in decorating his design to be placed at the bottom of the Monument as part of the ceremony of laying the corner stone. Peale added to the group one of his own portraits of Washington, judged by relatives and personal friends of the President, "to be the most accurate resemblance of the General extant." This portrait, painted from life, was sold to the Government, and for many years decorated the Senate Chamber in Washington.

After the orations and invocation of the day had subsided, the vast multitude witnessed the architect, his assistants, and the operative masons, place the corner stone into position. As corner stones keep their secret well, and generations later their contents are forgotten, it is well to repeat here what was enclosed on that important occasion. Deposited in the stone was a sealed glass bottle containing the likeness of Washington, his valedictory address, several Baltimore newspapers, and the different coins of the United States. The stone was engraved as follows:

"WILLIAM STEUART
and
THOMAS TOWSON,
stone cutters.
SATER STEVENSON,
stone mason."

A copper plate, enclosed with the rest, bore the legend:

"ON THE 4th OF JULY, A.D., 1815,
was laid this
FOUNDATION STONE
of a
MONUMENT
to be erected to the
memory
of
GEORGE WASHINGTON."

On the reverse appeared:

"DIRECTORS

John Comegys,	Washington Hall,
James A. Buchanan,	Lemuel Taylor,
Robert Gilmor, Jr.	George Hoffman,
Isaac M'Kim,	Edward J. Coale,
Wm. H. Winder,	James Partridge,
David Winchester,	Nicholas C. Ridgely,
Fielding Lucas, Jr.	Robert Miller,
James Cooke,	Nathaniel F. Williams,
John Frick,	Levi Hollingsworth,
James Williams,	William Gwynn,
James Barroll.	B. H. Mulliken.

ELI SIMKINS, Secretary.
ROBERT MILLS, Architect.
EDWARD JOHNSON, Mayor.
The Site presented by Col. John Eager Howard."

(*Continued on page* 40)

ALADDIN rubbed a lamp...

He flips a key!

Little short of magical is the convenience of intercommunication as offered today by Dictograph. Think of it! A flip of a key on a magic box practically puts an entire organization on this executive's desk.

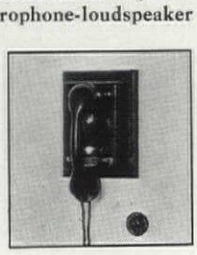
In a twinkling his associates and personnel are at attention. They are ready to give information, counsel and reports; on their toes to execute orders. Conferences may even be held without taking a single man from his duties. . . . All this without stopping to dial or waiting for an operator. The executive speaks in a low voice, without leaning over to talk or to hear; he may even walk around the room as he speaks. At all times both hands are free for notes, papers or to stroke his hair as he thinks.

Close to 9,000 executives are now using Dictograph Intercommunicating Systems to save time, to ease nerve strain. Architects today include these systems in plans for new buildings and for alterations. They know that Dictograph is as necessary as correct office arrangement for efficient organization administration. Dictograph, they agree, is modern magic—a vital factor in the solution of all problems of intercommunication.

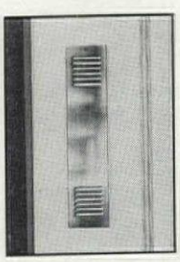
THE DICTOGRAPH DOORMASTER guards the home and serves it too!

Dictograph systems similar to those for offices are also available to assure co-ordination of all activities in large homes. And now, to these, has been added the DICTOGRAPH DOORMASTER —that not only provides the convenience of room-to-room communication, but *guards* the home as well. It offers invaluable protection where women are likely to be present alone.

In its simplest form, the DOORMASTER system consists of a combination microphone-loudspeaker nested in the entrance doorjamb and a hand-set or wall-type telephone located conveniently inside the home. When the caller rings the regular doorbell, the occupant picks up the hand-set and asks, "Who's there?" The caller hears the inquiry through the loudspeaker and replies, his voice being picked up by the microphone and transmitted inside. Until he identifies himself satisfactorily, the door remains unopened.



Dictograph Doormaster wall-type hand-set sometimes preferred for kitchens, garages, etc.



The Dictograph Doormaster Unit, a combination microphone and loudspeaker, nested level with entrance doorjamb. No phones or speaking tubes needed.

Another DOORMASTER system includes an additional microphone-loudspeaker at the rear entrance door. Still another has these *two* entry protections plus *three* interior stations, thus combining protection with the great convenience of room-to-room communication.

Dictograph Doormaster table-set, one of two models for use inside the home.

• For further details regarding Dictograph Intercommunicating Systems for Offices and Homes communicate with Dictograph Products Co., Inc., 580 Fifth Avenue, New York, N. Y. Dept. F. A.

DICTOGRAPH INTERCOMMUNICATING SYSTEMS

(*Continued from page* 38)

Among the ceremonies which followed the laying of the corner stone, the president of the Washington Monument Society addressed Mills as follows:

"The managers, appointed by the Legislature of Maryland to superintend the erection of this Monument, intended to hand down to the latest generation, the love of country, the disinterestedness, the valor, and the patriotism of one of the greatest and best of men that ever lived in any age, having the most unbounded confidence in your skill and integrity as an architect, do now entrust you with these symbols, (handing the S. P. and L.) by which you are to prosecute, according to that design, (pointing to a representation of the Monument, as designed by Mr. Mills, painted by Mr. Warren,) a Monument which may do honor to yourself as an architect, as well as those who have confided in you, and be in some degree commemorate with its object."

The architect answered:

"The honor, sir, you have been pleased to confer upon me, I hope to prove that I duly appreciate, by a faithful performance of the duties incumbent on me as your architect.

"I feel a double inducement to use my best exertions to execute faithfully, and with ability, the important duty entrusted to me, from the recollection that the work to be performed is the execution of a monument to perpetuate our country's gratitude to the father of her liberties; and that you have given a preference to native talent in the choice of a design for the work."

A diary of the architect for the year 1816, in the Library of Congress, testifies to the zeal with which Mills daily undertook the multitudinous duties of supervising the erection of the Monument, at the same time continuing his architectural work in the design of a church in Baltimore, a monument in Richmond, numerous private residences, and acting as president of the Baltimore water works.

For twenty years work continued on the Monument. In the first year, large stones of solid mass were laid as foundation. Subfoundations of the columns and walls of the grand base were raised in the following year. The third year saw the column at half its height. In the fourth year the column, completely finished, awaited the capital, and in the fifth year only the statue remained to be placed upon the top. In 1824, after some time had elapsed for the Monument to reach the necessary solidity before the statue was raised, the scaffolding about the obelisk was removed. General Lafayette was present at this event. In 1826 the marble terrace was erected over the grand base, and in 1827 the colossal statue of Washington, 16 feet in height, was raised to its position. Finally, in 1836 the Monument was enclosed with its bronzed iron palisade fence, composed of shields, facial columns and spears. All the white marble used in construction had been obtained from quarries in the vicinity of Baltimore.

The artist, Caucici, who had worked on the sculptures of the Capitol, spent two years in modelling the statue of Washington from a single block of marble, 30 tons in weight. To bring the 15 ton figure of Washington to a height of 160 feet was a gigantic task in those days. No one knew how it was to be done, until Mills, who had learned his engineering as an apprentice in Latrobe's office, accomplished the task by a small pair of shears being sent to the top of the Monument, through which medium a great derrick was eventually elevated into position, and the statue raised with fine precision to the highest apex of the Monument.

Throngs witnessed this feat of engineering skill. A commodore of the U. S. Navy, who was present, stated: "If I had a seventy-four ton ship hitched to the end of this cable, sir, I would not be afraid to hoist it to the top of this Monument."

When the statue stood in its final place, a great eagle circled above its top, and a brilliant star appeared in the sky, which only a few moments before had been darkened with clouds. Mills writes: "The appearance of the eagle and the star on this occasion were facts witnessed by many on that day. And the architect of this work, on another occasion, witnessed the appearance of the same star (Venus) on laying the corner stone, with General Lafayette, at Camden, S. C., of the monument to the lamented General De Kalb, who fell in defense of our liberties."

This statue, which depicted Washington in his own dress, was an innovation of a period prone to represent its heroes garbed with Roman toga or Grecian robe. The architect, in giving directions to the sculptor, stated that the classic effect might be preserved and yet have the figure clothed in a costume which would familiarize us with the man, and not with some Grecian philosopher or Roman senator. Caucici succeeded in this departure from the accepted style. The figure symbolizes General Washington's resignation of his commission to Congress, assembled at Annapolis, December 23, 1793, at the moment he advanced to the chair of the president to deliver the commission, having just concluded his speech with the words: "Having now finished the work assigned me, I retire from the great theatre of action, and bidding an affectionate farewell to this august body, under whose orders I have so long acted, I here offer my commission, and take my leave of all the employments of public life."

It was the first real statue of Washington to be sculptured, and the first Monument erected to his memory in the history of the land, by the first architect educated and born in America.

As the monument stands today, 180 feet high, we see its great Doric column, symbolical of strength, rise up above a little hill at the intersection of the four principal avenues of Baltimore. Its bronze doors lead to vaulted galleries with white marble floors, illuminated. Marble tablets above the door bear the legend in bronze letters, "To George Washington, by the State of Maryland."

Two hundred and twenty marble steps lead to the top of the Monument. We are told that in 1849 the visitor ascending those steps must proceed with the greatest caution, "as more than midnight darkness lies before him." A keeper of "uniform urbanity" showed the way with a lantern. A fee of 12½¢ was charged each visitor, who was also required to place

his name in a register book, kept for that purpose near the entrance.

At the top, finally, he was rewarded with a view of the whole city, studded with handsome edifices, great domes and glittering spires, and in the background the Patapsco placidly flowing into the Chesapeake; and still further, at the very verge of the horizon, on a clear day, Kent Island.

LETTERS (unpublished)

John Montord to Robert Mills

"Monument Place,
Baltimore, June 8th, 1815.

Sir:

Mr. McNulty is now progressing with the foundation, and unless prevented by bad weather will have it completed in the early part of next week. He has come to vein of good building sand, which I have directed to be thrown aside for the use of the masons; he desires me again to mention his want of money for the purpose of paying his men who are at work here.

Mr. Wolfe has commenced the wall, and progresses very fast. He expects to come to water this week; if he should want brick for the purpose of walling it up, before your return, I have directed him to provide them himself.

Steuart and Towson have given directions for their shop and wish it placed outside of the 200 ft. Square. Mr. Steuart told me he had spoken to Col. Howard, on the subject, who was satisfied it should be there provided he would pay the $40 pr. annum he now receives for the park as a pasture, which I believe Mr. Steuart has consented to do rather than be confined in the limits marked out.

Respectfully,
Yr. obt. Servt.
Mr. Robt. Mills. Jno. Montord."

Anthony Printens to Robert Mills.

