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CATALUÑAN ARCHITECTURE—III

Catalunan Churches

BY RALPH ADAMS CRAM, F. A. I. A., Lit. D., LL.D.

THEY cannot match it in magnitude or glory, but in a way the two other Barcelona churches that are the work of Fabra or his school, are even more individual and characteristic than the Cathedral. These are Santa Maria del Mar—Our Lady of the Sea, and Santa Maria del Pino—Our Lady of the Pine-tree. The first was begun in the same year with the Cathedral, the second, in all probability, about a year later, *i.e.* 1329. It is hard to believe that Santa Maria del Mar and Palma Cathedral are not by the same hand; here are the same airy grace, wide spacing, lofty aisles, absence of triforia. The details are practically identical; octagonal columns of great height and about five and a half feet in diameter, arches very sparingly moulded, with no overhang above the capitals which are only wreaths or corbels of foliage; the development of wall arches and vaulting ribs from these octagonal piers, at different levels, is identical. The Barcelona church has a fully developed and very beautiful chevet while Palma has a walled choir with octagonal apse, an eastern Lady chapel and no ambulatory, but the Palma choir was built by En Jayme I, "El Conquistador" a full generation before the nave was begun and was certainly by another architect, though one of great originality, power and capacity. If Fabra really did both the nave of Palma and this church, then he undoubtedly pleased himself by creating a perfect and logical termination to his great composition.

A CATALAN ORGAN FRONT

(Clixé Arxiu Mas)

I do not know of any interior more beautiful than this of Our Lady of the Sea—which was built, by the way, by the maritime merchants of Barcelona at their own expense. It is of the utmost simplicity, perfect in its proportions, airy, aspiring, very spacious, with a serene dignity that is almost incomparable. It consists of four great nave bays, 45 ft. square on the centres of the slender five-foot piers, with a half bay modulating into the seven-sided apse. The aisles are just half the width of the nave and are very high, the crown of the vaults coming well above the spring of the nave vaulting ribs, leaving space only for small rose windows above. The aisle vaults have a four-light traceried window in each tympanum, and below the walls subdivided into three small square chapels to each bay and each one of these encloses a very lofty two-light window with traceried head. The west wall is also divided in three, a portal and two flanking chapels, while each aisle has its western chapel as well and of course

each bay of the chevet has a chapel also. There are therefore no less than thirty-seven chapels encircling the church, each with its altar and retablo and metal reja except for three which are used as subsidiary doorways. All the retablos are richly carved and covered with gold-leaf, some of them with painted panels, many of them modern and perhaps not any too good, but the effect of this wall of gold and color with the slashings of painted windows above, all set in silvery gray stone, is beautiful and effective to a degree. The high altar is covered by an enormous Rococo baldachino ("O classicism, classicism, how many crimes are committed in thy name!") vast, vulgar and audacious, which does its best, but vainly, to destroy the scale of a perfect church.

Santa Maria del Pino is an altogether different type of church but equally Catalan. It is one great open hall, without columns, 54 ft. wide in clear span, of seven bays with a seven-sided apse. Each nave bay has its chapel built out between the buttresses, but these do not continue around the sanctuary though, curiously enough, a sort of triforium gallery is carried between and through the open buttresses. This hall plan is characteristic of Cataluña and is both well calculated for the seating of a large congregation and impressive in effect. This particular church suffers rather from defective proportions, the vault being decidedly too low for the width. There is also a sameness in the lighting since columns are wholly excluded, and it cannot compare either with the Cathedral or the veritable masterpiece of Santa Maria del Mar.

Of course this, like all the other great Catalan churches, is vaulted in stone, and one can only admire the daring of these XIVth century master-builders who seemed to be trying to see how wide a span they could safely cover. Santa Maria del Mar is only 42 feet in clear span, the Cathedral the same; Santa Maria del Pi is 52 ft., Manresa 57 feet and Perpiñan 60 feet. Palma is no less than 64 feet wide, while Gerona, the structural wonder of the world, is a full 73 feet from wall to wall. When we realize that Chartres has only a 45 foot nave and York one of 48 feet, we gain some idea of the daring and the competence of these Catalan builders. Vast dimensions and slender, widely spaced supports are marks of Spanish Gothic. In Seville, for example, the nave is 10 feet wider than York, while each of its four side aisles is the same width and height as the *nave* of Westminster. Double the latter and you get some idea of the prodigious nave of Gerona.

MANRESA

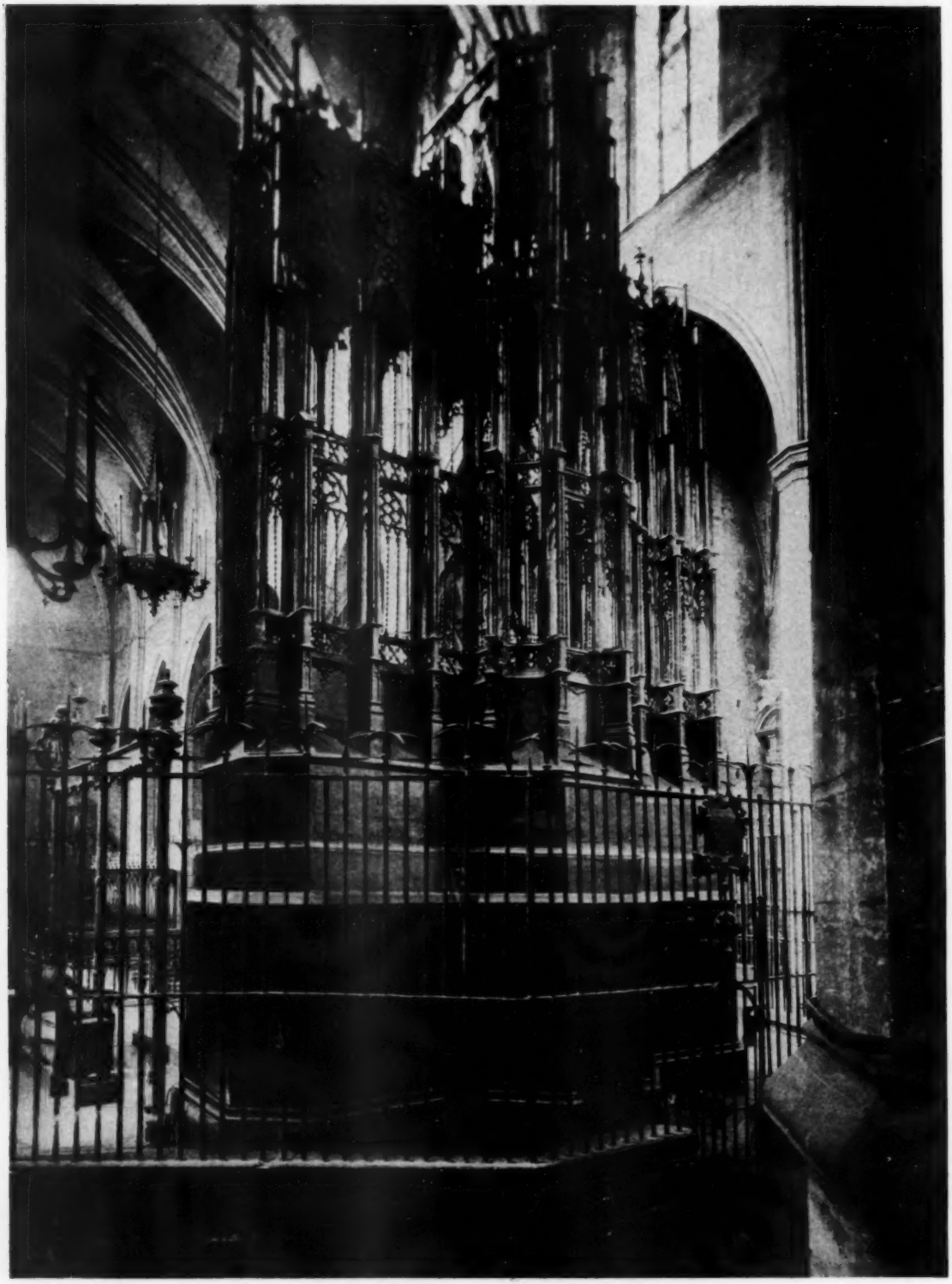
(Clixé Arxiu Mas)

MANRESA

(Clixé Arxiu Mas)

THE CHEVET, TORTOSA

(Clixé Arxiu Mas)



BACK OF REREDOS, CHURCH OF MANRESA

(Clixé Arxiu Mas)

SANTA MARIA DEL MAR, BARCELONA

(Clixé Arxiu Mas)

There is another type of church, not strictly Catalan but purely Spanish, which can be seen here to advantage in the little Santa Agueda just north of the Cathedral, formerly the private chapel of the Counts of Barcelona, now a small museum of fragments of religious art. Here a richly painted timber roof, very flat in pitch, is carried by pointed arches spanning the nave in place of trusses. The apse is five-sided with a fine ribbed vault, the windows are very high—the vertical dimensions very lofty in proportion to the width. All the work is delicate and austere to a degree, and marks a period about a generation earlier than that of Master Fabra. The Church of Our Lady of Carmen was originally of the same style but has been much rebuilt and finally ruined. Street says this sort of church was much favored by the Dominicans, which seems probable, as it was simple, austere and comparatively inexpensive. For these reasons also it commends itself to contemporary use.

So closely allied in style and date with Fabra's churches as to argue identity of authorship, are Manresa and Perpiñan. The former is only forty miles from Barcelona and is a variant of the churches there. Next to Palma it is the widest vaulted nave surrounded by aisles, 57 feet, and consists of six narrow bays with a seven-sided apse. Bay chapels surround the entire church, built in between the buttresses, the columns are plain octagons and the vault-ribs are brought down to the caps of the arcade by clustered colonettes,

CHOIR STALLS OF BARCELONA CATHEDRAL

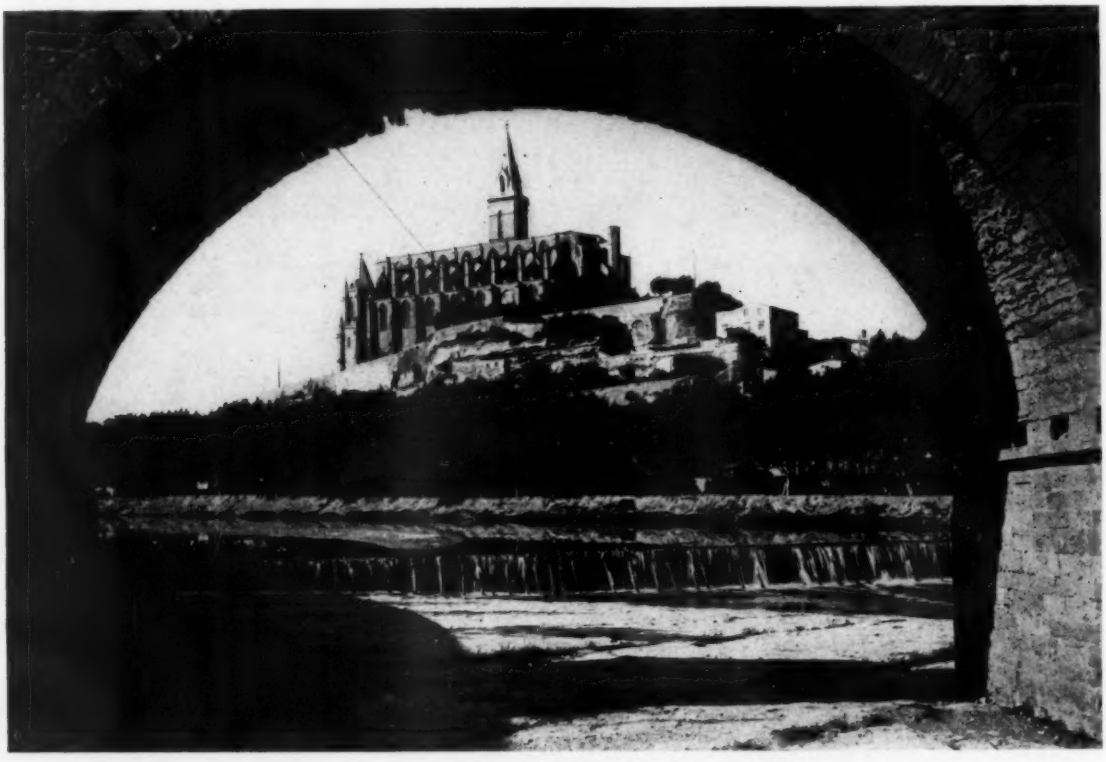
(Clixé Arxiu Mas)

ORGAN GALLERY, SANTA MARIA DEL MAR, BARCELONA

(Clixé Arxiu Mas)

French fashion. The church is so wide that the great height does not count, and therefore the place seems low and badly proportioned. Also the details are inferior and altogether it may be safer to attribute the work to a disciple of Fabra rather than to the master himself. The exterior, for once, is very fine, partly because of its noble site, but more because of its grave simplicity.

Perpiñan I have not seen, nor can I get any good photographs. It would seem to be much more like Manresa than the Barcelona churches, being very wide and comparatively low. It is pure Catalan in style, however, and must be counted in with the great sequence. That there must be many others I am sure, churches neither discovered nor listed by Street or Baedecker. There is another in Manresa beside the collegiate church, I know, and I daresay others await the curious investigator. In any case the churches that are known are enough for the one student and I am disposed to urge their cause. Here is a definite sub-style of Gothic with peculiar beauty and individuality, also unique adaptability to modern requirements yet, with the exception of Barcelona Cathedral, the churches are practically unknown. Arduous search failed to reveal any published measured drawings of Palma or the Barcelona churches. Is this not a very promising field for the traveling student? A book on the XIIIth and XIVth century Gothic of Cataluña would cover what is now an empty field and would, I believe, "meet a long-felt want." Nor would the investigation need to stop with religious buildings. The "Lonjas" of Barcelona, Palma and Valencia are buildings of extreme beauty and only the latter is known. Of course when it comes to the palaces and granges and farms of Mallorca there is another wide field as yet almost untouched, "But that is another story."



THE COLLEGIATE CHURCH OF MANRESA

(Clixé Arxiu Mas)

TWIN BEACONS OF AMITY

As Reflected *in the* Architectural design *of the* Liberty Bank *of* Buffalo

ALFRED C. BOSSOM, Architect

FROM the twin towers of the new home of the Liberty Bank of Buffalo, just completed, flash beacons of amity. On the two pinnacles of this twenty-three story structure, stand Statues of Liberty, emblematic of a land of the free, and also of the enlightened constitutional government which rules over the Dominion of "Our Lady of Snows." Lambent torches in hand, they greet those entering the northern gate of America in a spirit of international amity. By day, they are etched against the blue of the sky and can be discerned far across the Canadian border. By night, their friendly fires beam over a saltless sea. The president of the Liberty Bank of Buffalo, John A. Kloepfer, and his associates desired that this $4,000,000 structure besides serving the immediate community, should also visualize the increasing commercial and financial relations between the United States and Canada. In fact, thousands of Canadians visit Buffalo every week.

PRESIDENT'S OFFICE

Buffalo's pre-eminent place as a great *entrepot* for the Great Lakes, and of the vast and fertile Empire State, demanded that the building should symbolize power and dignity. Such considerations as these and also efficiency and modern realty economics brought about the erection of this colossal structure.

The architect, Alfred C. Bossom, of New York City, in planning it, had full play for his ingenuity in solving many difficult and interesting problems of design and construction.

The site of the Liberty is two hundred and thirty-two feet on Court Street and sixty-one feet each on Main and Pearl Streets. The height of the structure from the Main Street pavement to the crowns of the statues is three hundred and thirty-two feet, or more than twice the height of Niagara Falls which is visible from the roof. The building is the highest in Buffalo and in northwestern New York. It contains about 4,000,000 cubic feet, and its floor space, 14,000 square feet each on the twenty full stories, is 300,000 square feet.

In clearing the site, 22,000 cubic yards of earth and debris were excavated. Thirty-seven caissons were then sunk to bed rock, seventy-two feet below the finished banking floor, or practically seven stories below the level of the curb. The 10,500 cubic yards of concrete work, required 15,000 barrels of cement. The caisson foundation represents 55,000 cubic feet, the foundation walls 50,000 cubic feet, the basement slabs 32,000 cubic feet, the Schuster slabs 50,000 cubic feet, the cinder concrete 100,000 cubic feet and the tile in the Schuster slabs 185,000 cubic feet. Then came the structural steel framework with a total weight of 3,800 tons, the beams of which if placed end for end would extend for sixteen miles in a straight line.

For such a fabric as this, which must bear not

only its own weight and its contents, but also withstand the stress and strain of high winds peculiar to all cities on the Great Lakes, foundations and skeleton of unusual strength were required. Owing to its height and narrow width, the building had to have wind bracings of an unusual character, especially at the ends of it, which are exposed to the gales which sometimes blow from Lake Erie. The building code of Buffalo requires that structures of this character should withstand at least thirty pounds of wind pressure to the square foot, but in this case allowance for far greater speed pressure was made. The bracing consisted of gusset plates and angles, which were so joined to the heavy upright columns and the horizontal beams, that the greatest amount of strength was obtained without in any way interfering with the space inside the building. It very often happens in structures of this magnitude that bracings and beams project into the interior, thereby marring the appearance of the rooms and also greatly reducing the rental values of the building. To get this maximum of strength and also to avoid having beams which interfere with the arrangement of windows, was a very nice architectural problem. Happily, it was so solved that neither in its exterior appearance nor in its internal arrangement, does the building show any trace of the unusual amount of wind bracing which was required.

It happened that Nature herself provided a practical test of the value of this bracing, for last winter, when the brickwork surrounding the four walls had been completed from the sixteenth floor up to the roof, a storm of great severity whirled through the city. All the winds that blew had full access to the lower part of the structure, but no vibration of the building whatsoever was observed.

The steel skeleton having been erected and articulated, the masonry work proceeded rapidly. The base of the outer walls of the building is of pink Milford granite. Up to the fourth floor, Bedford Indiana limestone is used. Above that is buff brickwork, the ornaments being of fire flash terra cotta similar to that used in the construction of the Pershing Square Building in New York City. In the construction 1,500,000 bricks and 300,000 tiles were employed. The exterior color scheme, especially as seen from a distance, is gray and light cream. The strongholds of security at the top recall in their hue the Eastern Legend of the Ivory Towers.

Individual as is the architectural design of the

MAIN BANKING ROOM AND STAIRWAY LEADING TO SAFE DEPOSIT VAULTS

Liberty Bank, it suggests the Adam style in its classical simplicity and its abiding sense of dignity. It is, however, American in every way.

There has been much comment in architectural circles, for instance, concerning what Mr. Bossom calls the Ur-American type of design used in the pedestals of the towers. These are really Mayan. The studies for them were made by the architect as a result of his impressions recorded in his book, An Architectural Pilgrimage to Old Mexico.* It will be remembered that the Mayans, centuries before the discovery of the New World, erected pyramids which were superior in grace and beauty of outline to the Egyptian. From the lofty summits of the temples of such pyramids priests called messages to the faithful. The idea of proclaiming the message of Liberty itself is carried out in these twin towers.

On the tops are the figures, twenty-six feet in height, made of bronze. The various sections of the statues are securely welded together so that the figures seem as though they had been cast in one piece rather than molded. Within the shells are stairways by which the electricians climb to the torches to attend to the thousand-watt lamps, the light of which will be visible for ten miles in every direction. Far above the busy throngs of the city are footholds of Liberty. The statues modeled by Leo Lentelli, sculptor, of New York City, are thoroughly American in outline and form.

DETAIL ON MEZZANINE FLOOR

The bank desired primarily adequate quarters for its expanding business. As the site was too valuable to be used for any other purpose than a single building, it was decided to erect a skyscraper. In order to give unity and balance to the architectural design, as well as to create a lofty landmark and beacon, towers were placed at each end. Whether the building is viewed from the ends, or from the long side, it presents a well balanced outline.

Viewed in its mass, the building is a remarkable example of fenestration in that the maximum amount of surface is given to windows, without in any way detracting from the architectural design. There are 1600 windows in all, requiring 37,500 square feet or nearly an acre of glass. Probably no building in the United States has a better balance of window and exterior wall space. This gives to every room in the structure, be it large or small, the maximum amount of sunlight and ventilation. In addition to the ample space on the wide streets which surround the building on three sides, there is also a private alley twenty-three feet in width on the other long side, especially reserved by the bank. Every window in the structure has its view and its access to those most prized commodities, light and air.

When G. Topham Forrest, the distinguished architect of the London County Council, visited this country some months ago, he was greatly impressed by the remarkable way in which the tall American building was able to utilize to the utmost all the benefits which come from the unimpeded penetration of the rays of the sun. This, of course, as he so well pointed out, is a condition due to the fact that the large cities of the United States are hundreds of miles nearer the equator than are such cities as London and Paris; therefore the rays of the sun strike them at a better angle. This, together with the greater width of

*See also Mr. Bossom's article on America's National Architecture, in The American Architect issue of July 29, 1925

the streets of American cities than that of the thoroughfares of the municipalities of the Old World, makes it possible for the American commercial building to have every natural benefit. This condition is accentuated in the Liberty Bank.

