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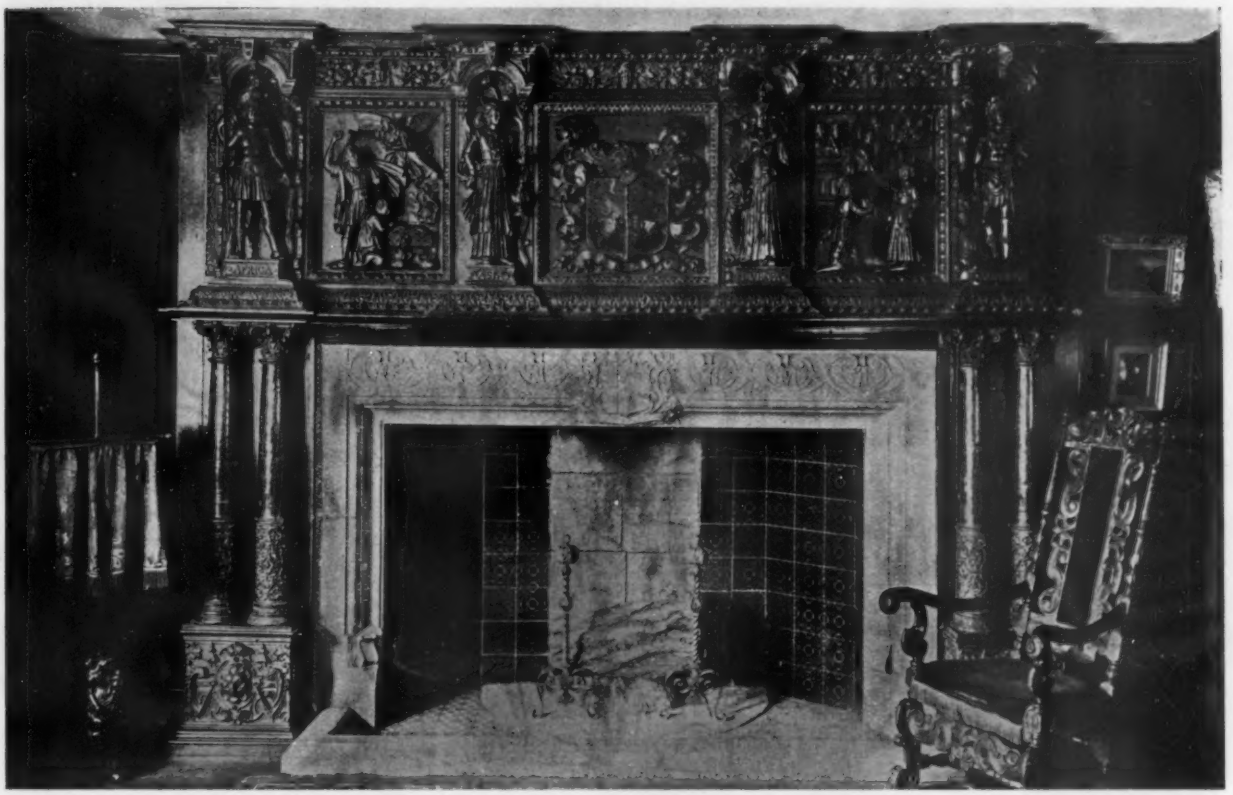


FIREPLACE, MANOR HOUSE PETERBOROUGH, ENGLAND

Some Essentials of Chimney Construction

BY ARTHUR G. BEIN

"BUILD me four good chimneys with a little house around them," said a client to his architect. Because, in the half-dozen country houses he had hired during as many summers the chimneys always smoked, he dwelt long and earnestly on this feature and was promised satisfaction. The house turned out to be a very presentable looking little place; and now, after three years' doctoring by "chimney experts"—which doctoring amounted almost to rebuilding—three of the fireplaces in it can be used. The fourth has been given up as irreclaimable.

There is nothing unusual about the above tale of woe. It could be matched by thousands of disappointed admirers of the open fireplace. In nearly every case they have been defrauded of a cheerful blaze and driven out by smoke that smarted in eyes and nose, by one common fault—a flue entirely disproportionate to the fireplace opening.

The chimney should serve a twofold purpose; it should be an exit for the smoke and waste gases of combustion, and it should be the chief decorative feature of the room where it starts and lend beauty to the exterior of the house as well. Architects have paid more attention to the second consideration than to the first. They seem to have an architectural creed that all flues should be the same size—eight and a half by thirteen inches, and this, whether the smoke is to be carried from a small bedroom grate on the second floor, or from a large living-room fire on the ground floor. To be sure, this stupidity is humane since it makes possible the en-

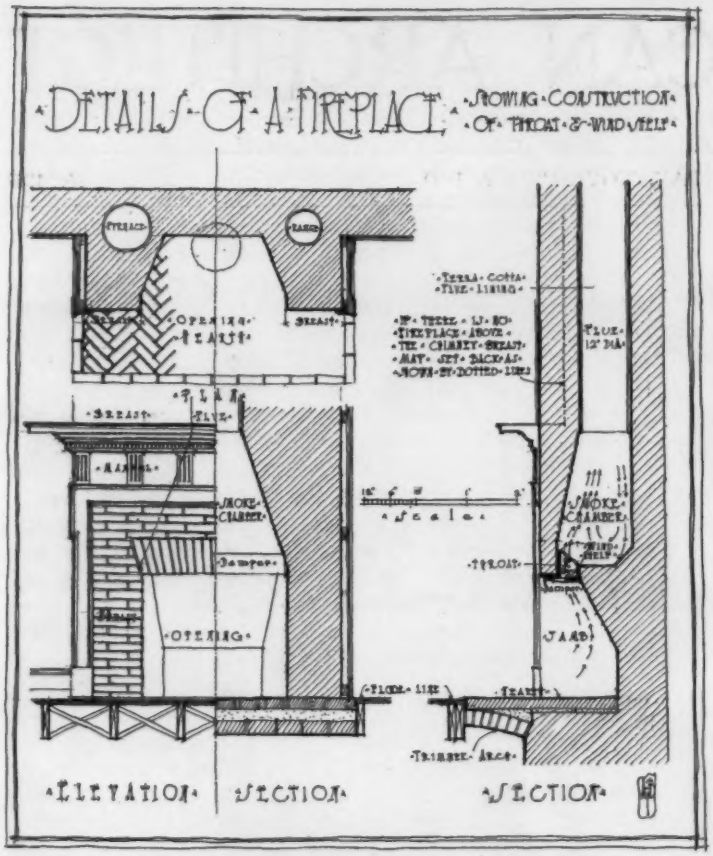


FIG. 2

terprising career of the "chimney expert," but the disgusted client does not take this philanthropic view of it. Aside from the extra money it costs him, he is sore at seeing what was originally a well-designed fireplace made hideous by such contrivances as a sheet metal hood, or a hearth raised above the floor in order to bring the fire nearer the flue, or a lining of vitrified brick in a cobblestone structure, or a cowl outside to augment the draught.

Considering the venerable age of the chimney—six hundred years at least—such defective construction is a serious reproach to us. It means that there has been little advance over those earliest chimneys built when people were not over sensitive to the discomfort of smoke. In fact our Fifteenth and Sixteenth Century ancestors had become well used to that long before the introduction of the chimney, owing to the custom of building a great roaring fire on the middle of the stone floor, and letting its smoke escape through doors, windows, or the specially provided "louvres" which may still be seen at Penhurst Mansion in Kent. Some of these well-seasoned old Englishmen actually deplored the invention of the smoke shaft, as may be gathered from the following extract by an early Seventeenth Century writer:

"Now we have many chimneys, yet our tenderlings complain of rheumes, catarrhs, and poses (colds in the head); then had we none, and our heads did never ache." Smoke was also considered beneficial for the timber.

As our word chimney comes from the Greek *kaminos,* it was long supposed that chimneys were known to the ancients. But *kaminos,* it is now proven, never meant more than a furnace or oven, and not the funnel connecting them with the outer air. Roman writers allude frequently to smoke escapes in walls or ceiling, but in no case is there sufficient ground for assuming that an actual flue existed, and we can only conclude that in the absence of any artificial means of carrying off the smoke, the wealthy Romans, on the rare occasions when they needed a fire, endured the accompanying smoke.

"Last evening," writes Seneca, "I had some friends with me, and on that account a stronger smoke was raised; not, however, such a smoke as bursts from the kitchens of the great and which alarms the watchers, but such a one that signifies that guests are arrived."