"To the Honoured and Respected Architect
of the Washington Monument of Baltimore,
Mr. Robert Mills, Esq.
The Humble Petition of Anthony Printens,
Respectfully Showeth,

That your Humble Petitioner is Latterly from Charleston, South Carolina, where he has resided fourteen years and where he has Latterly become a Citizen of the United States, by a Certificate of Citizen Ship delivered to him by the honourable Judge of the Federal District Court of the said City;

your Humble Petitioner, therefore Respectfully Submits to your Consideration his intention of becoming the Keeper of the Washington Monument, if ever one was wanted;

your Petitioner, does venture to suppose that he possesses Some Qualification suitable to that Situation, Knowing how to Speak English, French, Spanish and Italian, and his wife Speaking English, French, German and Italian, and being both acquainted with the *Suavity in Modo* of those nations by travelling in their Countries;

your Petitioner dares venture to represent to your honour that he would fulfill his duty according to your instructions, in a worthy manner, of deserving your Complet and ample Protection;

your Humble Petitioner, farther Submits to your honour for Recommendations of his Sobriety, Integrity and Morality, Mr. Lucas, Esq., an honourable Member of the Washington's Monument Building Committy, and reference to a Respected friend of his, Mr. Armstrong, Esq., Likewise, Mr. Butson, who Lives close by the Washington Monument; and your Humble Petitioner,

Very Respectfully,

Robert Mills to Robert Gilmore, Jr. (London)

"Baltimore, April 7th, 1818.

My Dear Sir:

But a few moments are allowed me to write a few lines. Mr. Neilson has just informed me of his departure for England, and tho' I shall be denied time to write in detail, yet I cannot think of your leaving England on your return home without doing myself the pleasure of addressing you. It has been long my intention to enclose you the drawings of the decorations for the Washington Monument, to enable you (according to proposal) to procure some information of the probable cost of executing them from Bronze either in England or France, but a variety of delays I fear will defeat my purpose in regard to the drawings, but may I not anticipate your recollection of the nature of these proposed decorations so as to obtain some correct information relative to their cost? I trust you will not be at any loss. You remember the character of these decorations, viz. Around the Base upon the Frieze there were to be a series of wreathes, of oak or laurel; at the Base of the Column & against the shaft, a series of Colossal Shields were to be placed; over these besides the inscriptions, were to be the Roman Eagle on each front, passing thro' wreathes, & connected together by a festoon'd garland or drapery. The uppermost decoration is composed of wreathes with a spear passing thro'. It was contemplated to make the whole capital of the Capital of Bronze, the oval wall & neck enriched, & perhaps the abacus or sqr. part. The statue of Washington would of course be of Bronze if the other decorations were of this material. The dimensions of this figure would be colossal, not less than 15 feet, perhaps 20 feet.

Except the Statue, all the rest of the castings would be very simple & easy to mould. I hope this brief explanation will suffice to enable you to ascertain such particulars of cost, as will enable the Committee to make up their minds on the subject of the decorations.

We are making preparations to resume our Spring operations, & hope in the course of this season to raise the Monument 100 feet high. We shall welcome you with sincere pleasure back to your home, & trust yourself & lady will be much favoured in every blessing. It gives me much satisfaction to learn of the benefit you have received in health by your voyage. Present my best respects to your lady & receive Dear Sir for yourself the salutations of your indebted

Robt. Mills."

(*Continued from page* 31)

sloppier mixes. Specifications universally restrict the maximum amount of water that may be used and therefore permit the minimum amount to be determined by requirements imposed by job conditions. It is fundamental, however, that no water be added to freshly mixed concrete after discharge from the mixer.

Placing Concrete.

The placing of concrete embraces the operations required to deposit the freshly mixed plastic mass in the place which it is desired that the hardened concrete will occupy. It embraces the casting of the plastic mass in the forms, the puddling and working required to completely fill corners and surround embedded reinforcing steel, the compacting of the mass to procure maximum density, the spading required to obtain mortar facing against forms, the removal of excess water and the finish of the exposed top surface.

Preparatory to placing concrete in the forms, all chips, dirt or foreign substances must be removed and the surfaces of the forms exposed to the fresh concrete thoroughly wetted or oiled. Traps or temporary openings at the low point of the forms should always be provided for the removal of debris and the discharge of water.

The depositing of the fresh concrete in the forms should be performed in such manner as to eliminate the possibility of segregation. Free falling of the fresh mixture for heights of over two feet should be discouraged but if unavoidably permitted should be subjected to closest supervision to avoid segregation. Concrete should be started at one end of the section to be poured and progress toward the other end. Concrete should not be dumped directly from vehicles upon bare forms. Better results will usually be obtained if the first concrete to be placed is dumped upon an adjacent platform and shoveled into place or if a batch of mortar is first placed in the forms at the point where concreting is to begin. Successive loads of concrete should be deposited upon concrete already placed and worked ahead so that the concrete flows sluggishly over the exposed surface of the bottom forms. Concrete for reinforced concrete columns should be deposited in the forms through a pipe which discharges the load close to or just below the surface of concrete already placed.

Concrete should not be deposited under water if it is practicable to place it in the dry. When under-water placing is necessary, a bottom dump bucket which may be discharged only upon contact with the surface upon which the concrete is to be deposited, should be used, or, in lieu thereof, a tremie having a pipe not less than 10 inches in diameter with a hopper on top thereof having a capacity of not less than one batch of the bucket delivering concrete to it. Particular care must be exercised in using the tremie to maintain a full pipe of concrete at all times during the pouring.

As the concrete is placed in the forms, it should be promptly and thoroughly puddled and worked with rods, poles or by stamping of workmens' feet so as to cause it to flow around reinforcing rods and into recesses and corners. Movement of new concrete with shovels should be avoided except to facilitate the flow from point of deposit to point of final position. The puddling and working into position should be continued until the mass is thoroughly compacted and entrained air released. Mechanical vibrators may often be used to advantage in these operations particularly when considerable quantities of concrete are to be placed. Excessive puddling and working should be avoided. Nothing is gained by continuing these operations after the soft concrete has been worked into all corners and the mass has been thoroughly compacted. Excessive agitation may tend to bring about partial segregation in the freshly placed concrete.

During placing, spading of surfaces against the forms is highly important in order to prevent the appearance of honeycomb upon exposed surfaces. The spading should be done with thin flat tools which can be worked up and down against the vertical faces of forms in such manner as to force pieces of large aggregate back into the mass and permit the cement grout to flow against the forms and, at the same time, serve to release trapped air from pockets against the forms. The spading should be done simultaneously with and immediately following the puddling and working process. Excessive spading is to be avoided and only sufficient amount done to insure the procuring of good surface finish.

During the processes of puddling, working, compacting and spading, particularly in heavy sections, water may accumulate upon the top of the freshly placed concrete. This is excess water forced out of the concrete previously placed in the lower portions of the sections by the compacting and the pressure of the superimposed fresh concrete. Such excess water should be removed when it appears in material amounts or the amount of mixing water reduced. Failure to remove it, permits it to become mixed with concrete deposited on top of it thereby increasing the water content of the last placed concrete with a resulting lowering of its strength. Another evil of the accumulation of excess water is that the water travels upward along the face of the forms creating unsightly sand streaks. The dark tone of concrete surfaces often noted at the top of concrete pours results from shadows created by sanded surfaces.

Following the completion of the pouring of a section and before the initial set of the concrete shall have taken place, the top surface of the newly poured work should be screeded and finished as required to meet construction conditions.

The formation of laitance upon the top surfaces of concrete is due to the presence of excess water in the upper portions of the plastic mass. If the excess water is removed from the forms as it accumulates during the placing of the concrete, laitance will not form. Its presence is a clear indication of weak concrete immediately underlying it. After it has been removed, an examination of the apparently solid concrete immediately below it will reveal the presence of small air pockets from which water particles have evaporated leaving a porous and relatively weaker concrete. The importance of the removal of excess water from forms as rapidly as it accumulates cannot be overemphasized.

Forms and Formwork.

Forms are required to support, retain and mould freshly mixed concrete until it hardens and develops sufficient strength to sustain its own weight together with extraneous loads that may be placed upon it. They must possess strength adequate to resist the forces exerted by the plastic mass, rigidity sufficient to prevent deformation under the applied loads beyond limits consistent with the permissible deviation from theoretical positions and surfaces comparable with those desired in the finished product.

In general, forms may be divided into two classes, namely, those which support superimposed loads such as slab forms and the bottoms of beams or other horizontal members, and those which furnish lateral support such as wall forms and the sides of beams. In both classes, the primary requisite is strength to perform their respective functions without undue deformation. In the former case, the loads are determined by the weights of the forms themselves, of the freshly mixed concrete, of men and equipment required to place the concrete and of any extraneous weights that may come upon the concrete before it has hardened and developed structural strength. In the latter case, the loads are principally horizontal pressures of a hydrostatic nature developed by the plastic mass. The magnitude of these pressures varies at different depths below the upper surface of the freshly placed concrete and is influenced by three principal factors embracing; first, the method of compacting the mass, whether by hand or by mechanical vibration; second, the rate at which forms are filled; and, third, the temperature of the concrete. Curves prepared for hand compacted concrete by Universal Form Clamp Co., and reproduced by the Portland Cement Association indicate the following:
For concrete at 70° F.:

Rate of Pouring; Feet Vertically per Hour.

	2′	3′	4′	5′	6′
Pressure at surface, lbs./sq. ft.	0	0	0	0	0
Dist. down to max. pressure	4′	4.7′	5.4′	6.3′	6 9′
Max. pressure; lbs./sq.ft.	330	430	530	640	740
Dist. down to zero pressure	10′	13.6′	17.8′	21.4′	25.5′

For concrete at 50° F.:

Rate of Pouring; Feet Vertically per Hour.

	2′	3′	4′	5′	6′
Pressure at surface, lbs./sq. ft.	0	0	0	0	0
Dist. down to max. pressure	5′	6′	7′	8′	9′
Max. pressure; lbs./sq ft.	440	590	740	890	940
Dist. down to zero pressure	10.8′	15.1′	19.3′	23.5′	27.4′

When vibrators are used for compacing purposes, the whole mass assumes the characteristics of a fluid weighing 145 pounds per cubic foot for the depth to which the concrete is vibrated thus introducing pressures upon forms materially in excess of those shown in the tables. When the side forms are built to a batter so that concrete is deposited against the underside of an inclined face, the upward thrust of the fresh concrete exerts a considerable uplift upon the forms as a whole against which anchorage may be necessary in order to prevent displacement.

In all forms, tightness of areas exposed to the concrete is highly important in order to prevent leakage of mortar. Close fitting square edged boards and tongue and grooved or ship-lapped lumber are all used successfully by contractors each electing to use that which he considers most satisfactory. Plywood and special wood products have come into wide usage by many contractors particularly when it is desired to exercise particular care in obtaining good surfaces. Metal forms or sections of forms are utilized for specific purposes and, by some contractors, for economical reasons.

