THE AMERICAN ARCHITECT
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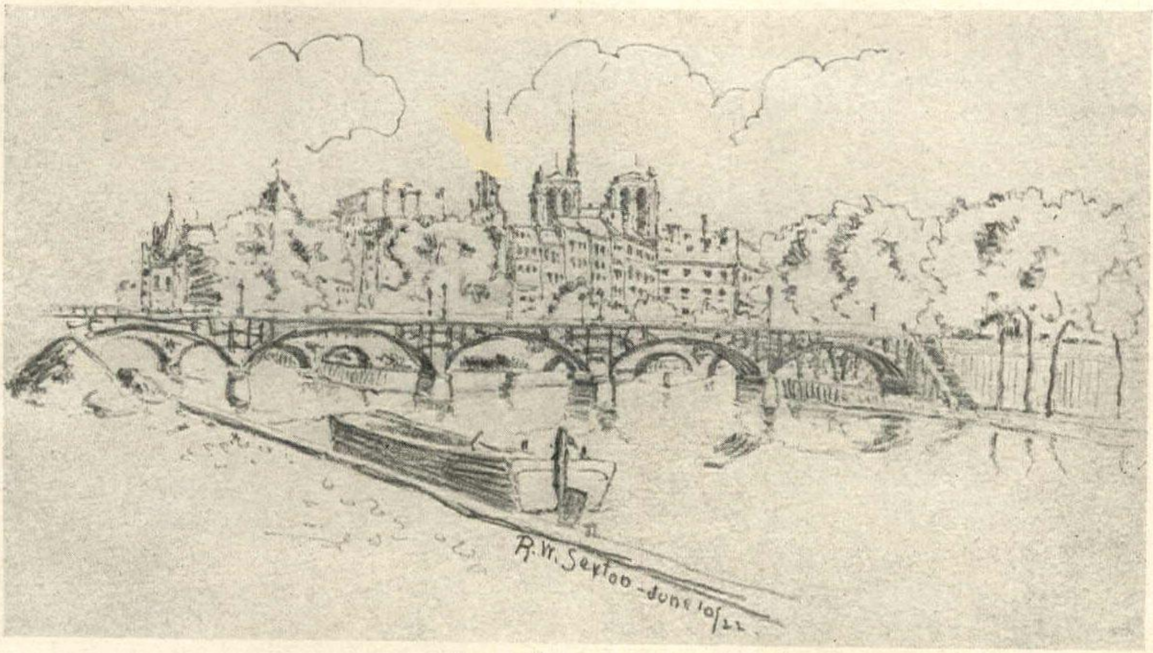


An example of out-of-door sketching. Looking down the Seine toward the old island city of Paris, with Notre Dame in the distance

AN ARCHITECTURAL SKETCHING TOUR *in* EUROPE *and* HOW I DID IT FOR LESS THAN SIX HUNDRED DOLLARS

BY R. W. SEXTON

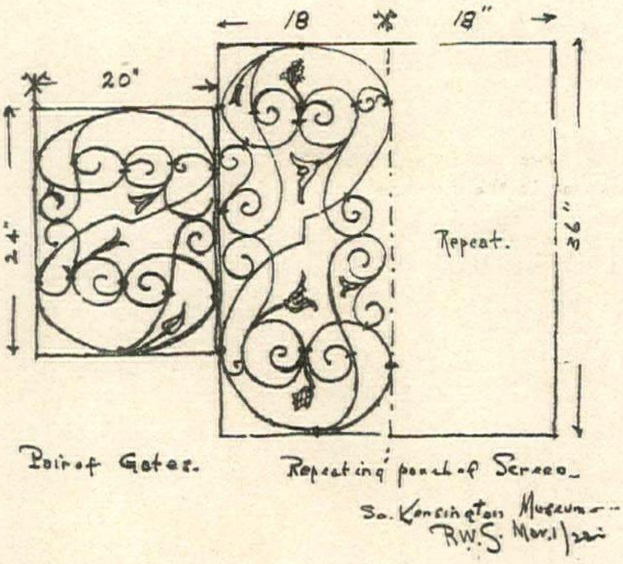
Illustrated by Sketches by the Author

WHAT do you say to a couple of months' trip in Europe for a vacation? We could see many of the famous architectural masterpieces of the world, study periods and styles directly from original specimens, bring back sketches galore of ideas and suggestions, a lot of valuable photographs and have a good time thrown in. For the young student architect such a trip would be of more value than a degree obtained by successfully completing a university course in architecture; while to the older, seasoned architect a dozen sketchbooks, filled with sketches of designs and details he made himself from things which impressed him most on such a trip, would be of much more value than a dozen of the best architectural books that could be found in any library of the country. Unfortunately, the general reply to this proposition, no matter how much it might appeal, is lack of money. Up to one year ago, I would have said, too, that I could not afford it, but never again! Did you ever really figure out what a trip to Europe costs? I never did before, but when I got "down to brass tacks," I found it was actually within my means.

I got my inspiration this time (for I had gotten as far as the inspiration before, but that was all) at the movies. I was "taken" on a trip up the Grand Canal of Venice in one of those travelogue pictures, and was so carried away by the magnificence and grandeur of St. Mark's and the palaces of the canal, that I resolved then and there to find out definitely how much it would cost to get me there. Two days after that I had reserved a second class passage on the "Baltic" (good enough for anyone, especially out of season,—this was in February), I applied to Washington for my passport, notified my employer that I was leaving in two weeks, and surprised my family and friends by announcing that I was sailing for Europe in two weeks. I was laughed at by them, sneered at by my employer, but evidently applauded by my government, for I received my passport in short order. I had $500 in available cash, and this is how I figured it out:

Steamer over	$130
Steamer back	130
Railroad, Europe	100
Living expenses 8 weeks at $10	80
Extras	60
	$500

I got a lot of first-hand advice from several friends and acquaintances who had recently been over, and some good tips from the steamship agency on railroad fares, etc. The rate of ex-



Old iron screen and gates of German design, circa 1700, sketched in the South Kensington Museum

change at this time was very favorable to me, but, I believe, is even lower now. The English pound was then $4.40, the franc 10 cents, and the lira 5 cents. Although I made no definite itinerary, I made a general route for my trip, knowing that I could change it at a moment's notice if I wished. I would always avoid tour tickets for this reason. My rough itinerary was New York to Liverpool to London, with two or three stopovers on the way, two weeks; steamer to Le Havre, to Rouen, to Paris, four weeks; to Venice, to Florence, to Genoa, two weeks, sailing home from there. I stuck rather closely to this route, changing only the latter part, for in Paris I took a job as tutor to two American architectural students in perspective sketching and rendering,—a great piece of luck for me,—and was taken by them on an automobile tour from Paris through Southern France and along the Riviera to Florence, to Venice and back to Paris by Switzerland. In this way I prolonged my trip two months and saw a lot of beautiful country that I would never have gotten to, and all with no additional expense.

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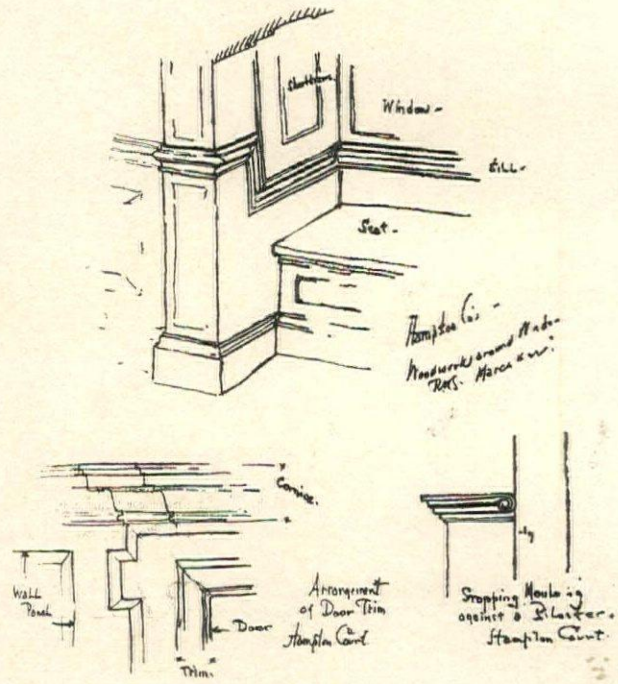

Details of woodwork of architectural interest, made at Hampton Court

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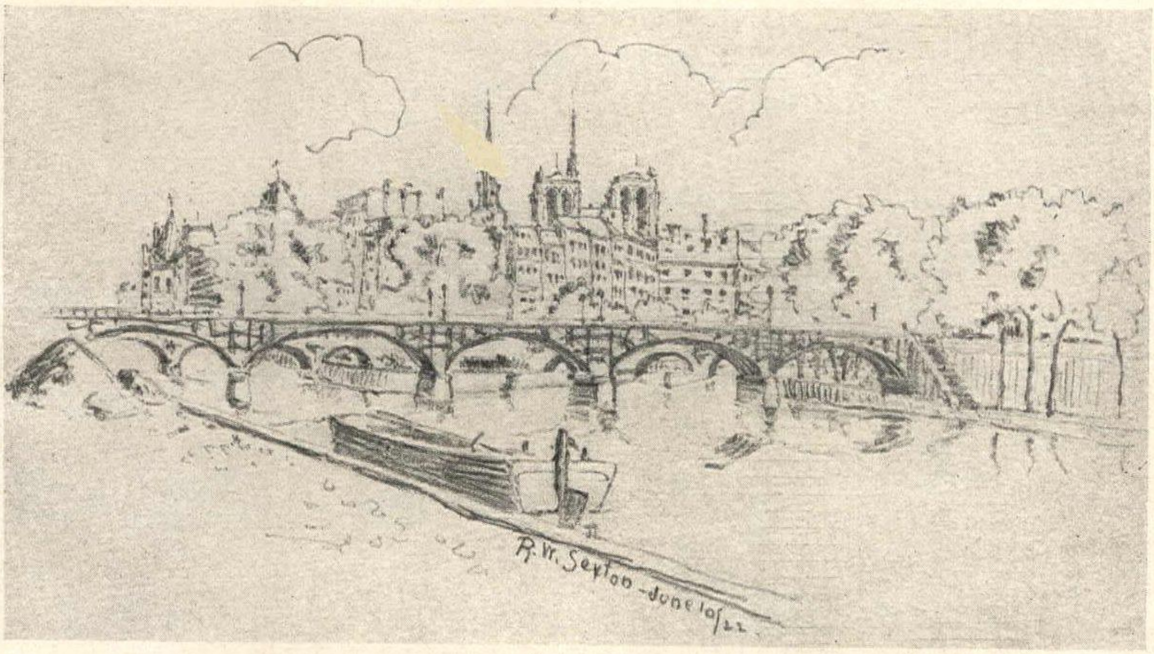

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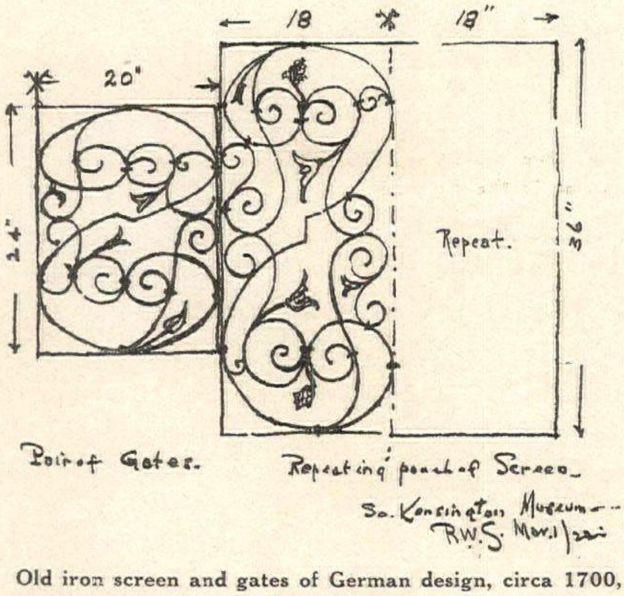

Old iron screen and gates of German design, circa 1700, sketched in the South Kensington Museum

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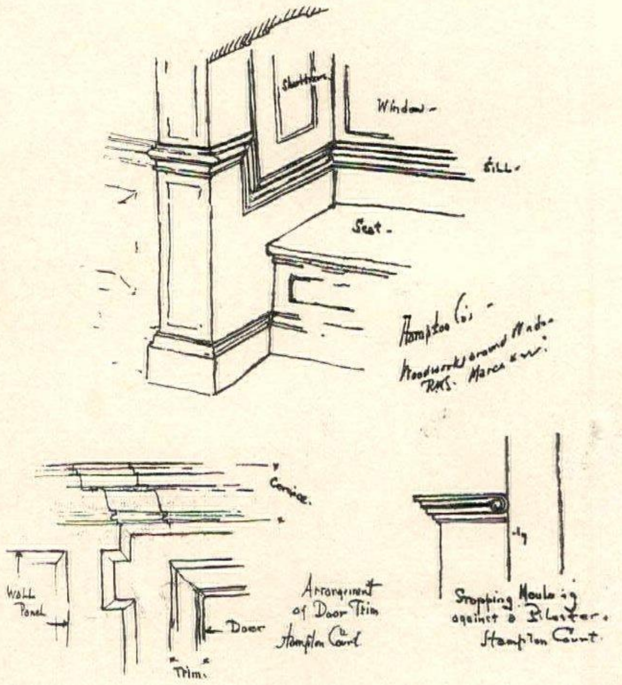

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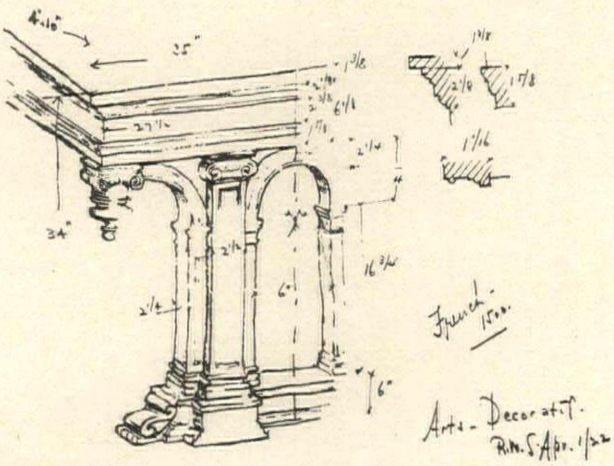
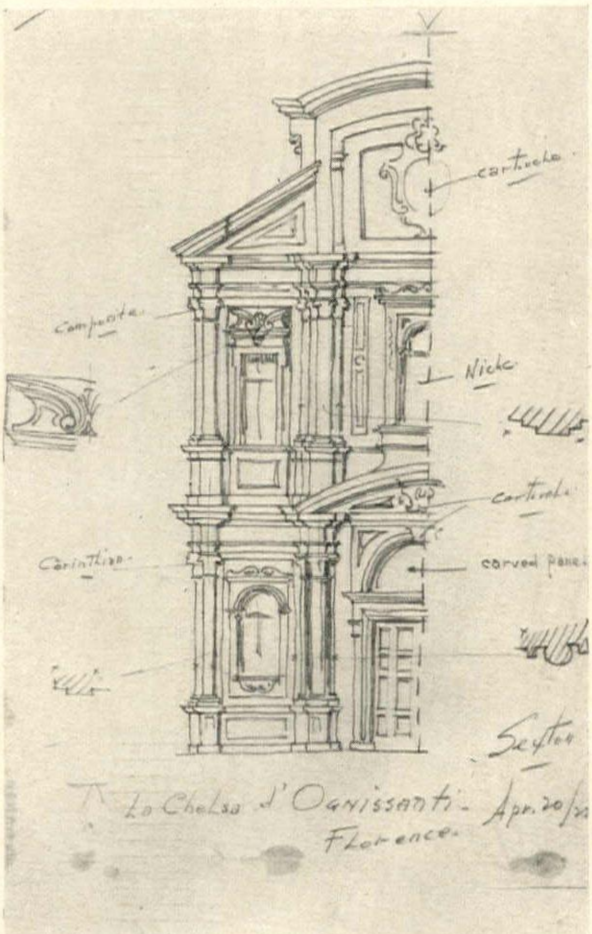


Reproduction of an original measured sketch of a table in the French style of the XVth Century, made in the Musee des Arts Decoratif, Paris

and elevations, and I was therefore all the more surprised and delighted to find that I could really make quite interesting pencil sketches. Naturally I desired to improve in this line, so kept it up all the way. I soon even appeared as one of the many wandering artists in Europe, stopping suddenly, producing my tools and setting to work on a picture. All I lacked to put me in this class was the folding camp stool. I never got as bad as that. Nor was it necessary for me to carry a folding easel, for I did all my sketching in pencil. But I always had the sketchbook on my hip pocket, and could produce it at a moment's notice. (It is not necessary to smuggle anything else in this pocket in Europe, not yet, anyhow.) By the way, I was surprised to find that wherever I went, there were always those who seem to have nothing else to do but gaze over the shoulders of sketching artists. You rather expect that over here. Artists are not as common here as there. But I thought they would be accustomed to it over there by this time. But there is a difference in the way the people watch you there. In this country, especially in New York, a crowd always gathers behind an easel. The first ones are just plain inquisitive, while a few people standing looking at something always draw a crowd in New York, and so there is soon a crowd eager to see what is going on, fearful lest they will miss something. But over there, the people look on in admiration and appreciation. You don't feel their gazes as you do here. But I must say, as a beginner, these gazers did not help me a bit.