Another general feature of the building is the arrangement for fighting the flames. It has two fire stairs provided with hose equipment, two to each floor. The Chief of the Fire Department of Buffalo permitted a new plan by which the water damage to the building, in the event of a blaze starting anywhere, could be greatly minimized. Plates in the sidewalks around the building are brass metal ferrules, spaced approximately twenty feet on centers. These the firemen can lift and insert their hose in the pipe without dragging their own hose into the building. In this way, any fires that might appear in the basement or the sub-basement can be extinguished without any hose whatsoever being carried into the building. This means that the new home of the Liberty Bank will probably get the lowest rate of insurance given to any building of its size in this country.

In every respect, of course, the structure is fireproof and the equipment and all the office furniture employed are, as far as possible, of a non-inflammable nature. What with the admirable facilities for fighting fire and the ingenious method employed for averting water damage, tenants will have the utmost protection and the least fear of their business being interrupted by damage in the event of the building being entered by the city fire fighters.

Considering this building in its entirety, it also presents a *tour de force* in construction. In these days, when banks and loan companies as well lend their money for the erection of mammoth commercial buildings, it is more than desirable, after the funds have been furnished, that the work is carried on with expedition. This, as a student of architectural economics, Mr. Bossom had thoroughly in mind when the effort was made to erect this structure as quickly as good workmanship would permit. As soon as the general contract had been given to John Gill & Sons, of Cleveland, Ohio, no time was lost in speeding up the building operation. The shortest estimate for construction was three hundred and sixty-five working days, exclusive of the bank equipment. When on October 13, 1925, the completed structure and the banking room also were officially opened, exactly three hundred and thirty-three working days had elapsed. In point of time the building was completed more than a month in advance of the time on which its owners were figuring. This result was due essentially to the most enthusiastic and thorough co-operation among architect, contractors and sub-contractors. The shop drawings were completed promptly and checked up as quickly as possible and the plans were so carefully and elaborately worked out, that few changes or alterations were necessary in the carrying out of the details.

"From the very first," said Mr. Bossom, "every step was carefully planned. The materials were prepared well in advance and were held at strategic positions. As the site was a narrow one and there was little room for storage, the materials could only be delivered practically as needed. Thanks to the co-operation of all concerned, however, all these materials were brought up with the precision used by army engineers in a campaign. There were practically no delays due to labor disputes or even to a misunderstanding of the terms of the contract or specification. The few questions that did arise were speedily adjusted so that at no time was the progress of work impeded. As some fifty trades in all were represented in this operation, either at the site itself or in connection with the preparation of materials, the building of the Liberty in this record time, is regarded as an achievement in construction annals."

Viewing the building now as occupied, its space is apportioned, as has been indicated, among stores, the bank itself and the offices. On the ground floor are a number of stores which are readily reached from the pavement and they will produce a good revenue. As there are considerable variations in grade from one end of the structure to the other, what is a basement on one end of the building becomes a ground floor on the other. Stores are situated where the grade permits.

The building has two entrances. The one on Main Street leads through bronze and glass doors to the long corridor or elevator hall. On one side of this passage appears a battery of nine high speed elevators with horizontal indicators. On the other side are the plate glass windows of a large store. Two bronze doors guard the Court Street entrance, from which the public passes up a short flight of stairs through an ornate foyer. The entire lobby of the building is lined with Tavernelle marble .with decorations in bronze, and the ceiling, deeply coffered, is harmoniously tinted. Facing the grand staircase, in a niche, is a marble Statue of Liberty of which those on the towers are replicas.

From the lobby a bronze doorway leads to the main banking room. One gets the impression of an Italian Renaissance palace on entering this lofty hall, with its walls of imported travertine, mellow and golden in tone, supported by fluted columns of Tavernelle marble, twenty-nine feet high, and bearing Corinthian capitals.

Counter screen railings, facia and balustrades are of Tavernelle marble. Its floor is of travertine, with inserts of gray Sienna, Moncerati, Struzzini and Botticino marbles. The ceiling is coffered in the style of the Italian Renaissance. Around the banking space on all sides are windows, sixteen feet in height and eight feet in width, so

that light may come into this space from all directions. There is also a free passage of air guaranteed by the basement ventilation plant, through which air is taken up from the street level, filtered and washed and then heated or cooled as the season demands before it is forced into the main banking room.

Unusually large in its dimensions is the banking space for the accommodation of the public, as it is one hundred feet in length and twenty-six feet in width. In the banking rooms are ornate check desks and every facility is offered to the public for the convenient transaction of business.

In the main banking room are twenty-four cages for the paying and receiving tellers and those officials in charge of discount, interest and other departments. Back of the cages is a specie lift communicating with the vaults below.

The president's room is finished entirely in American walnut wainscotting, while the directors' room is in teakwood with an oak deck floor. The foyer leading to the directors' room and also to the library is finished in American walnut and travertine stone. One of the salient features of the banking equipment is the library, which is accessible to all patrons and customers of the bank. It is finished in the style of the Empire and painted and gilded, while arrangements for the storing and distribution of books and pamphlets and other information has been planned in accordance with the latest systems.

In the main banking room is abundant officers' space where those having special business with any of these officials may transact it without being delayed by unnecessary formality.

In the basement of the bank is a vault space, thirty by forty feet, a repository for the resources of the bank. This space is one of the largest spaces of the kind in northern United States, and does in fact rival in size the vaults of some of the Federal Reserve Banks themselves. The vault structure is supported by numerous steel beams, which are practically tremendous bridge spans, and beneath it is a commodious cellar. Surrounding the vault is a thick outer shell of reinforced concrete through which run many electrical wires, which would make it absolutely sensitive to even the slightest attempt to tamper with it. The touch of a tool would send an electrical impulse through the wires of the entire building and ring an alarm at Police Headquarters. This vault is entered through a round door, ninety-six inches in diameter and twenty inches in thickness.

In the basement, also, is a very large office

SAFE DEPOSIT VAULTS

designed for the reception of clients from Canada or for the use of those who desire to have Canadian money exchanged. This is readily accessible from the level of Pearl Street. In this basement, also, are conference rooms and several special cages for tellers. This whole department, indeed, may be regarded as having an international character.

Near the main vault are sixteen coupon booths for the use of the patrons of the recently installed Safety Deposit Service. The safe deposit vaults in this basement are readily accessible to the main banking floor by a large central staircase surrounded by an ornate bronze rail. The walls of the Safety Deposit Department are of Tavernelle marble and its floor is of the Tennessee variety. All the metal work in this division is of bronze.

Much of the routine activities of the bank are entirely hidden from the general public as the clerical force is distributed in the mezzanine and through the second floor, and in part of the third floor. Everything possible is done to minimize noise. The bookkeepers' division is in a soundproof room all to itself, while the auditors' department has similar accommodations. A fireproof vault, thirteen by twenty-two feet, has been placed on this floor for the care of books and records. Surrounding this is a printing department surrounded by walls and floor so deadened that its presence would scarcely be suspected, although busy presses are almost constantly running there.

The welfare of the employees of the bank was especially considered in arranging quarters for them on the third floor. In that part of the building is a lounge, twenty-one by twenty-seven feet, assigned to the women employees. Adjoining it is locker space for fifty persons. Similar arrangements are also made for the men, who have a well appointed lounging room and seventy-five lockers at their disposal. In fact, these quarters are fully equal to any which might be provided in a modern club or hotel. Shower baths and all sorts of lavatory conveniences are available.

That part of the building devoted to offices for tenants was designed in accordance with the same ideals of comfort and convenience. At the Court Street entrance, that used by the tenants of the office part of the structure and their visitors, are two handsome American walnut revolving doors with bronze crestings. The ceiling of the main hall of this entrance is very ornate and on entering, the public get the impression of an alluring vista. Here are batteries of elevators, all of bronze. The signal system of these elevators is what is known as the horizontal indicator, which notifies the waiting public of all cars and is much more effective than the arrow indicator in common use. On the floors given over to tenants all the fitments are of the latest design and of the finest workmanship. In fact, it is conceded by all who have visited this building that it is one of the best equipped structures of its kind in the United States. Each door is within easy reach of an elevator and the interior arrangement of the huge fabric is such that there are no dark corners and no dead centers in ventilation.

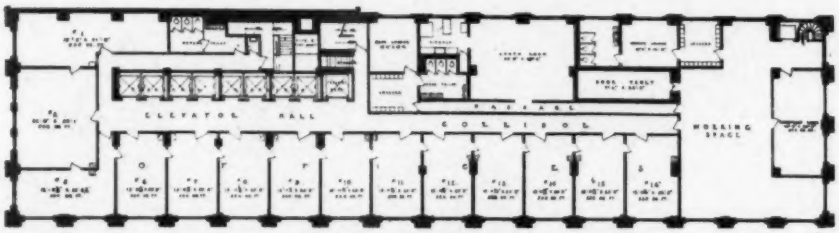
All the public facilities of the building are in reality for the exclusive use of tenants, as the bank has its own private elevators and other equipment. Those who go to the "Liberty" for the transaction of business, therefore, will find it equally easy to reach any department of the bank or to call on tenants, as this division of the elevator service eliminates confusion and delay.

It will be seen, therefore, that in every respect this great structure in northwestern New York is in keeping with its monumental character and serves well all the needs of commerce and of finance, and is a dignified and stately exemplar of the sentiment of international amity which permeates its design and construction.

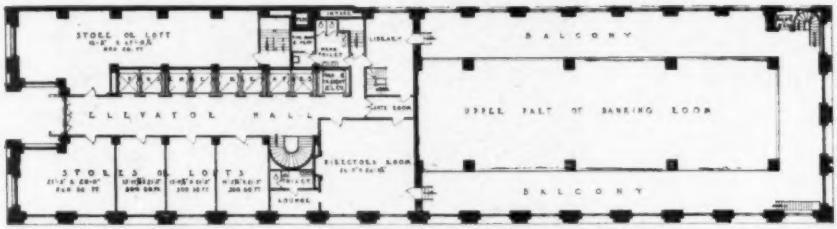
LIBERTY BANK OF BUFFALO, N. Y.

ALFRED C. BOSSOM, ARCHITECT

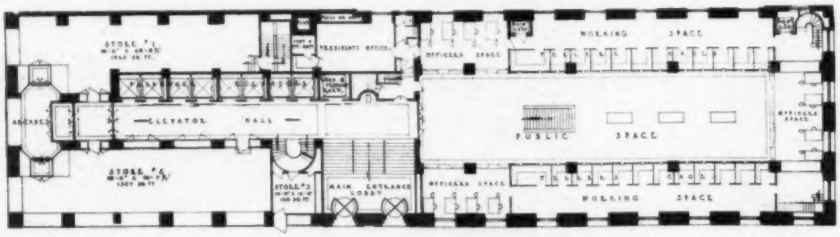
(See plans on back)



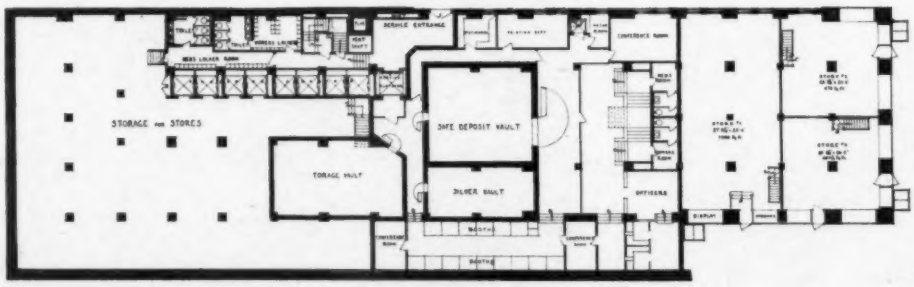
THIRD FLOOR PLAN



MEZZANINE FLOOR PLAN



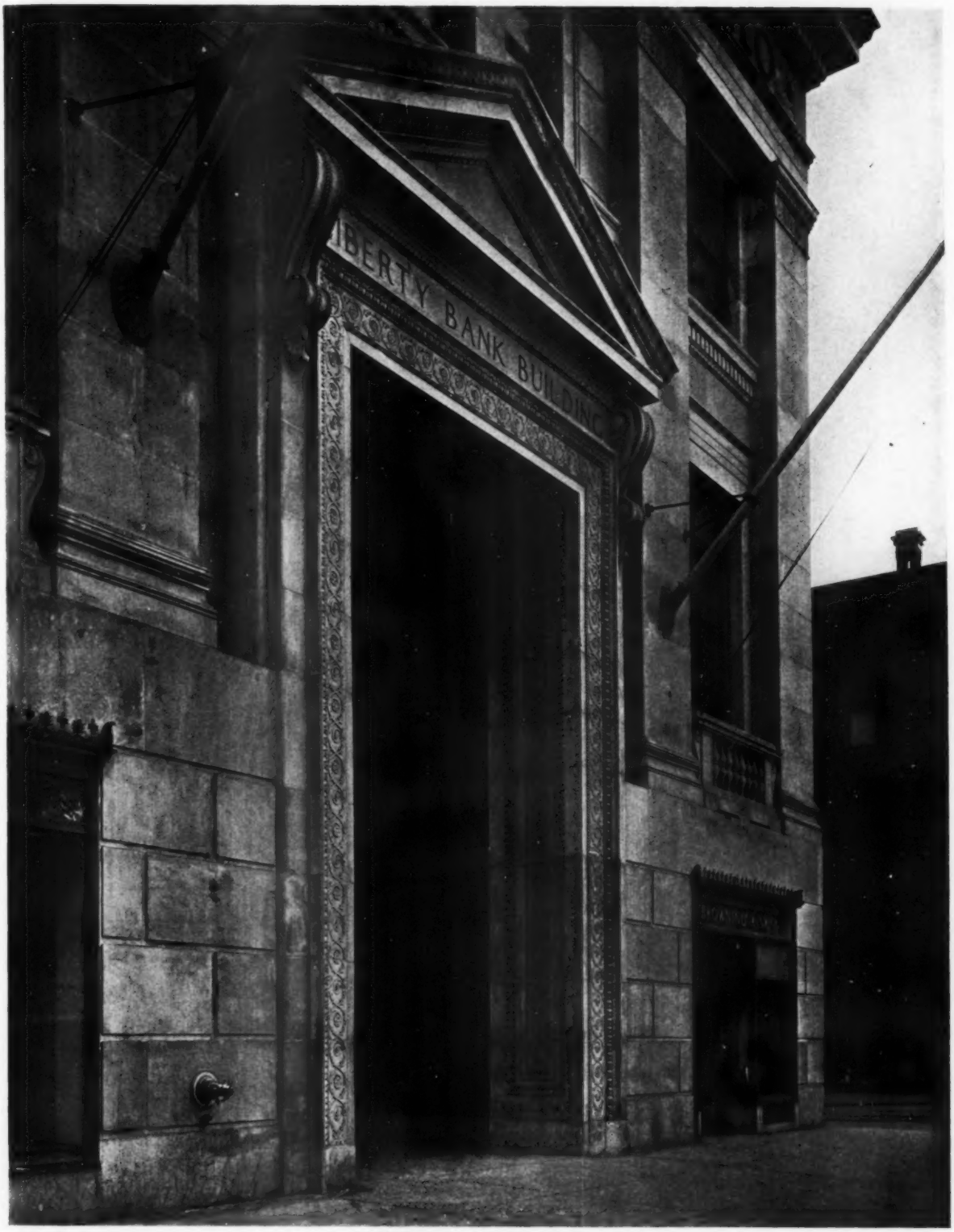
FIRST FLOOR PLAN



BASEMENT FLOOR PLAN

LIBERTY BANK OF BUFFALO, N. Y.

ALFRED C. BOSSOM, ARCHITECT



LIBERTY BANK OF BUFFALO, N. Y.

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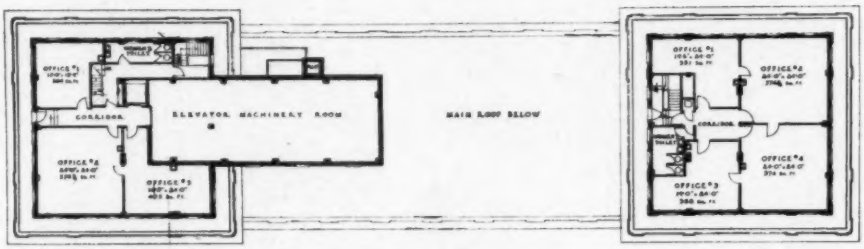
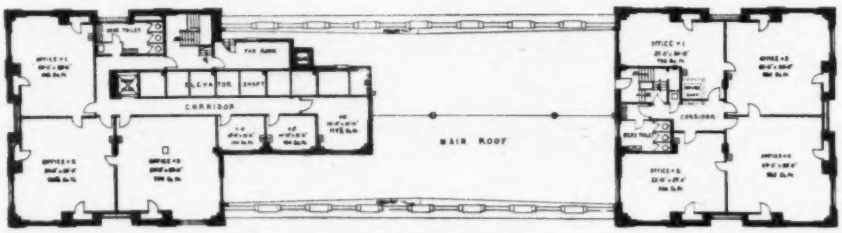
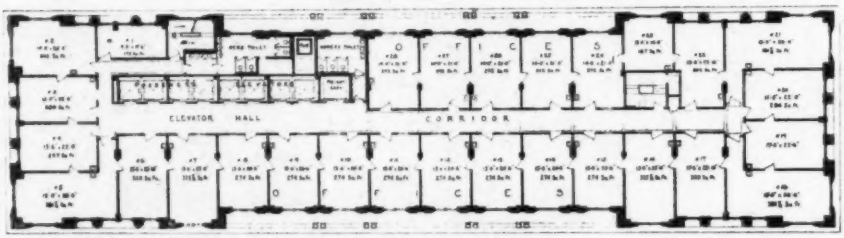


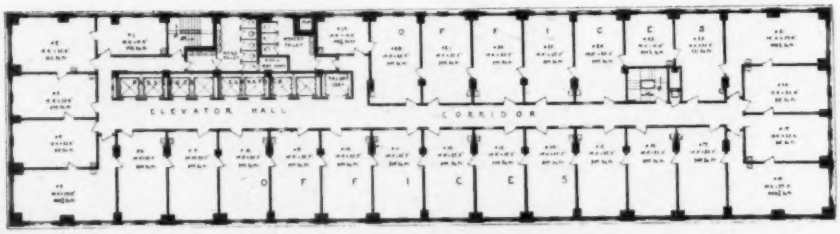
TWENTY-SECOND FLOOR PLAN



TWENTY-FIRST FLOOR PLAN



NINETEENTH AND TWENTIETH FLOOR PLAN



TYPICAL FLOOR PLAN

LIBERTY BANK OF BUFFALO, N. Y.

ALFRED C. BOSSOM, ARCHITECT

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ALFRED C. BOSSOM, ARCHITECT

EDITORIAL COMMENT

WE PRESENT in this issue the prize winning design for the Roosevelt Memorial in Washington, D. C. There were nine participants in this competition. The designs of the remaining eight will be illustrated in our issue of February 5.

Criticism has been made based on the belief that the site set apart for this memorial is that designated in the L'Enfant plan of Washington for the Supreme Court. As a matter of fact, when the L'Enfant plan was drawn, the site, as now proposed, was practically in the center of the Potomac River. All the land now proposed to be utilized is made or reclaimed ground.

As to the utilization of this site for a proposed building for the Supreme Court, we are reliably informed that the Justices of the Court are against the location of their building along the shores of the Potomac. Such a selection will never have the support of the Court for the very sufficient reason that it is too far removed from the Library of Congress and inconvenient for visiting jurists from all parts of the country. The Supreme Court wants, if possible, to remain for a time at least in its present building, until lack of space forces a removal to the site designated for the Supreme Court in the Park Commission Plan of 1901. The Court is now in the old historic Senate Chamber, whose walls have echoed the eloquence of Webster, Clay and Calhoun. The idea that the Court should for purely sentimental reasons leave a building so notable and historic for a new one on a site that is so far removed from the Capitol and Library of Congress, has, we understand, been the occasion in Washington and elsewhere of comments not entirely flattering to the judgment of American architects.

It seems unfortunate that this matter of site was not more thoroughly discussed, particularly in the field of architectural societies, before the competition was held. Between the date of the presentation to Congress last year of the resolution asking for the use of this site and the holding of this competition ample time was afforded for a frank expression of opinion and one that might in no sense have had any covert significance. Whatever is said or done at this time can in no wise change the present selection, or if it does, will only create a condition that will retard the progress of a very dignified undertaking.

It is difficult to understand the precipitancy of criticism of the design and the unfortunate comment expressed in a certain architectural journal. Aside from the publication in the daily press of a very indifferently presented reproduction of the main elevation of Mr. Pope's design, the presentation of the drawings in this issue of THE AMERICAN ARCHITECT is the first in the architectural press, and the earliest opportunity that the profession has had to study the design in all its details. Yet we find in an architectural journal a criticism by an architect of prominence who bases his objections on the ground that *he has been informed* that "the memorial as designed by Mr. Pope is a fountain."