The design of forms is the responsibility of the contractor who is charged with the production of work of acceptable character. At the same time, when imperfections develop, it is not always a simple matter to remove the unsatisfactory features and replace them. Complicating elements often enter into a consideration of the desirability of replacement—the contractor will desire to avoid the expense and resulting disorganization of his program, the owner may be anxious to procure delivery of his project, the inspector may consider that retention of the unsatisfactory work will be less detrimental to the structure than possible combinations of conditions that would ensue from a loss of integrity of the framing. In view of these circumstances, the inspector is distinctly interested in the adequacy of the forms and their ability to so support and mould the concrete that the final product will be satisfactory and acceptable. While he should not assume responsibility for the design of forms, it is certainly within his province to satisfy himself prior to approving the placing of concrete that those which the contractor has provided have been built strong enough and properly finished so that satisfactory construction will result.

In addition to considerations of strength in the integral parts of the forms, permissible deflections under load may be matters of considerable importance particularly where corners, edges and surfaces are to be left exposed in the finished work. The maximum permissible cumulative deflection of sheathing, studs and walers currently employed is 1/270 of the span length. Maximum deflections of shoring and falsework for beams and girders should be compensated for in advance by building camber into the forms so that the finished concrete will not sag below true theoretical finished lines.

The use of wires to support forms and to tie them together is unsatisfactory practice. Their use should be prohibited. In lieu thereof, steel bolts or pencil rods with positive adjustments and fastenings should be used in order that spreading of forms may be eliminated. Good practice requires that such adjustments and fastenings be provided at all horizontal construction joints.

In cases where it is necessary to support forms by means of special framing or falsework in which the load is transmitted through a number of joints or connections, allowances should be made for settlement in these joints when loads are applied. A common practice is to adjust the elevations of the forms upon the basis of a settlement of about 1/16th of an inch for each joint or connection through which the load must be transmitted. Similarly, compensation for deflection of steel beams under dead load may be made when the beams are encased in concrete by

varying thickness of concrete below the bottom flanges of the beams by amounts corresponding to the probable deflections under load. The amounts of the deflections to be anticipated can be readily determined from a steel handbook.

While metal is frequently utilized for forms, the use of wood is the general rule. The quality of lumber utilized is usually of little importance provided it is structurally strong enough to perform its functions and physically in fit condition to retain the mortar in the fresh concrete. So long as its strength is unimpaired and its physical condition suitable, form lumber may be reused. Reuse, however, involves an overhauling of the forms after each use for the purpose of repairing damages resulting from previous use and particularly arising from removal. Unless form lumber shall have been thoroughly dried prior to its initial use, shrinkage incidental to drying out will usually cause cracks to open up between adjacent boards in built-up panels. Sometimes these cracks can be closed by thoroughly wetting the wood and keeping it wet until sufficient moisture is absorbed to restore the planks to their original sizes. At other times it is necessary to rebuild the panels in order to close the cracks.

Current commercial processes practically preclude the possibility of getting anything but comparatively green lumber for building operations. Methods of manufacture and transportation are so closely coordinated that, in many cases the trees from which the lumber is cut may be still standing when the order for the lumber is placed, but delivery to the site may be completed in three or four weeks. Under such circumstances, the lumber is built into the forms while drying out during which process continual shrinkage, particularly across the grain, is in progress. Obviously, forms built of such material should not be permitted to stand long before being filled with concrete. When delays in filling forms are unavoidable, they should be kept thoroughly wet at all times until concrete is placed in them. The practice of letting the forms dry out and attempting to swell them back to full original dimensions will invariably fail to restore them to their original condition. During the shrinkage process many planks, particularly those cut from one inch stock, will curl or buckle. These irregularities will not be entirely removed by subsequent wetting and, if the planks are left in the forms, will produce local deformities in the finished concrete which cannot be satisfactorily removed.

The use of plywood and of pressed wood products is common for form facing or lining where surfaces free of board marks are desired. These materials are available for form uses in thin sheets. Their use entails either a solid backing of lumber or a close spacing of studs depending upon the thickness of material used. Pressed wood products have a semi-polished surface upon one side and a slightly roughened surface upon the other.

Side forms supporting vertical or inclined surfaces may be removed relatively soon after concreting has been completed without danger of impairing the concrete. With air temperatures above 60 degrees F., twenty-four hours will be ample time to leave them in place. In particular cases where there is little load carried by the concrete to be stripped, forms may be removed within a few hours as is often done where it is desired to start rubbing an exposed surface before the concrete has hardened too much. On the other hand, early stripping of forms permits rapid evaporation of water from the green concrete which, unless provision shall have been made to keep the surface continually wet, will result in checking of the surface and in shrinkage cracks.

Bottom forms supporting the weight of newly placed concrete should remain in place until the concrete has developed sufficient strength to support its own weight and the weight of possible superimposed loads. The periods of time that such forms and their supports should remain undisturbed is a matter for determination in each specific case after due consideration of the effects of prevailing temperatures and the probable strength of the concrete. The reuse of form bottoms is facilitated by backshoring the newly placed concrete after it has developed strength to support it dead weight but before it has developed its full strength.

Architectural Concrete.

Essentially architectural concrete differs from structural concrete only in the matter of forms and finishes. The principles which govern the production of good structural concrete apply equally to the production of architectural concrete. Architectural concrete, however, is subjected to special requirements particularly with respect to perfection of finish and surface texture arising out of the utilization of concrete for exposed walls and decorations of structures in which the concrete is the medium used to express the architectural motif.

Particular care in the design, building and fastening of forms for such work must be exercised to obtain true surfaces and alignment. The forms, in addition to performing their primary function of moulding the plastic mass, become the means of translating the architect's conception into a material thing. The craftsmanship with which the forms are built is revealed in the finished work which will reproduce all of the irregularities of the forms. Satisfactory architectural concrete surfaces may be expected to result only when highly skilled mechanics, approaching cabinet makers in skill, are employed for the building and setting of such forms. The use of ordinary form carpenters will be expected to yield unsatisfactory results.

Curing the Concrete

The hardening of concrete is the result of the chemical reactions between cement and water. The process proceeds rapidly for a short while after placing and then progressively more slowly for an indefinitely long period provided that moisture requisite for the action is present and that the temperature of the mass is favorable. It follows, therefore, that the quality of the concrete is largely affected by its age and the conditions under which it has been cured.

As a general rule, the amount of mixing water used in order to obtain workable mixtures is in excess of that required for the chemical reactions incidental to hardening. This excess of water may escape only through surface evaporation. Too rapid evaporation, however, is detrimental to the quality of the finally hardened concrete. Tests upon concrete specimens of the same mix stored under varying conditions and tested after four months, clearly indicate the importance of proper curing upon the strength of the finished product. These tests may be summarized as follows:

Days stored in damp sand	*Days stored in air*	*Age at Test*	*Relative Compressive Strength*
0	120	120	55%
2	118	120	65%
10	110	120	100%
20	100	120	125%
30	90	120	141%
60	60	120	157%
120	0	120	174%

Curing of concrete in its final position is accomplished by preventing the rapid evaporation of water. This is done by keeping exposed surfaces damp during the curing period. Sprays of water may be played upon the surfaces or they may be covered with burlap, special Kraft paper, straw, canvas, or layers of sand all of which are kept thoroughly wet. Ponding of water upon horizontal surfaces may be utilized but particular care must be used in buildings where brick or stone work is built up on floors as seepage of the curing water into the masonry will produce efflorescence or discoloration of the latter. Chemical salts which absorb atmospheric moisture, such as calcium chloride, may be advantageously used but they have a tendency to darken the color of the exposed surface which is not harmful to the concrete but may be undesirable for other reasons. Vertical surfaces are cured with more difficulty than horizontal surfaces. Delay in removing forms is a material aid to curing such surfaces, the further curing of which may be accomplished by sprinkling or by hanging against them burlap or canvas which are kept continuously wet.

The curing period should be not less than 7 days. Longer periods should be used when practicable and for concrete designed for especially high working stresses.

When non-integral wearing surfaces are poured on top of floor slabs or when plaster coats are applied to other

surfaces, it is important that the areas to be covered be thoroughly cleaned and roughened and wetted down prior to the application of the covering in order to reduce the absorption of moisture from either concrete by the other.

The effects of improper curing are manifest in shrinkage cracks which appear in areas which have been insufficiently cured and in surface checking of areas which were permitted to dry out too rapidly.

Construction Joints.

The use of construction joints is a necessary adjunct to concreting operations. The limitation of the amount of concrete that can be poured with available facilities, the structural sections into which the work is divided, the failure of equipment or any of numerous other factors require that the placing of concrete be interrupted before all concreting is completed. The introduction of construction joints is one of the most commonplace incidental operations in concrete construction. At the same time, improper care in the making of such joints is one of the most prolific sources of imperfect and unsatisfactory concrete work.

The locations of construction joints should be the subject of careful consideration prior to the starting of individual pours and, often, should be undertaken as a preliminary to the planning of the construction program. In every case the fundamental principle to be applied is that the location and design of the joint shall neither impair the strength of the structure, detract from the appearance of the completed work nor interfere with the integrity of the framework. No universal rule can be enunciated which will cover every conceivable case that may be encountered in field operations. On the other hand, a guide to good practices under varying conditions may be useful.

1. Foundation Walls.

Vertical construction joints in foundation walls should be formed with a keyed joint. The width of the key should approximate one-third of the thickness of the wall and its depth approximate one-half of its width but not less than two inches. Prior to the placing of the adjacent section the exposed face of concrete already poured should be cleaned, roughened and thoroughly wetted in order to insure proper bonding of the new concrete to the old.

Construction joints in foundation walls which are to be subjected to hydrostatic pressure from ground water require special precautions in order to prevent leakage. Under these conditions, it is generally desirable to provide a positive barrier against the passage of water through the joint by inserting a metal strip extending back not less than six inches into the concrete upon each side of the joint.

Vertical construction joints may usually be located at any place conveniently suited to the operations but preferably in locations where they can be carried through solid wall from bottom to top.

Horizontal construction joints in foundation walls do not usually require special details for keying the two adjacent lifts of concrete. Particular care must be exercised to thoroughly clean and roughen the top surface of the lower lift. Especial importance attaches to removal of laitance and spongy concrete from the top surface of the lower lift before placing any concrete of the upper lift upon it. The spongy concrete should be removed with a pick or other pointed tool until firm, hard concrete is exposed. The bonding of the upper lift to the lower will be much better effected if a batch of cement grout is flushed over the exposed top surface of the lower lift before concreting of the upper lift is begun. Failure to properly prepare the surfaces of the lower lifts of foundation walls at construction joints is a prolific source of leaks of such walls under hydrostatic pressure.

In foundation walls where watertightness is essential, prevention of leakage through construction joints may be practically assured if metal sheets are inserted in the manner described for vertical joints.