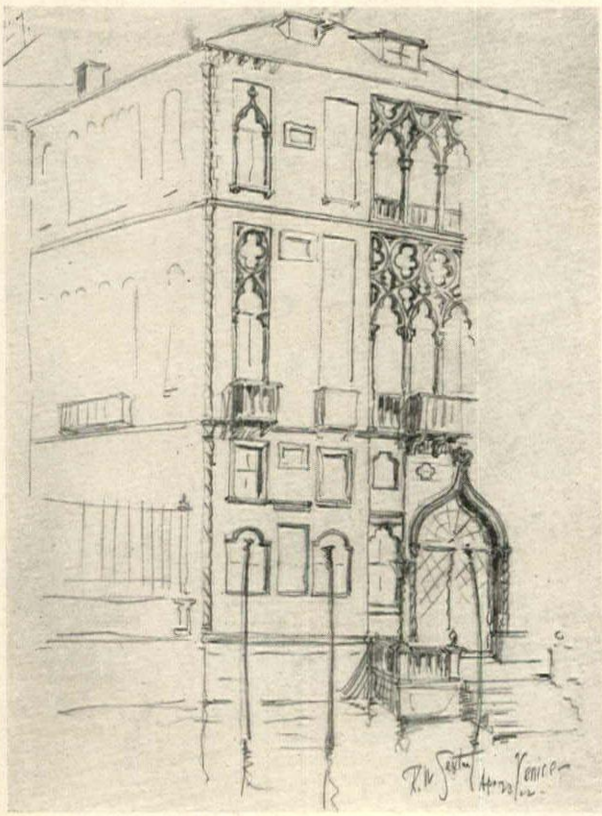
But I am getting away from my trip. Should this story suddenly rouse some student or old timer to do what I did, it might be interesting to know just where I went, what I saw and what it cost. I landed in Liverpool, but did not linger long there, as it was not the type of place I was looking for, in fact did not look foreign. I had selected the two stopovers on my way to London before sailing, and now that I had talked with several Englishmen coming over on the steamer, found I made good selections. The first was Chester, about forty minutes out of Liverpool. Here I found a real old time city of England, built almost to a unit of the Tudor style of half timber and rich carvings. Even the very newest buildings were designed of the same style and the effect of a good sized town in variations of the same style of architecture was most interesting and worthy of careful study and consideration by our own architects today. The result is that of a large old city carefully and accurately restored, while fully half the buildings



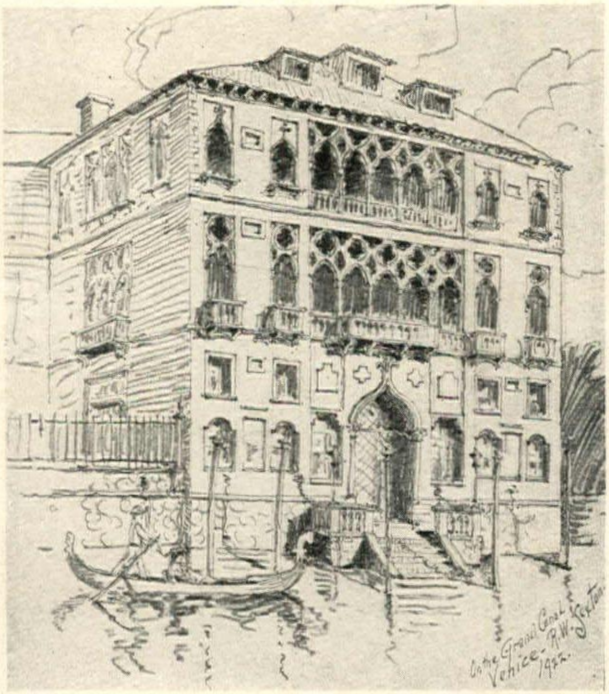
An Elevation Sketch
La Chelsa d'Ognissanti, Florence. Notice certain details sketched at the side

are actually very modern in construction. From here I went to Warwick, noted for its famous castle, a city in contrast to Chester in that while being old, it has kept up with the times, and its architectural designs cover a wide range of styles, from the same half timber, of which there are some worthy examples, to the most modern. The contrasting element of these two towns made an interesting study. The Warwick Castle is most stately and imposing, situated as it is, on the crest of a hill, with the town extending from it in all directions. The interior contains a collection of elaborate furniture with gorgeous decorations, while the layout of the grounds and the gardens is a source of delight to the landscape architect. By auto bus I went from here to Stratford-on-Avon, and enjoyed to the utmost Shakespeare's birthplace, and Ann Hathaway's cottage. This delightful old cottage, of brick and timber, with its thatched roof, and its old-fashioned garden, set beneath sturdy big trees, made as charming a picture as I saw on my entire trip, although not perhaps so inspirational from an architectural point of view as many other things I saw. The next day I went on to London. Such places as Parliament building, Westminster Abbey, St. Paul's, British Museum, and so many others, were each worth the price of admission, and the South Kensington Museum offers as wonderful a collection from point of quality and quantity as would be possible to put under one roof. For the architect, the collection of old wrought iron and woodwork is probably most instructive, and from another point of view, the exhibition of period furniture is wonderful. Our own Metropolitan rather takes a back seat after visiting South Kensington. My pencil worked fast and furiously for two days here, and only the hopes that I would see more, just as good, as I went on, (for the actualities had greatly exceeded my expectations so far,) allowed me to leave this place. Before leaving London ,however, I took one day at Hampton Court, a half hour's ride out of the city, and feasted on the period wood panelled rooms, sketching suggestions and ideas in rapid succession. Just two weeks after my arrival in Liverpool, I took the midnight steamer from Southampton for Le Havre. I had time for one stop on my way from London to Southampton, so got off at Winchester, and spent a pleasant hour or two visiting the Cathedral and historic places in that old town.

It was not my liking for the sea that tempted me to go to France by way of this night boat, but I had three very good reasons for going that way. First, it was much cheaper than any other way; second, I lost no daylight for sightseeing, as the boat arrived at Havre at six the next morning, and third, I wished to stop at Rouen on my way to Paris. In this way I would not have to retrace my steps, as it is directly on the route to Paris, while from any other way, I would have had to make a



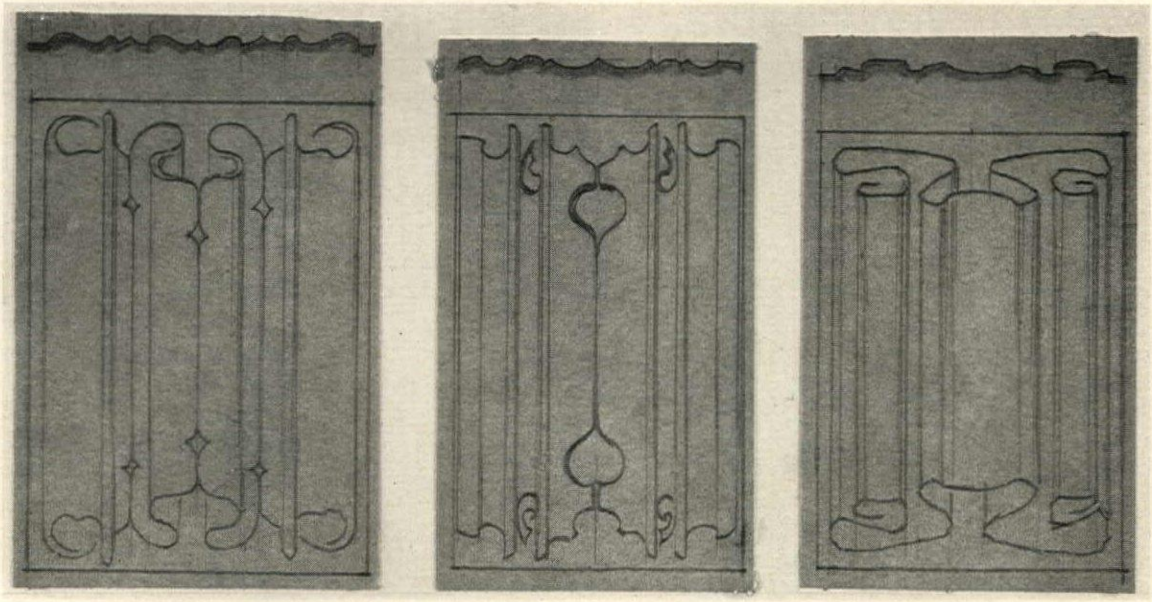
Original "shorthand" perspective sketch of a palace on the Grand Canal, Venice. See how little detail is shown for nothing is repeated



Finished sketch of palace on Grand Canal, Venice, made after returning home

trip from Paris and return. And that is a good tip for tourists. Never retrace your steps! Make every step take you somewhere you have not been. That holds just as much in going about a city as in going from one city to another. For anyone interested in French Gothic architecture, both interior and exterior, a visit to the wonderful cathedrals of Rouen is enough. But, in my anxiety to get to Paris, now that I realized that I was so near, I stayed only one day and a night, and arrived at Paris at noon the next day. Aside from the many famous places, there are many just as instructive, hidden in some dark alley, seldom seen by the tourist. Easy trips can be made from Paris to Fontainebleau, Versailles and Barbizon. The palace at Fontainebleau is especially attractive to the interior architect on account of its many rooms, each in a different period of French art, with original furniture. The exterior of the building is full of suggestions for designers and a trip there should not be missed. In the palace at Versailles are also rooms decorated elaborately in various periods while the well known Grand and Petit Palais are probably the center of attraction for those architecturally inclined. For the more artistic, nothing could be more attractive than the petite houses forming what is known as the Hamlet Village. These four or five cottages are all built in miniature, and were used by Marie Antoinette and her court ladies for playing peasant life. They are designed after the half timber style of early England with thatched roofs, and, although delightful, are somewhat extreme in detail. Barbizon interests, too, on account of its connection with artists, being the rendezvous of such men as Millet, Corot, and Rousseau. The atmosphere as shown in the paintings of these men is still very discernible there.

As I mentioned before, I was taken on a trip from Paris to Florence and the remaining places I visited were made while on this tour. We went directly South from Paris through the open country, stopping at little peasant towns and villages for the night, wherever we happened to be. Before coming to the Riviera, we passed through that delightful section of old Roman France, still holding many relics and ruins of Roman times. Probably the most interesting town was Nimes, where there is an old Arena, built by the Romans in the first century, and a wonderful Roman temple, Maison Carré. The Roman gardens, still showing the original Roman baths, are very artistic and well laid out. Another stop at Avignon, for many years a noted artist resort, and we arrived at the Riviera. Anyone with an atom of artistic sense, which is surely in each of us, comes to the front as you behold the wonderful natural scenery along the coast of the Mediterranean. Beautiful buildings fade into insignificance in comparison with the beauties of this setting! Still as you come into Nice and Monte Carlo, you are pleased by the personal touch to their buildings, seeming to show a sort of Spanish influence, as our houses in California suggest. And then, as you go on, into the Italian country, the style changes again. We passed hurriedly through Genoa, hardly having time to study details, but it was easy to notice the fine detail of the ornament, peculiar to the Italian.



Flemish **English** **French**

Interesting examples of Linenfold design of XVth Century

(Sketched in the South Kensington Museum)

And then we arrived at Florence! Another city of hidden treasure! Although greeted by the Cathedral and Campanile, and the St. Maria Novella we found the real gems of architectural design "around the corner." Have you ever noticed how this adds greatly to visiting a new town? You never know what is going to appear before your eyes at the next turn. But sure that there will be something worth while, you go on and on, eager for the next turn. The museums contain beautiful collections, while the old bridge—Ponte Vecchio,—is most sought for by artists. I went from here by train to Venice, the real inspiration of my trip, and had hard work to realize that I was in the same world as New York City, and not in a dream, as I glided peacefully along the Grand Canal, lined on both sides with palaces in the rich, refined Venetian style, and was brought in full view of the magnificent St. Marco. It was a building built of jewels! The panels over the doors sparkled in bright mosaic, and the domes above shone in blazing gold! The realization of my inspiration!

On my way back to Paris I stopped off at Verona, Italy, Lausanne, Switzerland, and Dijon, France. These places only increased by knowledge and made me more satisfied with my trip and myself, and I was back again for a couple of months more in Paris, to continue my tutoring. So I saw quite a bit of the world! Would you believe it if I told you that you could take that trip for $600? Few people have believed me since I came back, so here it is in black and white. Although I went from Paris to Florence by auto, I have included the price for that by rail.

New York to Liverpool	$130.00
Railway fare, Liverpool to London	6.55
Hotels, Chester one night	1.50
Warwick, two nights	5.00
London, eight nights, @ 6 shill.	10.80
Meals, 12 days @ 1.50 per day	18.00
Railway fare London to Paris Inc. Steamer	8.25
Sundries, laundry, tips, fares, etc.	10.00
New York to Paris	190.10
Paris, Room, three months @ 150 francs	45.00
Meals, three months @ 1.00 per day (10 francs)	100.00
Sundries	50.00
Trip to Italy and return	
Fare Paris to Florence	20.00
Florence to Venice	4.25
Venice to Paris	18.80
Rooms. Florence, two nights	2.00
Venice, two nights	1.80
Verona, one night and two meals	2.29
Lausanne, one night	1.75
Dijon, one night	2.40
Extra meals	6.00
Sundries	10.00
Paris to New York	130.00
Extras	15.00
Grand total,	$599.39

And now a word about sketching. Did you ever do any freehand sketching? Perhaps I could give you a tip or two, which I got from my experience. I made three distinct types of sketches. First, details; second, elevations; and third, perspectives. A detail sketch was a rather careful drawing of some part of a building, something in the decorative scheme of a room, or part of a piece of furniture. Sometimes this was a door surround, again an arrangement of panels, and, perhaps, a leg of a chair. An elevation sketch was made when the whole subject appealed to me. Very often I would sketch in this way the entire building from which I had just sketched one or two details, to show their setting. I also sometimes made snapshots of this. The perspective sketch was a picture or composition, and was the line of sketching which I attempted for the first time on this trip. All of my original sketches were in line only,—shadows often cover up details and can always be added to look natural. The most intricate of my sketches never took more than twenty minutes,—sort of "shorthand sketching,"—I took measurements where possible and helpful, and took as few details as necessary to give me the facts. In elevations, half of the building was often all that was necessary. A pilaster once sketched was sufficient for the whole group. Often a ground plan of some arrangement was enough for my purpose. But the most important is to understand your own sketch. I could sit down now and make a finished perspective or elevation drawing of everything in my sketchbook. It is worth much to me, nothing probably to you. Why don't you make your own sketchbook?

Billiard Room, Marshcourt, England
Sir Edwin L. Lutyens, R. A., Architect
(Courtesy of Country Life, London)

DAYLIGHT *in* BUILDINGS—PART II*

BY PERCY E. NOBBS, M. A.

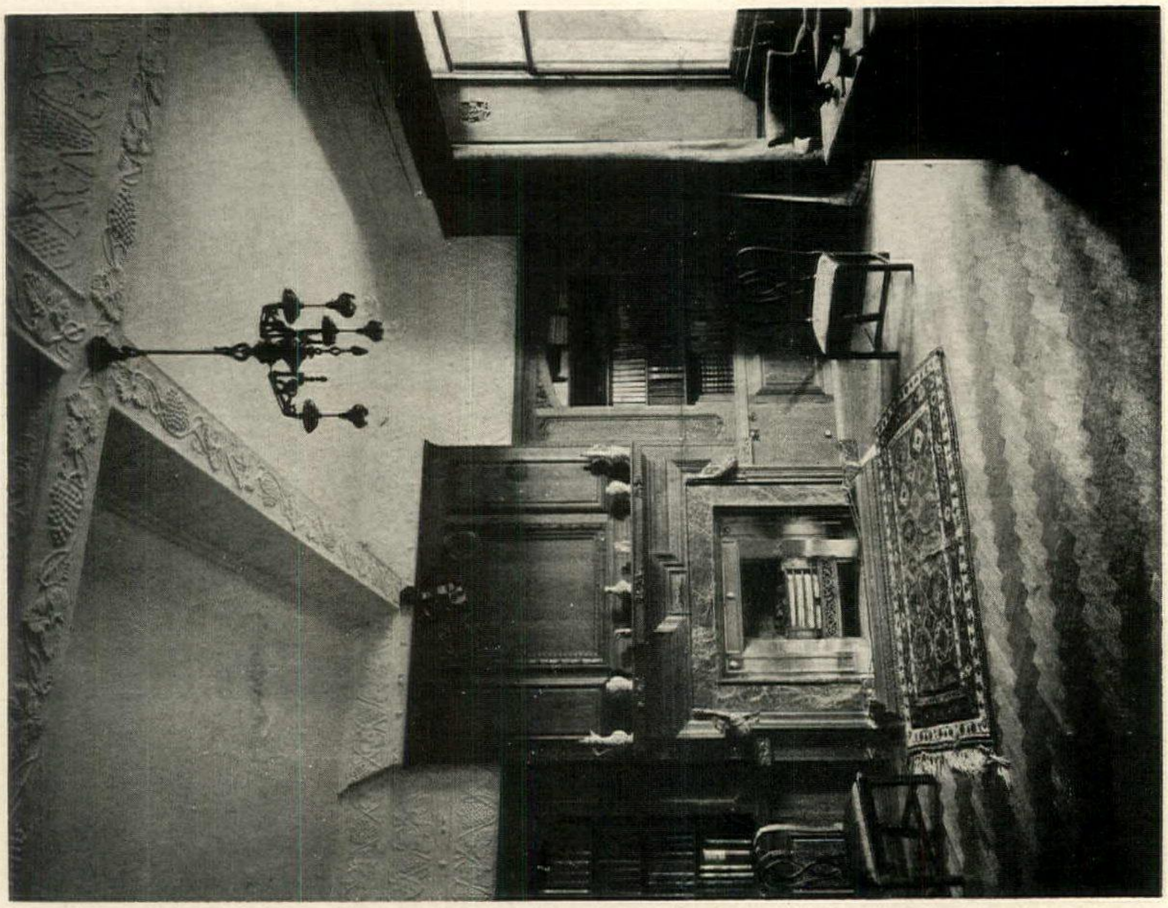
THE paintings of the old Dutchmen deal largely with the appearances of plain things in careful combination under judicious illumination. These highly valued paintings are after all merely somewhat stilted representations of the ordinary environment of cultured Dutchmen, in the seventeenth century. Such actual interiors exist today, in diminished numbers, but as exquisitely as ever they did in Peter de Hooch's time and if his paintings are indeed, as is averred, masterpieces of art, it seems reasonable to infer that the men who assembled these effects out of the apparatus of their lives and whose names and fames are lost, were greater artists far than he. It is unnecessary to say more on the quarrel between the originators and the representators of such aesthetic phenomena than to remark that an interior is often conceived and composed, even in modern times with as much ease of composition in light and shade as ever Fantin Latour lavished on a still life study.