The recent excavations of domestic architecture in Herculaneum and Pompeii reveal no chimneys, nor can any trace of them be discovered in the frescoes depicting the home life of the times. In the more palatial villas have been found heat-flues—clay pipes conducting heat from a compartment of live coals or embers to the living room, and terminating ornamentally in a lion's head, for example. But this predecessor of the modern furnace must not be confused with the chimney. It is not until the year 1347 that we have any reliable information, although

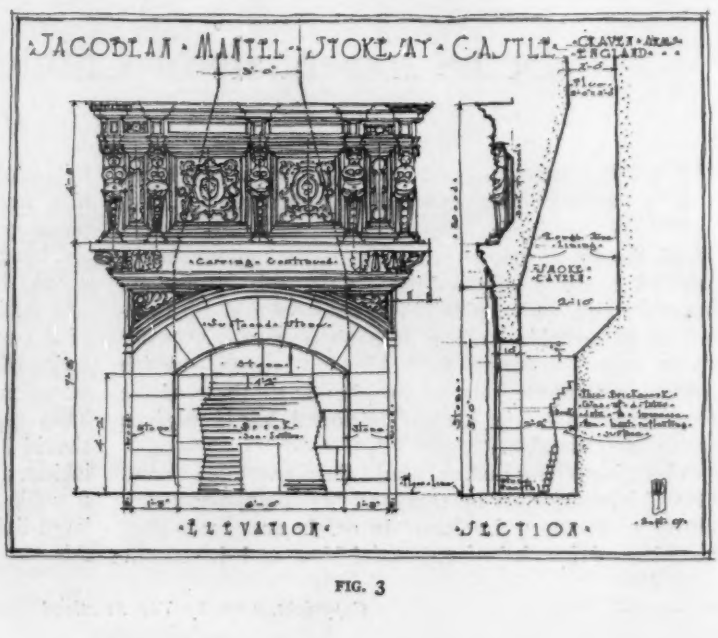


FIG. 3

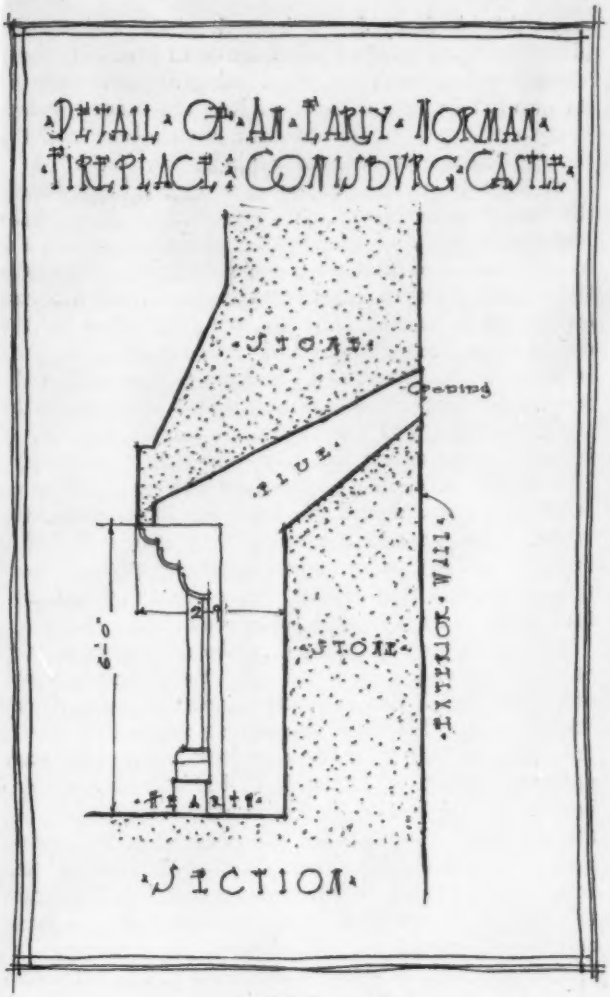


FIG. 1

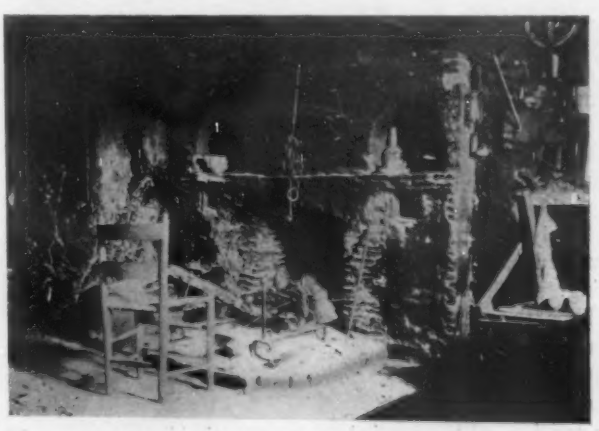
there are some obscure references as early as the eleventh century. But in 1347 a tablet was erected in Venice and could still be seen some years ago, to record that a violent earthquake had thrown down *molti camini*. Several historians of the day confirm the story. So, lacking similar testimony in other countries, many are inclined to credit Venice with the invention of the chimney; which is probable enough considering the acuteness and fertility of the Italian mind even a whole century before the Renaissance.

It would seem more natural to look for its origin in a colder country like England. But in the building regulations established in the reign of Richard I (1189-1199) and known as the Decrees of the Assizes of London, though we find familiar phrases such as *the thickness of party-walls*, and *the hight of ceilings*, there is not the remotest mention of the chimney. In Rochester Castle, constructed about the middle of the twelfth century, complete fireplaces may be seen, but their flues go up only a few feet in the thickness of the wall, and are then turned out through a small oblong opening in the exterior wall. In Conisburgh Castle, another Norman structure, the back of the fireplace also slopes funnel-wise into an opening in the wall. (Fig. 1.)

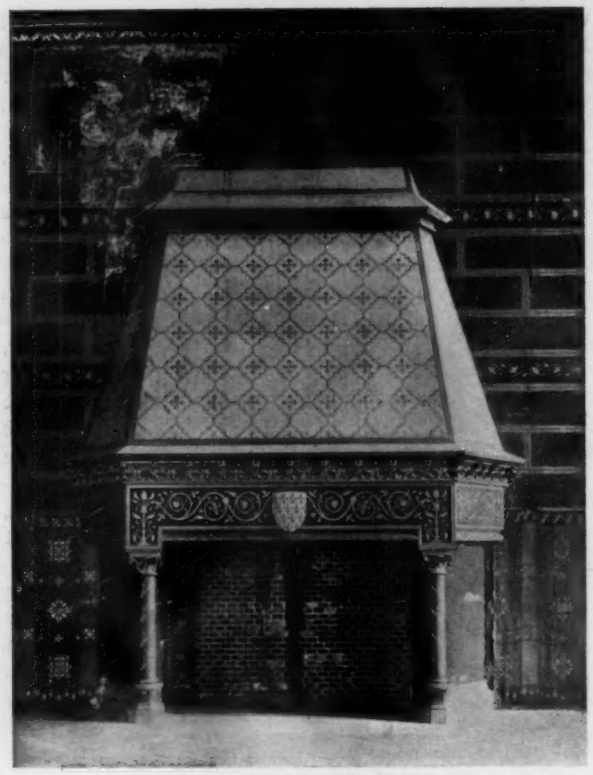
Probably the oldest complete chimneys running to the top of the building are in Castle Hedingham and in the old castle at Sherborne. During the reign of Henry VIII (1509-1547) they made their way into many private houses. As their gain in public favor was simultaneous with the introduction of glazing, it is not improbable that the obstructing by glass of the window outlet for smoke forced the use of the chimney. The luxury became a necessity, nor was its decorative value slighted. In fact, the chimney became one of the chief features in designing a room. To-day even the owner of a steam-heated house wants in addition open fireplaces for the sake of ornament and sentiment. But all too often, instead of inviting him by their cheerful blaze they drive him off by their smoky misbehavior.

To understand why this is, let us begin by defining the various parts of the chimney and then follow the mason in laying these up. The *fireplace*, where the chimney opens into the room, and the *hearth*, the stone or brick floor of this opening, are two of the most popular words in the language, and have expanded, indeed, into meaning the house itself as the symbol of comfort and hospitality. The vertical sides of the opening are the *jambs*, and the horizontal lintel resting on them is the *mantel*. Above the fireplace is the *throat* formed by the forward corbeling of the back at the point where it terminates in the *windshelf*. On this windshelf rests the *damper* and from the level of the damper rises the *smoke-cavern* which narrows into the *flue*. The front wall of the cavern is called the *breast*. When two or more chimneys are clustered together the partitions separating the different flues are known as the *withs*, while the several chimneys thus massed are a *stack*. Above the roof of the house rises the *chimney shaft*, capped by a *chimney top*. Sometimes this top is topped again by a *chimney pot*, an arrangement for augmenting the draught; or by a *cowl* which, revolving with the wind, prevents a down draught.