Where groundwater conditions have been anticipated by the designing agency and provision of dampproofing or waterproofing of the exteriors of foundation walls is specified, the inspector should recognize such provision as notice that the imperviousness of the concrete alone was not deemed sufficient to guarantee watertightness and that, as an additional safeguard, the protective coating was specified. Under such circumstances, particular care should be exer-

(*Continued on page* 47)

ON THE STRUCTURE OF THE NICKEL-TRIPEUM-SCATTIUM ALLOYS

By Attaboi Igotcha[1] and Okidoki Hotchacha[2]

(from Nickel Steel Topics)

SPECIMENS of a range of these alloys were rejected by the WPA Project for the Provision of Pork for Mohammedans, owing to excessive wear when subjected to the pig's bristle test developed by Sayzu[3] and Oyeah[4]. When the tests on new specimens were complete[5], it was found that the figures obtained were too difficult to work out, and that multiplication was very complicated, as none of the figures in the top line cancelled out with the bottom line. Pieces were therefore chiselled off the pieces rejected by the W.P.A.P.P.P.M., and further tests were made.

Close agreement was found between the expansion of the crystal lattices and that of specimens consisting of composite masses of tripeum, such as were used by Uraliar[6] and Donbeleevya,[7] who carried out similar experiments. The addition of scattium to the nickel lattice has two effects:

(a) We could not get any results;
(b) If we had any results, they could not be wangled successfully to agree with any other results.

No change in structure took place at the temperature of the magnetic transformation; the face-centered structure persisted from room temperature up to 800°C.[8] Hotchacha states that this disappoints him, as he had hoped that the self-centered structure of his mother-in-law would be altered by its ultimate exposure to high temperatures.

An ageing test of 15 months' duration on an alloy containing 97% scattium showed that no consistent change occurred in the lattice parameter over the whole period, and that no ageing effect occurs. Hotchacha here mentions that the same effect has been observed with women between the ages of 22-42 years.

About this time Hotchacha disappeared from the laboratory, but as his comparisons were becoming odiously personal, the investigations were continued without his aid.

Lattice parameters were measured at different temperatures and, from the parameter-temperature relationships, curves were deduced, showing effect of temperature on co-efficient of thermal expansion. Owing to the author burning his hand by picking up a piece of the hot metal, the atmosphere of the room rose by 0.0000412°C. (or F. according to whether the thermometer was upside down or not), owing to the heated words used. The curves are therefore slightly imperfect, but they have been instrumental in the winning of the baseball pool for the last three weeks.[9] At a particular temperature, the value suddenly increases to a point, which, on further increase of temperature, remained constant. This was when the author broke the thermometer.

The thermal hysteresis effect is also clearly shown, and has proved useful to the Bronx Zoological Society in judging when the hyenas will laugh.[10] Values are given for the lattice parameters of the pure d- and y-phases at different temperatures, but the author will refrain from dilating upon this subject, as he really knows nothing about it.

In the y-alloys, it was observed that the maximum becomes rather more or less pronounced as the temperature is raised, and that with increase in temperature it is displayed in the direction of the wy. In the d-alloys,[11] the form of the curves is opposite in direction. From this it was concluded that the crystal structure was of the order

$$\frac{\text{x. dy}}{\text{dx}} \quad \frac{\Sigma^3}{3} \left\{ \left\{ \frac{-\sqrt{3}+\text{m}}{2} \right\} \right\}^{-3}$$

To check this result, further X-ray examination was made, when it was found that the hard lump in the middle was a new Buffalo nickel which Hotchacha had stolen from me. Further check showed a high percentage of carbon, and it was therefore concluded that he had fallen into the melting furnace. It was therefore decided to recommence the investigations some time or other.

REFERENCES:

1. General Manager, Ferro-Bolonium Corp.
2. Director of Research, F.-B. Corp.
3. F. A. Sayzu—Podunk University Committee of Soporific Investigation 1066 (et alia).
4. Clarence Oyeah—Soporific Investigation Committee of Muddleburg Technological Institute, 1937 (ad hoc).
5. Complaints File—B.C. 55—A.D. 1937 (not yet complete).
6. G. Uraliar—Cf. Trans. Sing Sing Prison, 1899-1919.
7. I. Donbeleevya—Spaghetti a la Bolognaise, Pub. Tyrwhit and Tuwoo. $.02 per copy. Op. cit.
8. 800° C. $-(32+\frac{800\times9}{5})$ F°.—slightly warm (cf. Fr. d—d hot).
9. Extra copies $5.00. Apply to the Author.
10. Specially adapted, this curve will give fair warning of feminine hysterics.
11. "Monel" is a registered trade mark.

cised in the construction of watertight concrete foundation walls.

Foundation walls are sometimes constructed within cofferdams. The latter require bracing which is usually done by means of heavy shores or struts passing across the insides of the cofferdams. When foundation walls are built within such cofferdams, it is necessary to leave openings in the concrete walls through which these struts pass until such time as they may be removed. Upon the removal of the struts, the holes in the walls through which they passed must be filled with concrete. The proper filling of such holes is of the greatest importance. Every precaution must be taken to insure thorough bonding of the concrete plug to the surrounding body of the wall. In cases where groundwater is anticipated to be encountered, metal strips should be inserted for safeguarding against leakage.

2. Steel Frame Buildings; Slabs and Fireproofing.

Construction joints in floor and roof slabs should be made directly over beams or joists; in columns, at the soffit of the lowest beam framing into the column at a given floor height; in continuous beams and girders, in the middle third of the span.

3. Reinforced Concrete Frames and Slabs.

Construction joints in columns should be made at the soffit of the lowest beam framing into the column at a given floor height; in beam spans, over columns or supports for vertical joints, and for floor and roof slabs, along a center line of a span. In all cases, greatest care must be taken to remove laitance and spongy concrete from the exposed surface of a prior pour before placing a subsequent pour.

4. Architectural Concrete Exteriors.

The location of construction joints in architectural concrete is a matter of special determination prior to the beginning of construction. The particular problem involving construction joints during building operations concerns the actual making of the joints as inconspicuously as possible. A satisfactory method of preventing marked conspicuousness of the horizontal joints involves the placing of a small strip having its lower surface at the precise elevation of the top of the desired joint. The concrete is poured to a level just above this strip and all surplus water removed. As the mass sets and shrinkage takes place, the surplus concrete is removed and accurately finished flush with the bottom of the strip in such steps that the final operation is completed just prior to the attainment of a firm set by the concrete.

LIGHTNING PROTECTION MANUAL

The National Lightning Protection Company have prepared a very exhaustive manual covering the matter of safe-guards against lightning.

The book goes into the theory of the subject as well as practical procedure; and presents in illustrative form the damage resulting from not protecting buildings in accordance with best accepted practice.

It is illuminating and informative and presents a full survey of this matter under one cover which must of necessity be of great value to architects and others in the construction professions.

(*Continued from page 8*)

removing me from office. The *persecutions* to which I have been subject, from the moment the Senate adopted my Plans for the Capitol are *unheard* of, and only ceased when the object was attained of defeating my appointment, after the President had adopted my Plans, (of which I was informed by Secretary C——). If such influences have been brought to bear upon our new President to defeat me again, I hope my friend will defend my integrity, and demand an investigation into my official acts while in charge of the Public buildings, and if I cannot justify my acts before an impartial judge, then I will yield my claim to the President's confidence. *Twenty years* of my life have been spent in the Government service here, and my works there will prove my faithfulness to the interests of the Government. The buildings I have erected, compared with other Public buildings of a like character elsewhere, will show with what *economy* they have been constructed, costing but a *moiety* of other buildings of like dimensions. And tho' I have disbursed millions of dollars in such constructions, I have to *labor still for my bread*. Had I been unfaithful to my trust, I might have been wealthy at this day, in place of not having a dollar to call my own. I write this freely to you, that if necessary you may have the grounds of my justification.

Your friend,
ROBT MILLS.
March 3d 53.

(Italics, from underscoring by Robert Mills.)

Mt. Vernon, Mo.
August 17, 1937.

The Editors,
THE FEDERAL ARCHITECT.

Gentlemen:

Somewhere carefully filed is a card offering me 2 years' subscription to THE FEDERAL ARCHITECT for $1.50 and filled out with request that the subscription be made to begin with April, 1936. It was waiting for me to write a check for $1.50 and now the check is written I can't find the card though it was only a month ago that I had it and filled it out.

I made the subscription retroactive because it was at least that long ago that I began to find your periodical growing of more interest to the field engineer through articles on materials, etc., in the sample numbers which were sent me even though I was not a subscriber.

Your numbers since then have been better and better and the "Washington Completed" was alone really worth the year's subscription, but with the human tendency to get by with as little expenditure as possible I am hoping you'll be glad to get this $1.50 and still have to send me only October and January before another payment is due.

The news of changes in headquarters is always interesting although not artistic nor technical. I second George Seibert's suggestion in letter in the current July number as to a list of pamphlets on new materials being helpful in keeping up with latest materials and methods. Accounts of personal experience of members of the field force with methods of installing various finish materials, and particularly troubles encountered with the best method found for eliminating or avoiding them would be of great interest and give each in the service the benefit of the experience of all and especially of the more experienced.

Very truly yours,
DONALD T. SMITH,
Construction Engineer.

Los Angeles, California.
August 27, 1937.

The Editor.

Dear Mr. Morris:

Enclosed herewith, find $3.00 for my subscription for THE FEDERAL ARCHITECT.

I wish to express my appreciation for this SPLENDID magazine in general, and especially for the complete roster of our Department as published in the October, 1936, number.

There are so many articles of benefit and interest in each issue, that it is impossible to take the space to enumerate them. However, we do wish to extend our greetings, through you, to Judge James A. Wetmore, and appreciation for his very interesting articles. They keep us in touch with a grand person.

Wishing you continued success.

Very truly yours,
FRANK M. BEAUDREAU,
Construction Engineer.

Gregory, South Dakota.
July 28, 1937.

Editor, FEDERAL ARCHITECT.

Dear Friend:

Another project completed and on to other fields, leaving all the sidewalk inspectors and local commentators saying it was a good job well done. Therefore I feel that the time spent here has not been wasted as the impression in the community regarding a completed building is vital to the reputation of the Office. The district about here has been very hard hit for the past five years by drought and grasshoppers, but this year the conditions have been very favorable and everyone is looking forward to a good crop and plenty of feed to carry the stock through the winter.

Since receiving your publication, I have found much interesting and instructive information therein, and feel much credit is due to your staff for their ability to publish such a book each quarter. I wish it were monthly. Please credit me with the enclosed P.M.O. for $1.50, and change address to ALBION, NEBRASKA.

Sincerely,
WILLIAM McLAUGHLIN,
Construction Engineer.

Bradenton, Fla.
Sept. 17, 1937.

THE FEDERAL ARCHITECT.

Enclosed you will find P.O.M.O. for $1.50 for subscription to THE FEDERAL ARCHITECT. I enjoy it very much and don't want to miss a single issue.

Very truly yours,
RAY M. McNAIRY,
Construction Engineer.

Coudersport, Pa.
September 16, 1937.

The Editor, THE FEDERAL ARCHITECT.

Gentlemen:

Here's my $1.50 (for two years) — take it quickly!! My guilty conscience can no longer withstand the onslaught of laughs, of wonderful pictures, and of most interesting articles which continue to arrive in the jacket of THE FEDERAL ARCHITECT. They are sure to wear down, finally, those construction engineers having the most pronounced Scotch tendencies.