One is tempted, however, to believe that in those periods of debased architecture—the sixteenth and seventeenth centuries—a most loving attention was generally bestowed on these matters. Undoubtedly architectural composition was then more elastic than the taste of later generations admitted; but which was cause and which effect, who shall say? In the cases of the great churches of the later phases of the Gothic cycle in France and the great houses of Tudor, England, the art of interior design was a matter of planning voids and solids so that lights and shades might best reveal the sumptuous simplicities within.

Bays and deep embrasures besides masking the sources of light are of great value in causing diffusion. The long gallery at Haddon Hall and the nave of the church at Fiesole are instances. In the latter there is abundance of light notwithstand-

*This is the second of two articles by Mr. Nobbs. The first appeared in our issue of July 4.

A drawing room, Edinburgh, Scotland
Sir Robert Lorimer, R. S. A., Architect
(Photo by Milliken, Kircaldy)



Business Room, Hallyburton House, Coupar Angus, Scotland
Sir Robert Lorimer, R. S. A., Architect
(Photo by Milliken, Kircaldy)

ing the tiny openings—mere slots in the clerestory walls—and the latitude is that of Rhode Island. In the former the bays are large, the glass area generous, the climate dull and the latitude that of Edmonton, Alberta.

The placing of a window close to a cross, or end wall of a room is habitual with the pre- and post-Renaissance Dutchmen, and the modern Germans delight in the practice to this day. The

Holy Trinity Church, Kensington, England

The late Messrs. Bodley & Garner, Architects

(Photo by Ellis, London)

end wall is thus sharply illumined and diffuses light well into the room while everything connected with the wall so lit stands out in keen but delicate relief. Such effects are inevitably sacrificed when every room consists of one or more unit bays of a main fabric, each endowed with a window on its center with a patch of blank shaded wall on each side of it.

The most potent means of enchantment, however, is the variation of the quality of light between the eye and the object, and the light may be varied in actual color as well as in strength, or diffused volume. By taking thought in this matter many cubits may be added to the apparent length of a nave or gallery. A tower occurring at the crossing may be used as a lantern to flood a rood and screen with light, or by its shaded vault to interrupt the clerestory diffusion. Clerestory lighting itself is readily variable as between nave and chancel either way. Or again cross lighting may be introduced continuously through aisles or abruptly from a transept. The degree upon which lantern or clerestory lighting is relied on should affect all details of form, a matter often ignored. Deflected lights from paved areas are often left to chance sometimes with unfortunate results. Intermediate objects are greatly affected by their backgrounds. A screen may be silhouetted in relation to the illumined end wall without necessarily depriving it of all light and shade to reveal its detail.

The contrivance of these and such other effects as may be appropriate to the sentiment desired is, after all, the main business of design in its æsthetic aspect, in so far as interiors are involved. Trusting to luck may bring occasional successes beyond contrivance, but for the most part leads to dullness and wastage of form,—defects which are characteristic of modern interiors.

Top lighting has its own peculiar charms due to diffusion within the lantern space and a gentle downward diminution on wall surfaces with accents of light on horizontal objects. The Dutchmen were sensitive to this and often widened the upper portions of their windows as a compromise between real top lighting and side lighting with the happiest results. Also by carrying the glass as near the ceiling as construction would permit

Church of the Cowley Fathers, Oxford, England

The late Messrs. Bodley & Garner, Architects

(Photo by Ellis, London)

TOP LIT ROOM AT 120 QUEEN'S GATE, LONDON

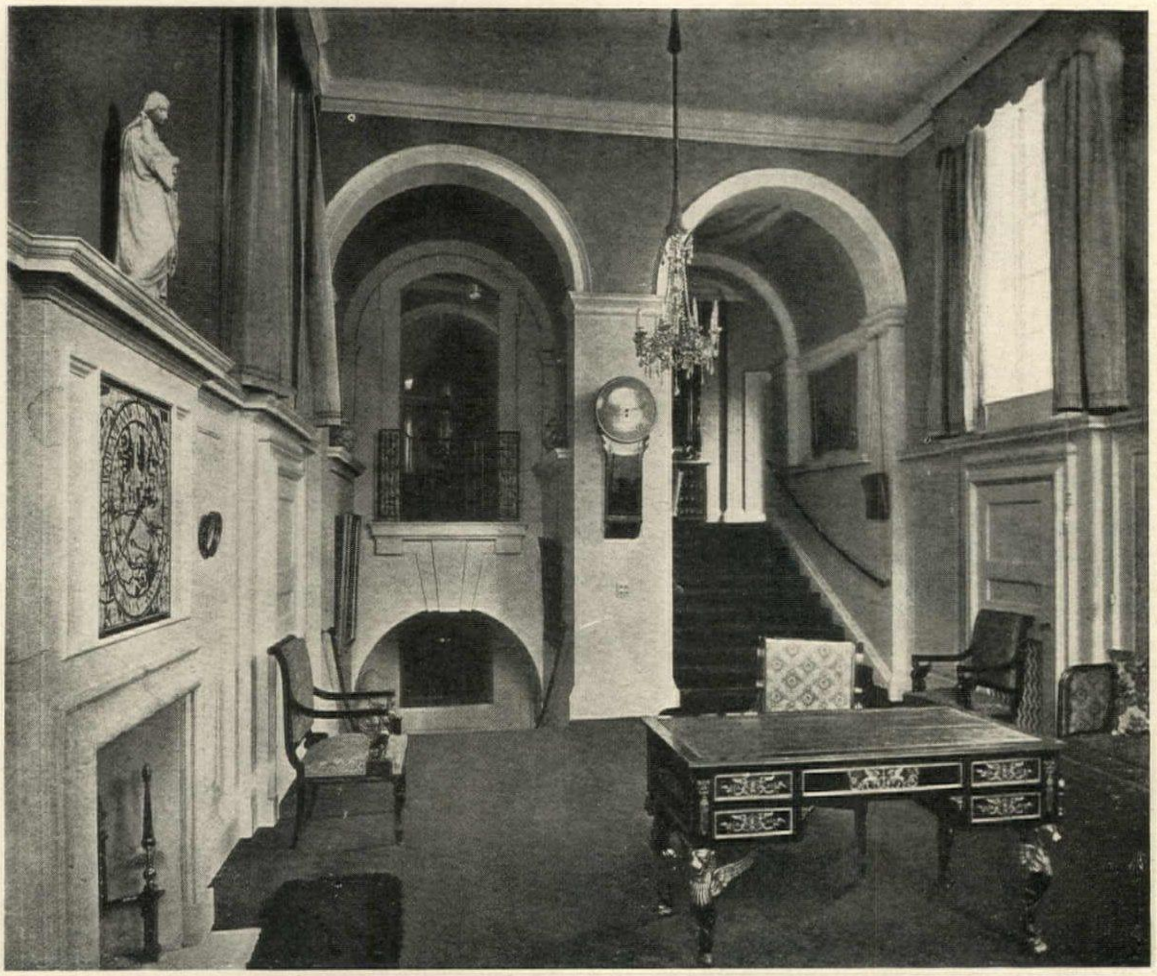
THE LATE R. NORMAN SHAW, R. A., ARCHITECT

(Courtesy of H. Muthesius, Berlin)

they contrived a diffusion of light percolating the shadows; this is artifice—æsthetic technique.

A very vulgar error in modern church design is the blinding of the worshippers with a large window in their faces. An East window which might with staining to the likeness of "the tiger moth's deep damasked wing" be tolerable in the mild light of Ely or Rouen becomes an unmitigated nuisance if of bright glass in Toronto or Philadelphia. The late Mr. Bodley delighted in tall dossals of gorgeous fabric and occasionally did away with his East window altogether, or else kept it high up and heavily toned. A large South window admitting a flood of cross light toward the end of the morning service (as at St. Agnes, Kensington, by the late John Aldred Scott) goes far to mitigate the asperity of East end lighting, besides suffusing the service with a benign radiance.

If we have illustrated these points largely from the work of the piper stages of the Gothic Revival and if we have drawn attention to the importance attaching to considerations of internal illumination at the end of the mediæval period it is not our intention to hold a brief for the modern use of mediæval construction and the forms resulting therefrom. On the contrary, we feel most strongly that the repetition, or worse still the simulation of dead detail serves no purpose other than to obscure the still live principles of every great tradition of the past. The co-ordinated arrangement of light and shade so that the interior of a structure may be seen pleasantly is never incompatible with a structural arrangement worth looking at. Six thousand years of architecture from China to California Westward show that.



The Landing, Nashdown, Taplow, England

Sir Edwin L. Lutyens, R. A., Architect

(Courtesy of Country Life, London)

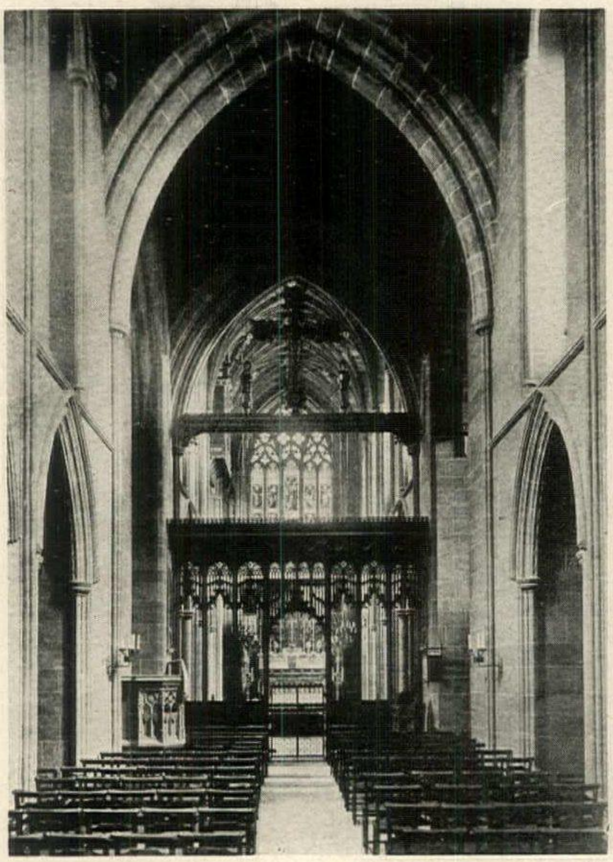
But one may value the Revival of Gothic during the last century chiefly for its recovery and conservation of the technique of arranging windows and internal structure in happy relation, even if this appreciation renders the violation of "Gothic principle" in the revived cusp and the revived crocket the more incomprehensible. An identical pedantry inspired the Greek detail of Stuart and Cockerell.

When Mr. E. S. Prior hurled his barbed phrase "the tinsel of modern ecclesiology" at the Angelican architects, he should have qualified the gibe by some recognition of the fundamental qualities of their art,—a synthesis of purpose translated into space, of material translated into form, of illumination translated into spirit. In the last resort all architecture is planning and good architecture is planning to make things worth seeing visible.

Let us turn from the temples of the gods with their glittering altars, filigreed screeds, and glowing windows to consider a very practical application of the matter under discussion to the home of the worker. Cottage planning as understood in connection with the housing schemes of Germany and England is characterized by a careful placing of windows in relation to the uses of rooms in comparison with which American efforts in a parallel field are somewhat inept. Regularity of fenestration has its use but not in a cottage in which every square foot of floor area has to be made the most of. Indeed, in very small work the middle of the side of a room is hardly ever the best place for a window. Now American design-

Dining room, house of R. Norman Shaw, R. A., Hampstead, England

(Courtesy of A. C. Armstrong & Son)



Church of St. Mary, Clumber, England
The late Messrs. Bodley & Garner, Architects

(From Modern English Churches)

The Thistle Chapel, Edinburgh, Scotland
Sir Robert Lorimer, R. S. A., Architect

(From Modern English Churches)

DRAWING ROOM, HYNDFORD HOUSE, NORTH BERWICK, SCOTLAND

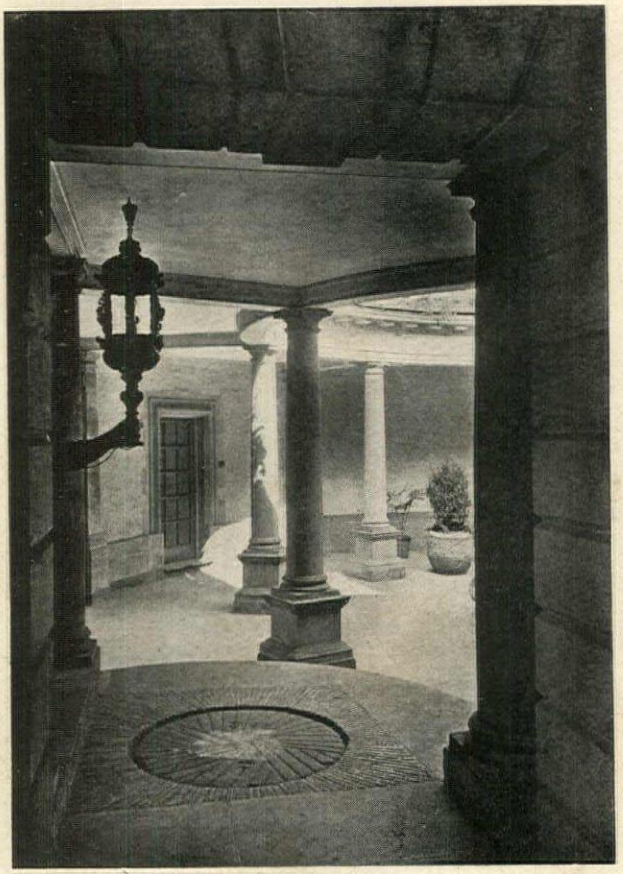
SIR ROBERT LORIMER, R. S. A., ARCHITECT

(Photo by Milliken, Kircaldy)

ers of cottage housing are wont to disfigure their plans and distort their thinking with a plethora of axial lines. These may on occasion serve a purely professional end in distracting attention from questions of furnishing or comfort—prerequisites of internal pleasantness. Sometimes these ubiquitous axial lines seem intended as a sign manual and general advertisement of an academic training. Yet again they are a mere decoration, the surplus energy of the rejoicing pen, the origin of which, like that of so many architectural nuances, is lost in antiquity.

Where a higher scale of accommodation is involved there is, of course, a real character in regularity. A comparison between the house planning of Sir Robert Lorimer and of Mr. Platt would be an odious thing. They try for different aims and each is master of his methods. Mr. Platt's plans result incidentally in the form of exquisite patterns; on paper they are as enjoyable and more suggestive than in being, at least to those who read plans. Beside them Lorimer's planning on paper is at first sight uncouth. But there is nothing maladroit about it, for none knows better than he the fine art of living in a house. The insides of Lorimer's houses, with the contents are carefully composed and cunningly lit, —still life studies, if you will, but completely comfortable still life within the limitations and austerities of the Scottish climate. One has moods in which becoming a part of an enchanted Lorimerian environment has its allurements, and then again one may have those hypercivilized moments when nothing less gracefully formal than a Plattian messuage and premises seem worth the trouble of living in.

These two ideals meet midway without sacrifice of fundamentals in much of the planning of the late Norman Shaw and oddly enough by the accident of a name and a temperament in the work still being done by Howard Shaw.