Count Rumford (1753-1814), that remarkable American of romantic career, having long and carefully studied the phenomena of heat, set himself the task of curing smoky chimneys—three centuries of which nuisance were beginning to tell on the British temper. To him we are indebted for the first improvements made in chimney construction, and it is to be regretted that the rules he laid down are not more closely followed. He proved, among other things, that by building the sides of the fireplace oblique, instead of at right angles



A XV CENTURY ITALIAN FIREPLACE



FIREPLACE IN CHATEAU AT BLOIS, FRANCE

to the opening as formerly, an increase of heat was obtained by reflection; this feature is well exemplified in the photograph of the old manor house fireplace at Peterborough, England; that the fire should be kept as near the hearth as possible; that a narrow throat prevented the escape of too much heated air; that one placed too near the fire wasted the fuel by creating too strong a draught, while one too high was insufficient and sent the smoke back into the room.

These suggestions, though far from perfecting chimney construction, so improved it that builders were content to let the matter rest there, trusting to Providence for occasional success. Yet it is a comparatively simple matter to carry the study a little farther and arrive at a few fundamental principles that will invariably result in at least a chimney that does not smoke, and often, in addition, one that gives out a maximum of heat.

Of course, where we are content, as they were long ago, to let 80 or 90 per cent. of the heat pass up the flue, it is easy enough, by allowing for an enormous draught in the construction, to avoid a return of the smoke; but it is precisely in trying to retain more heat in the room that the trouble is met. About 50 per cent. of the heat generated in any open fireplace goes immediately up the flue, and about 80 per cent. of the remainder is absorbed by the back and sides of the opening, which leaves 10 per cent for the shivering family. Then the radiating power of wood, when all the rays are collected, is only 23 per cent. In the efforts to retain more heat a new type of chimney has been developed, shown in Fig. 2. This, if built with mathematical precision, may be relied upon—that is if the owner will relinquish his fancy for a "huge fireplace" and content himself with an opening 3 feet across or less. He must remember that the larger the opening the more cold air its draught suction will collect into the room through every crack and crevice of door or window; and the fiercer the fire burns the more this is true.

To fully understand the merits of Fig. 2, let us follow the mason as he lays it out. Assuming that the well-understood detail of the framing of timber around the hearth is finished, that the trimmer arch is built and the hearth laid, he then maps out the plan of the fireplace on the rough hearth. The maximum of heat being the object, undoubtedly the best proportion is when the back is equal to two-thirds, and the depth to one-half, of the front. In other words, starting with 3 feet across the front, the sides would slant back to a depth of 1 foot 6 inches so as to leave 2 feet across the back of the recess. The height, of course, depends on the design; but no good design would ever call for a height exceeding the width. Many authorities say not to exceed 2 feet 6 inches, a greater measurement simply supplying superfluous area that may gather the air in a swirl and send little puffs of smoke out into the room.

The dimensions decided upon, the mason starts back at right angles for a distance of 4 inches before going obliquely; he thus avoids the expensive necessity of "rubbing" the bricks at the obtuse angle that would otherwise be formed at the very front. The jambs are naturally carried up to the desired height of the opening, which height also determines the resting place for the damper. The back of the opening, after having mounted vertically for about 12 inches, is then corbeled forward to meet the throat. This throat, it is important to observe, should never be more than 4 inches deep, and should extend the full width of the opening. Inclining the back forward in this manner has a twofold object—it increases heat reflection, and its top forms the windshelf.

All the walls of the recess having now been brought to the level of the windshelf, the mason is ready to set the damper. As the damper is made of cast iron, its outer flange, in the case of a flat arch, renders unnecessary the use of the supporting angle iron. Once placed, the damper acts as a form around which the mason may build his superstructure; and the establishing of this form on the most approved lines is one of the prime advantages of the damper. Without it one is at the mercy of the ingenious mason.

Directly back of the damper is the windshelf, formed,

STOKESAY CASTLE ENGLAND

as already mentioned, by bringing forward the back of the recess and terminating it in a horizontal ledge. This ledge extends back to meet the vertical line of the flue, giving usually a depth of 8 inches. Its object is to deflect the descending current of cold air outward to meet the ascending current of hot air in the throat, thereby reducing the friction of their meeting to a minimum.

Above the throat damper is the smoke chamber which, when this type of fireplace was first evolved, was dispensed with. It used to be the place for hanging bacon and hams to smoke, and when the adoption of the narrow throat made it inaccessible for this purpose, builders saw no reason for retaining it. Now, however, it is recognized as of vital importance, as it allows the smoke to roll lazily around and to gradually find its way to the smaller opening of the flue. The more attenuated the smoke chamber, the better it serves its purpose by reducing the friction of the smoke against the walls. It should be carefully seen to that none of the wooden supports of the mantel project into this opening, as they could easily become ignited by the flames which a good draught will sometimes draw up into the throat.

The smoke cavern naturally develops itself into the flue, the beginning of which should be directly above the fireplace. The reason is obvious—if it were placed to one side the draught would be strongest on that side, while the other would smoke. After it has been well started above the middle it may if desired be deflected to right or left, though never with an angle less than 60 degrees. Terra cotta is the best lining for the flue and a cylindrical shaft is more conducive to a good draught than a rectangular one. The base of the flue—and this is most important—should have an area in square inches equal to one-tenth of the square inches in the fireplace opening. Thus an opening 3 feet wide and 2 feet 6 inches high, giving an exposure of 1080 square inches to the room, would necessitate a flue 12 inches in diameter, giving an area of 108 square inches.

In domestic work no general rule can be applied to the height of the exterior chimney, as that must be regulated by the roofage of the house to which it belongs, and frequently—in city houses, at any rate—by the height of the next building. In no case should it terminate lower than the adjacent ridgepole, not only because sparks might fly against the shingles, but also because the downward currents of air which follow a sloping roof are apt to enter the chimney and force smoke back into the room below. Then it is that the owner has to resort to cowls and other disfigurements.

To be satisfactory the type of fireplace just described should not exceed 3 feet in width; which puts the large, old-fashioned and extremely ornamental fireplace inspired by the early Norman, English, French and Italian examples in another class. Some of these, as may be seen in the Doge's Palace in Venice, not only exceed 3 feet in width, but have a height of even more than 6 feet. For such a fireplace, sending as it does about 90 per cent. of the heat up the chimney, not much can be said on the score of economy. But, happily, all clients do not have to consider this phase of the question, and for them the architect may reproduce the beauty and charm which builders of old saw in the chimney when it was not yet reduced to the meagerest possible dimensions, but was a substantial element of the whole building and a prominent feature in the design. Its decorative value was not only considered in the interior, but also on the outside in the massing of ornamentation of roofage against the sky. By adopting another method of construction, these semi-sacred old gathering places for the host and his friends may be built to-day with satisfactory results.

To illustrate the constructional features of this type Fig. 3 is shown. It is a measured sketch of the fireplace and mantel in the solar room of Stokesay Castle,

CHIMNEYPIECE IN THE DOGE'S BEDROOM, DUCAL PALACE, VENICE.

Craven Arms, England. Though there is no attempt at throat or damper in it, I was told it was never known to smoke, but soot and dirt came down in abundance at times; but this I am sure could have been easily prevented by a revolving damper placed in the flue and managed from below by some sort of mechanical contrivance. While there is no fixed rule for dimensions, it will be observed in this as in other old fireplaces having no hood that the depth is rarely less than 2 feet, while in the French and Italian fireplaces, where the hood projects several feet from the wall, the recess is often as shallow as 8 inches; in fact, there are even instances where there is no depth at all beyond the slight projection of the side pilasters.

The sides of the opening may be oblique, the rule of heat reflection still being applicable, though in the fifteenth and sixteenth centuries they were at right angles. They are invariably carried up to a line 6 or 8 inches below the opening in the front, from there to extend backward at an angle of 45 degrees until they unite with the back of the smoke chamber. In this manner an opening is prepared large enough to admit both the heated ascending column and also the large quantity of cold air which so powerful a draught would naturally suck in at this point, as indicated by the arrows. In smaller fireplaces, where swirling eddies are less likely to form, this feature would not be so necessary, which fact permits the introduction of the throat and damper. With the old throatless flue the smoke chamber reached its greatest development and often rose to a height of 20 feet, forming a veritable cavern. In these days of low ceilings and thin walls, however, it is rarely practicable to build such an enormous smoke chamber; a smaller one, but always with walls not receding at less than 45 degrees, would serve just as well. As this part of the chimney place is subjected to great heat and cannot, like the flue, be protected by tile, only the best of cement should be used in laying it up.