This whole controversy, as far as we have been able to observe it, gives us the impression, and we believe has brought others to a similar point of view, that architects are not all "good sports" who uncomplainingly abide by the findings of competent juries. Setting aside all these controversial matters and viewing the results of this important competition on its artistic merits, we believe it true to state that no competition in recent years has set a higher standard than this. Herbert Adams, who was one of the judges, has, in fact, spoken of "the ideal way in which this competition has been conducted." With an aggregation of artistic excellence, and one where each of the distinguished competitors has so well expressed the purpose of this memorial, it is not strange that there may be differences of opinion. But in this instance, as in the many cases of art juries in picture exhibitions, the award of the jury is final; it is the court of last resort and it should be accepted without question. That is the sporting thing to do. Anything else "is not cricket."

* * *

AT A RECENT luncheon of the New York Building Congress, Alexander B. Trowbridge, consulting architect and president of The Architectural League of New York, spoke on the subject of winter work. During the course of his remarks he referred to the statistical records of a construction company covering a period of twelve years which showed that the number of bad days in winter varied in the course of a year from five to thirty-five or an average of fourteen days when conditions were so bad that no winter work could be done. He also cited the records of another construction company for three winter jobs in which it was found that the costs were increased 4½, 5, and 6½ per cent respectively. Large jobs stopped during the winter often result in carrying charges equal to or greater than this increased cost.

The second speaker, G. Richard Davis, a New York contractor, said that his organization has been and is doing a great deal of winter work and that his experience has been that suitable protection of workmen and materials, ordering of material well in advance and proceeding with winter work in a practical manner entailed no increased costs. The greatest difficulties encountered by his organization has been the matter of transporting

materials through the city streets when they were blocked with snow and ice.

An unfortunate situation brought out by Mr. Davis is the obstacle placed in the way of winter building by the union rules of steamfitters which require, in New York and vicinity, steamfitters to run the boiler plant when temporary heat is required. He stated that on one job requiring three shifts and paying the usual overtime this had amounted to a cost of $120 per day for firemen and engineer.

Many other important and valuable points with respect to winter work were mentioned by these speakers as well as other speakers who followed them. The idea of year around construction work which this journal has advocated for years is gradually becoming a reality. In fact, Canada is reported to be well in advance of the United States in the matter of continuing building operations during the winter months. Winter construction work is not a mere theory but sound business.

The work of Secretary Hoover's Committee on Seasonal Employment has emphasized these points and many others bearing on this topic. Inasmuch as a properly worked out scheme has been promulgated and the feasibility of the idea demonstrated, it is a cause for wonder why the various building elements have not more vigorously proceeded in these matters. No more important demonstration as to the possibility of quick and economical building during winter months has been placed before the architectural and building interests than was shown in the Standard Oil Building in New York. This operation was very completely shown in an article in THE AMERICAN ARCHITECT of January 14, 1925, and we refer to it as demonstrating the correctness of the results as set forth by the Hoover Committee and the conclusions as reached by Mr. Trowbridge in his admirable address.

* * *

ANNOUNCEMENT WAS MADE in these columns some time ago of a competition to be conducted by the Art-in-Trades Club of New York for schemes of decoration and furnishing of two apartments, in the design of which direct copies of old styles or obvious imitations of old designs were to be barred from consideration. The secretary of the Exhibition Committee has recently reported that "the Jury is obliged to announce that none of the designs submitted have met the conditions as set forth in the program." The report states that the Jury has, however, awarded two prizes, one of $1000. to Paul M. Zimmermann, and one of $1500. to Lorentz Kleiser, both of New York City, for their efforts in creating original designs, although neither sufficiently meets the conditions of the program as to cost to warrant forwarding to execution and exhibition, as originally intended. It is to be regretted that an opportunity to discover creative talent and ability among designers of interiors in this country, has so signally failed. The Club is, however, to be congratulated on its efforts to aid in the development of a distinctive American style of decorative design, as well as on its fairness in acknowledging the work of those designers whose schemes, although not meeting all the conditions of the program, possessed unusual merit. The result will be of particular interest and benefit to those who are taking the lead in eliminating foreign precedent in American design, and may aid them in their future efforts.

* * *

WE ARE NATURALLY in sympathy with any well directed effort tending to interest the public in the cause of good architecture. Specifically we have in mind the practice in vogue in a number of cities in accordance with which certain civic bodies seek to improve the architecture of their respective communities by awarding each year certificates or medals of honor to the owners and often to the designers of buildings of high merit.

It is highly desirable, however, that the architectural profession be represented on all such civic committees. The influence of the profession in the selection of the jury personnel is really imperative if satisfactory results are to be secured. Lawyers are quick to sense the importance of having their cases tried by judges and jurors who are capable of carefully considering the particular case in hand. This condition should be equally important in the case of men selected to judge the work of architects.

Architects frequently find it difficult to arouse their clients to an interest in their buildings beyond cost and revenue. Friendly rivalry and pride in having contributed to improved standards in the community may often excite in owners a further interest in architecture, especially when they realize that it can be had at little or no additional cost. It is simply a matter of selecting as architect one qualified to produce good architecture.

Then again the knowledge that awards are to be made may well serve as an incentive to those architects who feel that the public is not appreciative. Perhaps it will stimulate them to add the study often needed to lift a design from mediocrity to excellence. Altogether it would seem to be good business, as well as a civic duty, for architects in their respective communities everywhere to give some tangible recognition to outstanding architectural accomplishments of each year; lend their influence and support, where the movement is in effect, or initiate it where it has not yet been undertaken.

INTERIOR ARCHITECTURE

The Influence *of* "L'Art Moderne" *on* Interior Design *in the* United States

"L'ART MODERNE," as exemplified at the Exposition of Decorative Arts in Paris last summer, does not represent a new style or period of design, as many of its critics seem to think. It does represent, however, a unified world-wide movement—with which this country is thoroughly in sympathy, although, for some unknown reason, we were not represented at the exposition—to encourage creative genius and ability to originate, with which this generation seems to be so generously endowed. It is, of course, hoped and even expected that out of the exhibition certain principles will be established by which a new style may be developed. Considered in such a light, the efforts put forth at Paris to develop a new style can only be praised.

On another page there are reproduced two photographs of a small room which was designed and executed in Paris and is now set up in the show rooms of an upholstery concern in New York City as representative of the spirit of the modern movement in France. The woodwork and furniture are by Dubocq, whose exhibit attracted much attention at the Exposition, where also the frieze material, designed by Paul Follot, was shown in one of the rooms of the Modern French Embassy. Other features in the scheme are by leaders of the movement in France, as the tall standing wrought iron lamp and alabaster shade, and the table lamp, from the collection of Edgar Brandt, and the

RUTLEY'S CANDY SHOP ON BROADWAY, NEW YORK CITY
BUCHMAN & KAHN, ARCHITECTS—MACK, JENNEY & TYLER, DECORATORS

THE DECORATIONS ARE IN A MODERN STYLE, RICH IN COLOR, AND ALTHOUGH BIZARRE IN CHARACTER, IN KEEPING WITH THEIR THEATRICAL ENVIRONMENT

fixtures, which effectively demonstrate the interest achieved by unusual lighting effects in modern decoration, the work of Lalique, the French "Master of Glass". The ensemble brings together in one place representative examples of many artists of the present day and offers an opportunity to those who were unable to get to Paris last summer to see what "L'Art Moderne" in France is, as well as serving as an appropriate setting in which modern fabrics may be presented.

But, as regards the Exposition itself, it is more the efforts which this room and its furnishings represent that are to be applauded than, perhaps, its design. In certain details, — the unusual pilasters and some pieces of the furniture, for example—it seems to be extreme. But does not the pendulum swing far out and back again before it stops at the average point? In this age of electricity and aeroplanes, it seems there should be something more to architecture and decoration than merely copying the styles of "carriage and candle" times. People do not dress as they did in the 17th and 18th centuries. Why, then, should there not be something modern in

CHENEY BROTHERS' NEW STORE, NEW YORK CITY
HOWARD GREENLEY, ARCHITECT
LOOKING FROM THE VESTIBULE INTO THE SHOWROOM

CHENEY BROTHERS' NEW STORE, NEW YORK CITY
HOWARD GREENLEY, ARCHITECT
THE SHOWROOM IS FEATURED BY ORNAMENTAL IRONWORK IN MODERN STYLE, DESIGNED BY EDGAR BRANDT, THE LEADER OF THE MODERN MOVEMENT IN FRANCE, AND EXECUTED IN HIS SHOP IN PARIS

house decoration? The Paris Exposition should be applauded for the encouragement it gives to creative impulse. Much of the material exhibited at Paris had no reason for consideration except that it was "something new". That is, of course, absurd. Decoration, or interior architecture, is based on certain fundamental principles which cannot be eliminated. Architecture, interior or exterior, is a fine art and not an accidental growth, and design must ever be governed by those principles, and not by caprice, fashion or undisciplined taste.

A movement towards creative design has been evident in various sections of this country during the last five years or so. It is not a movement to effect extravagant radicalism, as the futuristic and cubist craze in painting proved to be, but rather a movement towards truth, sincerity and honesty in design, in which even ornament takes on a structural significance, as opposed to its applied method of past

TWO VIEWS OF A ROOM DESIGNED AND EXECUTED IN PARIS AND SET UP IN THE SHOWROOMS OF F. SCHUMACHER & COMPANY, NEW YORK, EXEMPLIFYING THE SPIRIT OF MODERN ART IN FRANCE

years. Color in architectural and decorative design, too, is given new meaning, by which design is more emphasized; and unity between architecture and decoration, whereby the completely decorated and furnished room constitutes a composition in which every element or detail is a component, is reincarnated, a lesson we learned, perhaps, from the study of the period rooms of the 16th, 17th and 18th centuries.

A certain American architect made the remark the other day that, in attempting to create designs which will represent his ideals rather than to copy or adapt ideas of others, he realized he has made many mistakes, for he admits his designs might be improved upon; but, at least, they show that he has been thinking. To develop new ideas always requires thought. Much of the architectural and decorative designing that has been executed during the last quarter century was designed years ago. Little thought, if any, is required to reproduce or adapt it. Even the old Colonial, which quite naturally bore evidence in its design of the ideas characteristic of the countries from which the Colonists migrated, is representative in its execution of the true life and spirit of the people of those days. In attempting to adapt period designs, characteristic of the people of the 16th and 17th centuries of Europe, to modern American conditions and requirements, we forfeit our personality, for it represents neither the life nor the spirit of our day. "The greatest work must bear the stamp of originality—of nationalism", Theodore Roosevelt once said in his "strenuous" manner. "American work must smack of our soil, mental and moral, no less physical, or it will have little of permanent value." L'Art Moderne, as represented at Paris by designers from countries all over the world, is not, then, a style, but it is the spirit of modernism making itself felt everywhere. It is a plea to the designers of all lands to spur them on to originality and nationalism. The modern art of France, Africa or Japan cannot be the embodiment of the life and spirit of this country. We cannot criticize their modern efforts unless we criticize their nationalism. But we can create, through our own efforts, our own ideas of modern art that will "smack of our own soil."

In the development of a modern style of design in architecture in this country, it must not be overlooked that the decorations of the interior—the interior architecture, as we choose to call it—are a part of the original conception. They should have their proper and indispensable part

LIBRARY IN THE HOUSE OF HENRY B. PETTIT, STOTHAM, MAINE.—A MODERN REPRODUCTION OF COLONIAL IDEAS

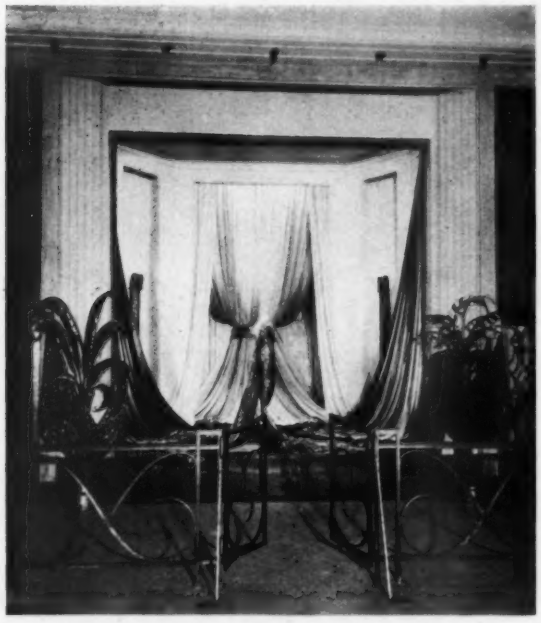
FROHMAN, ROBB & LITTLE, ARCHITECTS

MAIN STAIRCASE IN THE HOUSE OF ARTHUR E. NEWBOLD, JR., LAVEROCK, PA.

MELLOR, MEIGS & HOWE, ARCHITECTS

MODERN ARCHITECTURAL DESIGN, DEVELOPED FROM MODERN STRUCTURAL MATERIALS, COMBINES THE DECORATIVE WITH THE STRUCTURAL SO THAT ARCHITECTURE AND DECORATION BECOME ONE

to play in the harmony of forms and colors which make up the whole. "Interior design is, or should be, the interpretation or complement of the plans and elevations. It should complete, correct and



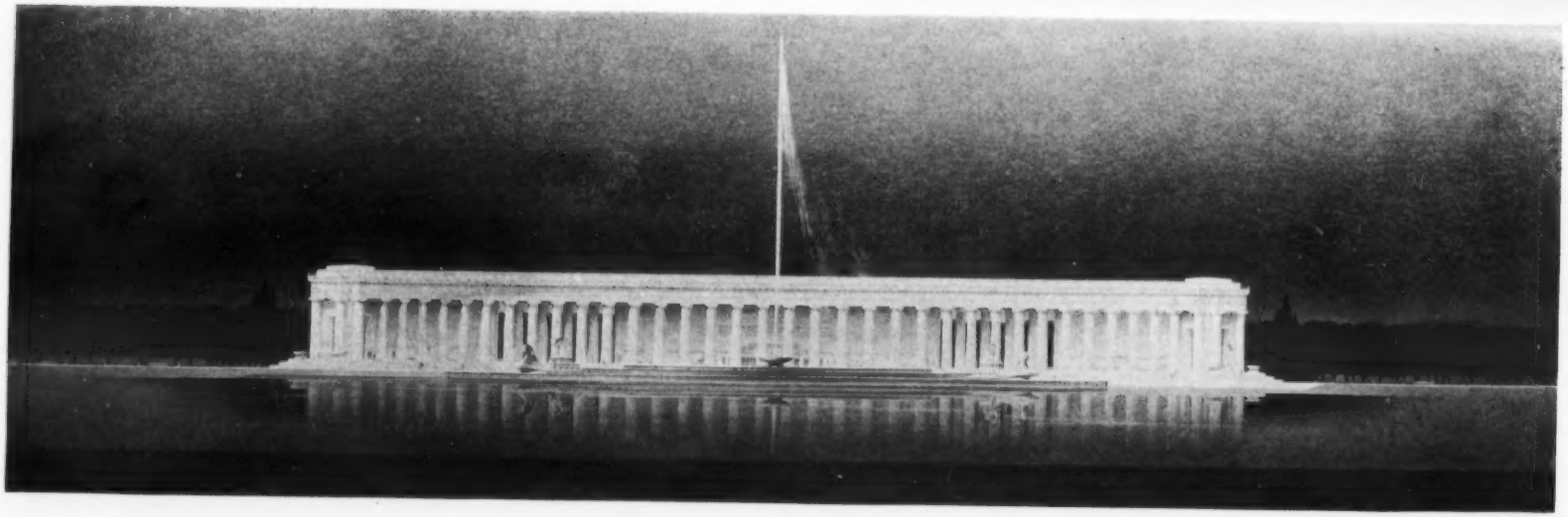
CHENEY BROTHERS' NEW STORE, NEW YORK CITY
HOWARD GREENLEY, ARCHITECT

explain them; the whole should constitute a unity, a concert of many arts." In an issue of THE AMERICAN ARCHITECT of 1877, interior design is thus defined, and it would be difficult to improve upon it today. Architecture is based just as firmly on construction as construction itself is on structural materials. And, as decoration is in its turn just as definitely established by architecture, it stands to reason that all are included in the original conception, although certain details need not be determined upon until later. The fact that architectural and decorative design are so dependent on structural materials is proof that there is something more to this modern movement than a mere fad or an effort to create "something different". But it also means that in decoration as well as in architecture, design must emphasize its structural significance. Structure itself can be made decorative, as was evidenced in Colonial designs but is seldom discernible today.

Appreciating, then, that design is controlled by structure, so that the quality of the materials is never challenged, architects and decorators can blame no one but themselves, or possibly their clients, for a lack of originality in their designs. They have at their disposal a large and varied assortment of modern American building materials, and their use alone would seem to dictate originality. The application of forms and motives of Europe of the sixteenth century to a building erected in this country today of modern American materials and methods of construction is contrary to the basic principles of architecture and results in an anachronism which bears neither the stamp of

MODERN IRONWORK DESIGNED BY EDGAR BRANDT

originality nor of nationalism, and has no permanent value. However a good reproduction is better than originality that has nothing else to recommend it. Only when an original design is an improvement on the styles of bygone periods is originality justified.



THE island from which the fountain rises is 280 feet in diameter, the basin, 600 feet; from the center of one colonnade to the center of the other is 800 feet; the colonnades themselves are each 670 feet long and 60 feet high.

At the center of an island of white granite, set in a circular body of water, flanked by colonnades, a living shaft of water rises two hundred feet. From the base of the fountain, symbolical ships carry the message of Roosevelt's life to the four points of the compass.

The design meets the stipulation in the Joint Resolution of Congress permitting the Roosevelt Memorial Association to secure a design with this site in view in taking into account "the requirements of traffic circulation and of recreational facilities." The traffic has been diverted to the rear of the colonnades.

The style of architecture and sculpture used in the design is Classical, the style recommended in the Park Commission Plan as best harmonizing with the general architectural scheme of Washington.

The site, used by permission of the Congress as the basis for the competition in which Mr. Pope was selected as the designer for the national memorial to Theodore Roosevelt, is situated in what is now the Tidal Basin (or Twining Lake) on the line of Sixteenth Street projected southward from the White House.

John Russell Pope was selected as the designer of the Roosevelt Memorial by a Jury consisting of Herbert Adams, Paul Cret and Louis Ayres, after a competition in which the following architects, sculptors and landscape designers took part:

Delano & Aldrich, James E. Fraser, John Gregory, John Mead Howells, C. P. Jennewein, C. Grant La Farge, Charles N. Lowrie, Edward McCartan, Hermann A. MacNeil, McKim, Mead & White, Charles Platt, Irving K. Pond, John Russell Pope, Albert Randolph Ross, Egerton Swartwout, Lorado Taft, Ferruccio Vitale.

PRIZE WINNING DESIGN

COMPETITION FOR A MEMORIAL TO THEODORE ROOSEVELT IN WASHINGTON, D. C.