For fear the above voucher may be *"returned for correction,"* we refrain from telling you how much MORE we value the magazine than the $1.50 sent.

Very truly yours,

MAURICE GAY,
Construction Engineer.

CELOTEX ANNOUNCES EASTERN DIVISION EXECUTIVE STAFF

Bror G. Dahlberg, President of The Celotex Corporation, announces the appointment of executive personnel who will operate the recently acquired plant at Metuchen, New Jersey.

Mr. Arthur Landis, former Vice-President of the Auburn Automobile Company, who joined The Celotex Corporation staff a year ago, has been appointed Eastern Operating Manager in charge of Works Operations of the Metuchen and Marietta Divisions. Mr. Landis has been active investigating the possible development of new products to be manufactured at these plants. He will headquarter at Metuchen.

Operating under Harold Knapp, Vice-President and General Sales Manager, will be George E. Swenson, who has been appointed Manager of Sales, Metuchen Division, and Paul D. Close, Assistant Manager. Both will headquarter at The Celotex Corporation's New York Office. Mr. Swenson has been with the Corporation for 14 years. Mr. Close, whose experience includes 9 years with the Corporation, was for 4 years Technical Secretary for the American Society of Heating and Ventilating Engineers.

Two new products are being manufactured at the Metuchen Plant—Celotex Cemesto, an insulation board with a fire resisting asbestos cement surface, and Traffic Top, a roofing board with a strong wearing surface. These are now being placed on the market. In addition, several new products are contemplated, all of which will help to round out a complete range of construction materials to be handled by the Celotex sales organization.

What if anything do you know about Elfreth Alley? Consult our Philadelphia number, promised for January.

(*Continued from page 12*)

■ THE modern passion for understatement is growing. One of our District Engineers the other day received a letter from a custodian of a certain post office which stated, "My janitor here says there is a termite in this building."

■ THE Government allows its employees certain sick leave under approved conditions. The frivolous question arose as to whether one taking a vacation involving a sea trip would be entitled to claim days of sick leave for such time as he was incapacitated by sea-sickness. Conclusion was that the premise was absurd. The above incapacitation is not an illness, but just a method of enjoying the voyage selected by the passenger. A man, being captain of his soul, should also be captain of his tummy and should establish and enforce suitable one-way traffic thereto.

■ MR. SOUTHWORTH of the Bureau of Yards and Docks recently was incapacitated by a severe attack of shingles. The editorial board of this magazine gathered together and passed a resolution of commendation praising him for his devotion to his chosen profession in that when it was necessary for him to be sick he chose an illness concerned with architectural materials. He also, instead of having the shingles around his waist, as is usual, had them on his head. This nicety of discrimination cannot be praised too highly. Shingles go at the top and not at the belt course and architects should insist upon this proper location. Otherwise the whole science of construction becomes an absurdity.

We
Have been trying
To
Remember
To say a word *in re*
The
PHILADELPHIA number
Possibly we did
Mention it
January it is
1938

CONTRACTS AWARDED BY PUBLIC BUILDINGS BRANCH, TREASURY DEPARTMENT

Dunn, North Carolina, P. O.—construction—Jones Bros., & Company, Lodge Street, Wilson, North Carolina	$49,445.00
Elkin, North Carolina, P. O.—construction—Mr. L. B. Gallimore, 215 Watson Building, Greensboro, N. C.	51,075.00
Alma, Michigan, P. O.—construction—James I. Barnes, Mt. Pleasant, Michigan	53,700.00
Northampton, Pennsylvania, P. O.—construction—Mutual Construction Company, 7 East 42nd Street, New York, N. Y.	48,933.00
Deer Lodge, Montana, P. O.—construction—Benjamin H. Sheldon, P. O. Box 349, Colfax, Washington	54,720.00
Ogallala, Nebraska, P. O.—construction—Beckenhauer Bros., 105 North 9th Street, Norfolk, Nebraska	45,428.00
Oneonta, Alabama, Agri. & P. O. Bldg.—construction—Cass and Daugette, Jacksonville, Alabama,	41,190.00
Florence, South Carolina, P. O. & CT. H.—extension and remodeling, etc.—J. A. Jones Construction Co., 614 Commercial Bank Bldg., Charlotte, N. C.	141,330.00
Ballinger, Texas, P. O.—construction—Dolph-Bateson Construction Co., 509 Construction Building, Dallas, Texas	51,040.00
Matawan, New Jersey, P. O.—construction—J. L. Robinson Construction Co., 1100 Block Pierce Street, Baltimore, Md.	53,800.00
Morton, Illinois, P. O.—construction—Dunlap and Company, Inc., 522 Jackson Boulevard, Columbus, Indiana	41,093.00
Dayton, Tennessee, P. O.—construction—Algernon Blair, 1209 First National Bank Bldg., Montgomery, Alabama	45,708.00
Rushville, Illinois, P. O.—construction—The Weitz Company, Inc., 713 Mulberry Street, Des Moines, Iowa	42,895.00
Everett, Pennsylvania, P. O.—construction—Wm. F. Sutter, 835 East Third Street, Nescopeck, Pa.	49,650.00
Liberty, Indiana, Agriculture & P. O. Bldg.—construction—E. A. Carson, 1165 E. 30th Street, Indianapolis, Indiana	46,771.00
Monroeville, Alabama, Agriculture & P. O. Bldg.—construction—Henry I. Flinn, 200 Thomas Avenue, Montgomery, Alabama	41,513.00
Cleveland, Ohio, P. O, CU. H. & Ct. H.—remodeling, etc.—Schirmer Schneider Co., 2719 Detroit Avenue, Cleveland, Ohio	144,762.00
Pocomoke City, Maryland, P. O.—construction—John K. Ruff Company, 100 West 22nd Street, Baltimore, Maryland	52,306.00
Rochester, Michigan, P. O.—construction—Francis W. Searles Co., 24 West Huron Street, Pontiac, Michigan	39,565.00
Louisville, Ky., P. O., CT. H. & CU. H. (NEW)—extension and remodeling, etc.—Algernon Blair, 1209 First National Bank Bldg., Montgomery. Alabama	168,218.00
Chesterfield, South Carolina, Agri. & P. O. Bldg.—construction—Jones Bros. & Co., Lodge Street, Wilson, North Carolina	40,688.00
Crossville, Tennessee, P. O.—construction—Ray M. Lee Company, 337 West Peachtree Street, Atlanta, Georgia	48,410.00
New Haven, Connecticut, Westville Postal Station—construction—The New England General Contracting Co., 341 State Street, New Haven, Connecticut	48,875.00
Richmond, Virginia, Saunders Postal Station—demolition and construction — Algernon Blair, 1209 First National Bank Bldg., Montgomery, Alabama	87,249.00
Rusk, Texas, P. O.—construction—J. J. Fritch, 504 Construction Building, Dallas, Texas	41,237.00
Linden, Texas, Agri. & P. O. Bldg.—construction—Andrew & Dawson, 17 Adams Avenue, Montgomery, Alabama	45,237.00
Marion, Kansas, P. O.—construction—Ernest Rokahr & Sons, 1815 Y Street, Lincoln, Nebraska	42,568.00
Tipton, Iowa, P. O.—construction—Viggo M. Jensen & Company, 803 North Bridge Avenue, Albert Lea, Minnesota	46,650.00
Albion, N. Y., P. O.—construction—Andover Associates, Inc., 110 East 42nd Street, New York, N. Y.	52,150.00
Hettinger, North Dakota, P. O.—construction—Henry Huether, Jr., Ashley, North Dakota	44,990.00
Gas City, Indiana, P. O.—construction—James I. Barnes Construction Co., Successors to James I. Barnes, Barnes Building, Logansport, Indiana	42,840.00
Santa Monica, California, P. O.—construction—James I. Barnes Construction Co., successor to James I. Barnes, Barnes Building, Logansport, Indiana	172,600.00
Paducah, Kentucky, P. O. & CT. H.—construction—Algernon Blair, 1209 First National Bank Bldg., Montgomery, Alabama	374,350.00
Toppenish, Washington, P. O.—construction—West Coast Construction Co., 1019 Lloyd Building, Seattle, Washington	49,723.00
Susanville, California, P. O.—construction—George Goedhart, 2244 W. 110th Place, Chicago, Illinois	59,820.00
Boonton, N. J., P. O.—construction—Carleton Brothers Company, 1078 Anderson Avenue, Palisade, N. J.	49,897.00
Colusa, California, P. O.—construction—George Goedhart, 2244 West 110th Place, Chicago, Illinois	64,380.00
Pleasant Hill, Missouri, P. O.—construction—Busboom & Rauh, 153 South Santa Fe Avenue, Salina, Kansas	51,740.00
West Point, N. Y., Bullion Depository—construction—Boudin Contracting Corporation, 105 West 40th St., New York, N. Y.	528,900.00
Mahoney City, Pennsylvania, P. O.—construction—Wm. F. Sutter, 835 East Third Street, Nescopeck, Pa.	64,900.00
Fort Worth, Texas, Narcotic Farm, Third Group of Buildings—construction of 3rd group of farm buildings, including roads and fences—E. L. Martin, P. O. Box 654, Dallas, Texas	423,300.00
Struthers, Ohio, P. O.—construction—George J. Murphy, 1871 Selma Avenue, Youngstown, Ohio	47,366.00
Lamesa, Texas, P. O.—construction—Algernon Blair, 1209 First National Bank Bldg., Montgomery, Alabama	62,337.00
Anacortes, Washington, P. O.—construction—T. D. MacNeil, Second Street, Mount Vernon, Washington	82,932.00
Clyde, Ohio, P. O.—construction—Skilken Bros., Inc., 44 East Broad Street, Columbus, Ohio	41,466.00
Greenfield, Ohio, P. O.—construction—James I. Barnes Construction Co,. P. O. Box 512, Springfield, Ohio	55,850.00
Concord, Mass., P. O.—construction—Structural Engineering Corporation, 110 East 42nd Street, New York, N. Y.	66,089.00
Sylvania, Ohio, P. O.—construction—C. R. Chappelear, 2080 East 5th Avenue, Columbus, Ohio	39,990.00
Delta, Colorado, P. O.—construction—James I. Barnes Construction Co., Wilhoit Building, Springfield, Missouri	92,760.00
Miami, Florida, P. O., Miami Beach Branch—	