There is a prevalent notion among builders that with the throatless fireplace the flue must be disproportionately large. To be sure, there is the precedent of the chimneys built long ago, but it is more likely they were made large to facilitate cleaning than as the result of any accurate figuring. The rule of a flue having one-tenth the area of the fireplace opening is as applicable to these large chimneys as to the smaller ones previously described.

It is with the huge old fireplaces that the architect has a chance of making a striking composition of chimney stacks against the sky. For the effect of getting light between the various shafts of the stack each flue is carried up in separate octagonal shafts placed about 4 or 6 inches apart with their bases and caps connected by their respective mouldings; but it must be remembered in getting this picturesque effect that each of these isolated flues presents a greater cooling surface to the air circulating around the entire shaft, and is therefore apt to cause a downward draught.

MANTEL IN ENTRANCE HALL OF A HOUSE ON STATEN ISLAND, NEW YORK

For decorative effect the old hooded fireplace is hard to beat. This is simply a fireplace flat against the wall with the hood thrown out several feet into the room to insure a proper draught. As seen in the photographs of old mantels at Blois and Venice, the chimney breast slopes away from the mantel upward until it intersects the wall, and its surface is generally ornamented in color or in plaster reliefs. Sometimes the sides, and even the back, of the fireplace are left open in such a manner as to permit the light and heat to reflect into other apartments as well.

In the Stokesay Castle illustration an interesting afterthought will be observed; this is the troweling out of the back by brick masonry applied to the original stone at a later date, in order to increase the heat reflecting surface. I have been informed by a Western heating engineer that this same form terminating some inches below the throat opening, and no damper being used, is applied to-day with good results in the West.

Even when a chimney is correctly built it is often pronounced a failure by its owner simply because he is ignorant of how to light and keep up a fire in it. Under no circumstances should a hearth be swept clean of its ashes and embers; while scrubbing the hearth and sides is as preposterous as scrubbing the inside of the kitchen range. Each night's unconsumed wood should be buried in ashes and kept warm for the next morning's kindling. Water should never be thrown on the fire to put it out, as it is one of the surest ways for preparing a smoky fireplace for the next lighting. Green wood should be avoided for a doubtful fireplace, but where the draught is unquestionably good it may be used with impunity and its sputterings of sap and its fragrant green odor are delightfully reminiscent of the camp-fire.

So much for the building of a chimney that will not smoke; for those long built that are faulty, numerous corrective devices have been patented, amongst them the smoke-consuming, self-ventilating, revolving grates, hideous to behold; and the caps, whirligigs, and other undignified and toylike appliances visible from the outside. In speaking of these various contrivances Mr. John Putnam in his book on fireplaces says: "Many of

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CONTENTS

IT is perhaps a trite saying that we ordinarily exalt our artists by not requiring them to decorate the walls of our humble structures and demean our craftsmen by not permitting their work to adorn our great buildings. Its truth, however, is obvious. Which of the two errors is the greater it would be difficult to say, but just at the present time, the arts and crafts movement in this country bids fair to correct the situation in so far as an appreciation of the fruits of the craftsman's labors are concerned. At no period of this country's development has the artist-craftsman been held in so high regard by the public as now. In fact, there may be cause for apprehension lest, in excess of zeal, some of the dreary work produced by so-called "craftsman shops" in endless duplication, will be accepted as the genuine article so suddenly and ardently desired. It is our misfortune that no sooner do we come to hold at their true worth objects of art or utility, or those combining these qualities, than some enterprising individual, whose prophetic eye had seen the movement while it was still afar off is discovered with a fully equipped factory, prepared to supply the demand on a commercial basis. Between the work of the true artisan and that of the artist there exists no clear line of demarcation, but between that of the artisan of the commercial factory established to profit by the sale of its spurious product, there is as much difference as between art and shoemaking.

WITH the advent in recent years of concrete as a practicable material with which to construct the façades of our buildings we have acquired many new problems. One of the most difficult appears to be the determining of a rational architectural treatment adapted to the physical properties of the material. Various solutions have been suggested, none of which appear wholly satisfactory, either from practical or architectural considerations. Unusual opportunitity has been afforded the "progressives" and they have wandered in some cases from the realm of good taste, have ignored precedent, apparently under the impression that newness and unusual forms would serve as a substitute for artistic originality, or perhaps be mistaken for it. There is still much to be learned as to the use of concrete, artistically and practically, but we see no occasion for impatience. A style of treatment particularly adapted to the material will inevitably be evolved eventually. In the meantime our chief concern should be to discourage the tendency to applaud the clever manipulation occasionally seen, which at best is only the exercise of a certain ingenuity, quite alien to dignified design, and which, if carried to its logical culmination, would lead to absurdity.

REPORTS from all sections of the country furnish unmistakable evidence that the building material interests' prospects for the coming year are brighter and fuller than at any time since 1906, if not in their entire history. The effects of the recent depression seem to have entirely passed. Money is cheap and plentiful and investors are taking advantage of present favorable conditions in a manner insuring a prolonged period of unusual activity in the building field. Already we are beginning to hear of mills and shops choked with orders, and preparations for greatly increasing the capacity of more than a few plants are being made with all haste. The situation is one of unusual promise, not alone for the building materials' interests, but for contractors and architects as well.

PERHAPS the most impressive evidence that can be adduced to prove the advance in matters of art in this country is to be found in the civic beauty movement now gaining strength from Maine to California. It would manifestly be impossible to attain the splendid results that have been secured in scores of cities if the public was apathetic, or unappreciative, of the immense value accruing from an intelligent handling of the city-planning problem. While realization of the fact that commercial value is directly proportional to artistic merit was not general a decade ago, little argument is required to-day to convince the average municipality of the advantages, from every point of view, of adopting a comprehensive scheme for betterments and future development. Obviously an appreciation of civic art is not the first stage in the artistic development of a people, and its presence speaks volumes for the advance in matters of art of the masses in America.

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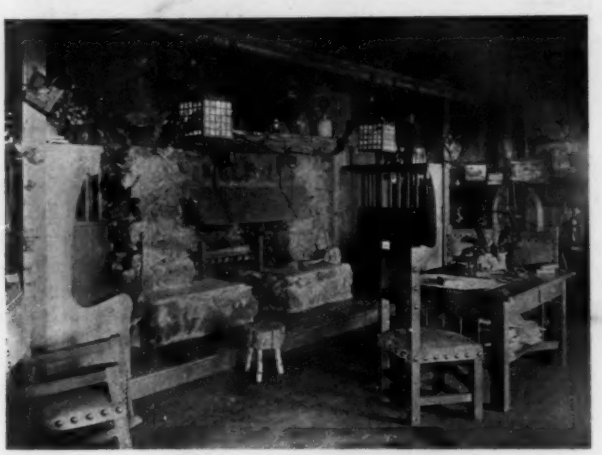
these appear so excellent that it is hard to understand why they were not seized upon at once; but we must bear in mind that the majority of people are unaware of the waste of fuel they actually suffer and only regard the style of grate and mantel." Any one who glances over the trade list of these hideous improvements, which in some cases even conceal the fire completely, would, like the unintelligent public, prefer sitting before a cheerful fire that wastes the fuel than before some unlovely sheet iron apparatus that saves it. Dr. Arnott, an enthusiastic Londoner who invented one of these smoke consumers, urges as one of its advantages that it would reduce the enormous amount of soap used for frequent



face and hand washing by those who live in a house where the chimney smokes!

The best known attempt at securing all the merits with none of the demerits of the fireplace is the gas-log. But the vitiated air it produces is probably a worse evil than smoke; while its shabby make-believe is intolerable to any one in whose mind there lingers even a ghost of reverence for the sacred traditions of the hearth. No wonder it has been said by a discriminating observer—"There are two kinds of people: those who burn gas-logs and those who burn real logs." The distinction is admirably subtle.