JOHN RUSSELL POPE, ARCHITECT

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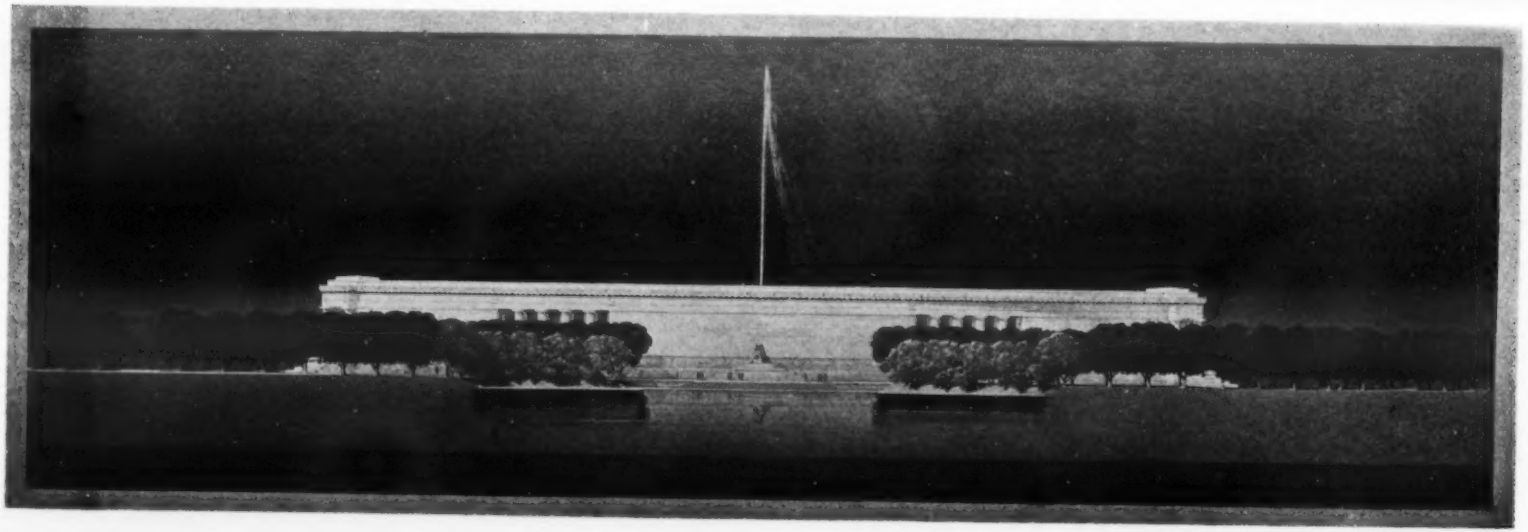

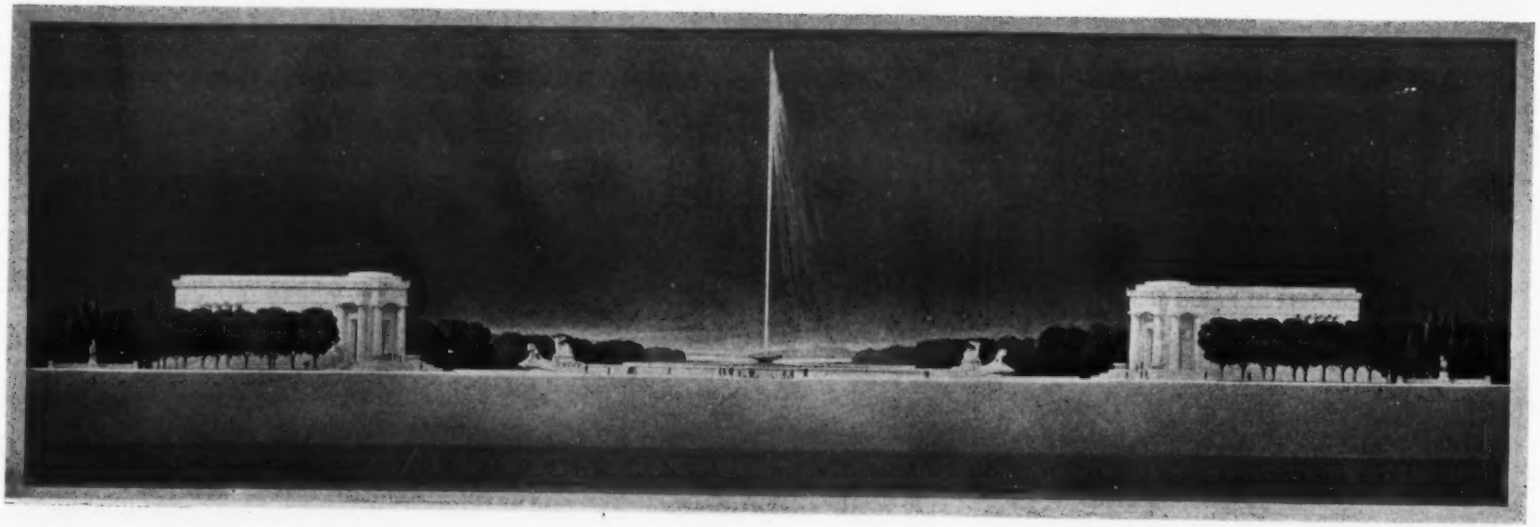

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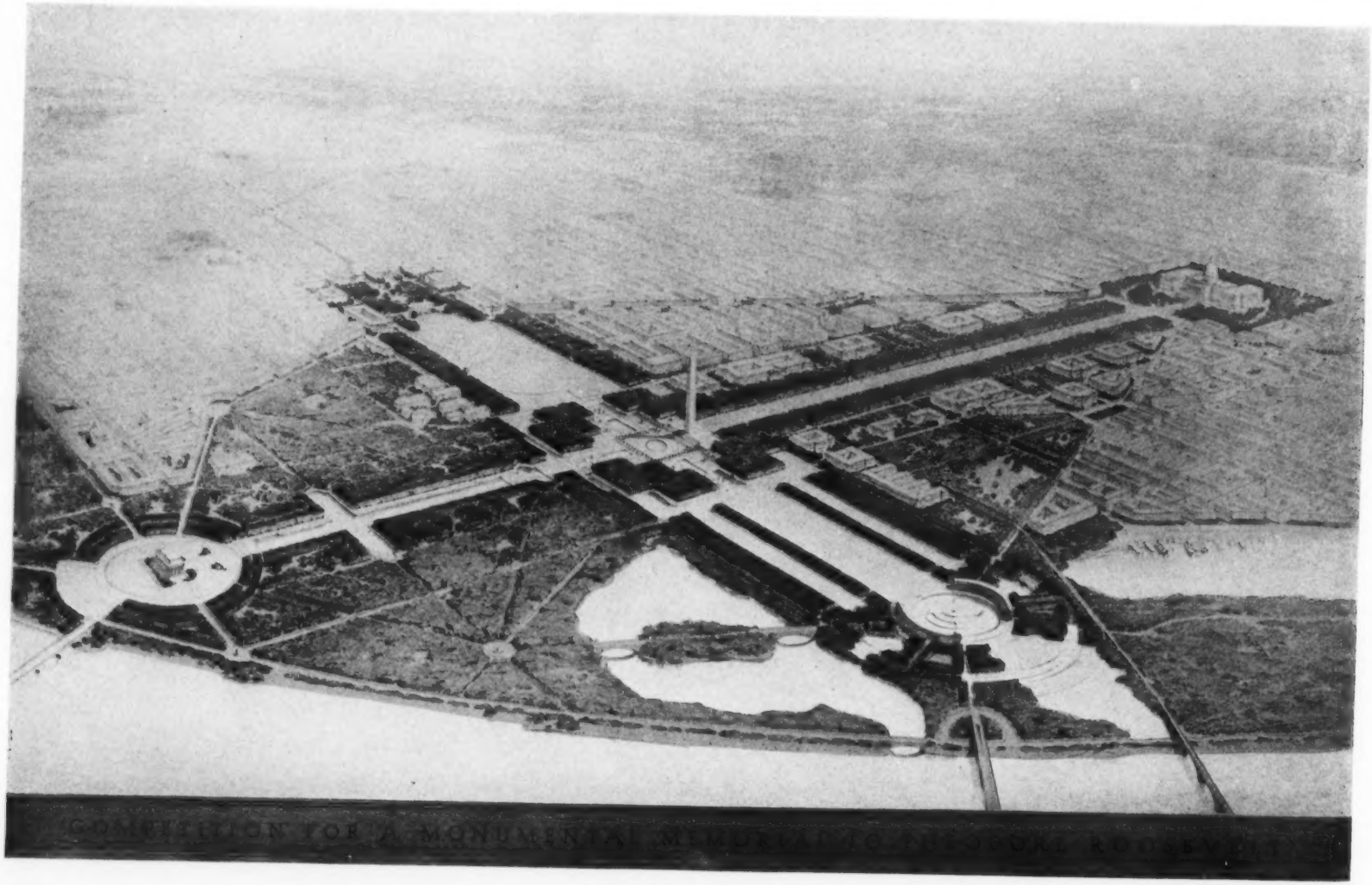

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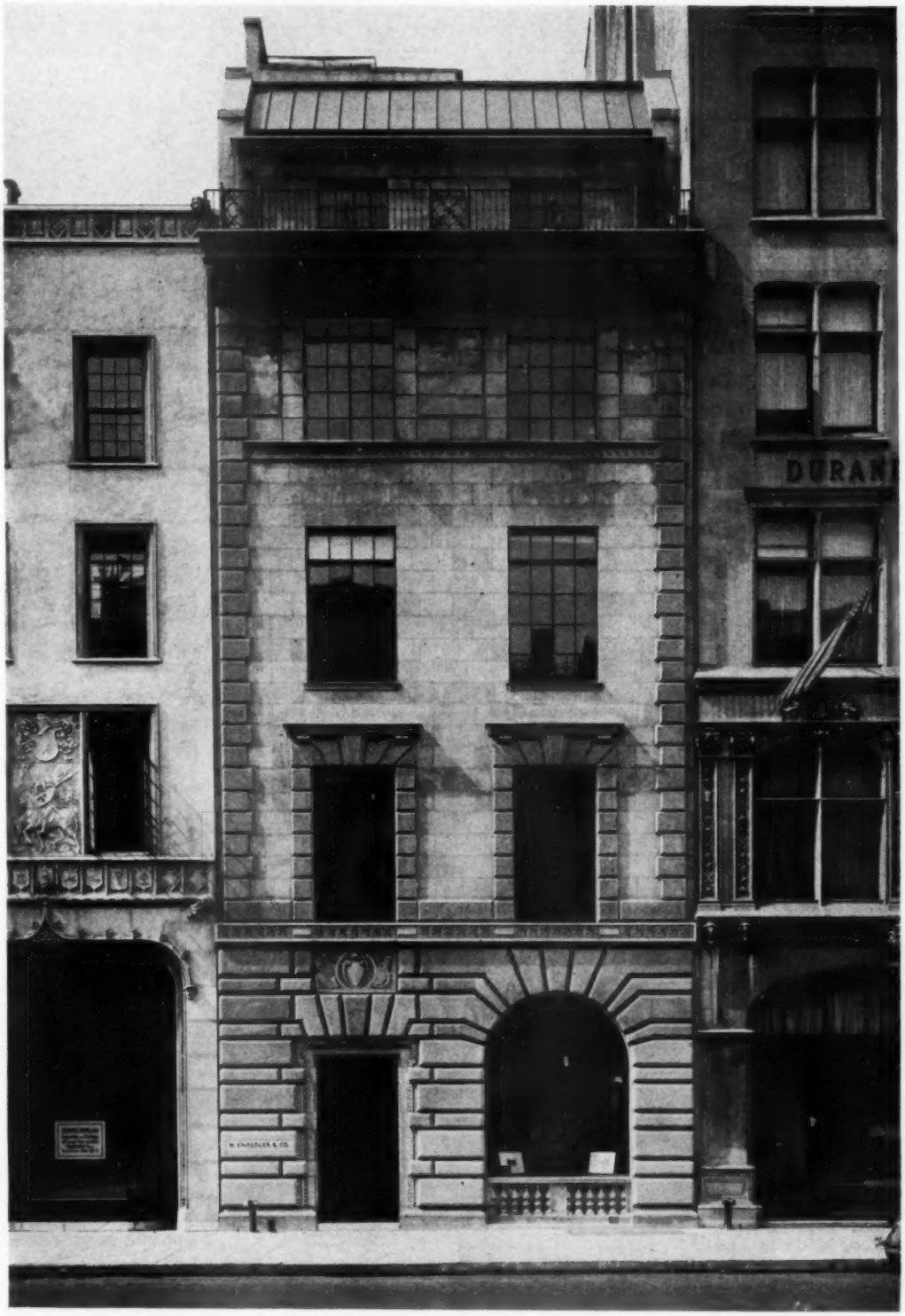

NEW BUILDING FOR M. KNOEDLER & CO., EAST 57TH STREET, NEW YORK

CARRERE & HASTINGS, ARCHITECTS

(See plans on back)

NEW BUILDING FOR M. KNOEDLER & CO.,

EAST 57TH STREET, NEW YORK

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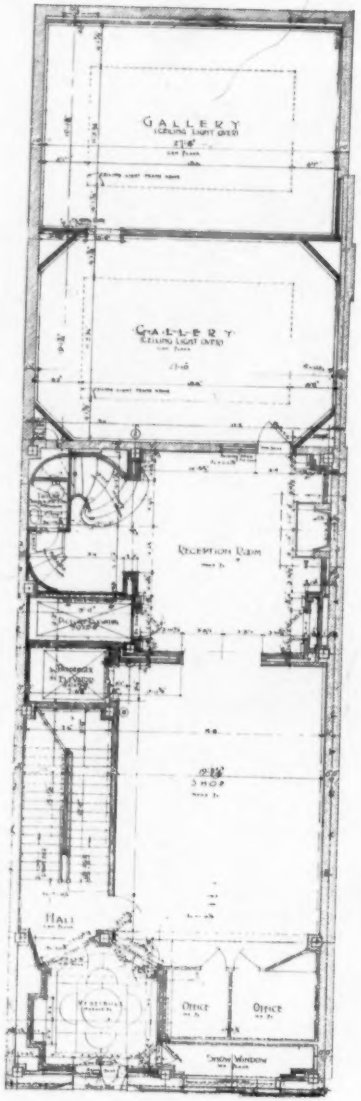
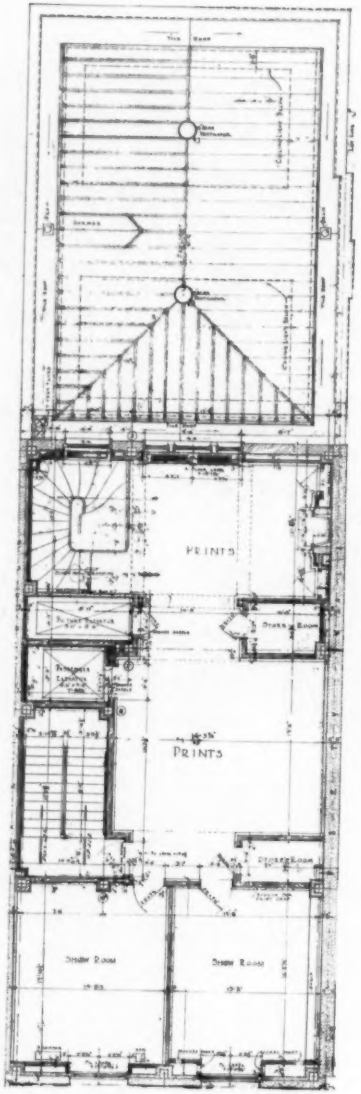
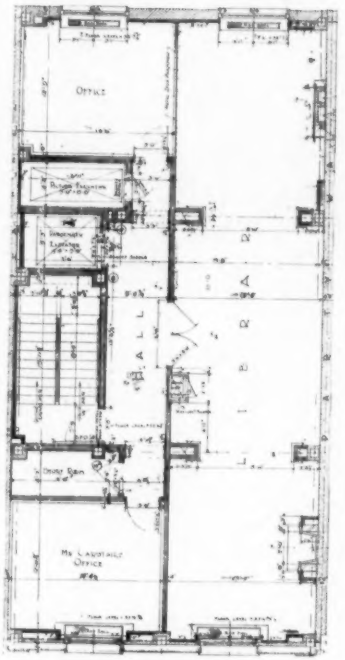


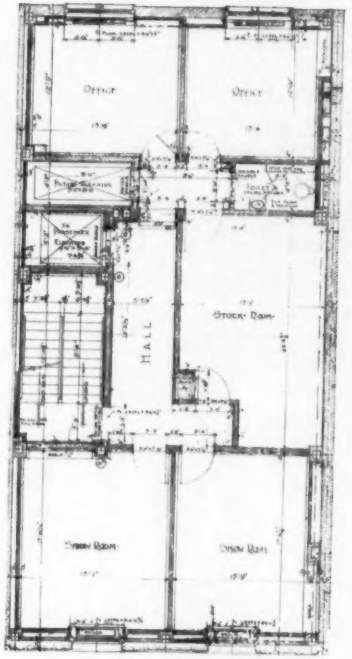
FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN



FOURTH FLOOR PLAN

ENGINEERING *and* CONSTRUCTION

FLUSH VALVES *and* WATER SUPPLY

A Simple Method *of* Determining Peak Loads, Water Consumption *and* Pipe Sizes

BY VERNER F. DAVIS, *Member* A. S. M. E.

THE working of almost every piece of apparatus in a building is influenced in some measure by some other correlated article or condition which affects its efficiency. For this reason it is necessary to consider and provide a complete and well balanced plan; otherwise unsatisfactory service will result. Among the comparatively recent improvements in plumbing equipment is the flush valve. The successful operation of this type of valve and all other plumbing fixtures depends upon an adequate water supply. To design such a supply has been a somewhat involved and tedious operation and THE AMERICAN ARCHITECT *is pleased to publish a simple, workable and dependable method for designing water supply systems where flush valves are used.—The Editors*

IT is a reasonable requirement that all plumbing fixtures be provided with a sufficient supply of water to operate them effectively and to maintain them in a sanitary condition. This cannot be done unless the water supply system is adequate for the demands imposed by the use of the fixtures, but few, if any, codes prescribe the size of pipe required for this purpose.

Very often pipe sizes are estimated by "rule of thumb" methods, the most popular one being based on assuming a percentage of the combined requirements of all the fixtures as the probable maximum water consumption. The application of such rules may result in using pipes that are too large, involving unnecessary cost of construction, or pipes that are too small, which, because of insufficient water supply, causes inconvenience and unsanitary conditions.

All design of supply systems is predicated upon an assumed peak load of water consumption. Several factors enter into its correct determination. Water consumption is controlled by the frequency of the use of the fixtures. To measure that usage correctly it is necessary to understand the habits of the users. From a study of these habits it is found that it is not a question of how many persons there are in the family, how often they bathe, or how frequently a water closet is flushed. *The true basis of estimate is the capacity of a bathroom and at what time of the day it is most used.* Obviously, the capacity of the bathroom is limited to one person and observation shows that the bathroom has its greatest use at rising time in the morning.

To flush a water closet properly, it requires approximately 4 gallons of water, delivered at the rate of one gallon in two seconds, usually termed the flow rate of 30 gallons per minute (this flow rate is designated as *gpm*). The "peak load" for one bathroom would be at least the rate of water consumption of a flush valve, or 30 *gpm*. Although the time required to flush a water closet is from 8 to 10 seconds, the probability of two water closets being flushed at the same time, is quite remote. But should a simultaneous demand occur, the flushing of the second water closet would be delayed only until the first flushing was completed. There is a probability, however, that a bath tub is being filled in one bathroom at the same time that a water closet is being flushed in another bathroom. A bath tub will consume about 15 *gpm* of which 10 *gpm* can be assumed to be cold water. The peak demand for two bathrooms should be at least 30 *gpm* for the water closet and 10 *gpm* for the bath, or 30 *gpm* + 10 *gpm*. A lavatory will consume water at the rate of about 5 *gpm*. As there is the probability of a lavatory being used while a bath is being drawn in one bathroom and a toilet being flushed in another, the "peak demand" for three bathrooms should be at least the total of 30 *gpm* for the water closet, 10 *gpm* for the bath tub and 5 *gpm* for the lavatory, or 30 *gpm* + 10 *gpm* + 5 *gpm*.

Because of the short duration of the water closet flushing, the probability of their use overlapping is not as great as that of bath tubs and the possibility of overlapping in the use of lavatories is far greater than that of the other fixtures. It is then reasonable and logical to add 5 *gpm* for every additional bathroom in excess of three.

On this basis the following formula has been developed and used successfully:

$gpm = 30 + 10 + .5 \times n$ .....(1)

in which

30 = gpm for one bathroom
10 = gpm for the second bathroom
5 = gpm for each additional bathroom
n = number of bathrooms in excess of two

Then for

One bathroom, $gpm = 30$
Two " $gpm = 30 + 10 = 40$
Three " $gpm = 30 + 10 + 5 = 45$
Twenty-five " $gpm = 30 + 10 + (5 \times 23) = 155$

To demonstrate the practicability of this method of determining the volume of water supply, an analysis is made of the requirements of a 25 family apartment house. The maximum demand for water will be at rising time in the morning, particularly in the summer when bathing is most frequent. Because little, if any, water is consumed at this time by kitchen sinks and laundry tubs, these fixtures need not be considered. The "peak load" at this time will be based on the water closets, bath tubs or showers and the lavatories.

Generally two persons, the heads of each family, will rise at the same time. In a 25 family apartment building, this would amount to 50 persons. Assuming that 20 per cent of these persons, or 10 persons, would draw a bath within 15 minutes after rising and allowing 5 minutes to fill the tub, we have 10 x 5 = 50 minutes of water drawing. As these baths are drawn in 15 minutes, then 50/15 = 3-1/3 baths drawing at the same time. Assuming that each of these 50 persons will flush the water closet within 3 minutes after rising and allowing 10 seconds for each flushing, we have 50 x 10 = 500 seconds of flushing. As this flushing is done within 3 minutes or 180 seconds, then 500/180 = 2-7/9 flushings going on at the same time.

Summing up the consumption above described we have:

For water closets @ 30 gpm = 30 x 2-7/9 = 83 gpm
" baths @ 10 gpm = 10 x 3-1/3 = 34 gpm
Total consumption =117 gpm

The probable number of baths and water closet flushings consuming water at the same time, is the basis of calculation for water consumption, and the capacity of a bathroom is limited to the occupancy of one person when in use. As the number of apartments supplied by a common street connection increases, the possibility of the use of fixtures overlapping also increases, but is not so great proportionately.

It will be noted that the comparative gpm derived by the use of the formula $30 + 10 + (5 \times 23)$ is 155 gpm, which allows a sufficient margin of safety for unexpected contingencies. No matter how many bathrooms are to be supplied, the assumption that 20 per cent of the persons are bathing and the water closets are being flushed within 3 minutes after rising, has been found to be liberal.

Two systems of water service are in use: Direct pressure system from the street main through a basement main from which risers extend upward to the fixtures, or the down-feed system where the water is pumped to a house tank above the roof from which the water enters an overhead main having risers extending downward to the lowest fixture. In some instances a split system is used —the lower stories supplied by direct city pressure and the upper floors by the house tank. This effects an operating economy because it is not necessary to pump to the house tank *all* of the water used. Examples of design for both systems are given.

A direct pressure system is illustrated in Figure 1 for a 25 apartment building having 5 supply risers, each serving 5 bathrooms. The first step is to determine the maximum water consumption, in this case 155 gpm as shown above.