construction—A. Farnell Blair, Lake Charles, Louisiana	191,870.00
Kansas City, Missouri, Court House—construction—Swenson Construction Company, 400 Victor Building, Kansas City, Missouri	2,403,219.00
Okolena, Mississippi, Agriculture & P. O. Bldg.—construction—Murphey Pound, P. O. Box 172, Columbus, Georgia	43,727.00
Muskegon, Michigan, P. O.—construction—James I. Barnes Construction Co., State Exchange Bank Bldg., Culver, Indiana	233,440.00
Gunnison, Colorado, P. O.—construction—James I. Barnes, Wilhoit Building, Springfield, Missouri	49,050.00
Langdon, North Dakota, P. O.—construction—J. H. Mackley Company, 307 First Avenue Bldg., Minot, North Dakota	45,252.00
West New York, N. J., P. O.—construction, etc.—Auf der Heide-Aragona, Inc., 530 Jackson Street, West New York, New Jersey	269,800.00
Port Washington, Wisconsin, P. O.—construction—A. C. Atherton Co., 1791 Howard Avenue, Chicago, Illinois	54,307.00
Northfield, Vermont, P. O.—construction—The Laucks & Clarke Corporation, 6-26 Ernest Street, Wallingford, Connecticut	47,457.00
Summerville, Georgia, P. O.—construction—Beers Construction Co., 70 Ellis Street, N. E., Atlanta, Georgia	42,195.00
Hawkinsville, Georgia, P. O.—construction—J. M. Raymond Construction Co., 710 Atlantic National Bank Bldg., Jacksonville, Florida	45,694.00
Webster, South Dakota, P. O.—construction—S. W. Jonason & Co., 609 Citizens Building, Aberdeen, South Dakota	45,680.00
Arcadia, Louisiana, P. O.—construction—Algernon Blair, 1209 First National Bank Bldg., Montgomery, Alabama	43,139.00
Tunkhannock, Pa., P. O.—construction—Herman Mailander, 169 Barney Street, Wilkes-Barre, Pa.	43,100.00
El Campo, Texas, P. O.—construction—Yarbrough Construction Co., 1309 Meriden Lane, Austin, Texas	38,233.00
Kansas City, Missouri, Ct. H.—installing an elevator plant—Westinghouse Electric Elevator Co., 150 Pacific Avenue, Jersey City, New Jersey	184,500.00
Ripley, Tennessee, P. O.—construction—Algernon Blair, 1209 First National Bank Bldg., Montgomery, Alabama	45,800.00
Dardanelle, Arkansas, Agri. & P. O. Bldg.—construction—Linebarger & Fraser, Emma Avenue, Springdale, Arkansas	44,923.00
Philadelphia, Pa., Court House—construction—McCloskey & Co., 1620 Thompson Street, Philadelphia, Pa.	3,249,500.00
Bethesda, Maryland, P. O.—construction—Sofarelli Bros., Inc., P. O. Box 88, Jamaica, N. Y.	54,112.00
Short Hills, N. J., P. O.—construction—Bonded Construction Corporation, 110 East 42nd Street, New York, N. Y.	46,683.00
Whitman, Mass., P. O.—construction—Tremaglio Brothers, 1500 Highland Avenue, Waterbury, Connecticut	57,590.00
Grand Rapids, Minnesota, P. O.—construction—W. C. Smith, Inc., 511 Builders' Exchange, Duluth, Minnesota	53,940.00
Philadelphia, Pa., Court House—for an elevator plant, etc.—Westinghouse Electric Elevator Co., 1500 North Branch Street, Chicago, Illinois	180,183.00
Cornelia, Georgia, P. O.—construction—L. B. Gallimore, 215 Watson Building, Greensboro, North Carolina	42,875.00
Los Angeles, California, Federal Jail—construction of buildings, custodial towers and	

guard's walk, etc.—Robert E. McKee, 1128 Central Building, Los Angeles, California.. 110,000.00

Jacksonville, Florida, Q. S.—construction—Batson-Cook Company, West Point, Georgia 63,000.00

Painted Post, N. Y., P. O.—construction—Andover Associates, Inc., 110 East 42nd Street, New York, N. Y. 48,748.00

Mobridge, S. Dakota, P. O.—construction—Dean Engineering and Construction Co., New Post Office, Reedsburg, Wisconsin ... 54,938.00

Summerville, S. C., P. O.—construction—J. A. Jones Construction Co., 614 Commercial Bank Bldg., Charlotte, N. C. 41,443.00

Fairport, N. Y., P. O.—construction—Samuel Plato, Field Office, Hamilton, N. Y. 44,493.00

Maywood, California, P. O.—construction—Campbell Construction Co., 5388 Alhambra Avenue, Los Angeles, California 48,258.00

Evanston, Illinois, P. O.—construction—S. W. Nielson Company, 3059 Augusta Blvd., Chicago, Illinois 443,941.00

Ville Platte, Louisiana, P. O.—construction—A. Farnell Blair, Lake Charles, Louisiana 51,993.00

St. Louis, Missouri, M. H. (Kirkwood)—construction—Foster & Creighton Company, 724 American Bank Bldg., Nashville, Tenn. ... 1,100,850.00

Danville, Pa., P. O.—construction—William F. Sutter, 835 East 3rd Street, Nescopeck, Pa. 62,440.00

Shelton, Washington, P. O.—construction—A. F. Mowat Construction Co., 1331 Third Avenue, Bldg., Seattle, Washington 59,530.00

Buffalo, N. Y., P. O.—alterations and remodeling, including elevators, etc.—Griffon Construction Co., Inc., 11 West 42nd Street, New York, N. Y. 169,796.00

CONTRACTS AWARDED BY THE BUREAU OF YARDS AND DOCKS

Mare Island, Cal.—Dry Dock No. 3, Navy Yard—George Pollock Co., Sacramento, Cal. 2,790,875.00

Carderock, Md.—buildings, roads and services, Naval Experimental Model Basin—Turner Construction Co., New York, N. Y. 2,634,780.00

Pearl Harbor, T. H.—improvement of harbor and channel, 14th Naval Dist.—Item 1—Hawaiian Dredging Co., Ltd., Honolulu, T. H. 600,000.00

Item 4—Standard Dredging Co., New York, N. Y. 400,000.00

Pearl Harbor, T. H.—fleet moorings, 14th Naval District—Hawaiian Dredging Co., Ltd., Honolulu, T. H. 277,150.00

St. Thomas, V. I.—aviation field and facilities—Boudin Contracting Corp., New York, N. Y. 123,000.00

Newport, R. I.—addition to Mahan Hall, (Library), Naval War College—New England Concrete Co., Providence, R. I. 109,000.00

Naval Academy, Annapolis, Md. — Helix House, high power radio station—Lange Bros., Audubon, N. J. 93,300.00

Brooklyn, N. Y.—boiler plant equipment and piping, Naval Hospital—A. Wilson & Co., New York, N. Y. 71,697.00

Norfolk, Va.—improvement of waterfront, Naval Operating Base—Tunstall-Johnson Co., Inc., Norfolk, Va. 63,500.00

Anacostia, D. C.—extension to hangar, Na-Air Station—W. F. Martens, Newport News, Va. 61,600.00

Philadelphia, Pa.—dredging, Navy Yard—American Dredging Co., Philadelphia, Pa. 50,000.00

Annapolis, Md.—boiler plant equipment and piping, Naval Hospital—William F. Kirwan, Baltimore, Md. 28,700.00

RECENT CONTRACTS AWARDED IN THE CONSTRUCTION SERVICE—VETERANS ADMINISTRATION

Los Angeles, Cal.—subsistence storehouse, No. 222, V. A. Facility—Robert E. McKee, 108 W. 6th St., Los Angeles, Cal. 75,300.00

Walla Walla, Wash.—Laundry Bldg., No. 66, V. A. Facility—Cherveny & Reverman, 2451 Southeast Main St., Portland, Ore. 37,996.00

Dearborn, Mich.—buildings and utilities, V. A. Facility—Cooper-Little Co., 572 Maccabees Bldg., Detroit, Mich. 1,112,000.00

Milwaukee, Wis.—addition to General Hospital No. 6, V. A. Facility—A. C. Guetzkow, Inc., 5420 W. State St., Milwaukee, Wis. 259,777.00

New York, N. Y.—linoleum and asphalt tile floors, V. A. Facility — Bronx, Custom Floors Company, 18 West 27th St., New York, N. Y. 31,714.00

Newington, Conn.—addition to General Medical Bldg. No. 2, V. A. Facility—Smith Construction Co., Inc., Derby, Conn. 69,595.00

Northport, L. I., New York—additions to sewage disposal plant, V. A. Facility—Delmar Construction Co., 112 S. 16th St., Philadelphia, Pa. 87,500.00

NECROLOGY

ROY BAGLEY HAYES

Construction Engineer Roy Bagley Hayes died at McKenzie, Tenn., on October 22nd, 1937. At the time of his death he was in charge of construction of the Post Office building at Ripley, Tenn., and had gone to McKenzie for treatment. Mr. Hayes had been in poor health for some time, but his death came unexpectedly, as stated by his physician, from heart failure.

Mr. Hayes was born at Whitewater, Wisconsin, April 1, 1875. He had a B.S. degree and Post Graduate degree in Civil Engineering. For eight years he was instructor in the Technical High School, Washington, D. C. Following which he was employed in private practice and Government positions for several years. In 1903 he entered the office of the Supervising Architect as a Structural Engineer, and in 1905 was appointed Superintendent of Construction in the field force of that office. He continued in the service of the Supervising Architect's office and the Procurement Division, until his death, except for about ten years, during and after the World War, during which time he was engaged in contracting and building at Lexington, Kentucky. Mr. Hayes is another of the "Old Timers" of the Supervising Architect's Office, who has passed on.

THE DATE RHYMER

Delos H. Smith

One time, when hero bard or sage
Had writ his name on history's page
Some magic twist of lofty fate
Constrained him to select a date
Which rhymed with his illustrious deed
So that historians might heed
And students memorize the year,
As for example when we hear,
"In Fourteen Hundred Ninety Two
"Columbus sailed the ocean blue,"
We may conclude he chose the time
To suit his sense of poetic rhyme,
And if his sailor's eye had seen
An unknown ocean billowing—green,
He would have sailed in "seventeen."

Thus, truth in rhyme becomes more clear
Where many a date to history dear
Is lost in the annals of the past,
Deductive thought brings truth at last;
Here is the tale of Washington
The model of a truthful son,
We know how he detested cheating
And how he took a dreadful beating
Rather than tell a lie—but none
Has told the year the deed was done,
'Til now at last the rhyming test-
imony leads us to investi-
gate the years when he would be
Prime to cut down a cherry tree;
One only fits—'tis Forty Three!

And so, the founders of our land
Correctly chose their dates to stand
In rhymed mnemonic clarity,
And years one hundred eighty three
Elapsed from the time when Jamestown, Va.
Was settled, to the fateful day
When Congress made the Federal Town
To incubate the high renown
Of L'Enfant as a city planner,
Of Thornton, Hallett, and the manner
Called Early Federal. One inspects
The triumphs of those architects:
James Hoban's White House was begun
In Seventeen Hundred Ninety Oone—
Chosen to rhyme with Washington!

Perhaps this date needs explanation
Lest it excite some perturbation
In readers shrewd and knowing who
Maintain the year was Ninety Two;
They are both right and wrong because
Our Hoban broke the rhyming laws
By breaking ground a year too late.
Columbus already claimed the date
Three hundred years before, and none
Would question fame so dearly won;
No! The true mysteries really ought-a
Be free from any crude errata,
The Sibyl values Truth too dearly
And lays a curse on fools, bi-yearly;
Her word is always right, or nearly.