Basin Court

Papillon Hall

England

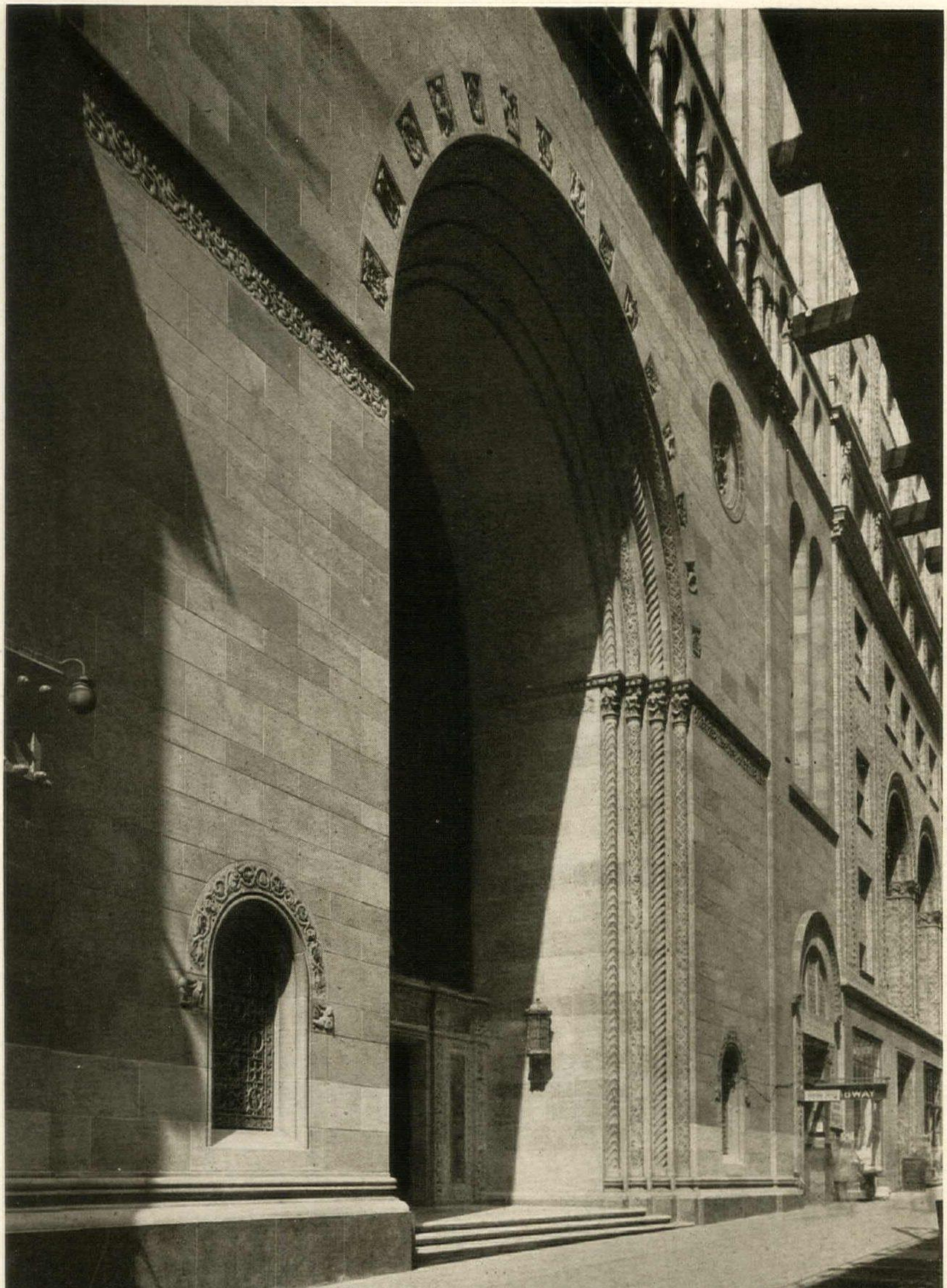
Sir Edwin L. Lutyens, R.A.,

Architect

(Photo by Courtesy of Country Life, London)

EXTERIOR DETAILS OF BUILDING FOR THE BOWERY SAVINGS BANK, EAST 42ND STRE

YORK & SAWYER, ARCHITECTS



EXTERIOR DETAILS OF BUILDING FOR THE BOWERY SAVINGS BANK, EAST 42ND STREET,

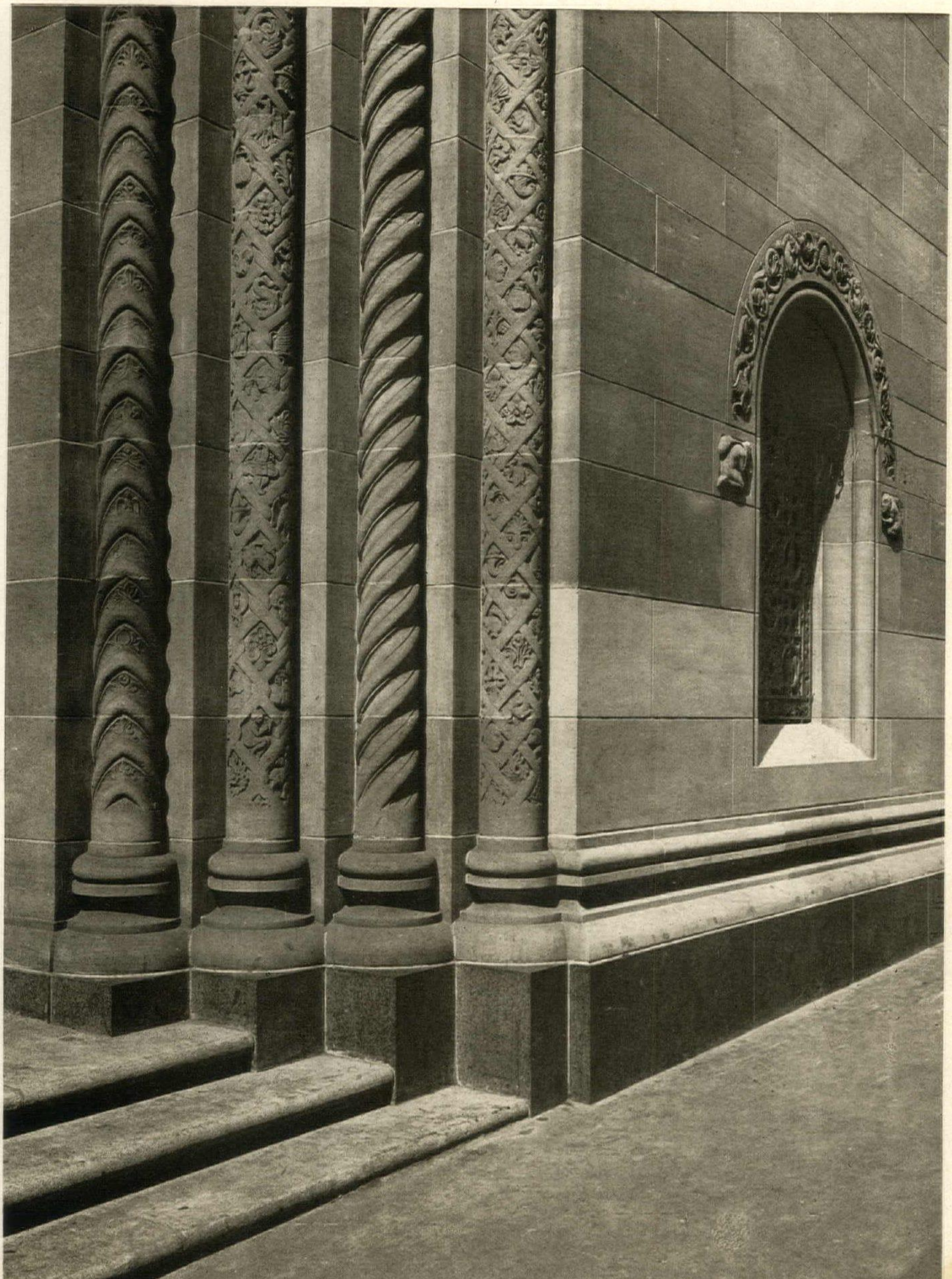
YORK & SAWYER, ARCHITECTS

EXTERIOR DETAILS OF BUILDING FOR THE BOWERY SAVINGS BANK, EAST 42ND STREET, NEW YORK

YORK & SAWYER, ARCHITECTS

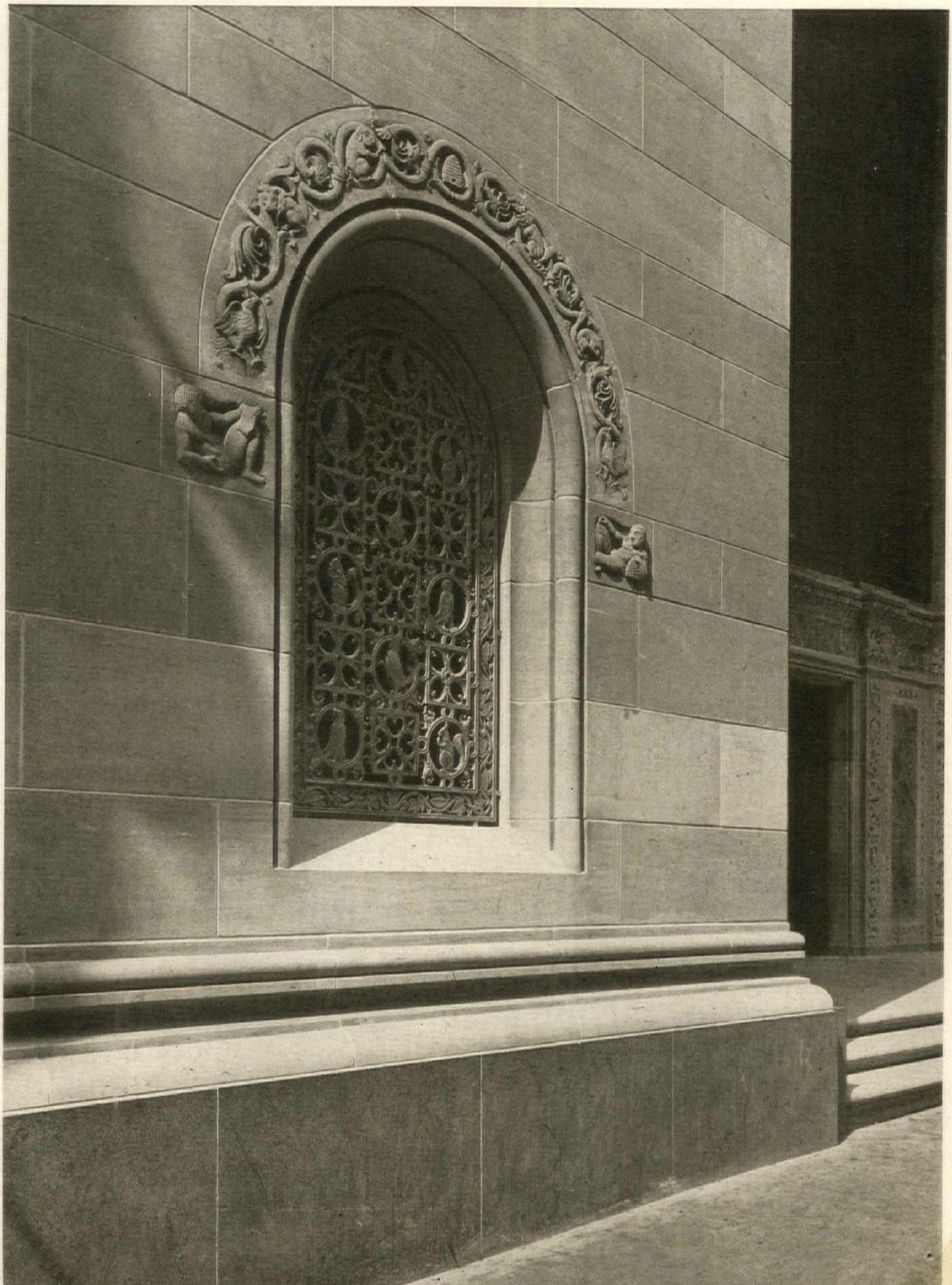
EXTERIOR DETAILS OF BUILDING FOR THE BOWERY SAVINGS BANK, EAST 42ND STREET, NEW YORK