The procedure for design, is as follows:

1st. Ascertain the water pressure at the street main in pounds per square inch. In this instance 60 pounds.

2nd. Ascertain the height in feet of the highest fixture above the street main. In this instance 50′; then the loss in pressure due to static head (the height in feet multiplied by .433) or 50 x .433 = 21.65 pounds per square inch drop in pressure.

3rd. Deduct this static head loss in pressure from the street main pressure or 60 — 21.65 = 38.35 pounds per square inch effective pressure.

4th. Ascertain the total length of pipe from street main to most distant and highest fixture,— in this instance 100′ + 40′ + 30′ + 50′ = 220′.

The rule $30 + 10 + 5$ should be applied to each riser, branch or main separately because the "peak demand" for the most distant and highest bathroom should have 30 gpm at all times.

The risers supply 5 bathrooms and they would consume $30 + 10 + (5 \times 3) = 55$ gpm for each riser. Enter the chart with straight edge on the line of "Water Pressure in Pounds" at the effective pressure at the highest fixture, 38.35 pounds. In the line of "Length of Pipe in Feet" locate the point indicating 220′. Connect these two points and extend the line until it intersects the line of "Drop in Pressure Per Foot, Pounds" below 0.18 at 0.178, from which point lay the straight edge on a horizontal line and find the intersection with the vertical line representing the "Gallons of Water Delivered Per Minute." The curved lines represent the size of pipe required. *Always select the pipe size represented by the curved line at the right of the in-*

tersection. In this case we find for 55 *gpm* that a 1½″ pipe is required for the supply riser which is true of the other risers in this example.

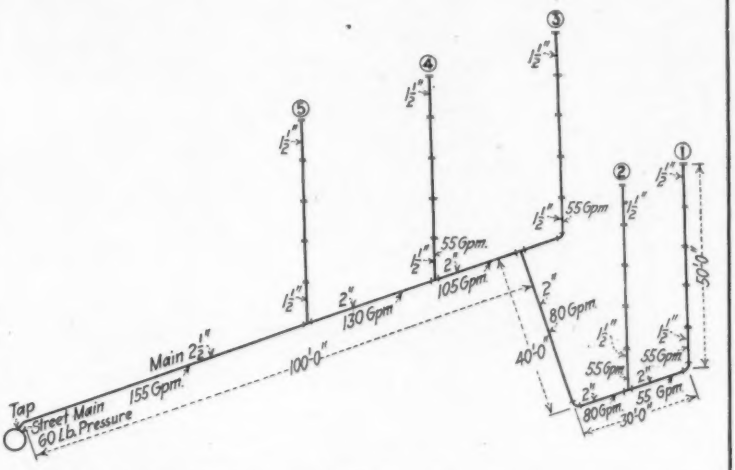


FIGURE 1. DIAGRAM ILLUSTRATING EXAMPLE OF A DIRECT PRESSURE UP-FEED SYSTEM OF WATER PIPE

The next step is to design the main supply pipe. Risers 1 and 2 together do not require the double capacity of *gpm* or 55 x 2 = 110 *gpm,* but by applying the formula we have for 10 bathrooms $30 + 10 + (5 \times 8) = 80$ *gpm.* On the chart we find that this capacity requires a 2″ main supply, which is extended to riser 1. For riser 3 we have $30 + 10 + (5 \times 13) = 105$ *gpm* requiring a 2″ pipe. For riser 4 we have $30 + 10 + (5 \times 18) = 130$ *gpm* requiring a 2″ pipe. For riser 5 we have $30 + 10 + (5 \times 23) = 155$ *gpm* which requires a 2-1/2″ pipe extending to the water main. In this example 5 bathrooms were allotted to each riser for convenience, but the same process is applicable to any number of risers with varying number of bathrooms.

The down-feed system of water supply can be designed by applying the *30 + 10 + 5* formula. The conditions are reversed from those in the direct pressure or up-feed system. In the down-feed system the smaller pressure is found in the header and branches to the risers. This is because the source of water supply, the house tank, is generally but a comparatively few feet above the header. In the down-feed risers the pressure increases directly as the vertical distance increases between the fixture and the house tank.

A down-feed system is shown in Figure 2. In this example there are 40 bathrooms with 5 bathrooms on each of the 2 risers and 10 bathrooms on each of the 3 risers. Applying the formula for the peak load on 40 bathrooms we have: $30 + 10 + (5 \times 38) = 230$ *gpm.* This 230 *gpm* is the peak load at the supply pipe from the tank to the header. The header on the right side supplies risers 1, 2, and 3 with 25 bathrooms; then we have $30 + 10 + (5 \times 23) = 155$ *gpm.* The header on the left side supplies risers 4 and 5 and 15 bathrooms; then we have $30 + 10 + (5 \times 13) = 105$ *gpm.*

Having established the peak demand in *gpm* for the supply pipe from tank to header and the headers on both sides, the procedure for design for these pipes is as follows:

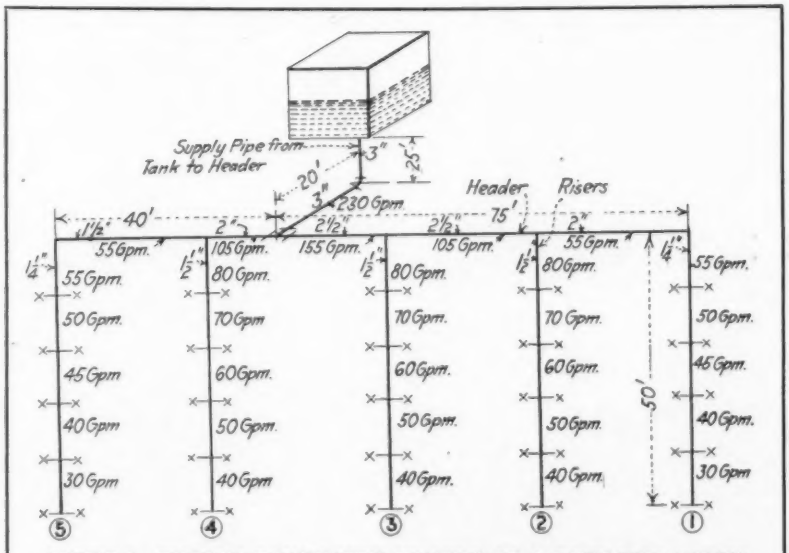


FIGURE 2. DIAGRAM ILLUSTRATING EXAMPLE OF A DOWN-FEED SYSTEM OF WATER PIPE SUPPLIED FROM A HOUSE TANK

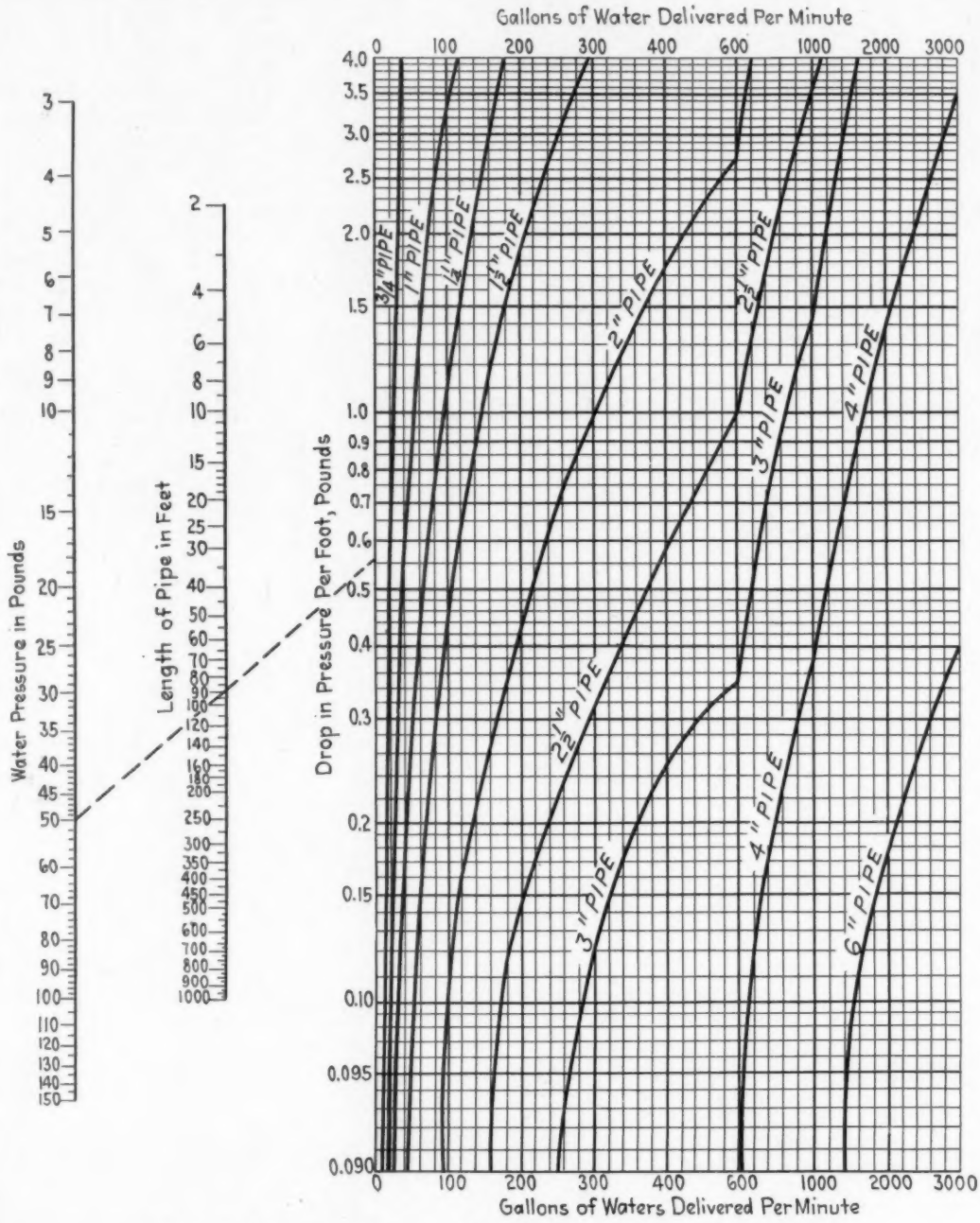


CHART FOR DETERMINING THE SIZE AND CAPACITY OF WATER PIPES

FORMULA

$$G = \frac{\sqrt{D^5 H}}{L} 35.3$$

G = gallons of water per minute
D = diameter of pipe in inches
H = head of water in feet
L = length of pipe in feet

EXPLANATION

Through the points corresponding to "water pressure" and "length of pipe" extend a line to the "drop in pressure" line. Find the intersection of a horizontal line from this point and a vertical line representing gallons of water delivered per minute. The curved line to the *right* of this intersection represents the size of pipe required.

1—Ascertain the height of the bottom of the tank above the header. In this instance 25′.

2—Ascertain the effective pressure in the header (the height from header to bottom of the tank x .433). In this instance 25′ x .433 or 10.8 pounds effective pressure in pounds per square inch.

3—Ascertain the total length of pipe from the bottom of the tank to furthest riser on the header. In this instance for the right side 25′ + 20′ + 75′ = 120′ and for the left side 25′ + 20′ + 40′ = 85′.

Enter the chart on the line of "Water Pressure in Pounds" at the effective pressure of 10.8 lbs. In the line of "Length of Pipe in Feet" locate the point indicating 120′, connect these two points and extend the line until it intersects the line of "Drop in Pressure per Foot, in Pounds" at .098 from which point lay the straight edge on a horizontal line and find the intersection with the vertical line representing the "Gallons of Water Delivered per Minute." The curved lines represent the size of pipe required. *Always select the pipe size represented by the curved line at the right of the intersection.*

Reading down we find that a 3″ pipe is necessary to supply 230 *gpm,* the required amount for the supply pipe from tank to header. A 2½″ pipe for 155 *gpm,* the required amount for risers 1, 2, and 3; a 2½″ pipe for 105 *gpm,* the required amount for risers 1 and 2 and a 2″ pipe for 55 *gpm,* the required amount for riser 1.

For the left side, the total length is 25′ + 20′ + 40′ = 85′. Enter the chart on "Pressure" line at 10.8 lbs. and through 85′ in "Length of Pipe" line, extend line to intersect the "Drop in Pressure per Foot, Pounds" line at 0.13. Laying the straight edge across the *gpm* table we find a 2″ pipe is necessary to supply 105 *gpm* for risers 4 and 5 and 1½″ pipe to supply 55 *gpm* for riser 5.

Usually the vertical distance between the header and the house tank is quite small and the pressure in the header is correspondingly low. The friction in the supply pipe from the tank and in the header greatly reduces or may offset this pressure. It is customary and satisfactory practice to estimate the effective pressure at the lowest fixture in the down-feed risers as due to the vertical distance from the lowest fixture to the header and not to the house tank. Some cities require that the bottom of the house tank be a certain distance above the high point of the roof. In New York City this distance is 20′.

In this example the vertical distance from the lowest fixture to the header is given as 50′ and the effective pressure at the lowest fixture would be 50 x .433 = 21.65 lbs. per square inch.

Risers 2, 3 and 4 supply 10 bathrooms each; the demand at the two lower bathrooms will be *30 + 10* = 40 *gpm*; for the next two above it will be *30 + 10 +* (*5* x 2) = 50 *gpm*; for the next two above *30 + 10 +* (*5* x 4) = 60 *gpm*; the next two above *30 + 10 +* (*5* x 6) = 70 *gpm*; and for the two at the top *30 + 10 +* (*5* x 8) = 80 *gpm.*

Risers 1 and 5 supply 5 bathrooms each. The demand on the lowest bathroom will be 30 *gpm*; for the next above *30 + 10* = 40 *gpm*; the next above *30 + 10 + 5* = 45 *gpm*; for the next above *30 + 10 +* (*5* x 2) = 50 *gpm;* and the highest *30 + 10 +* (*5* x 3) = 55 *gpm.* Enter the chart at 21.65 lbs. on the "Pressure" line and through 50′ on "Length of Pipe" line intersect the "Drop in Pressure" line at .42. Proceeding as before we find a 1¼″ pipe is required for 55 *gpm* (risers 1 and 5) and 1½″ pipe for 80 *gpm* (risers 2, 3 and 4). In many codes 1½″ pipe is the smallest riser allowed.

The *30 + 10 + 5* rule applies to groups or batteries of water closets in schools, gymnasiums, public comfort stations, hotels, office buildings, industrial plants and all other classes of toilet rooms, as well as to apartment houses and residences.

For example, in a schoolhouse with 20 water closets the pupils are recessed in large groups and all of the toilets may be occupied at one time. It does not follow that all of the water closets would be flushed at one time as the time of occupancy naturally varies. For 20 water closets the *30 + 10 + 5* rule provides a flow rate of *30 + 10 +* (*5* x 18) = 130 *gpm* or water enough for nearly 5 simultaneous flushings at 30 *gpm* each.

As the longest flush never exceeds 10 seconds, we find that the 20 water closets would require 200 seconds flow. As the flow rate found above by the *30 + 10 + 5* rule will provide for 5 simultaneous flushings, it will take care of a complete change of occupancy each 40 seconds—(10 x 20)/5 = 40. By this it is shown that the rule applies to all classes of toilet rooms irrespective of the type of building because the rule is based on the maximum capacity of the water closets and the habits of the users.

Exceptions to the *30 + 10 + 5* rule should be made where there are groups of showers in clubs, Y. M. C. A. buildings, industrial plants, gymnasiums and similar places and for bed pan cleaners in hospitals, and for laundries in hospitals, hotels and other places. The quantities obtained as given below should be added to those already obtained by the *30.+ 10 + 5* rule.

In the case of group showers, the probability is that all of them will be in use at one time for a period of from 5 to 15 minutes. The demand would be for 15 *gpm* for each shower which will include the flow of both hot and cold water. For bed pan cleaners the length of flush is 30 seconds and about 50 per cent of them will probably be flushed at the same time. We would then have 50

per cent of 30 *gpm* or 15 *gpm* for each bed pan cleaner.

For laundries the size and number of the water using equipment will determine the volume of water required. This data should be obtained from the manufacturers of laundry equipment.

LOSS IN PRESSURE CAUSED BY WATER METERS

Pounds per square inch

Gallons per Minute	Size of Water Meter					
	¾"	1"	1¼"	1½"	2"	2½"
30	20	8	3	2		
50	55	22	10	6	3	
70		40	22	12	4	2
100			42	23	9	4
150				52	21	9
200					38	16
250					57	25
300						36

Where water meters are used there is a drop in pressure due to the frictional resistance of the meter. This loss in pressure should be deducted from the pressure in the water main to determine the effective pressure. The loss of pressure is not the same in all types of meters. The figures in the table are those given by a well known water meter manufacturer and will apply in the majority of cases for meters 2½" or smaller. For larger meters, the drop in pressure should be secured from the manufacturer.

To obtain the effective pressure, first ascertain the pressure in the street main and from it deduct the loss in pounds per square inch due to the size of the tap (see table), plus the loss due to the water meter plus the loss due to the static pressure of the water column. The remainder will be the effective pressure to be used in connection with the chart of pipe sizes.

For small houses the pipe sizes for the street service, cellar main and risers are given in the accompanying table. This table is based on water pressures in the city main varying from 20 to 80 pounds per square inch.

Architects and engineers are often confronted with the problem of adapting existing water supply systems in small houses to new conditions involving not more than four flush valves. There are two typical conditions in existing work which can be described (1) as that where the street connections are too small and the house service can be increased to the correct size and (2) where both the street connection and the house service are inadequate.

In the first case (1), a storage tank is installed in the basement in a vertical position. For this service a standard 40 gallon tank and stand can be used. All of the tappings in the tank, except

DROP IN PRESSURE IN POUNDS PER SQUARE INCH FOR A GIVEN FLOW THROUGH VARIOUS SIZES OF WATER TAPS TAKEN FROM STREET MAINS

Size of Tap	FLOW IN GALLONS PER MINUTE											
	5 Gal.	10 Gal.	20 Gal.	30 Gal.	40 Gal.	50 Gal.	60 Gal.	70 Gal.	80 Gal.	90 Gal.	100 Gal.	
⅝"	.280	1.11	4.42									
¾"	.036	.46	.58	1.32	2.38							
1"	.008	.034	.137	.31	.56	.87	1.25	1.70	2.20	2.80	3.46	
1¼"	.003	.011	.045	.102	.184	.285	.410	.565	.725	.925	1.14	
1½"	.0011	.0045	.018	.041	.074	.115	.165	.221	.290	.370	.455	
2"	.0003	.0011	.0043	.011	.017	.027	.040	.053	.067	.088	.01	
2½"						.009	.013	.017	.023	.029	.035	

Size of Pipe	FLOW IN GALLONS PER MINUTE											
	125 Gal.	150 Gal.	175 Gal.	200 Gal.	250 Gal.	300 Gal.	350 Gal.	400 Gal.	500 Gal.	600 Gal.	800 Gal.	1000 Gal.
1"	5.45	7.82										
1¼"	1.78	2.56	3.50	4.55								
1½"	.72	1.02	1.40	1.80	2.85	4.13	5.08					
2"	.170	.244	.333	.432	.680	.978	1.33	1.72	2.70	3.92	6.88	
2½"	.056	.080	.109	.143	.222	.320	.438	.568	1.06	1.25	2.26	3.53
3"	.022	.032	.044	.059	.089	.128	.175	.228	.356	.515	.91	1.43
4"	.0053	.0076	.010	.0135	.020	.030	.041	.059	.084	.123	.215	.338
6"			.0013	.0018	.0028	.004	.005	.007	.011	.016	.028	.045

Size of Pipe	FLOW IN GALLONS PER MINUTE							
	1250 Gal.	1500 Gal.	1750 Gal.	2000 Gal.	2500 Gal.	3000 Gal.	4000 Gal.	5000 Gal.
2½"	5.56							
3"	2.24	3.21	4.37	5.70				
4"	.528	.765	1.03	1.35	2.15	3.50	4.47	8.42
6"		.100	.136	.178	.284	.402	.592	1.11
8"	.016	.0238	.032	.042	.067	.095	.140	.265
10"	.0065	.0078	.0107	.0139	.0217	.031	.046	.086

Height above street main	Size of Tap	20 POUNDS PRESSURE					30 POUNDS PRESSURE				
		Street Service		Cellar Main		Risers, Branches	Street Service		Cellar Main		Risers, Branches
		Length	Size	Length	Size		Length	Size	Length	Size	
10′	⅝″ or larger	1— 20 21— 60 61— 80 81—200	1¼ 1¼ 1¼ 1½	1—30 " " "	1¼ " 1½ "	1¼ " " "	1— 45 46—145 146—200	1 1¼ 1½	1— 40 " "	1¼ " "	1¼ " "
20′	"	1— 25 26— 60 61—200	1¼ 1½ 2	1—40 " "	1½ " "	1½ " "	1— 30 31— 90 91—200	1 1¼ 1½	1—40 " "	1¼ " "	1¼ " "
25′	"	1— 30 31—200	1½ 2	1—40 "	1½ "	1½ "					
30′	"						1— 20 21— 50 51—100 101—200	1 1¼ 1½ "	1—40 " " "	1½ " " "	1¼ " " "

Height above street main	Size of Tap	40 POUNDS PRESSURE					50 POUNDS PRESSURE				
		Street Service		Cellar Main		Risers, Branches	Street Service		Cellar Main		Risers, Branches
		Length	Size	Length	Size		Length	Size	Length	Size	
10′	⅝″ or larger	1— 75 76—200	1 1¼	1—40 "	1¼ "	1¼ "	1— 25 26—100 101—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "
20′	"	1— 60 61—200	1 1¼	1—40 "	1¼ "	1¼ "	1— 20 21—100 101—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "
30′	"	1— 40 41—140 141—200	1 1¼ 1½	1—40 " "	1¼ " "	1¼ " "	1— 75 76—200	1 1¼	1—40 "	1¼ "	1¼ "
40′	"	1— 30 31— 90 91—200	1 1¼ 1½	1—40 " "	1¼ " "	1¼ " "	1— 55 56—200	1 1¼	1—40 "	1¼ "	1¼ "

Height above street main	Size of Tap	60 POUNDS PRESSURE					70 POUNDS PRESSURE				
		Street Service		Cellar Main		Risers, Branches	Street Service		Cellar Main		Risers, Branches
		Length	Size	Length	Size		Length	Size	Length	Size	
10′	⅝″ or larger	1— 30 31—140 141—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "	1— 40 41—170 171—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "
20′	"	1— 30 31—120 121—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "	1— 35 36—150 151—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "
30′	"	1— 25 26—110 111—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "	1— 30 31—140 141—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "
40′	"	1— 20 21— 90 91—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "	1— 25 26—120 121—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "

Height above street main	Size of Tap	80 POUNDS PRESSURE				
		Street Service		Cellar Main		Risers, Branches
		Length	Size	Length	Size	
10′	⅝″ or larger	1— 45 46—200	¾ 1	1—40 "	1¼ "	1¼ "
20′	"	1— 40 41—190 191—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "
30′	"	1— 40 41—170 171—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "
40′	"	1— 35 36—150 151—200	¾ 1 1¼	1—40 " "	1¼ " "	1¼ " "

Pipe Tables for Small Houses

With 1 to 4 flush valves and all other fixtures

Many plumbing codes require lead street service pipe. In this table the street service pipe sizes are based on lead or other non-corrodible pipe. Where corrodible pipe is used for the street service, use pipe one size larger than given in the table. The pipe sizes in the house are made 1¼" and larger to allow for possible corrosion.