Now take the Capitol if you will
And the dates that lie on Capitol Hill:
In 1793 begun,
In 1800 it was done
And done again in 1804,
1811, and then once more
In 1814 by Latrobe—
An architect and not a stove—
'Twas done again in twenty five
In sixty four was still alive
But finished then and on that day
The architects all went away;
Some hope that they have gone to stay.

But follow history's tale and see
How rhyme and action must agree:
The house wherein dwelt Thomas Law
Was built in 1794:
Old Arlington, the home of Lee,
Was built in 1803;
The house of Admiral Decatur,
In 1819 the theater
Of saw and hammer, watched the fun
In 1871
When the State War and also Navy
Building was stewed in sculptured gravy—
Here point we to an era's end,
With tear for Greek Revival's end
And the Georgian Style without one friend.

Weep now, to see our stricken land
With awesome sights on every hand,
Victorian Mid-victorious,
Unfathered and inglorious,
Hero and Beaux Arts sage unknown,
Wren and his followers all flown;
The very mysteries gave way
And rhymes collapsed upon the day
When the Pension Building was built by Meigs
For which there is no rhyme but legs.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

Of FEDERAL ARCHITECT, published quarterly at Baltimore, Maryland, for October 1, 1937.

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared Edwin B. Morris, who, having been duly sworn according to law, deposes and says that he is the Editor of the FEDERAL ARCHITECT and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Association of Federal Architects, 1700 Eye St., Washington, D. C.

Editor, Edwin B. Morris, 1700 Eye St., Washington, D. C.

2. That the owner is: (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Edwin B. Morris, 1700 Eye St., Washington, D. C.; Association of Federal Architects, 1700 Eye St., Washington, D. C.; A. L. Blakeslee, President, 1700 Eye St., Washington, D. C.; Abraham Waranoff, Secretary, 1700 Eye St., Washington, D. C.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

EDWIN B. MORRIS, Editor.

Sworn to and subscribed before me this 28th day of September, 1937.

IRVING DECKELBAUM.

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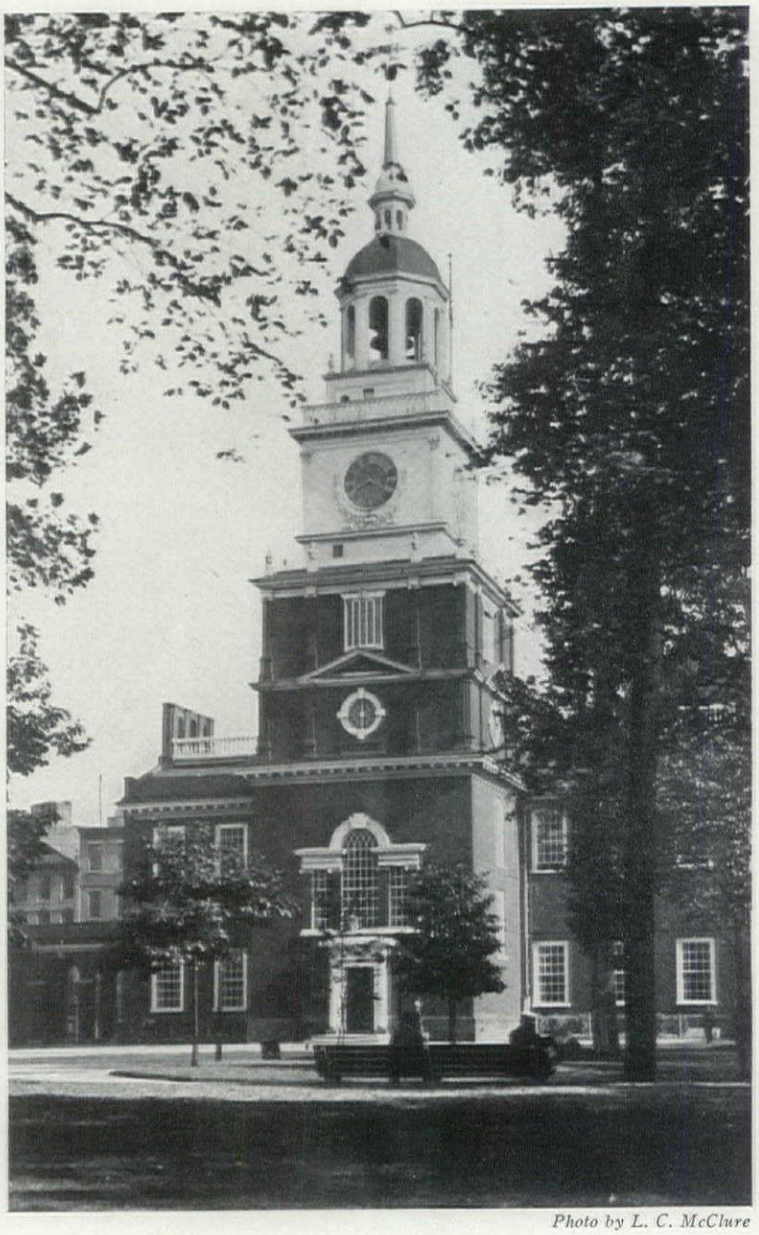

Photo by L. C. McClure

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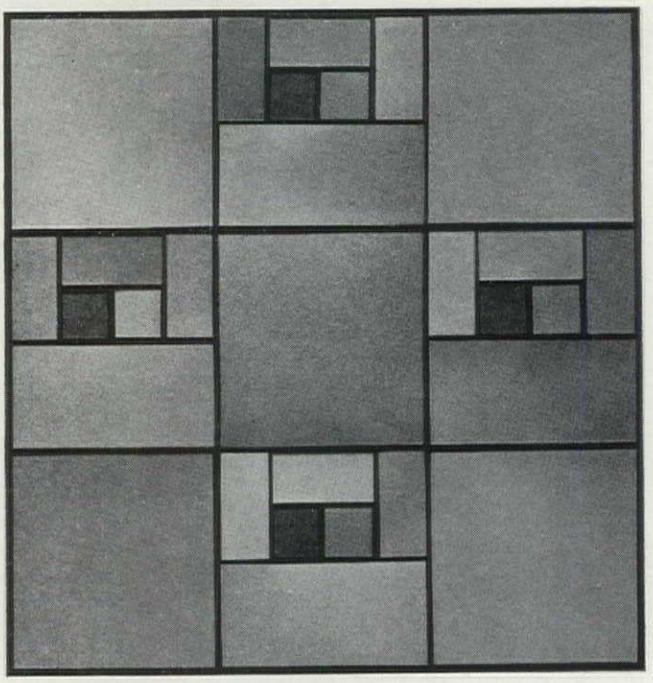

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Due to pure exuberance of spirits induced by the royal game of golf a number of light-hearted architects, spying a new motor-car belonging to a certain architectural engineer, wrote words on the dusty surface of the car, reciting, for the perusal of all and sundry, things lacking in the architectural engineer, both of a golf nature and otherwise.

The engineer responded with a bill as follows:

"HOWARD K. CHAPMAN
OWNER—PONTIAC 6—H. P. 120
WASHINGTON, D. C.

October 9, 1937

Mr. H. S. Chandler,
Washington, D. C.

Statement of Account

Account rendered as to date $0.75

(Charges made necessary for the sabotage, vandalism and just plain scars and disfigurements to one brand new Pontiac 6, 120 H. P. red in color and sporty in design. Such charge represents in addition to actual labor of repair considerable mental anguish, shock and general debilitation of the owner to say nothing of shame and adverse advertisement. In addition it behooves the owner to defy the allegation so infamously and prominently displayed upon the body of said car and with his feeble strength to defy the allegator.)

Unless the said sum of $.75 is forthcoming immediately it will be necessary to institute civil or uncivil suit or the damagee may reciprocate by damaging the body of one decrepit Ford 8, blue in color, H. P. (questionable)—owner said H. S. Chandler (also questionable).

10% off for immediately coming across."

IF I SHOULD DIE TONIGHT

If I should die tonight
And you should come to my cold corpse and say,
Weeping and heartsick o'er my lifeless clay—
If I should die tonight,
And you should come in deepest grief and woe
And say, "Here's that ten dollars that I owe,"
I might arise in my large white cravat
And say, "What's that?"
If I should die tonight
And you should come to my cold corpse and kneel,
Clasping my bier to show the grief you feel—
I say, If I should die tonight
And you should come to me and there and then
Just even hint 'bout paying me that ten,
I might arise the while,
But I'd drop dead again.

THIRD ANNUAL MEDAL PLAY HANDICAP. OCT. 13, 1937

P. Bldg's Branch

CLASS A
Handicap 1-19

* Denotes winner Silver Trophy.

	GROSS	HANDI.	NET
*HOLAHAN, E. J.	81	7	74
*McCRARY, F. H.	87	16	71
ABERNETHY, K. G.	88	11	77
ALSUP, W. W.	89	6	83
SEERY, K.	89	12	77
CHANDLER, H. S.	90	13	77
ASHE, C. L.	92	15	77
DAIDY, G. A.	92	14	78
McMAHON, J. J.	93	13	80
MADDOCKS, J. L.	93	18	75
HILLYER, C. C.	93	12	81
HERMAN, H.	94	14	80
GUERVITZ, M. A.	95	17	78
SONNEMANN, K. O.	95	15	80
BEDNERCHAK, S. J.	96	18	76
TABBUTT, A. M.	97	16	81
LOWE, J. M.	98	16	82
MORRIS, E. B., Jr.	98	16	82
CHEATHAM, W. D.	99	17	82
HARRISON, E. S.	99	12	87
CRAMPTON, G. E.	99	16	83
CHAPMAN, H. K.	100	18	82
WEIS, F. J.	102	14	88
DICK, T.	102	13	89
BUCKINGHAM, G. H.	105	18	87
HAGERLA, L. H.	105	17	88
ROBBINS, F. E.	105	17	88
MILLER, R. C.	105	16	89
WETZEL, SAM.	105	16	89

CLASS "B" HANDICAPS 19 to 26

	GROSS	HANDI.	NET
*SWEENEY, W. A.	93	19	74
JONES, R. L.	94	19	75
*LANDES, W. S.	97	23	74
ENO, A. R.	98	22	76
CONOVER, R. J.	100	20	80
WERNER, J. H.	102	22	80
WARD, V. S.	103	26	77
FARRINGTON, T. H.	103	25	78
LEROY, J. P.	103	25	78
MILLS, L. H.	104	25	79
MYERS, M. E.	104	24	80
DIETRICH, L. E.	105	22	83
FRY, E. L.	106	23	83
WILLIAMS, F.	106	22	84
GLANCY, F. P.	107	26	81
HEIN, P. L.	107	24	83
MAYO, R.	108	24	84
HUNTER, H.	109	23	86
RUSH, J. H.	111	24	87
HARRIS, Y. A.	116	24	92
CHAMBERLIN, L.	116	23	93
WERNER, A. D.	117	22	95
CHOVAN, A. L.	121	26	95
HARRISON, J. R.	126	24	102
WALKER, S. A.	129	22	107

CLASS "C" HANDICAP 27-30

	GROSS	HANDI.	NET
*HENTHORN, J. T.	99	30	69
*ELLIS, L. C.	100	30	70
*CUDD, J. E.	101	30	71
HIXSON, W. E.	105	30	75
SHELDON, G. B.	109	30	79
CARTER, M. B.	112	30	82
KOTH, E. R.	112	28	84
WOLFE, R. M.	117	30	87
SIMPSON, J. B.	117	28	89
RATRIE, J. S.	117	28	89
REDMILE, H. W.	119	30	89
BENNETT, H.	119	30	89
GRAEBER, GEO.	119	29	90
LITZAU, E. R. A.	119	28	91
FURLONG, P. S.	120	30	90
FARNUM, A. B.	121	30	91
HEWITT, J. A.	122	30	92
KELLERT, M.	124	28	96
ECKENDORF, G. E.	125	27	98
PETERSON, C. A.	127	30	97
MULQUEEN, L. F.	128	30	98
POST, C. L.	145	30	115
AUGUSTERFER, R. J.	146	30	116
STEUBER, M. C.	149	30	119
POWELL, J.	162	30	132
OERTLY, D. W.	174	30	144

INDEX TO ADVERTISERS

Romany Tiles for Post Theatre

FORT SAM HOUSTON TEXAS

Designed by Construction Division
Quartermaster General
War Department

United States Quarry Tile Co.