YORK & SAWYER, ARCHITECTS



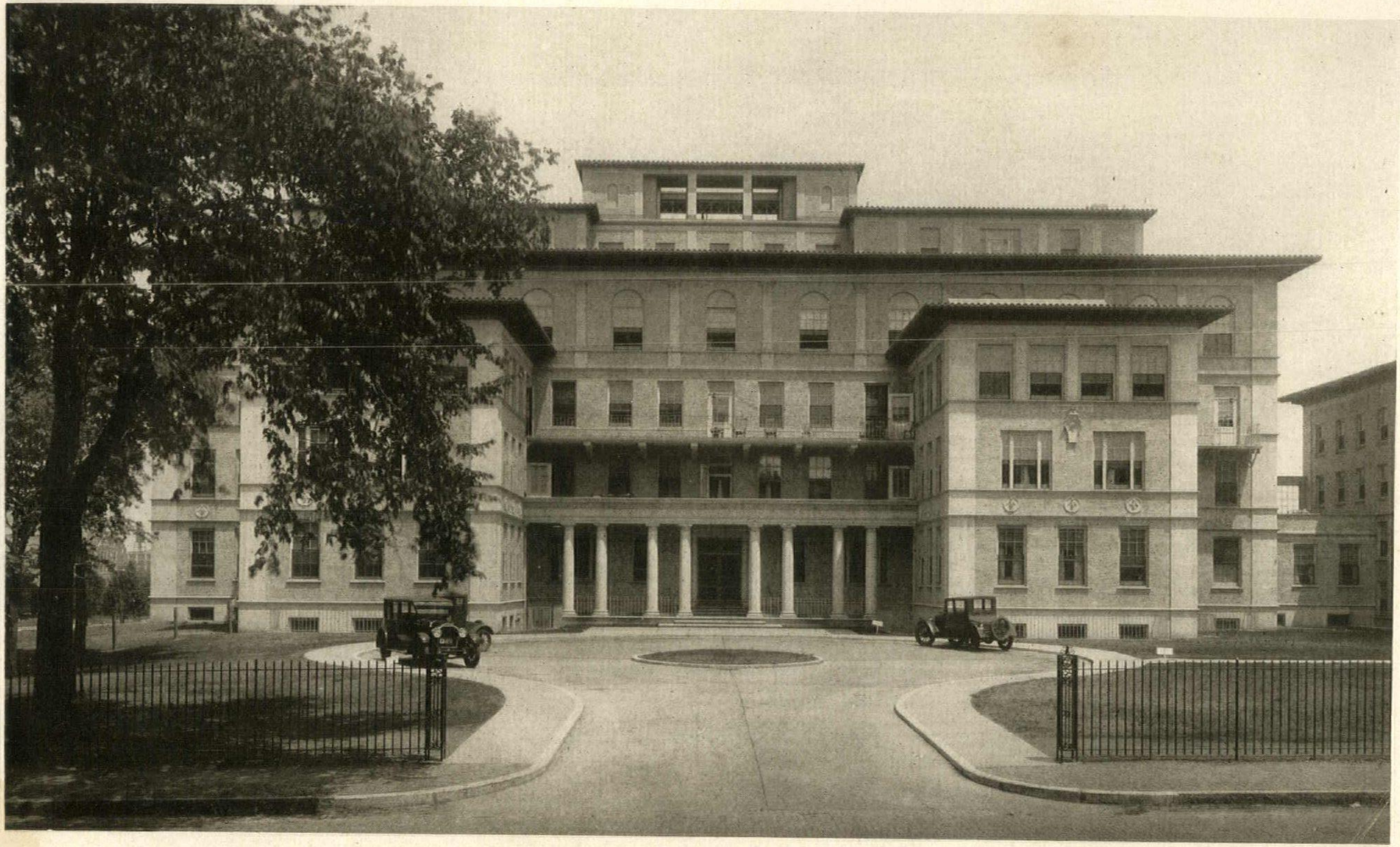
EXTERIOR DETAILS OF BUILDING FOR THE BOWERY SAVINGS BANK, EAST 42ND STREET

YORK & SAWYER, ARCHITECTS



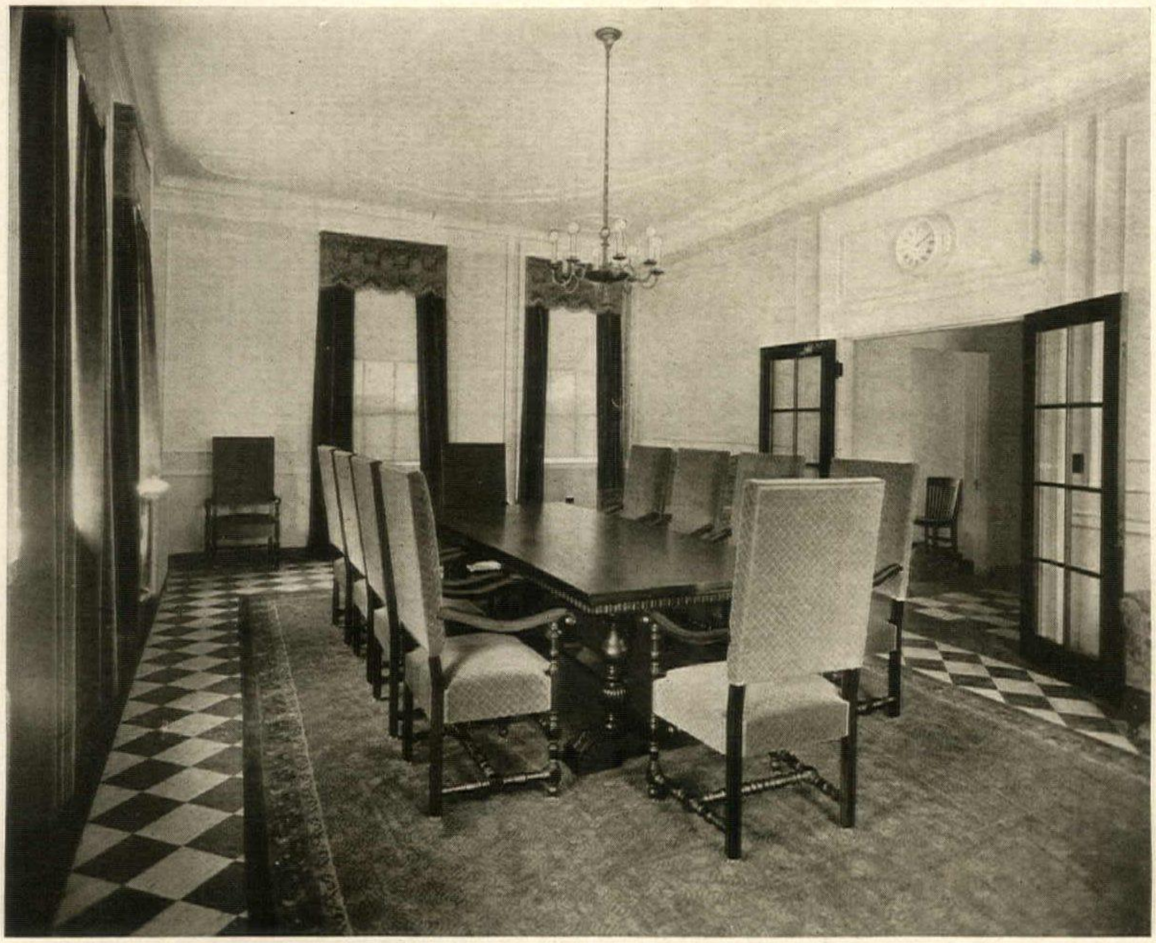
EXTERIOR DETAILS OF BUILDING FOR THE BOWERY SAVINGS BANK, EAST 42ND STREET

YORK & SAWYER, ARCHITECTS

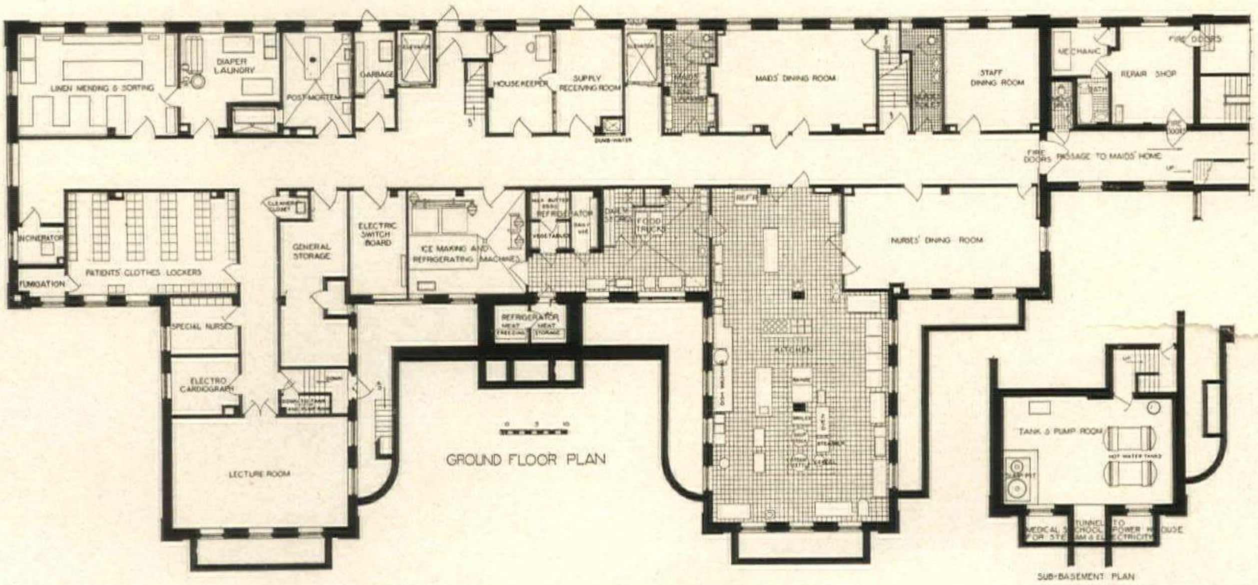


BOSTON LYING-IN HOSPITAL, BOSTON, MASS.

COOLIDGE & SHATTUCK, ARCHITECTS



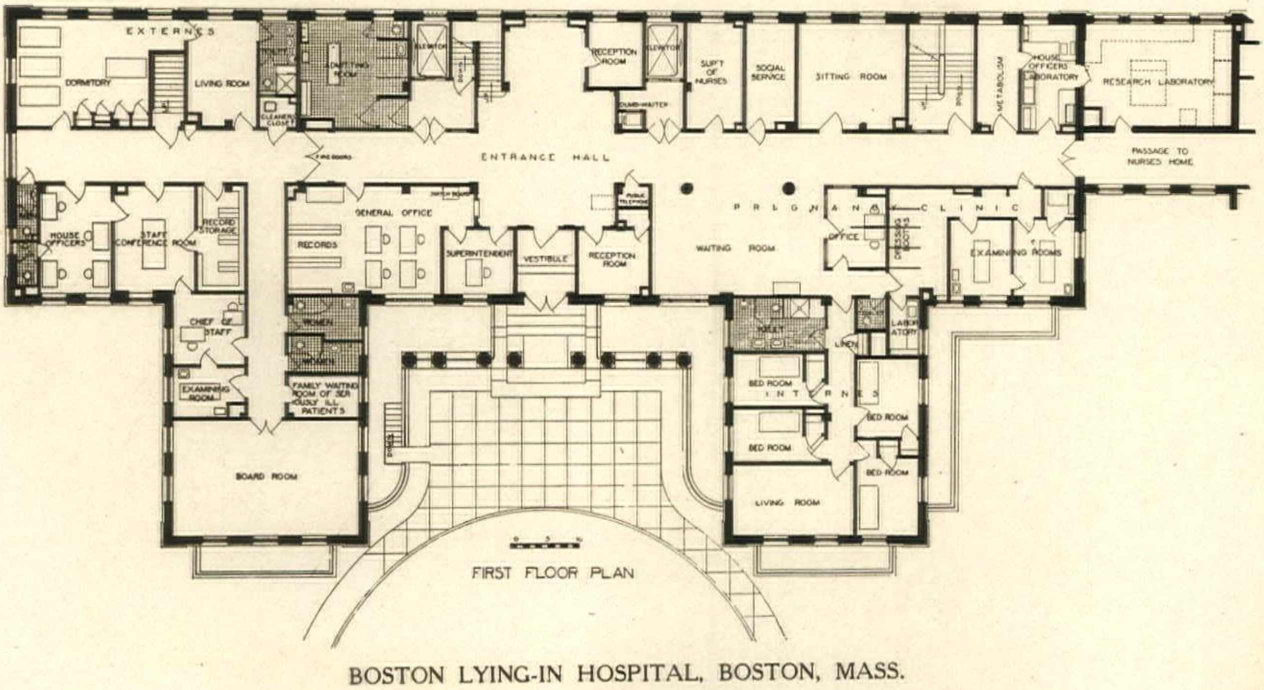
BOARD ROOM



BOSTON LYING-IN HOSPITAL, BOSTON, MASS.

COOLIDGE & SHATTUCK, ARCHITECTS

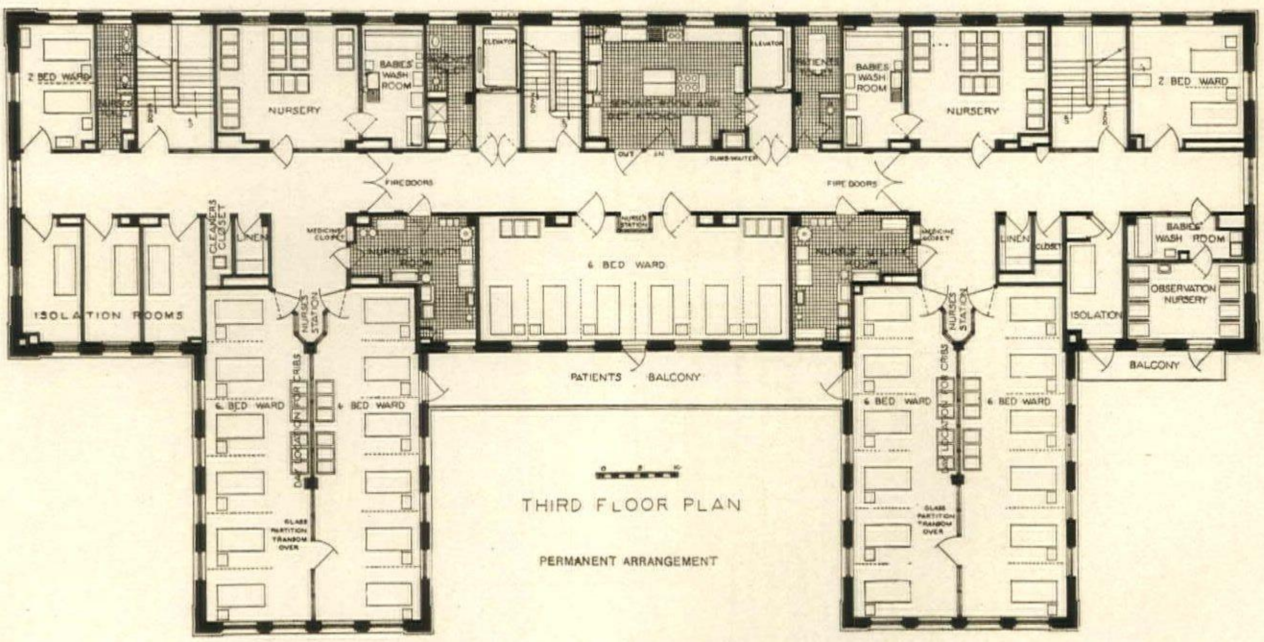
ENTRANCE LOBBY



BOSTON LYING-IN HOSPITAL, BOSTON, MASS.

COOLIDGE & SHATTUCK, ARCHITECTS

CUBICLE WARD, THIRD FLOOR



BOSTON LYING-IN HOSPITAL, BOSTON, MASS.

COOLIDGE & SHATTUCK, ARCHITECTS

OPERATING ROOM, WITH NEW "DAYLIGHTING"

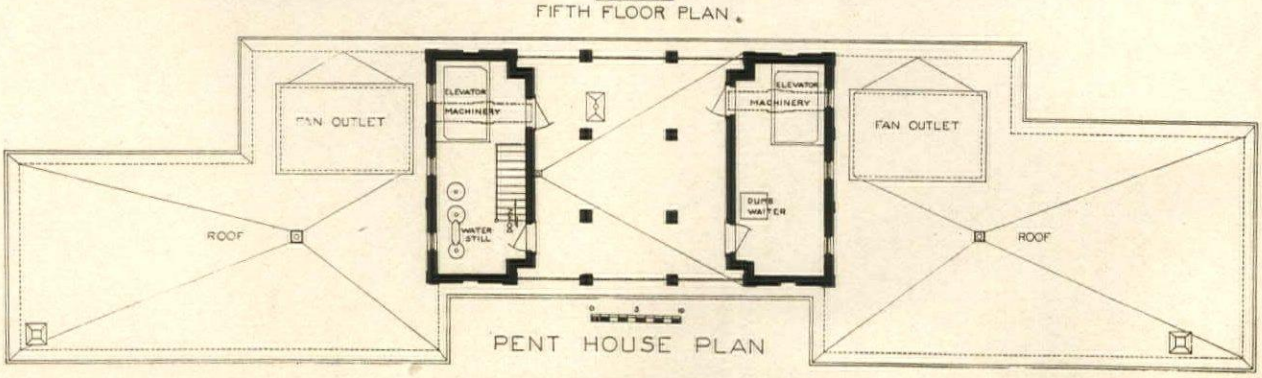
FOURTH FLOOR PLAN

BOSTON LYING-IN HOSPITAL, BOSTON, MASS.

COOLIDGE & SHATTUCK, ARCHITECTS

REAR VIEW

FIFTH FLOOR PLAN



PENT HOUSE PLAN

BOSTON LYING-IN HOSPITAL, BOSTON, MASS.