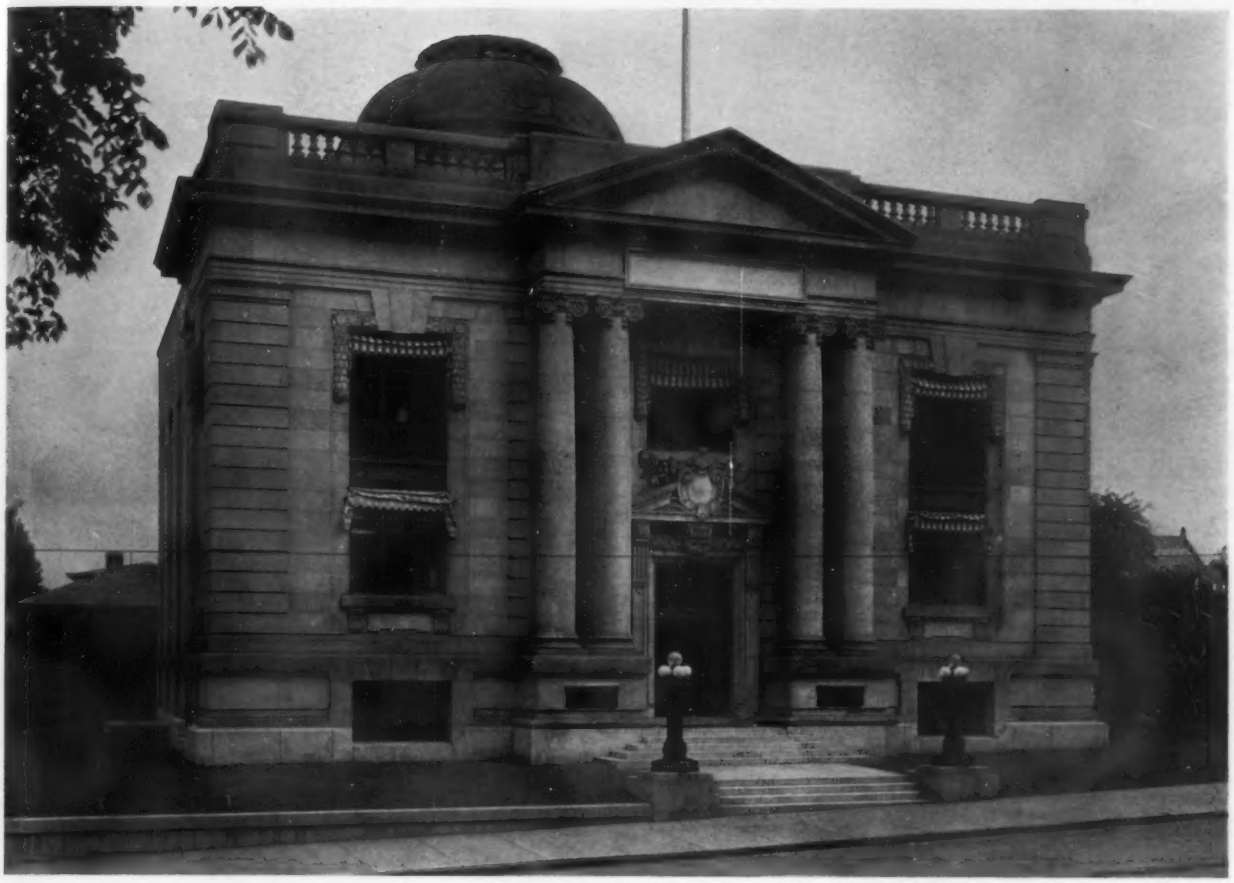
REINFORCED CONCRETE TESTS

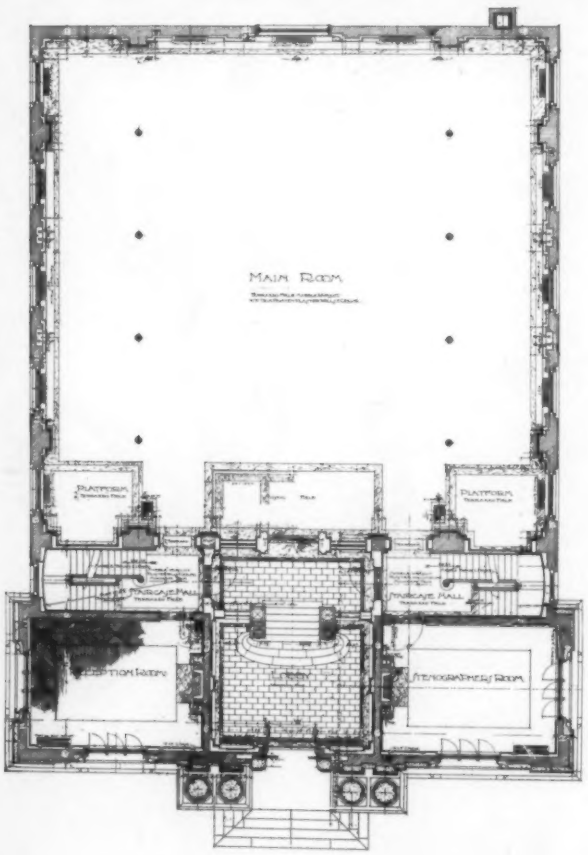
A preliminary report by the United States Geological Survey

The increasing use of reinforced concrete as a building material has led to numerous investigations of its strength when variously prepared and when subjected to various conditions. Perhaps the most elaborate series of tests is that now being carried on by the United States Geological Survey, which has recently published (Bulletin 344) a preliminary report on the subject. A full report, with a thorough analysis of the results, will be published after the 52-week tests are completed. The attempt has been made to bring out the comparative value of gravel, granite, limestone and cinders for use in concrete, and the effect of age and consistency on the strength and on the stiffness. No attempt has been made in this preliminary report, however, to generalize the results of the tests, or to draw any conclusions, however warranted they may appear from an examination of the test data. It is hoped that the matter presented will provoke discussion, and in order to promote this end extended expressions of opinion or attempted applications of theory to results have been avoided. A running commentary on the results of the tests, however, emphasizing matters of particular interest and indicating a few points that might lead to interesting analyses, is included. The bulletin, which is by Richard L. Humphrey, may be had free of charge on application to the Director, United States Geological Survey, Washington, D. C.—*Exchange.*

REINFORCING WOODEN POLES WITH CONCRETE

The Electric Railway Journal, in its annual maintenance number, publishes an interesting article on the above subject. It points out that every company using wooden poles has expended large sums in renewing poles which were perfectly sound above the ground line, but which were dangerously decayed below that point. Then follows a description of a method of reinforcing devised by General Superintendent A. S. Orr, of the Allegheny County Light Co., Pittsburg, Pa. The pole to be reinforced is supported by tripods or held securely in place by temporary guy ropes or wires; the earth is then removed for a distance of about 18 ins. from the sides of the pole to a depth that will expose the solid portion of the butt remaining. The decayed portion of the pole is then scraped out. Steel rods ½ in. in diameter and from 3½ ft. to 6 in. to 6 ft. long are used for reinforcing. The rods are pointed at both ends, the upper end being bent at right angles to form a dog or point from 5 in. to 6 in. long. The straight end of the rod is driven into the sound portion of the butt at an angle by the use of a special driving tool. The upper portion of the rod is then bent in toward the pole and the dog driven in to its full length. The length of the rod used is such as to permit the proper anchorage of its lower end in the sound wood of the butt and to allow the portion extending above ground to be of sufficient length to span the decayed section of the pole, and be driven into perfectly sound wood. The points of the rods are usually driven into the pole from 12 in. to 18 in. above the ground level. From four to eight rods are used to form the reinforcing cage, depending on the diameter of the pole. Concrete is filled in around the pole, replacing the decayed portions of the wood, and forming a protecting sleeve or envelope for the rods about 6 in. thick. This concrete extends above the ground sufficiently to cover the upper terminals of the rods and protect them from the action of the moisture in the air, forming a collar above ground and tapering from about 3 in. thick at the ground level to about 1½ in. at the top. It is finished off in a sightly fashion by a special sheet metal form designed for the purpose. Where the butt of the pole is partly rotted away the rotton portions are removed and the space is filled in with concrete, thus providing an anchorage for the rods either in the solid wood of the butt or in the concrete.—*Cement Age.*