CANTON, OHIO

Because of their wear resisting surface Romany Quarry Tiles are especially suited for public buildings. Their warmth, cheerfulness and beauty make them very desirable for a theatre lobby. Being stainless and non-absorbent they are sanitary. Cleaning and maintenance costs are reduced to a minimum.

Walls and Floors, 6 x 6 Rainbow Quarry Tiles with 2¾ x 2¾ decorated inserts.

Installed by

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San Antonio, Tex.

UNITED STATES POST OFFICE, SOUTH ORANGE, NEW JERSEY

Andrew Christensen, Builder

Treasury Department Procurement
Division, Public Works Branch,
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Atlantic Terra Cotta used for the main entrance, window treatment, frieze and coping in light and dark mottled mat glaze. Our trade name for these effective color combinations is "Abbochrome."

For small communities Post Offices of this type present a distinctive and distinguished appearance impossible to obtain in other materials at the same cost.

The increase in total cost of a similar structure, if so designed that machine-made terra cotta can be used for the field, is relatively slight.

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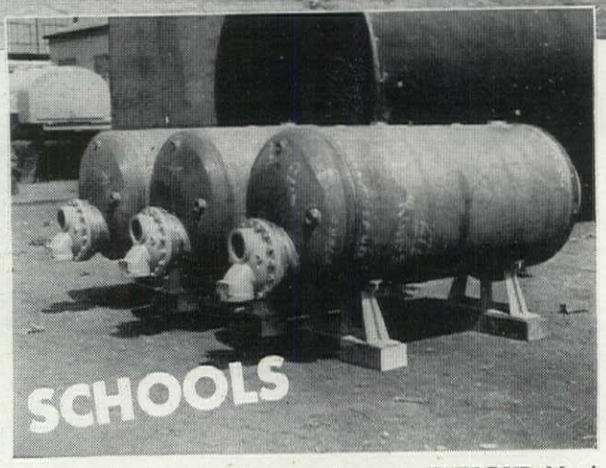

Three heaters of non-rust EVERDUR Metal made for new Philadelphia schools. Fabricated by Quaker City Iron Works, Philadelphia, Pa.

These photographs indicate the ever-increasing trend toward use of non-rust EVERDUR Silicon Bronze for storage tanks and heaters. This Anaconda metal eliminates rust and rust-destruction . . . gives an installation that will be rendering faithful service long after tanks of rustable metal have been discarded.

EVERDUR Metal is ideal for non-rust purposes because it is easily welded and moderate in price. Yet it combines the rustproof qualities of copper with the strength of steel! It fulfills every requirement for strong, durable, non-rust heater shells. Obtainable from leading equipment manufacturers. 37166

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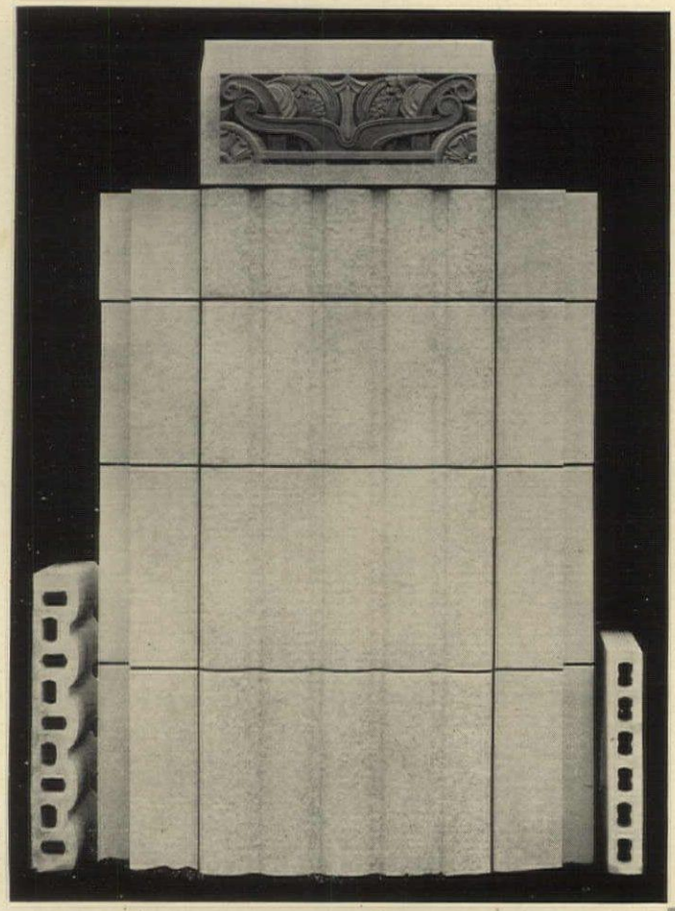

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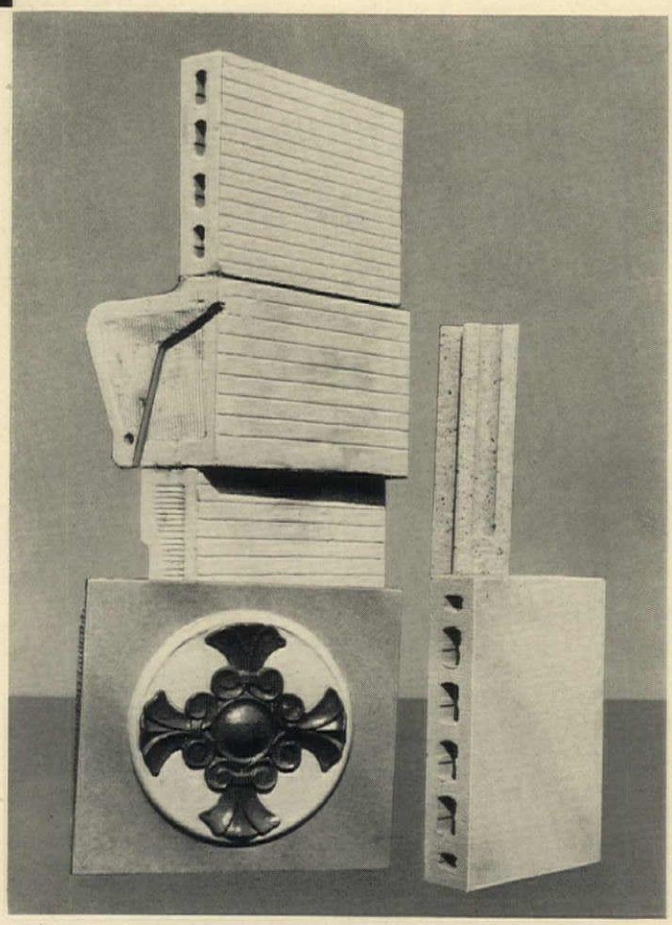

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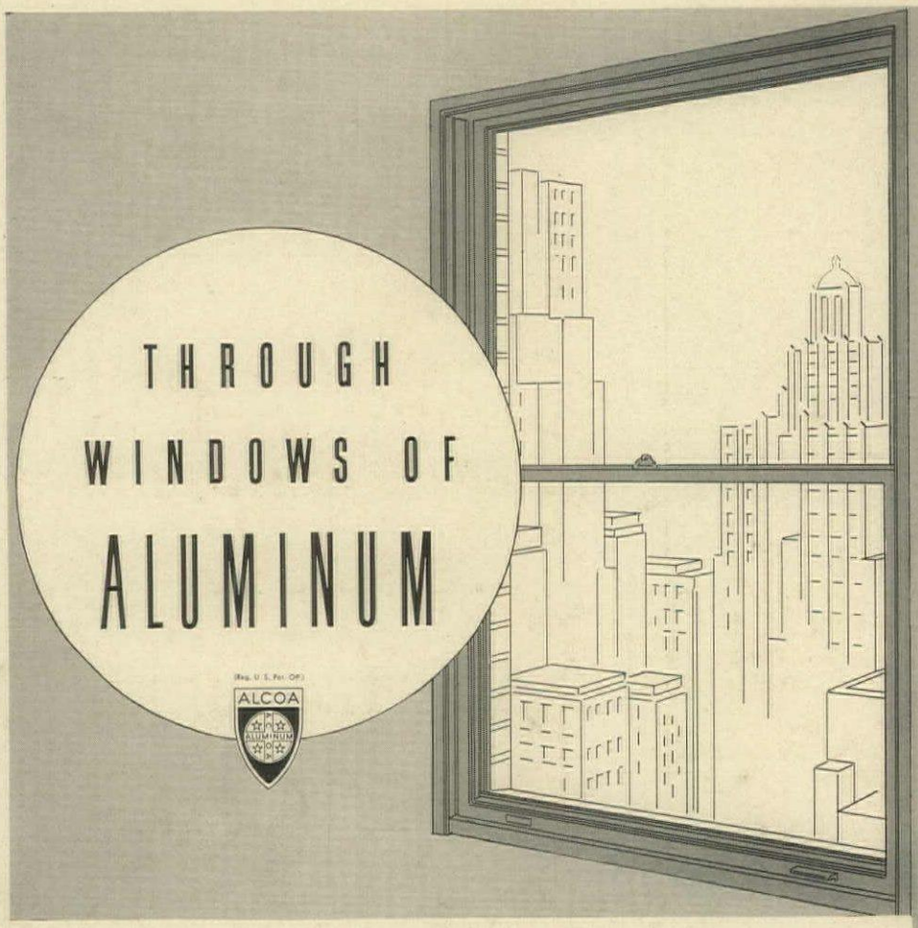

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