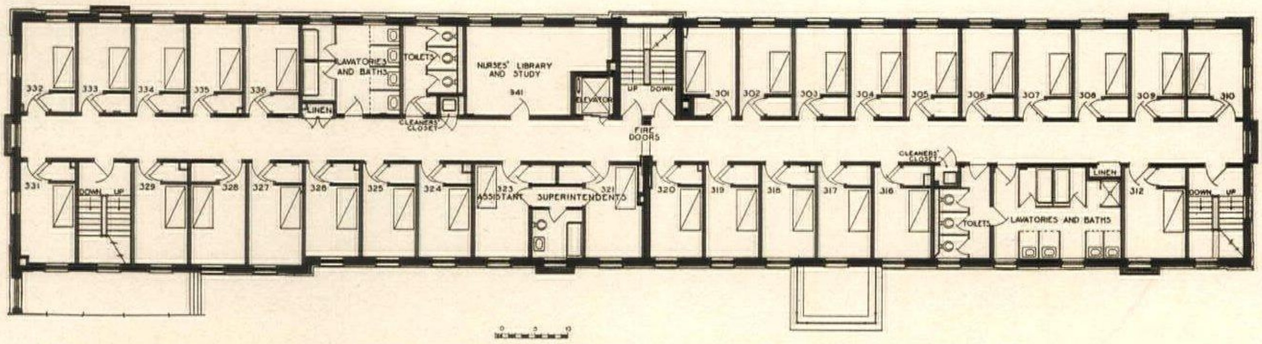
COOLIDGE & SHATTUCK, ARCHITECTS

NURSES' HOME, BOSTON LYING-IN HOSPITAL, BOSTON, MASS.
COOLIDGE & SHATTUCK, ARCHITECTS

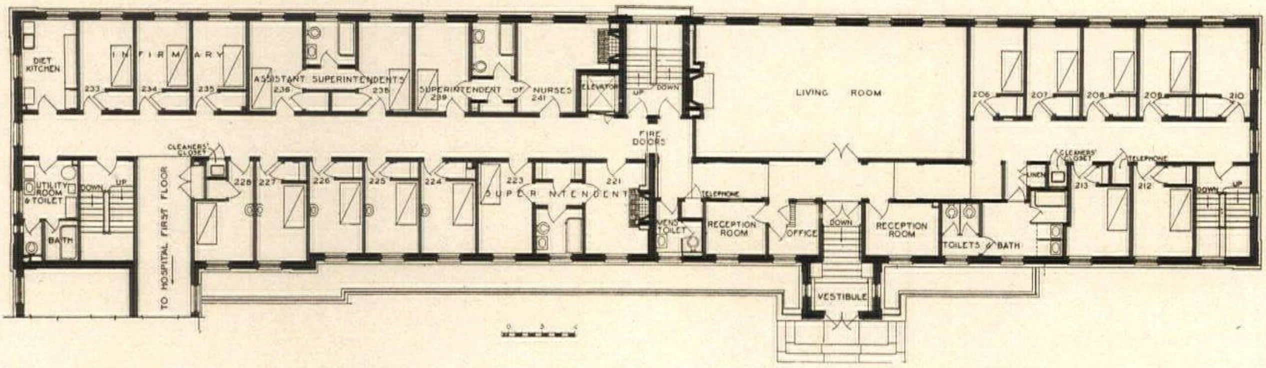
ENTRANCE DETAIL

NURSES' HOME, BOSTON LYING-IN HOSPITAL, BOSTON, M

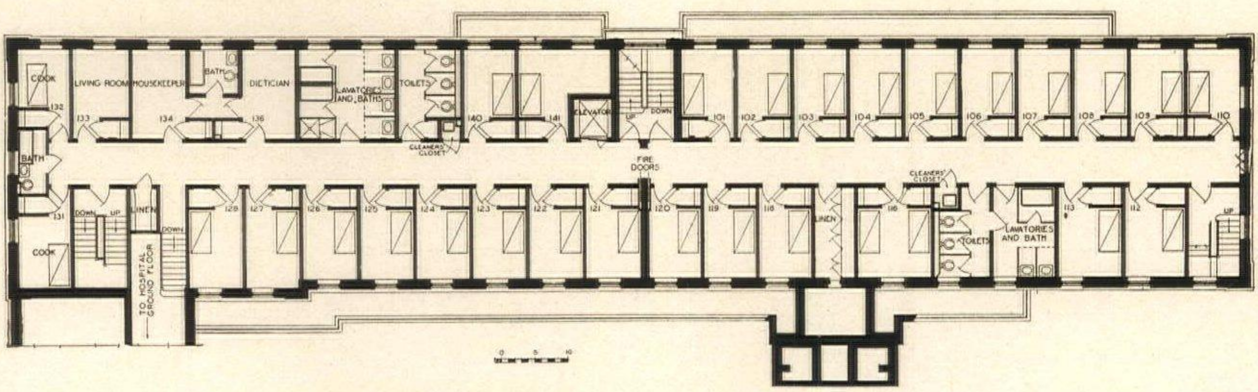
COOLIDGE & SHATTUCK, ARCHITECTS



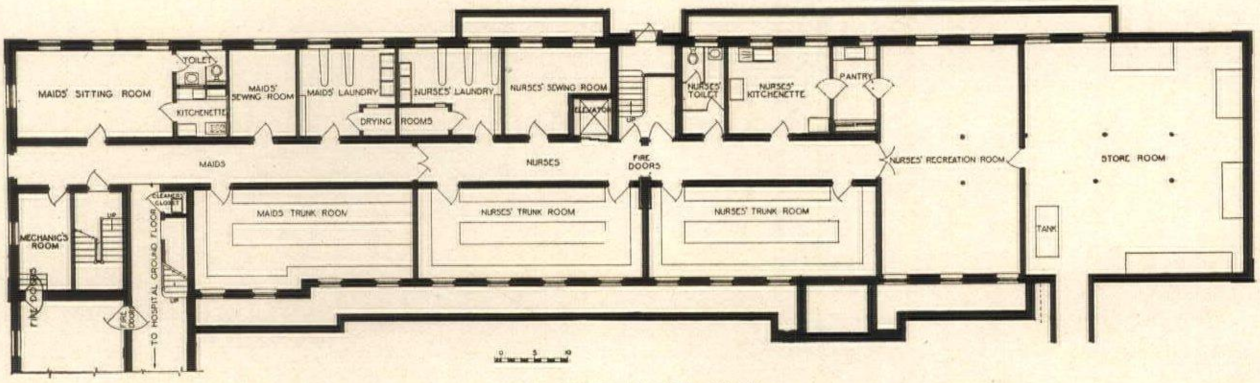
THIRD FLOOR PLAN



SECOND FLOOR PLAN



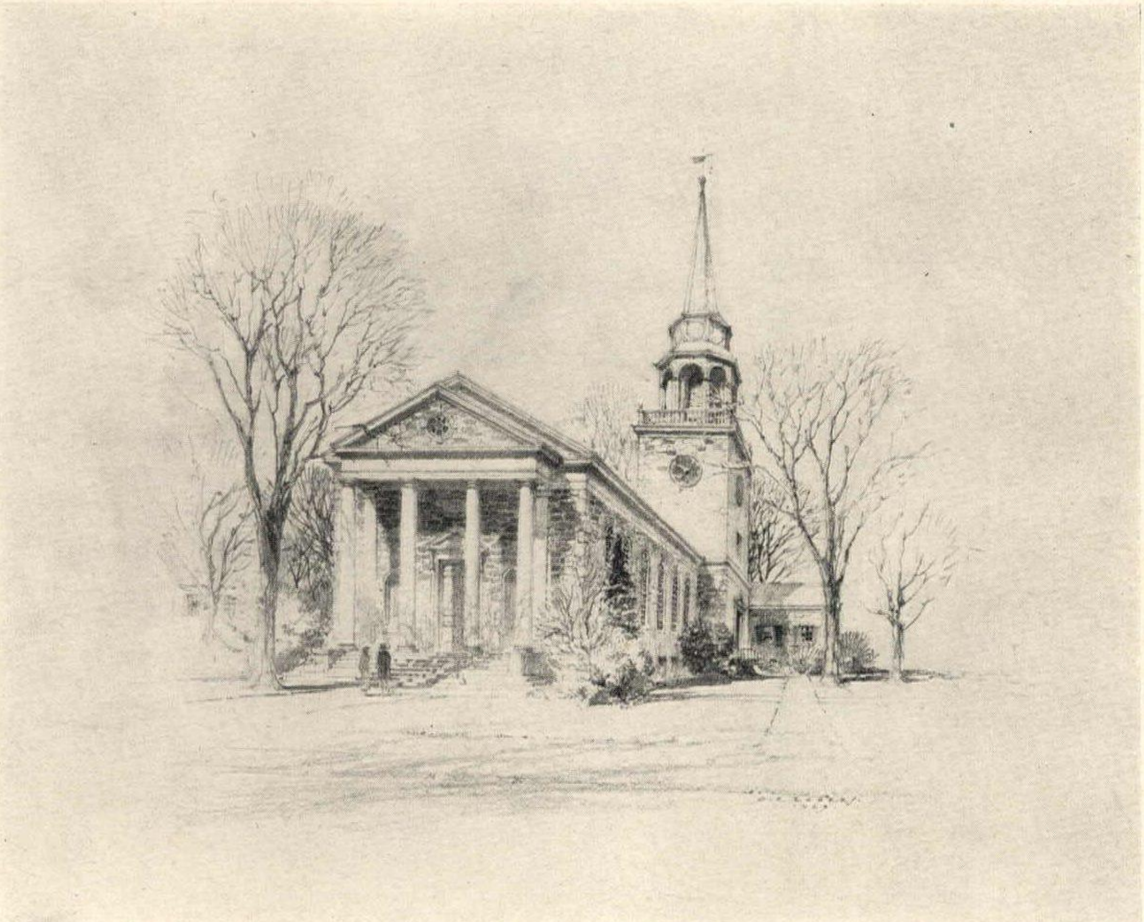
FIRST FLOOR PLAN



BASEMENT FLOOR PLAN

NURSES' HOME, BOSTON LYING-IN HOSPITAL, BOSTON, MASS.

COOLIDGE & SHATTUCK, ARCHITECTS



THREE SKETCHES *for a* PROPOSED CHURCH, FROM *the* OFFICE *of* JOHN RUSSELL POPE, ARCHITECTS

(Reproduced from the original drawings by Otto R. Eggers)

THE above and the following two drawings were specially made as suggestions for one site, incorporating the same requirements, but presenting an opportunity to compare various styles that would fit the same location.

These designs were made for the guidance and selection of the building committee of a Presbyterian Church at Larchmont.

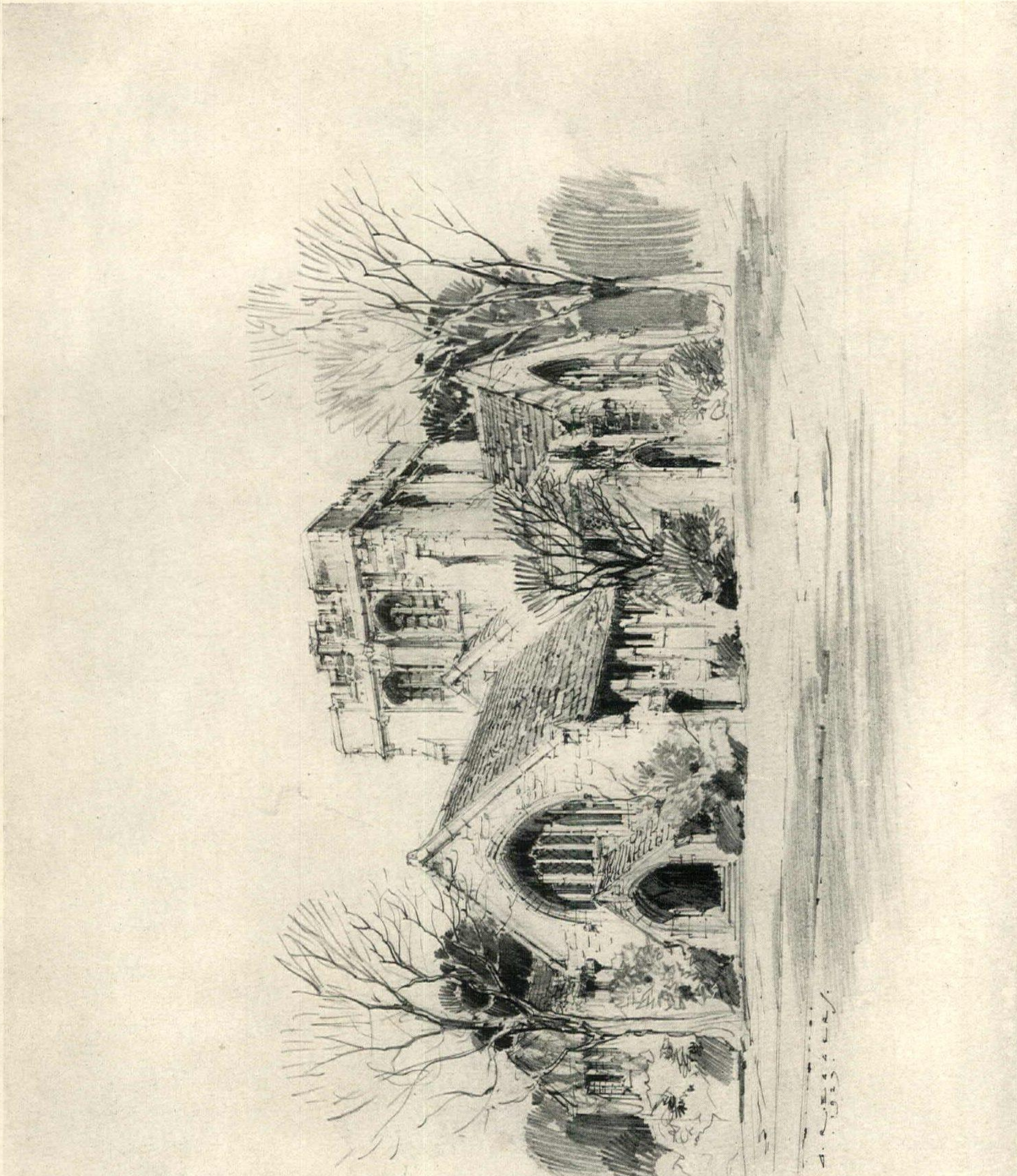
The designs are all practical, in the sense that they are not merely "pretty pictures" to attract a client, but suggestions for an actual building based on rigid economy of construction and the best architectural expression.

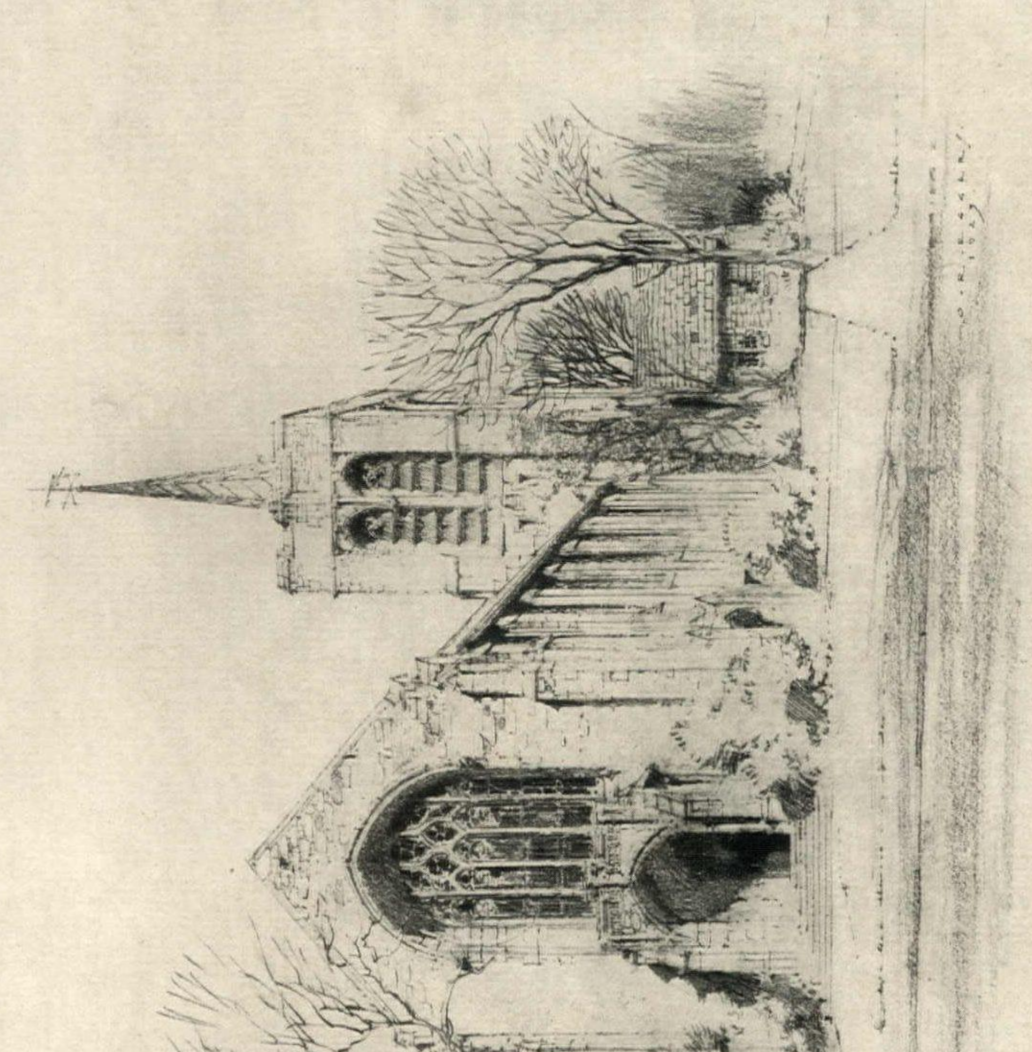
IN the illustration of an apartment house in the Borough of the Bronx, we have excellent proof that a building to compete with existing poorly designed and planned structures, need not follow a sordid or commonplace example.

The clients proposing this venture desired a structure that would present a due regard for good architecture and would in addition be a desirable commercial venture.

This group has been carefully checked as to plan as relating to income, as compared with cost of construction. The whole scheme, as outlined, is a lesson of efficiency in art.

The brick to be used is practically discarded brick. Its availability for purposes both artistic and practical has been demonstrated by use in houses designed and executed by Mr. Pope's office and illustrated in THE AMERICAN ARCHITECT. The general composition of the design is such that the usual misapplied ornaments are eliminat[ed] and their cost saved.





SUBMITTED DESIGN FOR A PROPOSED CHURCH

OFFICE OF JOHN RUSSELL POPE, ARCHITECTS

(Reproduced from the original sketch by Otto R. Eggers)

SUBMITTED DESIGN FOR AN APARTMENT HOUSE IN THE BOROUGH OF THE BRONX, NEW YORK

OFFICE OF JOHN RUSSELL POPE, ARCHITECTS

(Reproduced from the original sketch by Otto R. Eggers)

(See note on page 107)

BEAUX-ARTS INSTITUTE *of* DESIGN

ACTING DIRECTOR OF THE INSTITUTE—WHITNEY WARREN
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Special Notice to Students

BY special arrangement with the Society of Beaux-Arts Architects, there appears in each issue of THE AMERICAN ARCHITECT *an average of five pages devoted to the presentation of drawings selected from the Beaux-Arts Institute of Design exhibitions, and also the listing of awards and the promulgation of all notices to students. These matters will be exclusively presented to students of the Beaux-Arts Institute of Design through the pages of* THE AMERICAN ARCHITECT. *By arrangement with the publishers of* THE AMERICAN ARCHITECT, *a special student subscription rate of* $5.00 *per annum has been secured. Further particulars with reference to this service to Beaux-Arts students may be obtained by addressing* THE AMERICAN ARCHITECT, 243 *West 39th Street, New York City.*

JUDGMENT OF MAY 22, 1923

THE KARNAK TEMPLE CHAPTER OF THE SCARAB FRATERNITY PRIZE COMPETITION

The gift of the Karnak Temple Chapter of the Scarab Fraternity, offered for the best solution of the Fifth Class "B" Esquisse-Esquisse of the season.

PRIZE $50.00

CLASS "B"—V ESQUISSE-ESQUISSE

"A VASE"

At the top of a wide flight of steps leading up to a great public building, space has been left on either side for placing of a vase of heroic size. These monumental vases are to stand on low bases and each entire motive shall not exceed 6 ft. square on the ground and 12 ft. in height.

The material may be stone, marble, metal, or a combination of these, but the character of the design should be appropriate to the medium in which it is to be executed. While the form suggested is that of a vase, such a form has been treated in the past with great freedom; garlands, reliefs or full figures being worked in with it to give architectural solidity to the mass.

CLASS "A" AND "B" ARCHÆOLOGY—V PROJET
"AN ENGLISH 18th CENTURY PUMP ROOM"

The Pump Room and its dependencies constitute the portion of a hydrothermal establishment where the mineral spring water is drawn and consumed. The subject lends itself to a variety of treatments, such as those embodied in the numerous "Casinos" and "Kursaals" of Continental Europe, as well as the buildings erected in America for this purpose.

A famous example, situated in the Southwestern portion of England, is the Pump Room at Bath, which during the 18th Century became a fashionable meeting place for prominent people of the day. Thus the problem developed from a simple shelter in which the waters were drunk, to an assembly room of more or less monumental character.