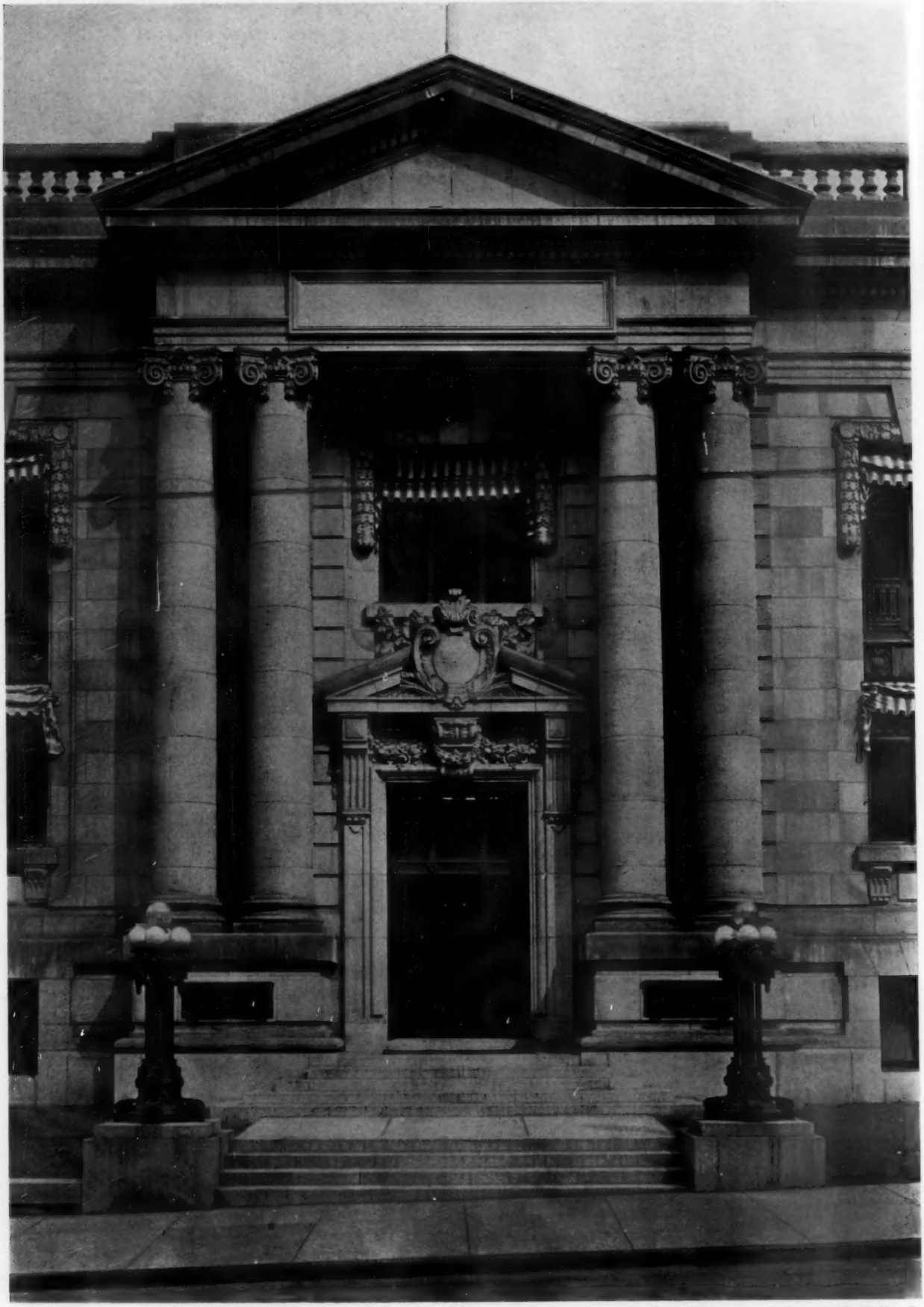




The building is fireproof construction throughout, with limestone front and gray brick back of the front division. The interior lobby has a Tennessee marble base, Pavanazzo marble pilasters, marble tile floor. Main room doorways and wainscot are of vein statuary marble and the plaster ceiling is heavily beamed and ornamented. It is an interesting fact that the large main room which is lofty, domed and entirely constructed of hard material, has no echo whatever. The architects believe this is due to the fact that all the plaster services are so richly ornamented that the echo has been successfully broken.

BUILDING OF ORIENT INSURANCE CO.
HARTFORD, CONN.

MESSRS. DAVIS & BROOKS
ARCHITECTS



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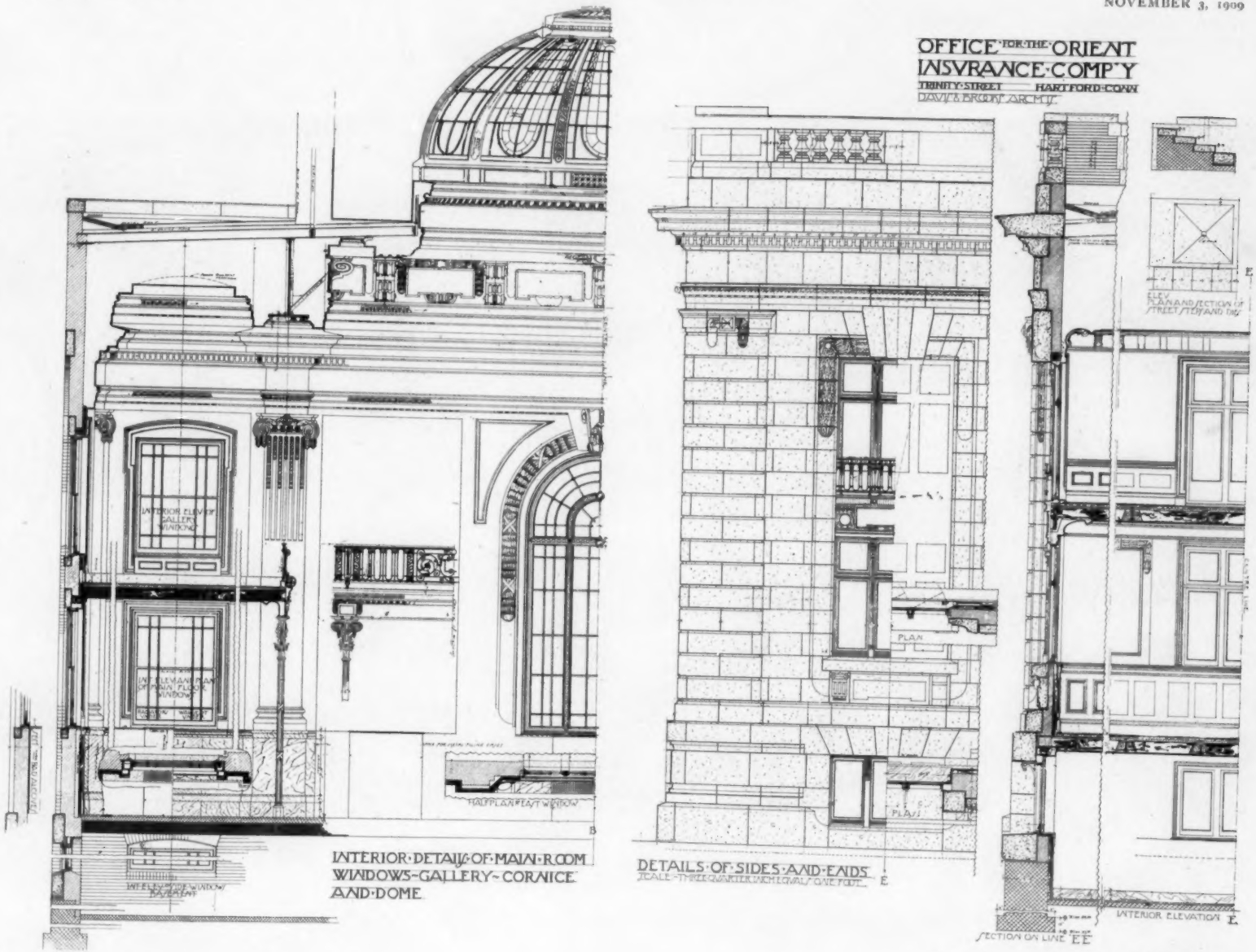