Where water meters are used deduct from the pressure for ¾" meters 20 lbs, and for 1" meters 10 lbs.

one in the bottom, should be plugged air-tight (preferably with nipples and caps), as it is used as a compression tank. A reducing tee below the tank makes the connection between the small service pipe from the street and the larger pipe to the flush valves which should be an 1¼″ pipe. Place a gate valve above the tee to shut off the water and between the gate valve and the bottom of the tank, place a drain cock so that the water can be drawn from the tank and the tank recharged with air, if this becomes necessary. If the tank is made air-tight, the air will not have to be replenished for many months.

The principle of this system is that the water entering the bottom of the tank, compresses the air which it contains to the same pressure as that in the supply system. When a flush valve is opened, the compressed air will force the water through the pipe with sufficient velocity to furnish the required volume to insure a satisfactory flushing of the water closets. This volume is a flow rate of 30 *gpm*.

This system has been found perfect in operation and can be used for any number of valves depending on the size of the tank. A 40 gallon tank is suitable for a 3 flush valve installation.

In the second case (2), each flush valve has its individual compression tank operating on the same principle as in (1). These individual tanks can be placed in an attic, on a floor above or in a closet adjoining the fixture. A 10 gallon tank usually serves the purpose. The tank should be protected from freezing.

The 10 gallon compression tank should have a 1¼″ horizontal pipe connection. If the pressure exceeds 20 pounds, the vertical connection should be of less size so as to prevent the water leaving the tank at a too high velocity. For pressures of more than 50 pounds, place a gate valve in the vertical connection to regulate the velocity.

The flush valve is a small, compact and simple flushing device connecting the water closet directly to the roof tank, pneumatic tank or street main supply. Its use reduces the quantity of water required for each flushing of the water closet to a minimum.

PLASTIC MAGNESIA

METHODS of making satisfactory plastic magnesia, used extensively in the manufacture of stucco and composition flooring, from the magnesite deposits of the Western States have been developed as the result of an investigation conducted by the Bureau of Mines, Department of Commerce. The investigation also revealed that plastic magnesia of fair quality could be produced from dolomite, a material cheaply obtainable in the Eastern States. The experimental work of the Bureau of Mines was conducted with magnesite from Washington and California.

The first commercial use of magnesian cements was in Germany, the Bureau of Mines points out in a report recently issued. Their use in the United States was just being established at the beginning of the World War, but is gaining rapidly at present. Most of the plastic magnesia now made from domestic magnesite comes from California producers.

Magnesia stucco makes a strong, hard, and elastic cement which adheres firmly to wood surfaces, but it is not as weatherproof as cement stucco. Weatherproofing compounds are therefore being tried. The structural firmness and density of the stucco are the qualities that best insure protection, and these qualities largely depend on the quality of the plastic magnesia used, which in turn depends mainly on selecting suitable raw material and accurately controlling the proper calcining temperature. Judged from the cumulative experience of the industry, properly made magnesian stucco is resistant enough to weathering to be considered entirely satisfactory.

Composition floors, if properly laid, are quite satisfactory. They are permanent, warm to the touch, elastic and fireproof, and can be laid over old or new wooden floors. Bathtubs are frequently encased in it. Slabs of the same material are used for drainboards on kitchen sinks and so forth.

At present manufacturers of composition flooring and of stucco buy plastic magnesia and prepare mixtures that are ready to be moistened with magnesium chloride solution at the point of application. Formerly the supply of plastic magnesia was variable and occasionally bad, but this condition is now rapidly improving.

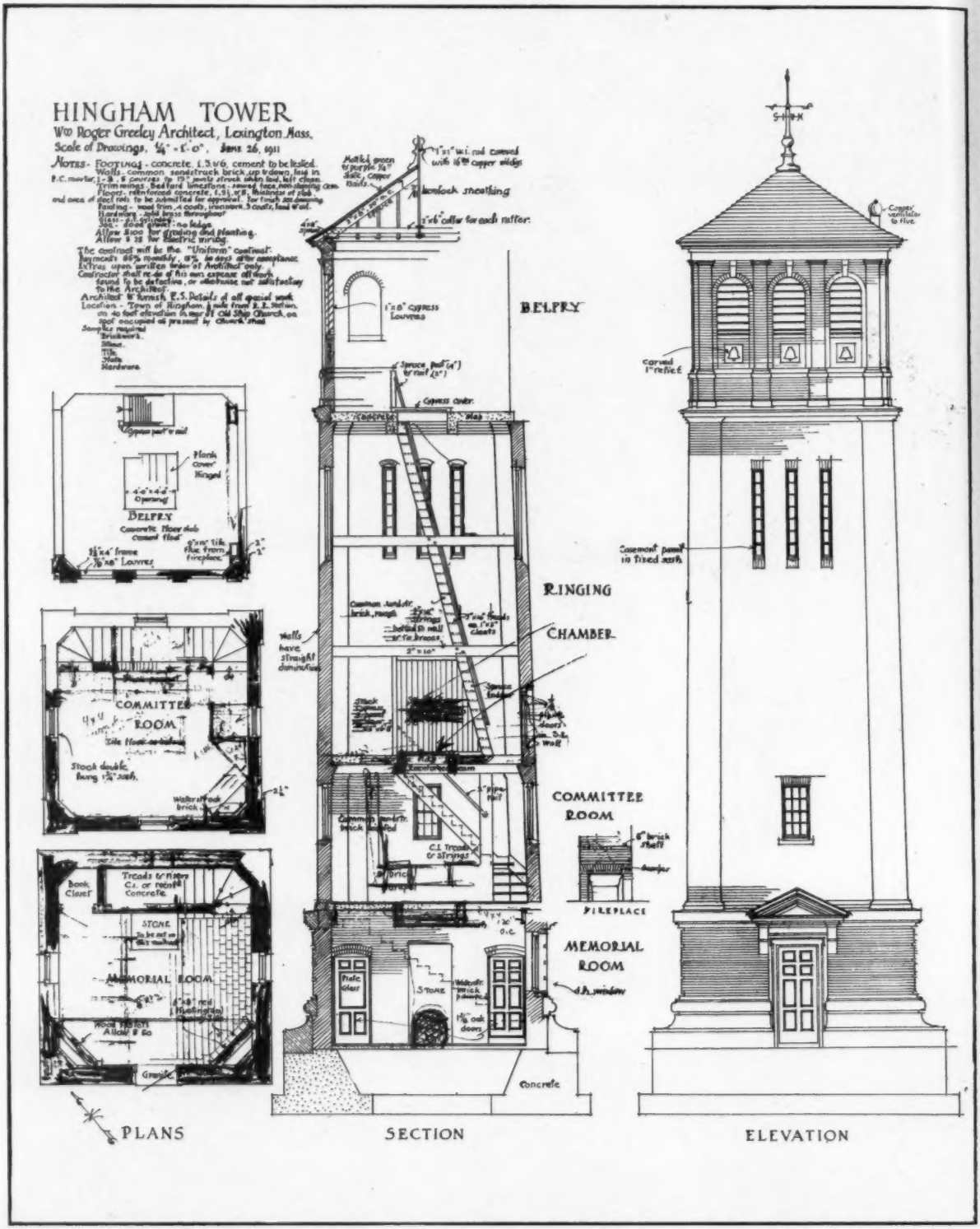
Recarbonation of free lime in burned dolomite or plastic magnesia, in order that these materials will yield satisfactory magnesian cements, has proved of great value for dolomites, but of doubtful value for magnesites, although they are benefited to some extent.

Research undertaken to show the suitability of Washington crystalline magnesite for the manufacture of plastic magnesia, while accomplishing its purpose definitely and satisfactorily, incidentally discovered a process for using dolomite in magnesian mortars which may well prove commercially important. This discovery indicates a use for vast deposits of pure dolomite near Eastern consuming centers and may revolutionize the magnesium mortar industry.

The results of this investigation are contained in Bureau of Mines Bulletin 236, "Plastic Magnesia," by Oliver C. Ralston, Robert D. Pike, and Lionel H. Duschak, copies of which may be obtained from the Superintendent of Documents, Washington, D. C., at a price of 30 cents.

CARILLON TOWER, HINGHAM, MASS.

WM. ROGER GREELEY, ARCHITECT



THIS DIGNIFIED MEMORIAL TOWER HAS A "PEAL" OF BELLS, A MEMORIAL AND COMMITTEE ROOM. IT IS A TYPE OF MEMORIAL, LARGELY AN IMPROVEMENT OVER THOSE GENERALLY FOUND IN SMALL COMMUNITIES

CARILLON TOWER, HINGHAM, MASS.—WM. ROGER GREELEY, ARCHITECT

HOUSE OF MONROE H. LONG, PLAINFIELD, N. J.

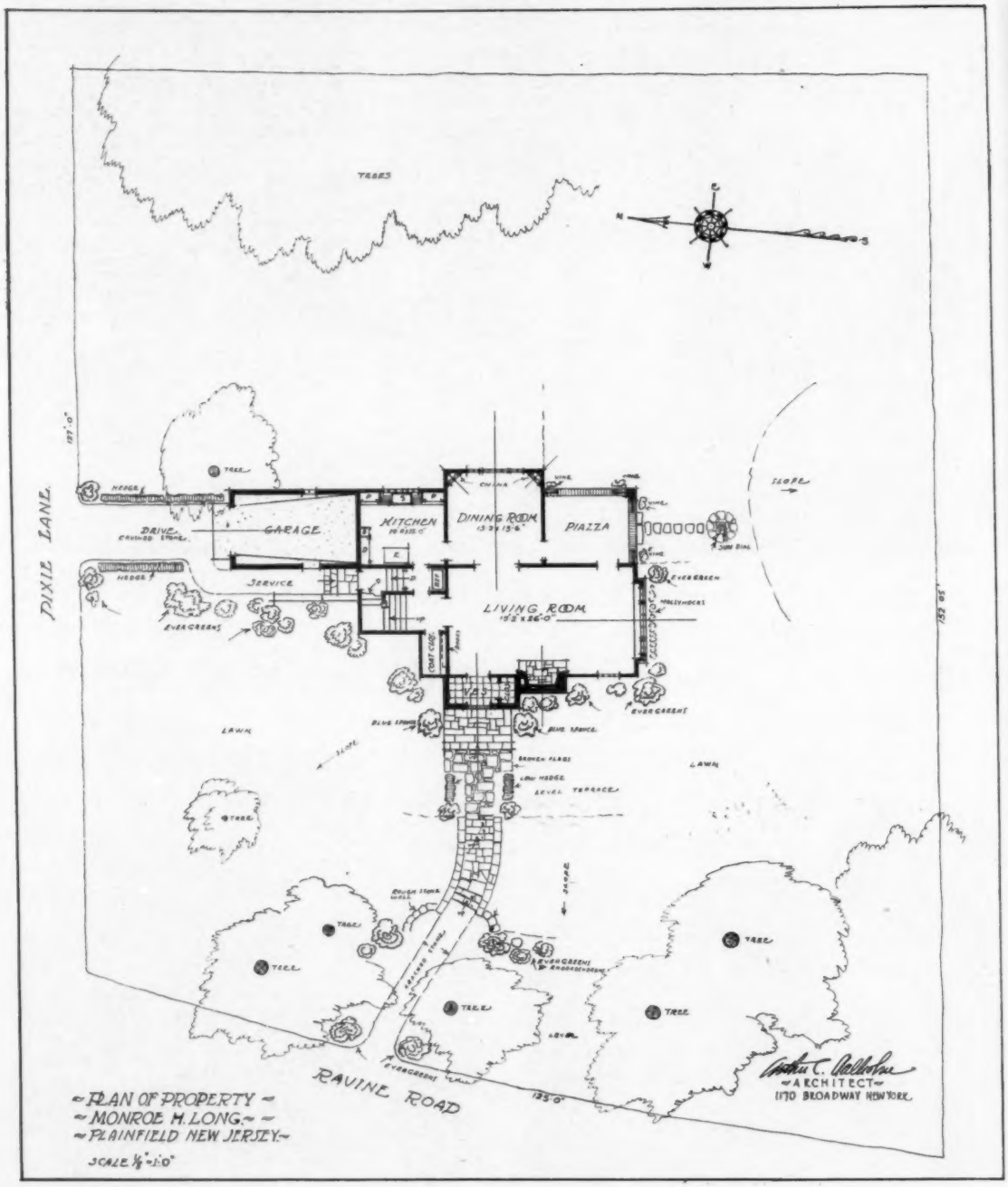
ARTHUR CLEMENT AALHOLM, ARCHITECT

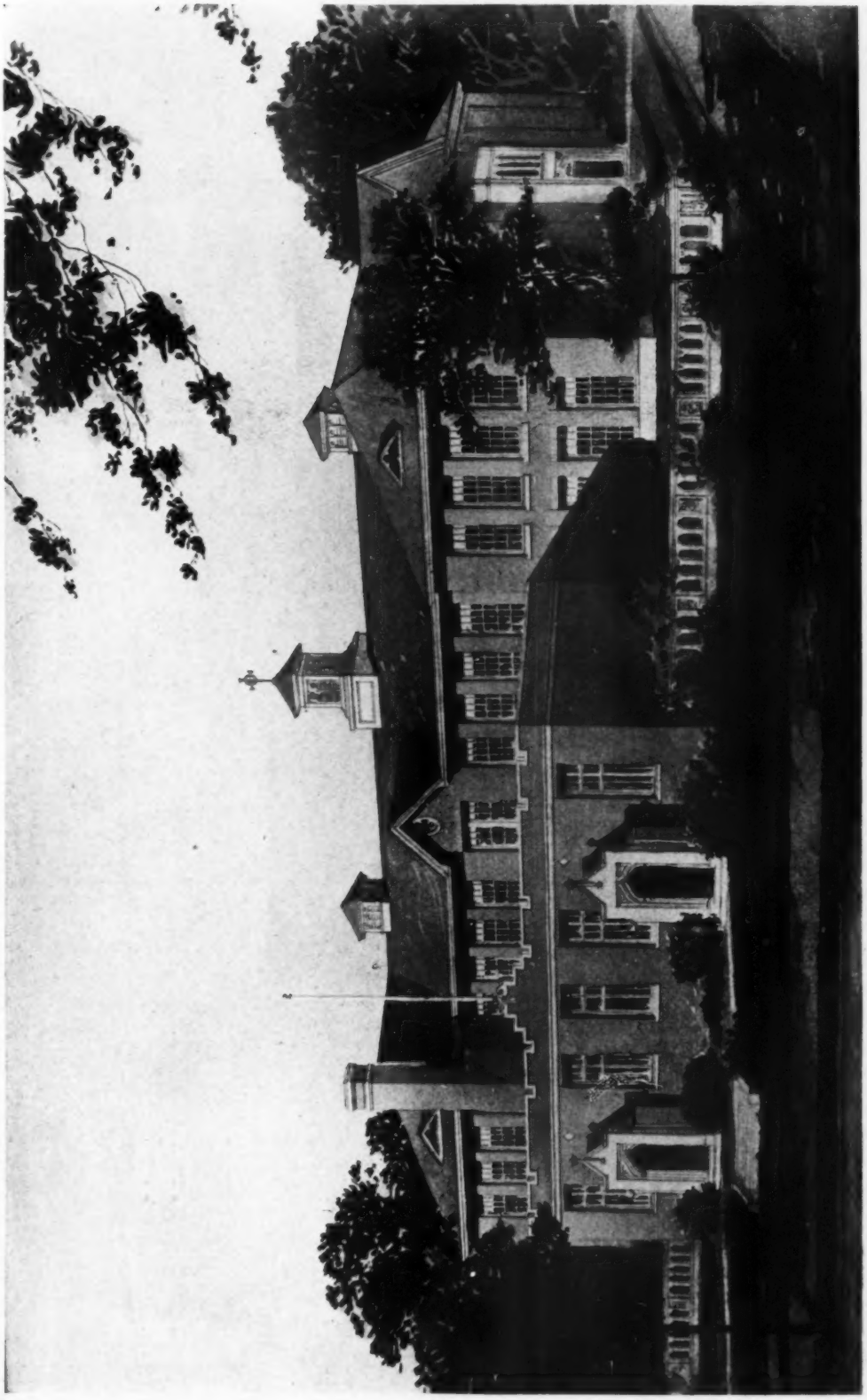
COLOR SCHEME: CREAM STUCCO; SHINGLES STAINED FOUR SHADES OF BROWN AND GRAY, LAID IRREGULARLY. BLINDS AND DOORS, APPLE GREEN

HOUSE OF MONROE H. LONG, PLAINFIELD, N. J.

ARTHUR CLEMENT AALHOLM, ARCHITECT

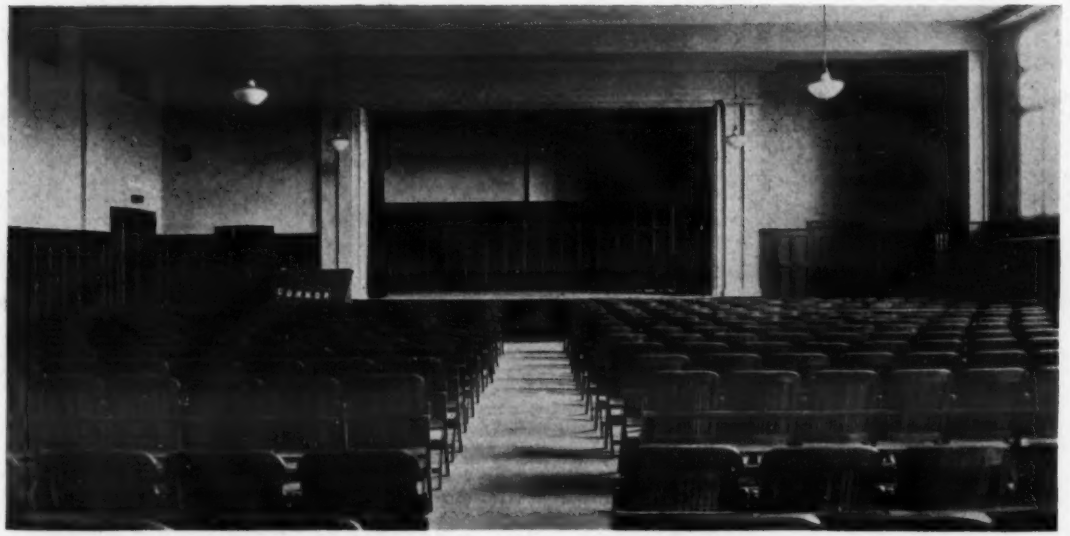
ON account of soft nature of soil, the entire building is supported on reinforced concrete mat 14″ thick. Exterior walls, stucco on metal lath. Roof, wood shingles. Sheet and leaded glass used in windows. Steam heated. Wrought iron plumbing, enameled iron fixtures. Interior walls are sand finished. Floors, oak, with linoleum in kitchen and tile in bathroom. Interior color scheme, chestnut trim, finished with white lead filler and waxed. Cost per cubic foot 50¢.