Such a pump room is the subject of this problem.

The room itself, which shall not exceed 100'-0" in any dimension, is situated in the wing of a building, or in a separate building connected with others only by means of open arcades. One side of the room has windows and a central door opening on a street. The opposite side has windows or glazed doors giving access to a terrace or balcony which overlooks a pool of water in a park.

The ends of the room should be made to communicate with spacious vestibules which contain coat rooms, doors leading to the arcades, and stairs communicating with the lower level of the park. Near the center of the room and arranged in such a manner as to permit free circulation, are the counters, over which the water is served by attendants.

The student is reminded that the character of 18th century architecture in England is dignified and formal, but over-elaboration of ornament is neither necessary nor desirable in a place of public assembly such as the Pump Room.

THE EMERSON PRIZE

The gift of Professor William Emerson, offered for the best solution of a decorative problem.

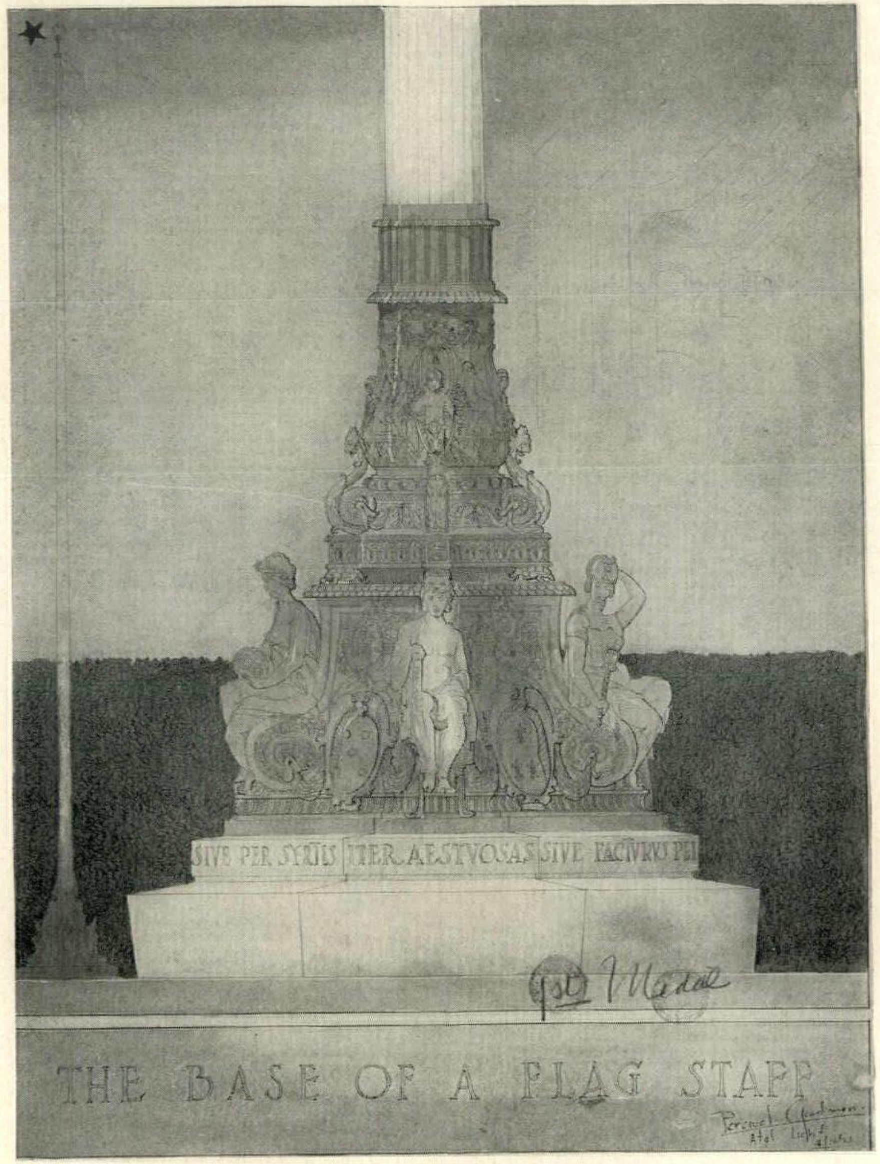
PRIZE $50.00

"THE BASE OF A FLAG STAFF"

As a special feature of interest on a prominence in a public park, it has been decided to erect a Flag Staff. There will probably be steps and ramps leading to the terrace on which this Flag Staff rests, but these do not concern the subject of our problem beyond indicating the importance attached to it.

The Flag Pole will measure one hundred (100) feet in height, and has a diameter at its base of twenty-four (24) inches.

The decorative supporting base that is the subject of this competition measures ten (10) feet in its greatest dimension in plan. Any combination of stone or metal may be utilized.

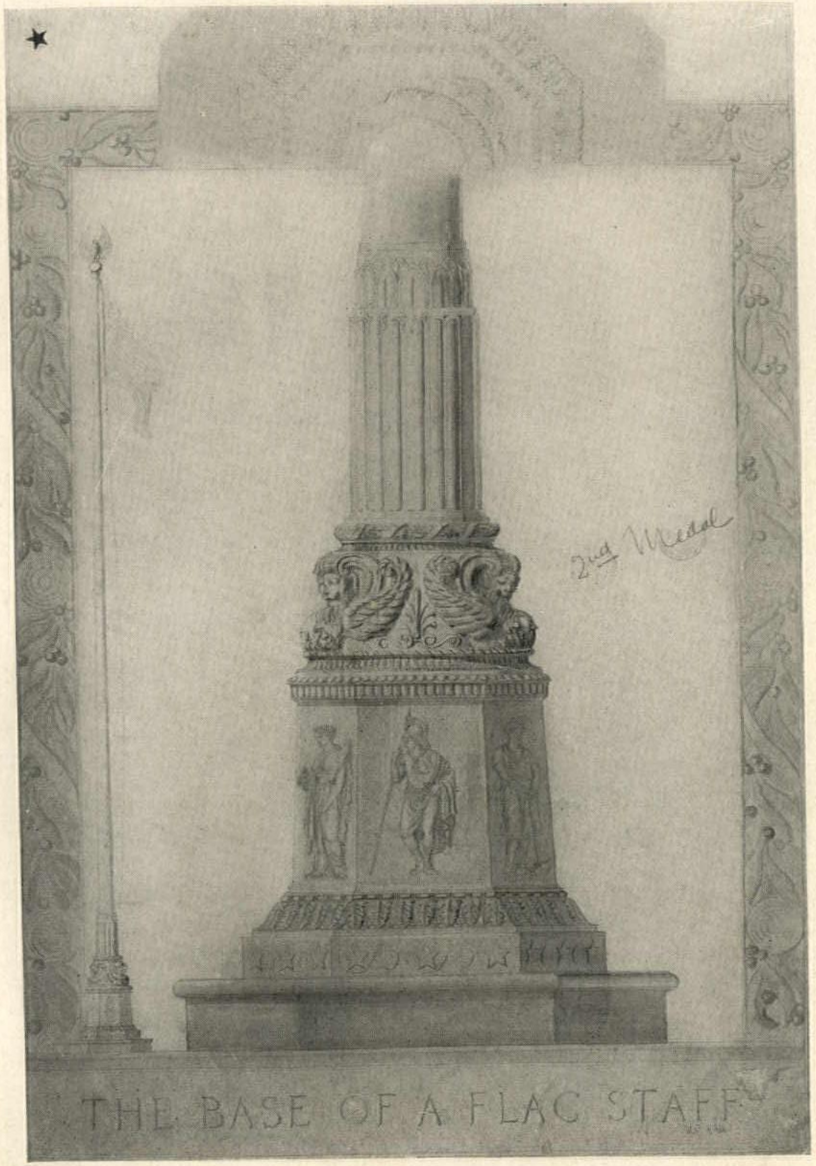


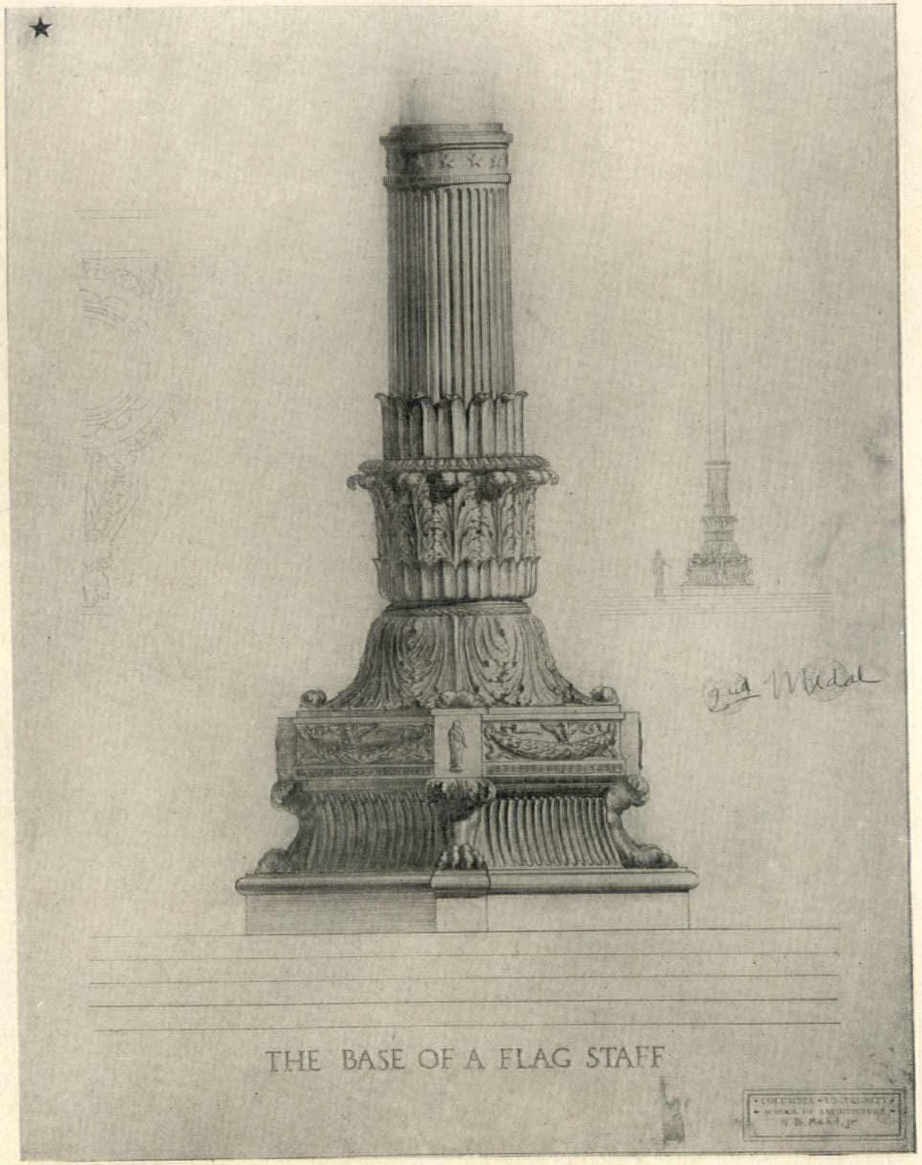
CHAS. FULLER FIRST MEDAL AND PRIZE COLUMBIA UNIVERSITY

P. GOODMAN FIRST MEDAL ATELIER LICHT

EMERSON PRIZE COMPETITION—THE BASE OF A FLAG STAFF

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN





M. C. HILLS SECOND MEDAL COLUMBIA UNIVERSITY

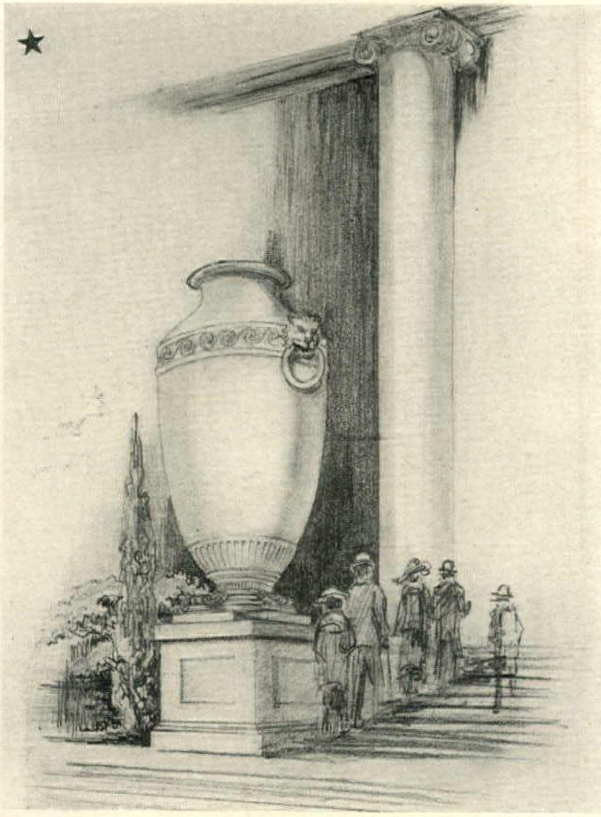
N. B. MEAD, JR. SECOND MEDAL COLUMBIA UNIVERSITY

EMERSON PRIZE COMPETITION—THE BASE OF A FLAG STAFF

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

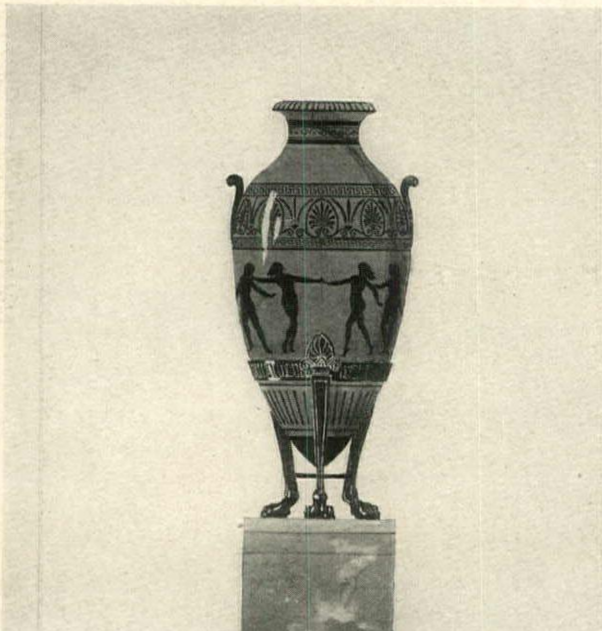
FIRST MENTION AND PRIZE

WM. C. PYLE — CARNEGIE INST. OF TECH.



FIRST MENTION

J. J. WALLWORK — ATELIER HIRONS



FIRST MENTION

R. V. MERWIN — COLUMBIA UNIVERSITY

FIRST MENTION

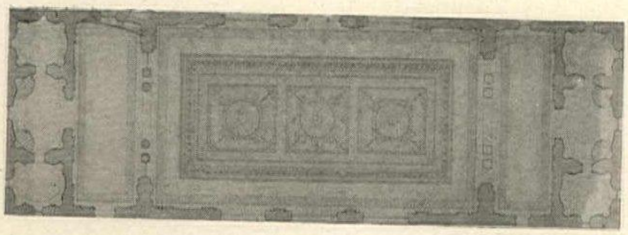
B. G. MARTIN — CARNEGIE INST. OF TECH.

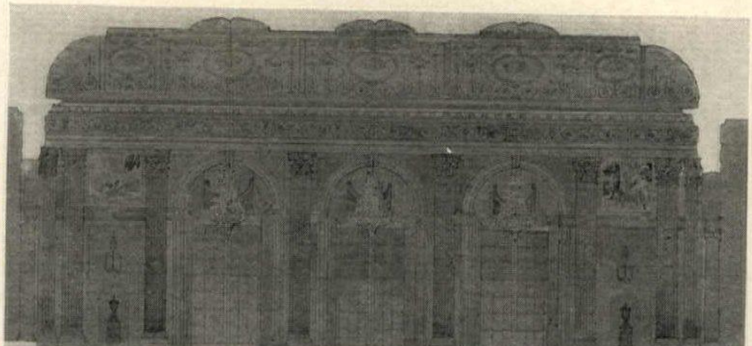
CLASS "B"—V ESQUISSE-ESQUISSE—A VASE

THE KARNAK TEMPLE CHAPTER OF THE SCARAB FRATERNITY PRIZE COMPETITION

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

ALBERTA RAFFL SECOND MEDAL UNIVERSITY OF ILLINOIS





H. A. DUMPER SECOND MEDAL COLUMBIA UNIVERSITY

CLASS "A" AND "B" ARCHÆOLOGY—V PROJECT—AN ENGLISH EIGHTEENTH CENTURY PUMP ROOM

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

SHORT TALKS *on* LIVE TOPICS

Summary *of an* interview *with* Rudolph P. Miller *on the* matter *of* Seasonal Building

RUDOLPH P. MILLER, Consulting Engineer has to his credit a successful record as Superintendent of Buildings of the Borough of Manhattan and as Chairman of the Board of Standards and Appeals. His connection with the Building Department exceeded in time that of the total service of many of his predecessors and successors. This long experience during the time of many of the greatest advances made in the field of building construction and construction methods, with his training and experience as an engineer particularly qualifies him to be a member of the Committee on Seasonal Operation in the Construction Industries recently appointed by Secretary Hoover of the Department of Commerce.