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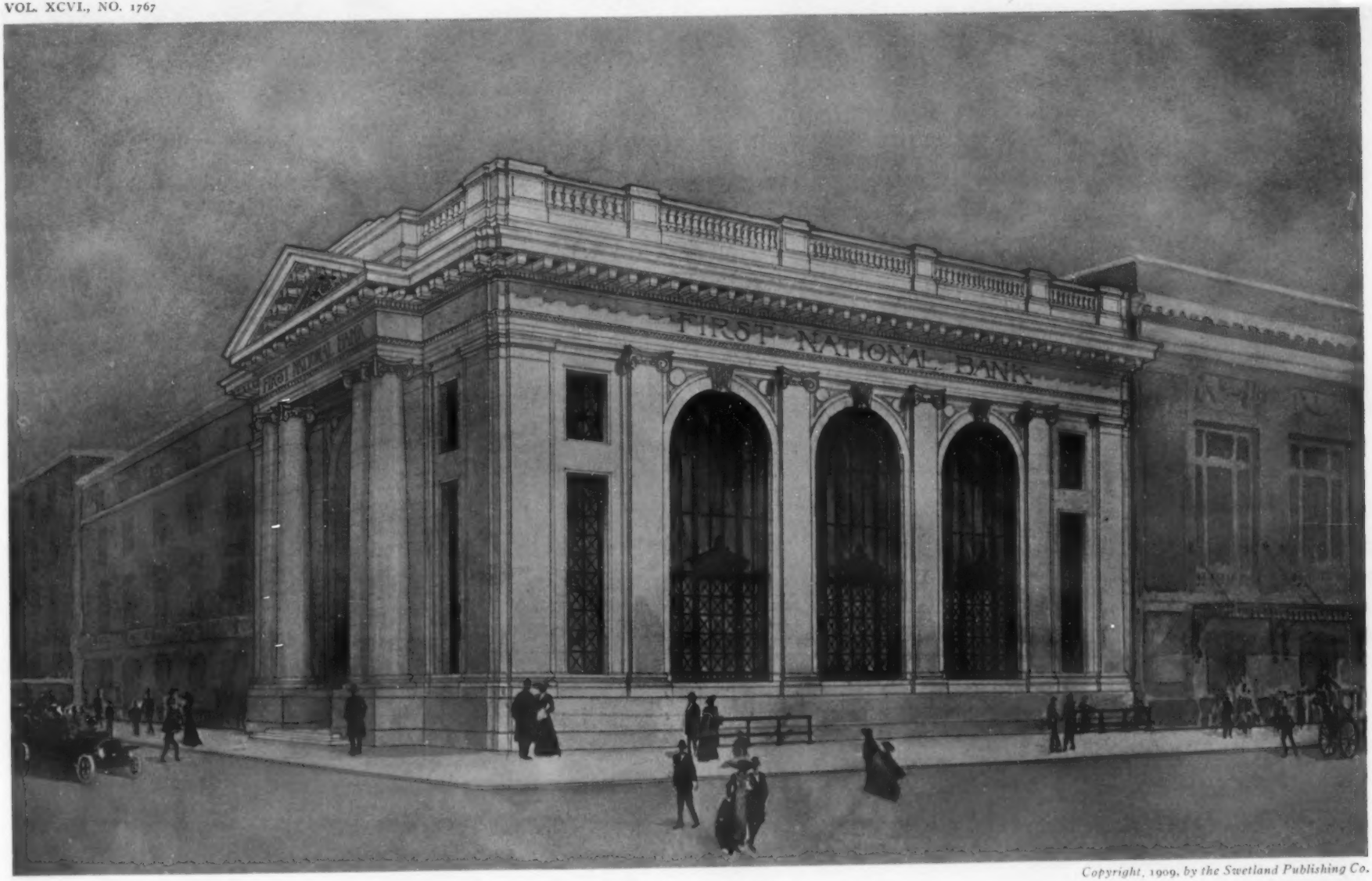
THE AMERICAN ARCHITECT

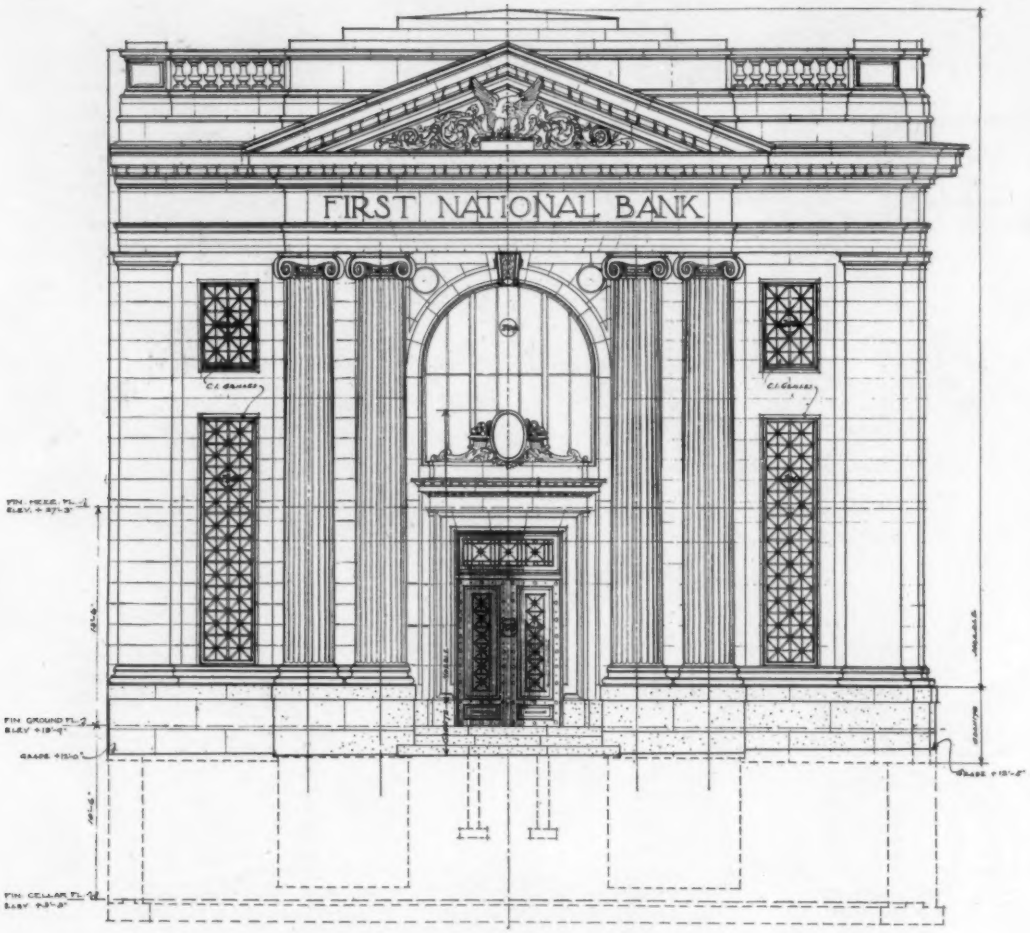


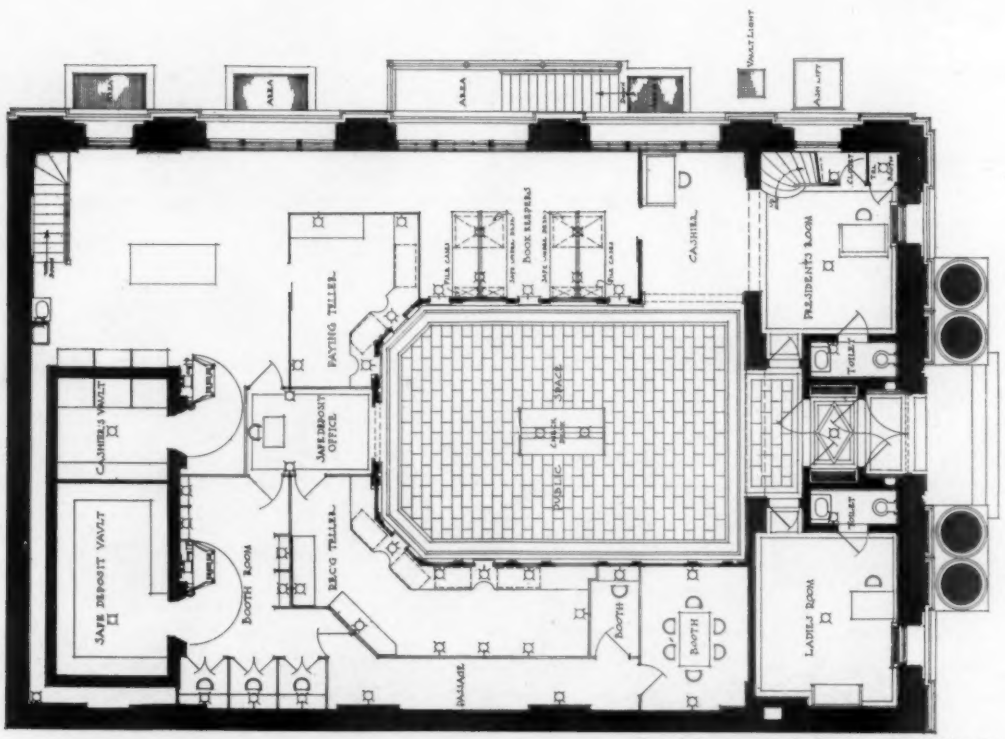
ACCEPTED COMPETITIVE DESIGN

The exterior of this building is constructed of South Dover marble, with bronze window frames and doors. A simple classic design has been adhered to as being the most dignified and appropriate style for such an institution. The interior is finished in Greek marbles, Skyros for the wainscoting and bank screen, while Tynos is used for the base throughout. The furniture and fittings are all of metal of the latest and of the most approved type. All the working space is contained on one floor, and the Directors' Room occupies a small mezzanine in the front of the building. The interior is well lighted by three large arched windows, as well as by a large skylight overhead.

FIRST NATIONAL BANK
HOBOKEN, N. J.