ST. CHARLES PAROCHIAL SCHOOL, PITTSFIELD MASS.

PETER F. McLAUGHLIN, ARCHITECT



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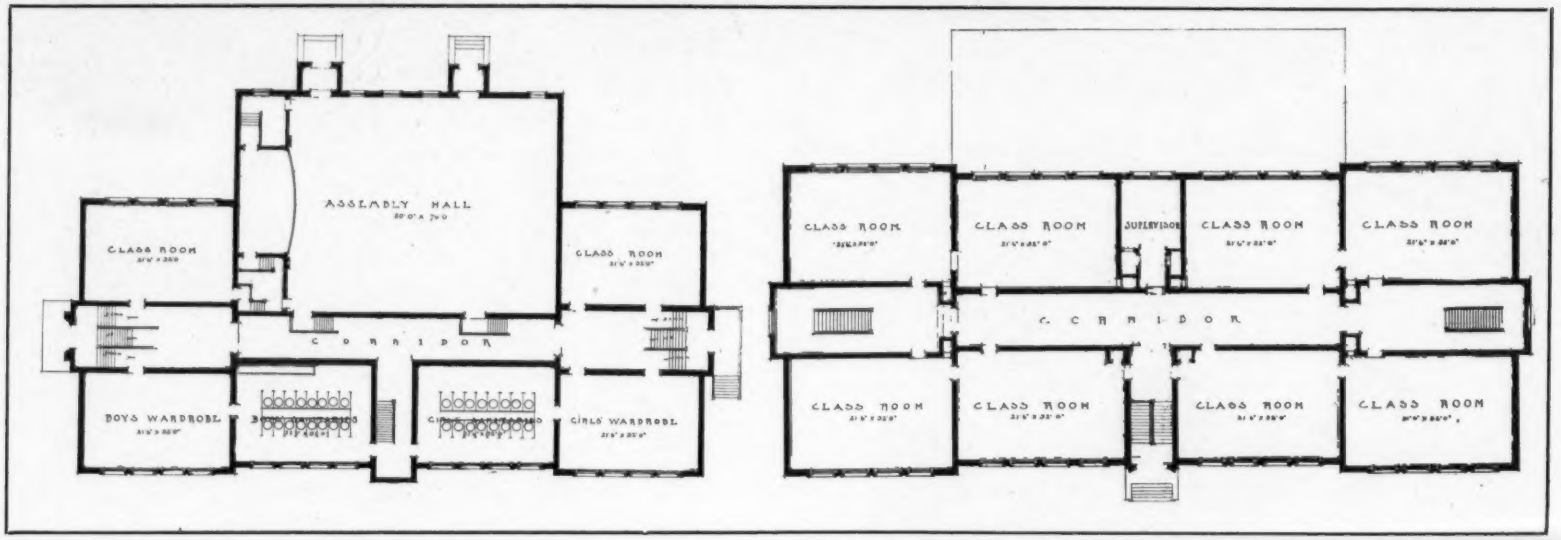
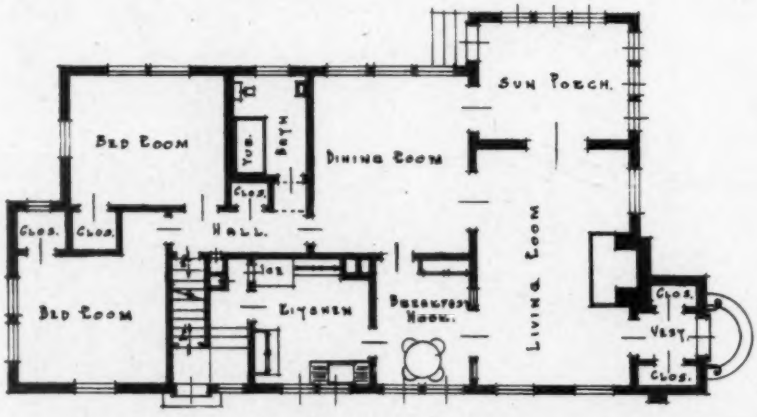


Exterior walls, brick veneer on 6″ studding. Roof, red tile shingles, copper flashed. Interior walls, plastered and papered. Vapor heating system. Plumbing, cast and wrought iron pipe. Sewer connection. Cost per cubic foot, 63¢.

HOUSE OF MARION T. SMITH, ALLENDALE, IND.

SHOURDS—STONER CO., ARCHITECTS & ENGINEERS



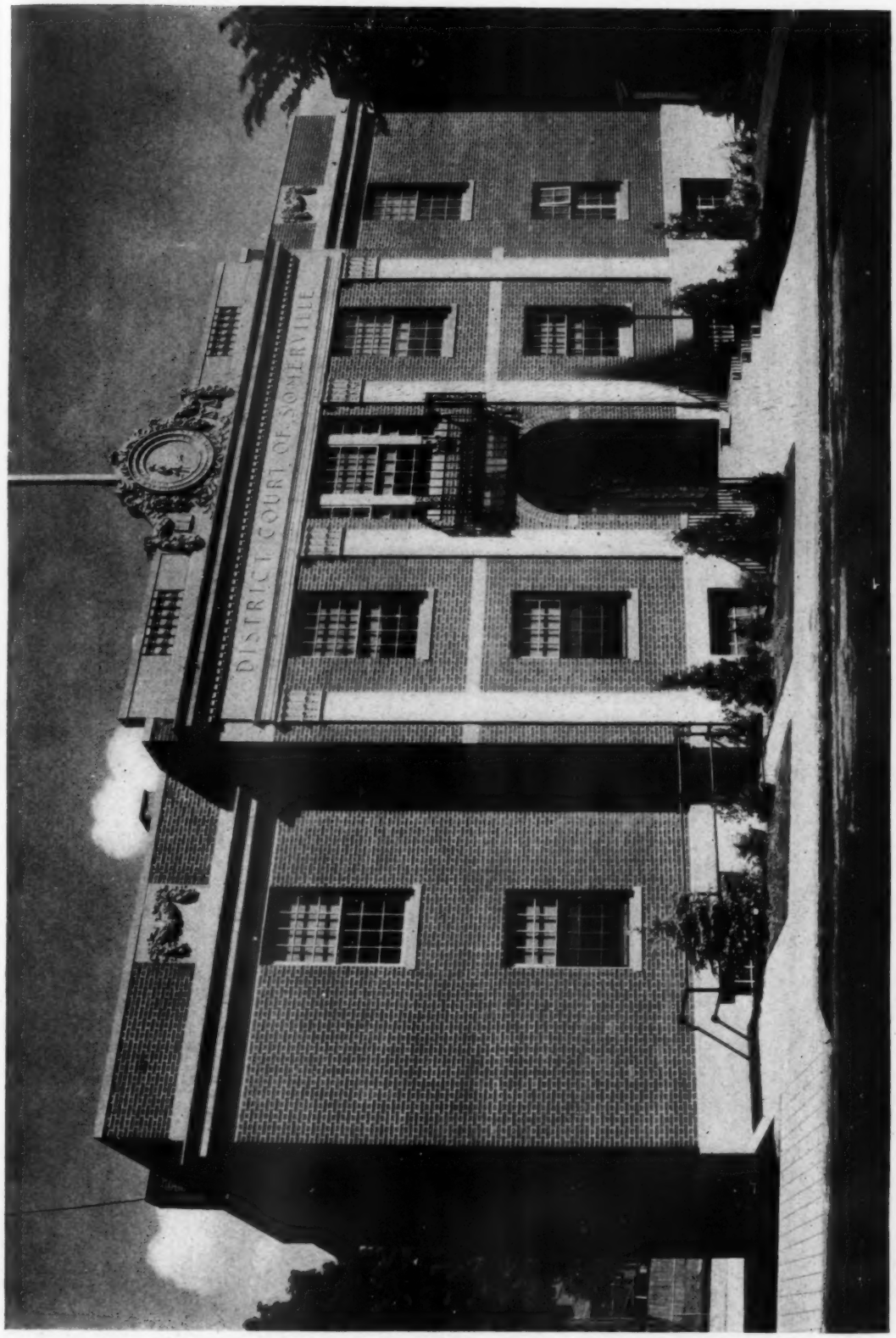
HOUSE IN

TERRE HAUTE, IND.

SHOURDS—STONER CO.,

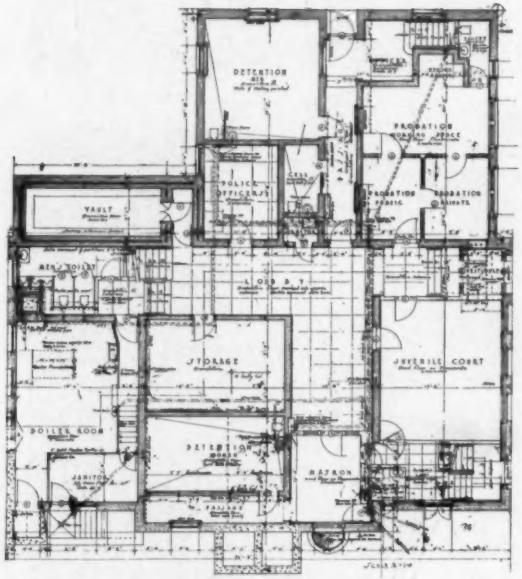
ARCHITECTS & ENGINEERS

Frame construction, stuccoed and brick veneered. Roof is covered with asbestos shingles. Floor construction, wood, with wood stud partitions. Walls plastered and papered. Floors, wood and linoleum, with tile in bathrooms. Exterior color scheme, dark red face brick with white trim. Vapor heating system, sewer connection. Electric conduits. Cost per cubic foot 42¢.

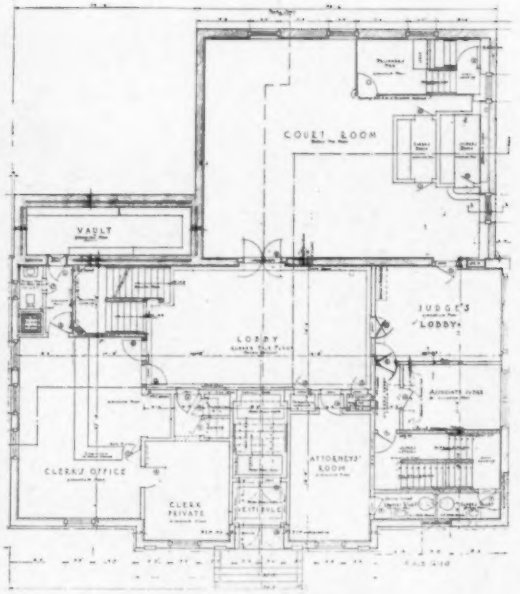


DISTRICT COURT, SOMERVILLE, MASS.

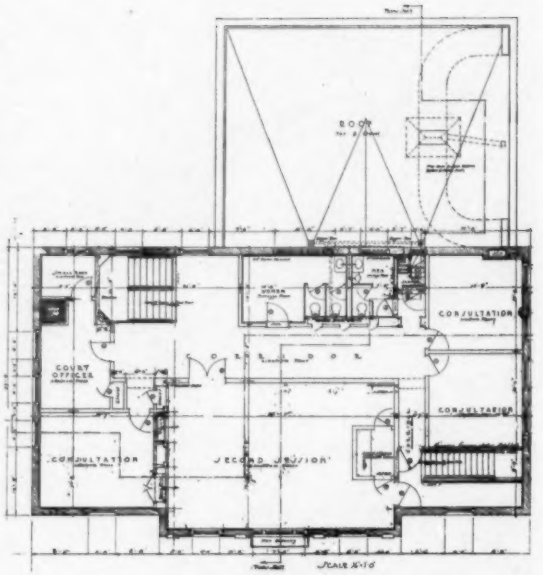
CHARLES R. GRECO, ARCHITECT



BASEMENT PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

DISTRICT COURT, SOMERVILLE, MASS.

CHARLES R. GRECO, ARCHITECT

A WELL designed and conveniently planned court house for a smaller city. The exterior walls are of water struck brick, trimmed with artificial stone. Roof, gravel. Plate glass in all windows. Doors and window casings, wood. Stud partitions. Wall surface, plaster, painted. Floors, wood, rubber and linoleum. Wood trim. Standard hardware. Building is steam heated. Plumbing fixtures are of vitreous ware, and connected directly with sewer. Piping is brass. Electric conduits throughout. Large steel vault in basement. Building was erected in 1924–5, and cost $110,000, or approximately 66¢ per cubic foot.

HOUSE OF C. A. THOMPSON, SHAKER HEIGHTS, CLEVELAND, OHIO

MUNROE WALKER COPPER, JR., ARCHITECT

HOUSE OF C. A. THOMPSON, SHAKER HEIGHTS, CLEVELAND, OHIO

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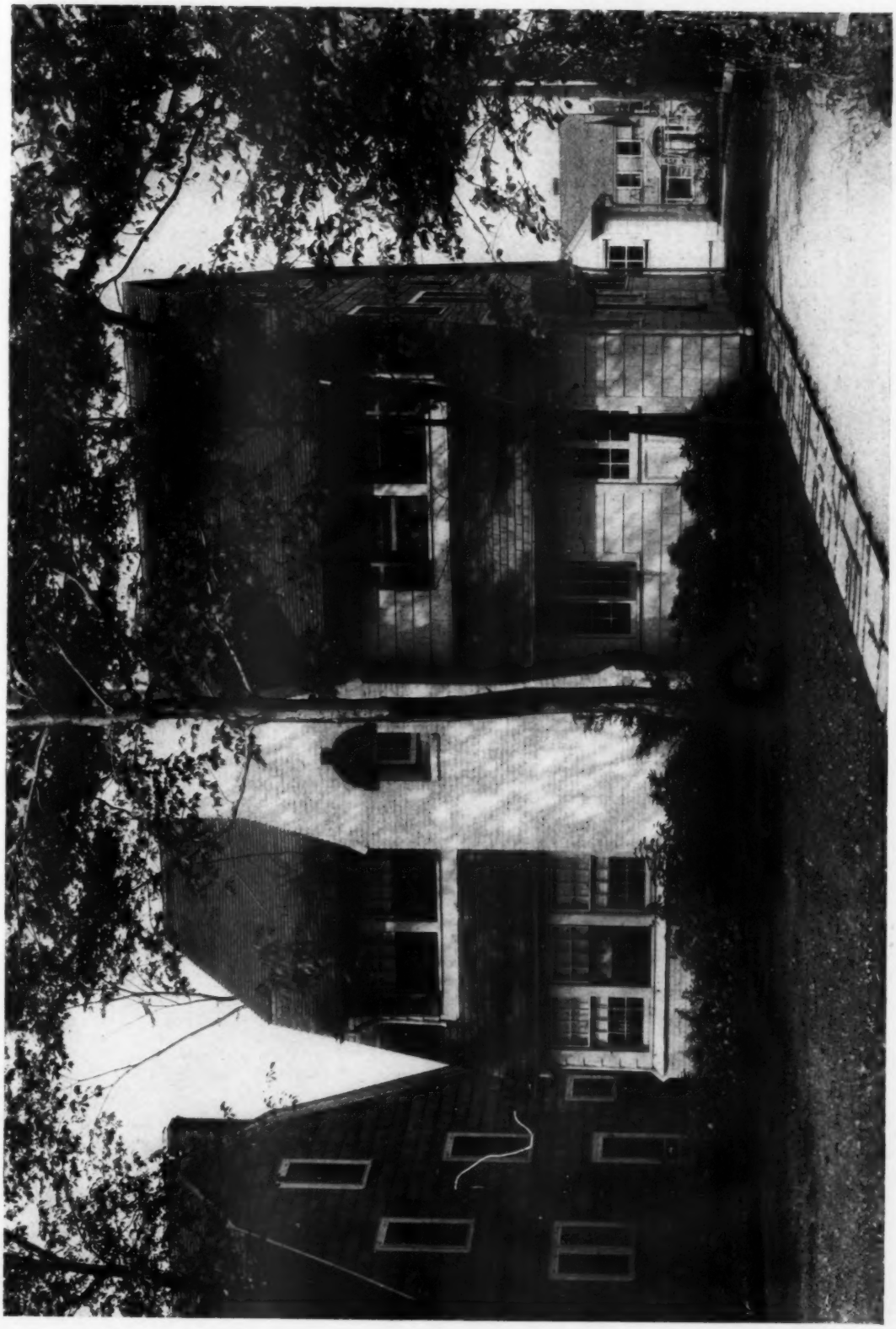
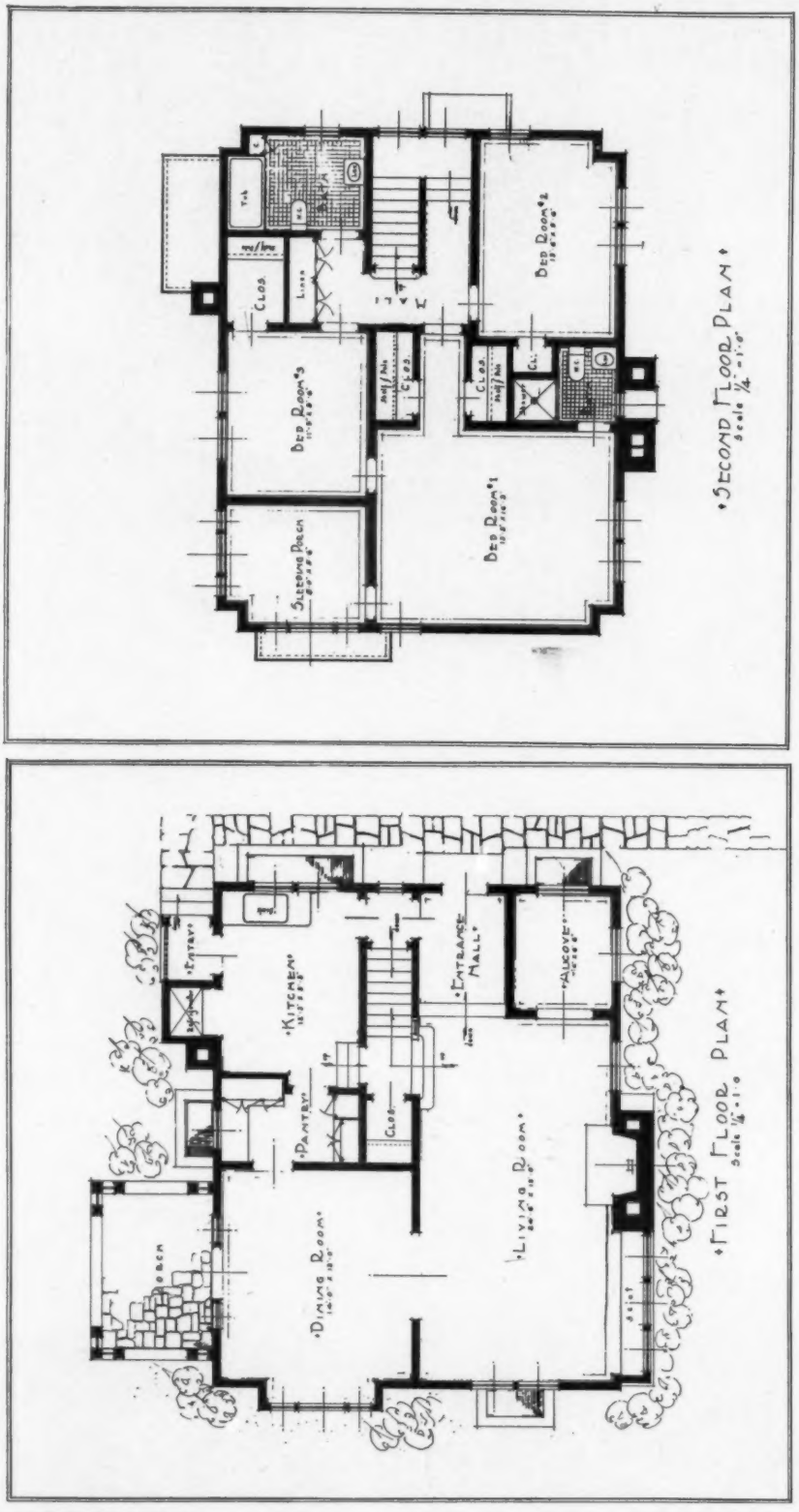