KENNETH M. MURCHISON, JR.
ARCHITECT





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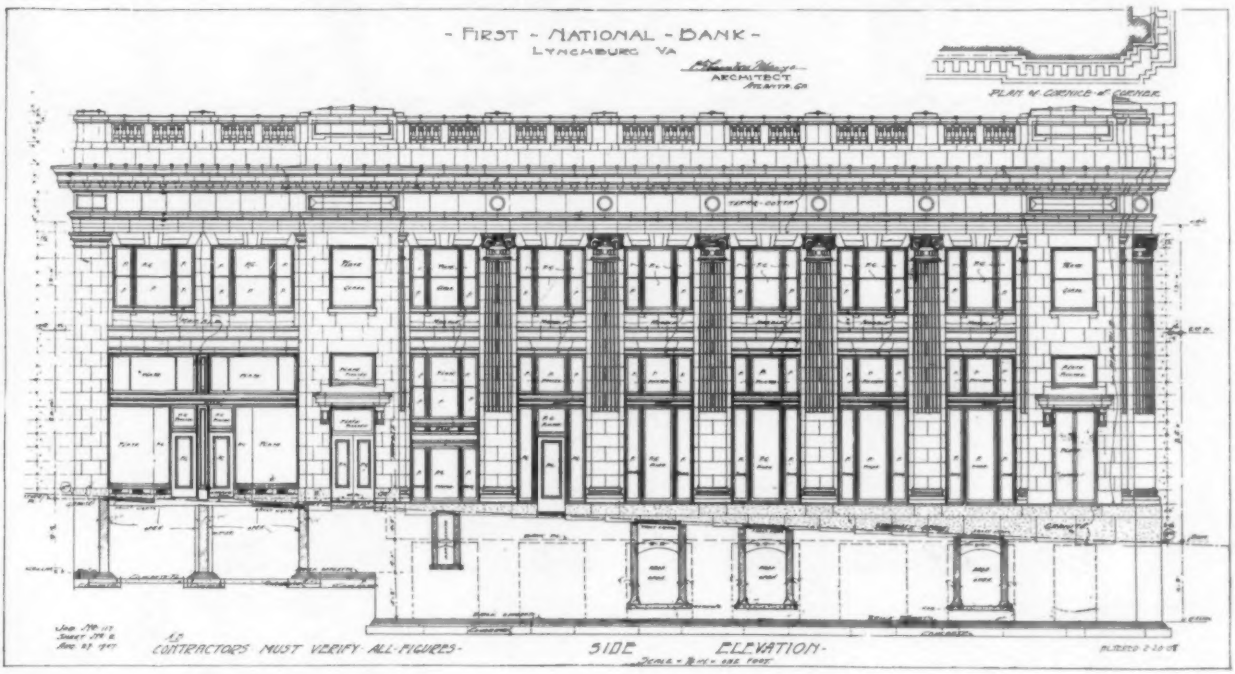
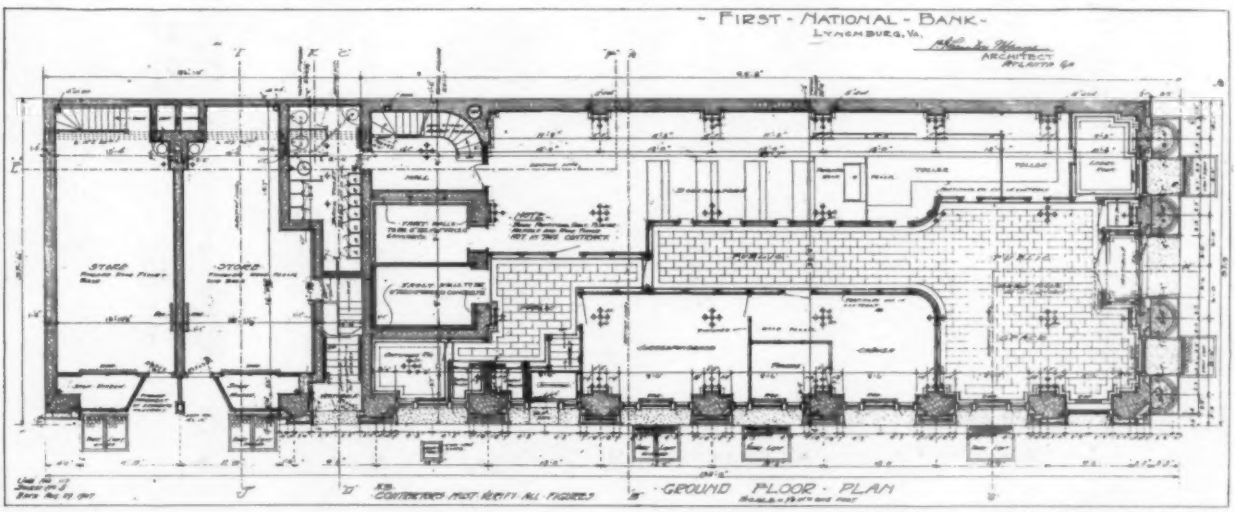
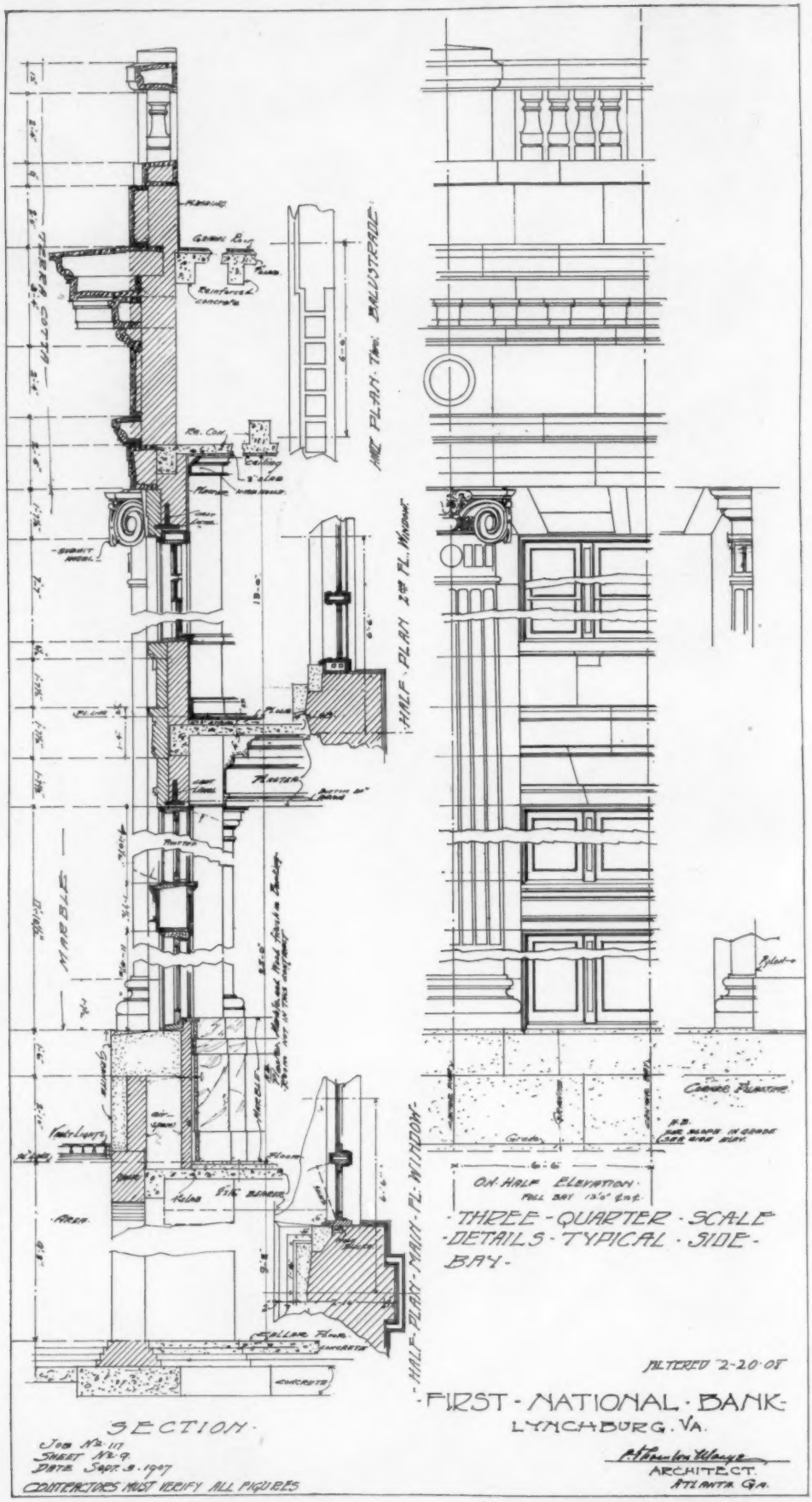




FIRST NATIONAL BANK BUILDING
LYNCHBURG, VA.

MR. P. THORNTON MARYE
ARCHITECT



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