HOUSE OF RALPH H. COMEY, SHAKER HEIGHTS, CLEVELAND, OHIO

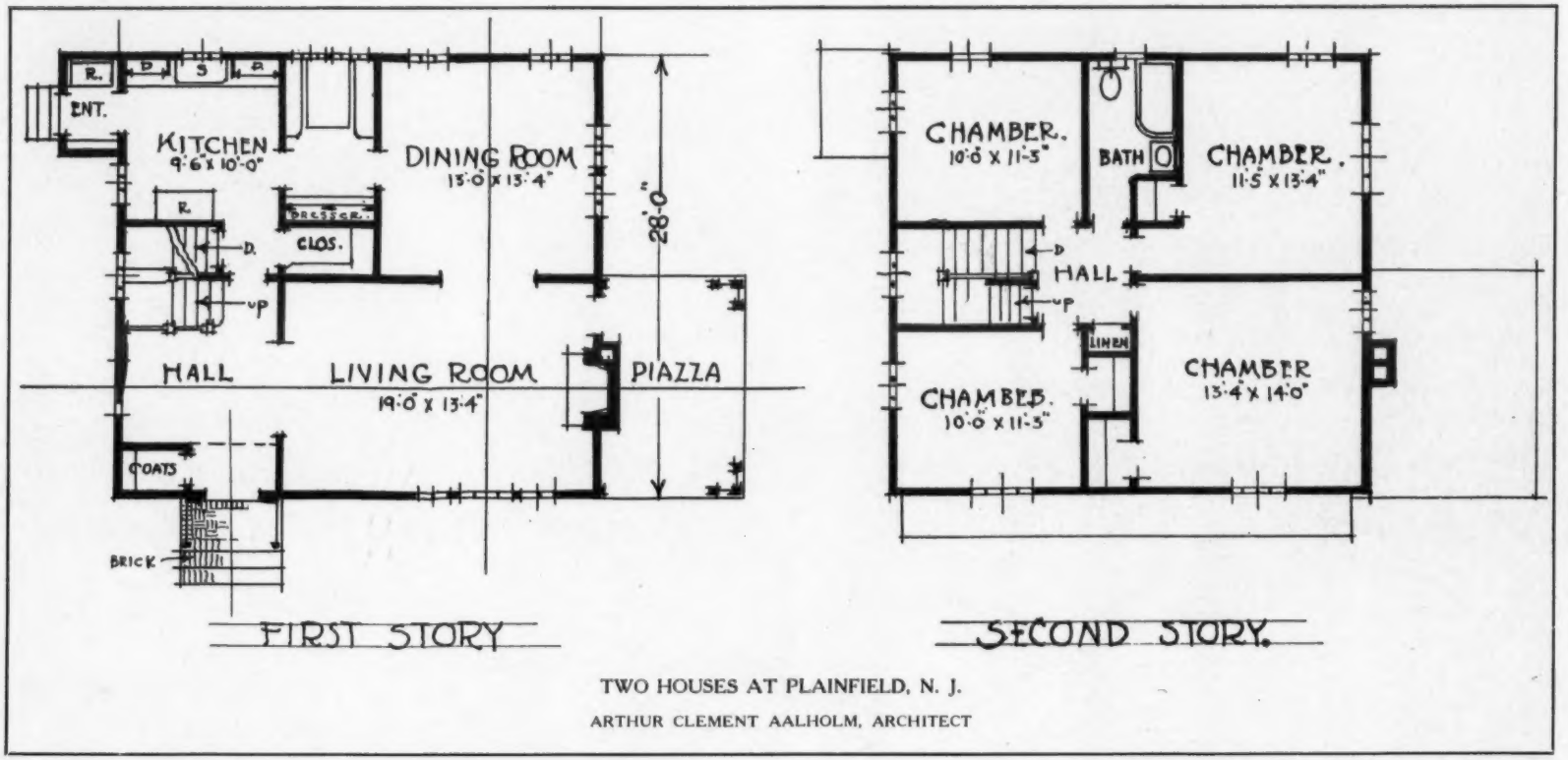
MEADE & HAMILTON, ARCHITECTS



HOUSE OF RALPH H. COMEY, SHAKER HEIGHTS, CLEVELAND, OHIO

MEADE & HAMILTON, ARCHITECTS

TWO HOUSES AT PLAINFIELD, N. J.
ARTHUR CLEMENT AALHOLM, ARCHITECT



TWO HOUSES AT PLAINFIELD, N. J.

ARTHUR CLEMENT AALHOLM, ARCHITECT

ONE plan serves for both houses. Frame construction. Exterior walls and roof, wood shingles. Doors and windows, wood. Partitions, stud and lath. Exterior color scheme: roof, two tone green, dipped shingles. Side wall shingles painted white. Steam heat. Wrought iron piping, enameled iron fixtures. Built 1922 at a cost of 34¢ per cubic foot.

"THE LITTLE RED SCHOOLHOUSE" AS A THEATRE*

WHETHER the legitimate theatre likes it or not, the fact remains that every year sees a reduction in the number of structures, outside of New York and two or three other of the large cities, devoted exclusively to the presentation of dramas and musical plays.

There are a dozen factors responsible for this reduction, no one of which is wholly to blame. The high cost of traveling; the calibre of road companies; misleading advertising; competition from vaudeville, motion pictures and the radio all play their part. New theatres are built, it is true, but there are not enough of them to balance the losses occasioned by competition and the rebuilding of our cities.

More and more it is becoming apparent that even when road companies do go out in greater numbers than now, they will have to count on playing, in many cities, in halls which were not designed primarily as theatres.

This is a fairly common experience for many of the Lyceum or Chautauqua companies, and for those who accept independent bookings. One of Equity's members who has been concerned in this type of entertainment for many years wrote recently:

"I have played in school auditoriums, appearing on Lyceum courses, university extension work, and independent bookings. Nearly ninety per cent of our bookings are filled in school or community auditoriums.

"Nearly all school buildings are now constructed with a central assembly hall or auditorium, which is frequently quite as large as any but a first class theatre. But the care which is expended on the seating arrangements is not extended to the stages, or more often, the architect is unaware of the peculiar problems which crop out in the presentation of plays.

"As a result of these deficiencies the stages of these school or community auditoriums are so small, or so shallow, or constructed so crudely, that they impose an almost insuperable burden on those companies which are forced to use them."

If, then, "The Little Red Schoolhouse" is to become the theatre of the future for many of our smaller towns, it is very greatly to the interest of all concerned that it should be as complete and as well equipped a theatre as is possible with the money available.

Certainly there are few enlightened communities today which do not admit the educational and cultural value of the drama, or which would choose to forego it entirely. And just as those enlightened communities do not ask their pupils to study in dark, cold, cramped school rooms; or require their teachers to prepare for the day's work in the cellars, so at least equal consideration should be shown to the praecentors of the drama.

Theatrical construction involves principles which are not generally employed in ordinary buildings, and it is not to be expected that the knowledge it requires be widespread. But it is not too much to hope that local architects who may be called upon to design school or community buildings, conscious of their potentialities and cognizant of the difficulties involved, should consult recognized theatrical architects for that part of their work.

If every theatre is to be housed in a school, or a community hall, then let us, at least, try to insure as adequate housing as can be devised.

Reprinted from Equity, official organ of Actors' Equity Association.

PROFESSOR FORSYTHE OF UNIVERSITY OF MINNESOTA DIES

JAMES H. FORSYTHE died on November 1, 1925. He was a graduate in architecture of the University of Pennsylvania and Master in Architecture of Harvard University from which he received the Nelson Robinson Travelling Fellowship in Architecture and travelled abroad and studied at the American Academy in Rome. He was associate professor of architecture and advisory architect at the University of Minnesota and a member of The American Institute of Architects, Minnesota Chapter.

H. R. MAINZER DEAD

HERBERT RICHARD MAINZER, architect, died at his home in New York City on December 13, 1925. A native of New York City and a graduate of Columbia University, he began practice in New York after a post graduate course in Paris. He was forty-seven years old at the time of his death. His latest completed work is the Borough Park branch of the State Bank in Brooklyn.

THE 1926 PARIS PRIZE COMPETITION, SOCIETY OF BEAUX-ARTS ARCHITECTS

THE first preliminary competition for the annual Paris Prize of the Society of Beaux-Arts Architects will be held on February 27, 1926. The Paris Prize entitles the winner to enter the advanced work of the Ecole des Beaux-Arts in Paris, and he also receives $3,000 for his expenses for two and a half years' residence and study abroad. Competitors must be American citizens and under twenty-seven years of age on July 1, 1926.

Application for circular should be made to H. O. Milliken, Chairman of the Annual Paris Prize Committee, 126 East 75th Street, New York, N. Y.

OLD STORE IN OLD TOWN

A CIGAR store which has been in possession of the same family in Lancaster, Pa., since before the Revolutionary War is believed to be the oldest store of its kind in America.

SOCIETY OF BEAUX-ARTS ARCHITECTS TO HOLD BALL

ARCHITECTS, painters, sculptors and others in artistic professions are giving their aid to the preparations for the forthcoming Beaux-Arts Ball, which will be held in the grand ball room suite of the Hotel Astor, New York, on the night of January 29. The proceeds will be devoted to the work of the Beaux-Arts Institute of Design, where instruction is given to deserving students in architecture, painting, sculpture and interior decoration. It will vary from other years, as there will be no public sale of cards of admission, which will be allotted altogether by invitation.

Whitney Warren, now in Paris, will serve as Chairman for the General Committee, and he is collecting special decorations for the pageant which will portray with historical accuracy the great courts of Louis XIV, XV and XVI. Kenneth Murchison, recently elected President of the Beaux-Arts Society of New York, will again serve as Chairman of the Executive Committee. Music of each period will be carefully studied, and it is being arranged by Mr. Murchison.

CORNELL UNIVERSITY MEMORIAL STAIRWAY

A MEMORIAL stairway and overlook to commemorate the memory of Morgan Smiley Baldwin, Cornell, '15, who was killed in France while serving in the 107th Regiment, has been given to the Delta Phi fraternity by Arthur J. Baldwin, Cornell, '92, a New York lawyer, it was announced recently.

The structure will consist of a broad entrance way from University Avenue, some twenty-four feet in width, leading to a platform walled and guarded by an imposing Gothic pier. From this vestibule a flight of cut stone stairs will lead to a broad overlook above, located so as to command the splendid views of the city, valley and lake to be had from this point. The stairway begins at a natural fault in the rock and follows very closely the location of the former foot path leading to Cornell Avenue.

JAMES HARRISON STEEDMAN MEMORIAL FELLOWSHIP IN ARCHITECTURE

FIRST COMPETITION, 1926

THE Governing Committee of the James Harrison Steedman Memorial Fellowship in Architecture has announced the first Competition for a Fellowship of the value of Fifteen Hundred Dollars, the holder of which is to pursue the study of architecture in foreign countries, as determined by the Committee and under the guidance and control of the School of Architecture of Washington University, St. Louis, Mo.

This Fellowship is open on equal terms to all graduates in architecture of recognized architectural schools of the United States. Such candidates, who shall be American citizens of good moral character, shall have had at least one year of practical work in the office of an architect practicing in St. Louis, Mo., and shall be between twenty-one and thirty-one years of age at the time of appointment to this Fellowship.

Application blanks for registration can be obtained at any time upon written request addressed to the head of the School of Architecture of Washington University, St. Louis, Mo., to whom all candidates are required to forward their application blanks, properly filled out, not later than January 31, 1926.

WEATHER-WISE BUILDERS

BY closely watching forecasts and weather conditions a firm of architects succeeded in constructing a large public building last Winter at Green Bay, Wis., where the performance is considered unusual for that climate. The official in charge at that station says that the men were set to work or laid off according to official thermometer records, no masonry work being done at less than 10 degrees above zero. Work was stopped for extended periods when the forecasts issued by the Weather Bureau were adverse.

VALUE OF REAL ESTATE

THE total wealth of the United States, according to the Federal Census Bureau, is $310,274,476,476, exclusive of the property owned by the government. In this valuation real estate is credited with $274,231,456,000. This includes the real estate belonging to the States and to municipalities.

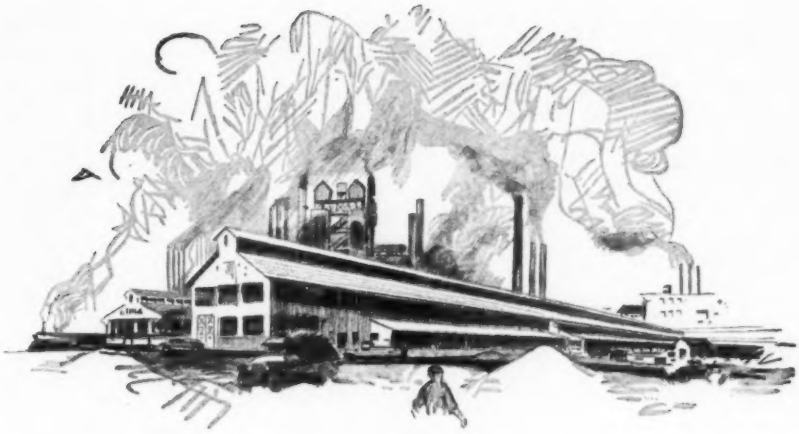
BUILDING COSTS 1924-1925

AVERAGE building expense was slightly higher in 1925 than the year previous, according to the building costs index of the Federal Reserve Bank of New York, which gives the average cost per square foot of floor space during the first five months of 1925 and the corresponding period of last year, by classes, as follows:

	1925	1924
Commercial	$5.39	$5.17
Educational	6.51	5.77
Institutional	7.92	6.83
Industrial	6.91	6.78
Military	5.78	6.60
Public	7.68	6.85
Religious	8.63	7.44
Residential	4.87	4.58
Recreational	8.22	5.62
Average	$5.47	$5.06

MOTORS EXCEED PHONES

THERE are now more than 17,000,000 automobiles in use in the United States and less than 16,000,000 telephones. Thus one-half of the families of the country have telephones, while an even larger proportion have automobiles.



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A SUMMER TOUR AND SCHOOL OF INSTRUCTION IN ITALY

STUDENTS of architecture, and others having similar interests, who are contemplating a visit to Italy for the purpose of completing, by personal investigations, their studies initiated at home, are advised that an opportunity is now being offered them by the Royal Italian Government.

Under the direction of Professor Paul Valenti, this Summer School and Tour of Instruction is being organized with a definite educational object in view. Authorized by the Royal Italian Government, which will co-operate to the end that American students may profit in the highest degree, this special traveling Summer School presents the greatest possible advantages. Professor Valenti is a graduate of the Royal Academy of Fine Arts in Milan, Italy, has devoted a number of years to the study of architecture, archæology, and ethnology in the land of his origin, and is now a member of the faculty at Washington University, St. Louis, Missouri.

For fuller particulars address Professor Valenti at Washington University.

FIRE IN AMERICAN HOSPITALS

IT is somewhat startling—in view of the fact that it is natural to expect occupancies wherein the sick and incapacitated are housed to be specially safeguarded—to learn that in the years 1922–1923 as many as 850 fires occurred in hospitals, asylums and sanatoria, states *Safeguarding America Against Fire*. That is the equivalent of one fire a day on the average. The value of the property thus destroyed amounted to exactly $1,791,909.

The greatest single amount of damage was inflicted by sparks on roofs. Even though a large percentage of the institutions may be of frame construction, the substitution of modern fire-resistive roofing for the tinder-like wooden shingle would permanently remove this leading hazard.

Stoves, furnaces, boilers and their pipes ran a close second to sparks on roofs. This, too, as a fire cause, is usually regarded as strictly preventable, being due to faulty construction or negligent operation.

Third in importance among the causes was exposure. In nearly every case these serious causes are regarded by fire prevention engineers as strictly preventable, since they are created either through carelessness or lack of knowledge of what constitutes a fire hazard.

Rough estimates place the number of hospitals, sanatoria and asylums in this country at 10,000, sheltering year in and year out upwards of a million persons. When it is realized that most fires are preventable and that there never can be too many hospitals, it seems a pity that such sums must go annually toward replacing what might have been conserved for further usefulness.

LECTURE ON TUDOR ARCHITECTURE

AN illustrated lecture on Tudor Architecture will be given to a number of Chapters of The American Institute of Architects by Sidney E. Castle, R.I.B.A. Mr. Castle, who is familiar to American architects through his pencil and pen and ink sketches, will illustrate his lecture with about sixty lantern slides, and will have with him, for inspection by his audiences, a sketch book of details covering panelling, plaster, fireplaces, chimneys, doors, etc. In many instances his talk will be followed by a general discussion.

The lecture will be given under the auspices of the Producers' Research Council, affiliated with The American Institute of Architects, as a part of their educational program, and the following itinerary has been arranged:

January	29,	Lecture in	Cleveland, Ohio
February	1,	" "	St. Louis, Mo.
"	3,	" "	Minneapolis, Minn.
"	4,	" "	St. Paul, Minn.
"	5,	" "	Indianapolis, Ind.
"	9,	" "	Chicago, Ill.
"	12,	" "	Atlanta, Ga.
"	15,	" "	Philadelphia, Pa.

Definite arrangements have not as yet been completed, but it is very likely that the lecture will also be given in Boston, on January 27; Cincinnati, Ohio, February 8; Knoxville, Tenn., February 11, New York City, February 17.

PERSONALS

Isidor Richmond, architect, announces the opening of an office at 248 Boylston Street, Boston, Mass.

Howard & Early, architects, have opened an office at 150 Southeast First Street, Miami, Fla., where they would appreciate receiving manufacturers' catalogs and samples.

Jerry Loebl and Norman J. Schlossman announce the organization of the firm of Jerry Loebl and Norman J. Schlossman, architects, with offices at 612 North Michigan Boulevard, Chicago, Ill.

Announcement is made that Garber & Woodward, architects, are now occupying their new offices at 4 West Seventh Street, Cincinnati, Ohio, having moved from the Union Central Building, that city.

Robert Frost Daggett announces that Thomas E. Hibben is associated with him for the practice of architecture under the name of Daggett & Hibben, architects, 920 Continental Bank Building, Indianapolis, Ind.

Gilbert J. P. Jacques of Windsor, Ontario, and A. Stuart Allaster, formerly of Brookville, have formed a partnership under the firm name of Jacques & Allaster, architects, with offices at 3 Ouellette Avenue, Suite 108, Windsor, Ontario.

The PUBLISHERS' PAGE

SINCE our Golden Anniversary Issue was mailed we have received scores of letters of the most congratulatory nature. Thus far no dissenting voice has been raised. As this issue was conceived and carried to completion in a spirit of the truest service and as an expression of gratitude for the material support that has been so freely given to us, it is gratifying to be assured that our motives are understood and our efforts so finely appreciated.

This unanimity of sentiment toward this special issue and agreement as to its importance as an historical record of fifty brilliant years of architecture, is not confined to our subscribers. We have kind words of approval also from producers, business associates, from people hitherto unknown to us,—not on our subscription lists,—and what pleases us greatly, from certain other architectural journals.

It is, therefore, with some feeling of elation,—justified we venture to believe,—that as publishers we rededicate this journal to the tasks that were assumed when the first issue was sent out to a then barely constituted architectural profession more than fifty years ago.

An enthusiastic subscriber writes: "It is quite the most notable piece of architectural 'publishment' of years." A distinguished architect, at one time high in the councils of the Institute, writes a long and interesting letter in which he states: "Please accept my hearty congratulations. I spent nearly two hours in a preliminary review of the articles which are exceedingly interesting to me, for they bring back so many events in which I have been interested and of which I have had some personal knowledge." And what gives us pride and a feeling of elation is the concluding paragraph: "I have known THE AMERICAN ARCHITECT from its first number. Have known its editors and highly regard them."

An old-time business acquaintance of long experience in technical journalism, writes: "As I leafed the pages of your Golden Anniversary Issue and noted their breadth of subject matter and appreciated the endless detail and heartache it meant, my admiration grew apace. You have certainly made a monumental task a triumph."

* * *

In the future, as in the past, and acting by right of seniority, we shall maintain the privilege editorially to discuss all matters in the field of architecture that affect the profession, and will stoutly dissent from any scheme or project that involves the suppression of the architect or deprives him of the right to function in his own community.

The year is yet young but there already appear certain privately promoted ventures that are inimical to the interests of architects, particularly in the smaller communities. Possibly we shall write more definitely and more emphatically on this subject later. We, of course, would not participate in any venture of that sort, no matter how alluring the inducements were, and we assume that no other publication in this field will.

* * *

We have been commended by several of our advertising friends for not making a strenuous solicitation for one-time insertion advertisements in our Golden Anniversary Issue. While a one-time advertiser might be classed as a casual acquaintance, we are, of course, ready and willing to make as many such acquaintances as we can. But having decided as to just what proportion of advertising to text we would preserve in our anniversary issue, we quickly learned that old and valued friends would absorb the bulk of that space. So while we did not make a great effort to acquire new acquaintances based on a one-time insertion, we were, of course, glad to meet and cordially greet the newcomer. Naturally, it is the association that promises to be of long standing that we most desire. We know that the successful and pleasant continuance of acquaintance depends as much upon ourselves as those whose lasting friendship and good will we seek. After all is said, there's really very little difference between social and business relations. The basic principles governing both are much alike. If we would keep our friends, we must so conduct ourselves as to make us worth while to them. Service and upright dealing, the correct attitude, and a willingness to do our part, must at all times be present.

* * *

In this issue there is presented an interesting series of drawings by eight competitors in the Roosevelt Memorial in Washington competition. This concludes the complete and authorized publication of the drawings submitted in this important competition. No competition in recent years has aroused greater interest both in and out of the profession. The manner of its conduct is to be very highly commended.

* * *

The 100 per cent co-operative apartment is, in a sense, a new type of dwelling of the more expensive class. We have in the past received many letters from subscribers asking for specific information as to this type of building both as to planning and promotion. We present the first of two articles by Ruford D. Franklin, an undoubted authority on this subject.

DETAIL OF FACADE, NATIONAL MUSEUM, MEXICO CITY