In discussing the recent first meeting of this committee, Mr. Miller said that it was decided that the first step should be to establish definitely the fact of seasonal variation in the employment of building labor rather than to accept the general opinion to that effect. As climatic and other conditions and customs are of considerable variation in this country, a survey should be made in the several distinctive regions. This survey will be undertaken by staff employees of the Department of Commerce. With a definite knowledge of the exact conditions which obtain in the various sections of the country, the committee can proceed to develop a recommendation for procedure. Surveys have been made by the Boston Building Congress and the New York Building Congress, the results of which are shown by Seasonal Labor Charts for the various trades employed in building construction.

The whole situation embraces many remotely related influences, each of which must be studied individually and their relationship to the other factors fixed. The problem then will be to find some way to adjust these to each other so that seasonal employment can be obviated.

One influence to that end, cited by Mr. Miller, is due to a condition shown in his annual report as Superintendent of Buildings in 1921. By tabulating the conditions shown by department records since 1868, it is shown that about twenty years ago the average cost of building operations in Manhattan was $40,000 each. In 1922 the average cost was $140,000 each. It is evident that $40,000 operations can be executed within what is usually termed the "building season," from April to October. Many of the operations which average $140,000 each cannot be completed within the minor project "building season" and they consume from twelve to sixteen months' time. This condition naturally makes the entire year an open season.

Building repairs and alterations constitute a large volume of building construction which has several reasons for being seasonal. Among them is the custom of fixed leasing periods. This is one of the conditions that will be extremely difficult to overcome or adjust to other factors. Many other influences were cited by Mr. Miller and he stated that the committee would welcome the suggestions and co-operation of architects and architectural organizations, which should be vitally interested in correcting the condition of seasonal labor in the building industry.

EDITORIAL COMMENT

THE NEXT CONVENTION of The American Institute of Architects will be held in New York City, probably in February, 1924. This decision was reached after a discussion by the Board of Directors of an invitation to hold the next convention in New York, extended by the New York Chapter. Undoubtedly this annual meeting of the Institute in New York will be marked by many unusual features.

It is further learned that a conference held between D. Everett Waid, President of the New York Chapter, and Harvey W. Corbett, President of The Architectural League of New York, has resulted in the decision to combine with the usual exhibition of the League, the annual architectural exhibition of the Institute, that exhibition to be opened conjunctly with the opening of the Institute convention. Under such auspices, the proposed exhibition will no doubt be the largest and most representative showing of the work of the architectural profession and the arts allied to architecture ever held in this country.

* * *

A Letter From Mr. Cunningham

William H. Crocker, Esquire,
Editor, THE AMERICAN ARCHITECT,
Mr. dear Mr. Crocker:

Your editorial in THE AMERICAN ARCHITECT for 4 July, relative to my article on the convention in the *Journal* has been brought to my attention by a fellow practitioner who subscribes to your paper.

The editorial smacks so strongly of the Stock Thunder of the Professional Reformer—the chap who thinks the Earth is flat, and that W. J. Bryan, Henry Ford and Payne B. Healer are the greatest Americans—and I am so secure in the knowledge that my article expressed neither disrespect nor an "offense against good taste," that I should not bother to reply to it, were it not for the fact that your "Thunder" has included a bolt against the Institute and the membership thereof. (I note from the Annuary that you are not a member.)

I contend most emphatically, that the *Journal does* represent the best element in the Institute, just as the Institute includes and represents the best element in the profession—and I personally, along with the numerous "confrères" who have expressed an enthusiastic appreciation of my poor effort, claim Life Membership in that element.

You will find attached, copies of two letters selected from a number I have received, both of them signed by men who represent not only the best element in the Institute, but the best element in the country.

It is most curious to me that you have found a vein of irreverence or flippancy in my remarks, where none was intended nor expressed. My own personal opinion of Saint Paul is that he is, next to Jesus Himself, the most inspiring, lovable character in Religious History—he is so very human. As regards Mr. Taft—had you ever seen him at close range, as I have frequently been privileged to do, you would know that this great good man is a delightfully natural, jovial, representative of the very best America can produce. His wholesome good humor and his keen appreciation of Life as it is, have been famous in Washington for years. And my appreciation of his lovable character was merely an appreciation of the delightful character that is his, and had nothing to do with the High Office he holds in so distinguished a fashion. I might suggest, in this connection, that you, as an Editor, should try to emulate his fine example, and not let your High Office prevent your hearing with two ears and seeing with two eyes. Your editorials might thus become more stimulating, and more in keeping with the high quality of material your paper publishes.

Sincerely yours,
HARRY F. CUNNINGHAM.

Copies to C. H. Whitaker,
Editor, the *Journal*
and E. C. Kemper, Executive Secretary, A. I. A.
July 9, 1923.

Editor's Note: The sentiments expressed in Mr. Cunningham's letter of July 9, are admirable. If his contribution in the *Journal* relative to the convention had even remotely reflected the same feeling, there would have been no occasion for comment. It is hoped that the change of heart indicated will prove to be both real and permanent.

* * *

SEASONAL VARIATIONS in building construction involve waste. That this is true is generally accepted by everyone connected with the building industry. Many reasons have been advanced for this seasonal inactivity. It is the result of several conditions, often remotely related and all of which are, in a great measure, the result of habit or custom.

In order to attempt a correction of this evil, the Secretary of Commerce has appointed a committee to investigate the causes and suggest remedies. The personnel of this committee represents many elements of the building industry. It h held its first meeting which was devoted to a general discussion of the scope and a plan of procedure.

There are many persons who, while admitting the desirability of instituting successful corrective measures, do not think the desired result can be accomplished. It certainly cannot be unless an attempt is made and these persons are the ones who should dismiss their pessimistic attitude toward the undertaking and lend every influence they may possess toward its accomplishment. We have today many conditions that were thought to have been impossible a few years ago. Some of them have come about through the pressure of necessity and a way being shown by persons and organizations which had faith in the ultimate success of any movement justified by economic necessity and based on a common sense method of procedure.

Architects should be particularly interested in this subject and lend their individual and organized effort.

In this issue is printed an interview with Mr. Rudolph P. Miller, member of the committee. Comments and data on this subject will be published in future issues.

* * *

THE VALUE TO ARCHITECTS and designers of an experience as described by Mr. Sexton in this issue, is very great. At present rates of foreign exchange, a journey, as outlined, can be undertaken safely within the $600 limit to which Mr. Sexton confined his expenditures. Similar architectural rambles in this country and Europe are prolific of valuable results. And, with economy and good planning, they are within the reach of most people.

Referring to sketching in lead pencil out-of-doors, Mr. James Salway, A. R. I. B. A., in the first of a series of articles printed in a recent issue of *The Architect*, London, states:—

> Twenty years ago it was quite the custom for the student to ramble round and pry about after architectural gems, to sketch and to measure whenever opportunity offered. Office work was reinforced by the prospect of this—a comparative delight for the week end; but it seems that the art of doing this is in some danger of being lost. We live in a new world most certainly since the war, and values are still awry; there is much searching after short cuts to prosperity and fame, much copying and reproducing; but sooner or later the rolling ball must fall into its slot, and restlessness give place to repose; the value of methods which are unsensational and uphill, perhaps, but which lead eventually to sounder judgment and more profound delight, will supersede the present tendency to blow trumpets to announce a jester only. Sooner or later we must "wash out" the present fallacy, so conspicuous among many who are still in training, that it is possible to arrive without travelling.

"Short cuts" as a means of acquiring knowledge in any field of art are never thoroughly successful. As well might the painter content himself with a study of nature based on a series of photographs of masterpieces of the landscape painter's art as for an architect to study the monumental buildings of the world from the photographs and measured drawings that are so easily accessible.

Certainly all may not find the means and the time for travel, but we learn from Mr. Sexton's experience that the obstacles are not so unsurmountable as many of us believe. A three months' trip to England, Italy and France, equipped with a sketchbook and a firm resolve to get every possible good result, is the finest post graduate course to an architectural education a man can take.

* * *

NOT ONLY ARE AMERICANS continuing to make inroads on the art of Great Britain, but we learn from the plaintive protest of a member of Parliament, "they have even transported entire houses from England to the United States."

It appears that paintings, etchings and antiques to the extent of approximately eight million dollars were sent to this country during the first six months of this year, as compared with less than three millions for all of 1922. This large exportation, if continued, it is claimed, will so deplete the art treasures of England as to create a very grave condition.

As a matter of fact, collectors of art in this country appear to be more willing to back their appreciation with hard dollars than are those in England. These things, if sold, go to the highest bidder, so that it will be easy to keep England's art in England if they outbid our collectors.

It is therefore proposed, by the member of Parliament already quoted, to stop the alarming exodus by outbidding all foreign would-be purchasers. But he sorrowfully remarks, "There is no market here at the present time." If by "market" is meant to imply a willingness to meet the price offered by Americans, it is just as well perhaps that this art finds lodgment in the country where it is best appreciated.

LEGAL DEPARTMENT

Conducted by

CLINTON H. BLAKE, Jr., of the New York Bar

A SUBSCRIBER makes inquiry as to his rights in a situation which in the practice of architecture is all too common. He writes that a commission has been due to him from a client for more than a year; that the commission charged was six per cent; that the client now objects to the rate as excessive, and refuses to pay, and that there was no written contract covering the services to be performed.

It is not stated whether there was a verbal contract. If there was such a contract, its terms must naturally control, and the rate agreed upon will be the rate which the architect is entitled to charge.

I judge, however, that in the case in question, there was no contract, either written or verbal. Assuming this to be the case, can the architect sustain his claim for a six per cent commission? This will depend upon various circumstances and upon the facts in each case.

The general rule which will determine the question in such a case is our old friend the rule of *"quantum meruit,"* familiar to readers of the Legal Department. This rule stated in plain language is simply that when services are performed and there is no contract to govern the case, the person performing the services will be entitled to recover the reasonable value of the work done. It thus at once becomes a question of what this reasonable value may be and of how it is to be determined. It is true that the case will depend for its determination upon the special facts involved. In a locality where the usual rate for similar services is 6 per cent, the architect can show this fact and, if he can establish that the rate which he seeks to recover is not more than the usual and customary rate in force in the vicinity, he should recover. He may, the New York courts have held, put in evidence the standard charges of the American Institute of Architects as showing the custom in the profession. He may show that he has done work previously for the client and that the rate then charged him was the same as the rate which he now seeks to sustain. He may show that he has charged the same rate generally in his practice and that the client, while he has not before had direct dealing with him, has been aware of the rate charged by the architect to other clients.

All of the foregoing are methods of proving the reasonable value of the architect's services. In the last analysis, it is a question of fact, as to what such reasonable value is.

The client, on his side, may of course bring forward evidence to contradict that adduced by the architect and the question, if carried to a final conclusion, will in all likelihood not be decided until it has been passed upon by a jury or by a board of arbitrators.

The inquiry from the subscriber emphasizes anew how important it is to have a definite contract covering the architect's services, and how great an amount of uncertainty and wholly unnecessary confusion and legal complications will be avoided by securing such a contract in the first instance. It emphasizes, too, the importance of a written, as distinguished from an oral, contract. If the agreement is verbal, there will still be a mass of contradictory evidence to be passed on. If it is in writing, it speaks for itself and will control in determining the respective rights and liabilities of the parties.

Perhaps it would be in order to suggest here that if any subscribers to THE AMERICAN ARCHITECT AND THE ARCHITECTURAL REVIEW have legal questions at any time which perplex them, and will submit them, we shall be glad, without the mention of names, to discuss them in these columns, so far as space and the other requirements of the Legal Department will permit. As a rule, the problem of one architect may well be that of many, and a discussion of the legal difficulties of an architect in New York may have a special bearing upon the problem of a fellow architect in the South or West. A discussion of the practical, as distinguished from the theoretical, is always informative and helpful.

LEGAL DECISIONS

THE action was brought by the plaintiff, to restrain the defendant from changing his house from a one-family dwelling house to a two-story building with upper and lower apartments, to be occupied by separate families. The plaintiff and the defendant had both derived title from the same grantor, who had placed upon the land certain restrictions bearing on its development as a residential section. All sales were made subject to these restrictions. The restrictions provided what portion of the land might be used for business, for churches, for club purposes, for railroad station and for park places. They then provided, in addition, "that the land in the entire tract shall be used for residence and dwelling purposes only" and they further provided that "but one dwelling and one barn shall be erected in each subdivision lot appearing on said map." The court held that, if the words "dwelling house" had been used, the phrase would have been construed as including apartments; that the word "dwelling" alone, without the addition of the word, "house" did not exclude an apartment, and that consequently, and notwithstanding the restrictive covenants, the defendant was within his rights in changing his house into the two-family apartment house described.

Bennett et al v. Petrino, New York Court of Appeals, April 17, 1923. (Not yet reported.)

A CONTRACT provided as follows:

> "The work embraced in this contract shall be begun within ten days after this contract binds and takes effect, and shall be prosecuted regularly and uninterruptedly thereafter with such force as to insure its full completion within one hundred thirty days from the date of the award; the time beginning, rate of progress and time of completion being essential conditions of this contract."

Upon completion of the work, the issue arose between the parties whether Sundays were to be included in the time limit specified in the foregoing clause, one side claiming that the period was to be taken as a whole, including Sundays, and the other side claiming that the clause should not be so construed as to include Sundays. The court held that the time limit did not include Sundays; that the work specified in the contract could not be legally performed on Sunday under the Laws of the State of Kansas, and that Sundays should accordingly be excluded in computing the time within which the contract had to be performed.

VanHafften v. Clayton, Kansas City Court of Appeals 246 Southwestern 964.

(NOTE: In view of the last case cited, it is evident that it is safer practice to specify a certain date by which the work shall be completed, rather than to specify that the work shall be completed within a certain number of days, from the date of the contract, or from any other fixed time.—C. H. B., Jr.)

THE sub-contractors entered into three separate contracts with the general contractor. By the first of these contracts, they agreed to furnish the general mill work necessary in the construction of the building, and aggregating the sum of $65,000. By the second agreement, they agreed to furnish and install bank fixtures for the sum of $21.28. By the third agreement, they undertook to install the mill work furnished under contract No. 1 and also to furnish additional doorbucks for the total sum of $31,266. A lien having been claimed for the work done and materials furnished, it was apparent that the sub-contractors, so far as the first contract was concerned, were materialmen, and that, so far as the remaining two contracts were concerned, they were contractors. The general contractor claimed that the three contracts, having been entered into at the same time and as a part of the same transaction, should be considered as a single contract for the purposes of the lien statute, and that the sub-contractors, by entering into contracts No. 2 and No. 3 in effect merged these contracts in contract No. 1 and thereby waived the benefit of their lien rights as materialmen under the latter contract. The court held that this contention could not be sustained; that the contract for the material, *viz:* contract No. 1, was complete in itself, and that the sub-contractors did not waive the benefit of that contract by entering into other and different contracts for different classes of work or material and with different subject matters.

Tacoma Mill Work etc., Co., v. McClintic-Marshall Co., U. S. Circuit Court of Appeals, 9th Circuit. (Not yet reported)

THE plaintiff, in his complaint, alleged that he had performed all of the conditions provided for by the specifications up to the point where he was stopped by the owner from performing further. The owner claimed that the plaintiff could not recover, without an allegation that the work had been done to the satisfaction of the architect and owner. The court held that the allegation of the plaintiff under the circumstances was sufficient, and that it was not necessary that he should allege that the work had been completed to the satisfaction of architect and owner.

Rosen v. Dawson, 195 Pacific 63.

DEPARTMENT *of* ARCHITECTURAL ENGINEERING

TORSIONAL STRENGTH *of* RECTANGULAR SECTIONS *of* CONCRETE, PLAIN *and* REINFORCED

BY C. R. YOUNG, *Associate Professor of Structural Engineering;* W. L. SAGAR *and* C. A. HUGHES, *Demonstrators in Applied Mechanics, University of Toronto*

CASES of torsion on rectangular sections of concrete or reinforced concrete are of frequent occurrence in practice, and under certain conditions the stresses resulting therefrom may be large. Wall beams, girders or headers next to floor openings, wall foundation beams used in cantilever wall footing construction, and piers supporting skew arches are examples of members subjected to twisting or torsional moment. More commonly than not, any analysis of the stresses in members subjected to twisting has been made by the simple torsion theory, which applies only to circular sections, with the result that large errors have often been committed in the calculations. While for square sections the true maximum shearing stress is only 6% greater than is given by applying the common or circular section theory, for a rectangle with the long side twice as great as the short one, the true maximum stress is 50% greater than is given by the common theory.

Exact Method

Exact analysis of the torsion problem was first made by the noted French elastician, Saint-Venant. The expression for torsional shearing stress derived by him is very cumbrous, as may be seen by reference to Burr's Elasticity and Resistance of Materials, where the subject is presented in English with considerable detail. Perhaps the most remarkable conclusion reache[d] by Saint-Venant was that the maximum torsio[nal] shearing stress does not arise at the corners o[f]

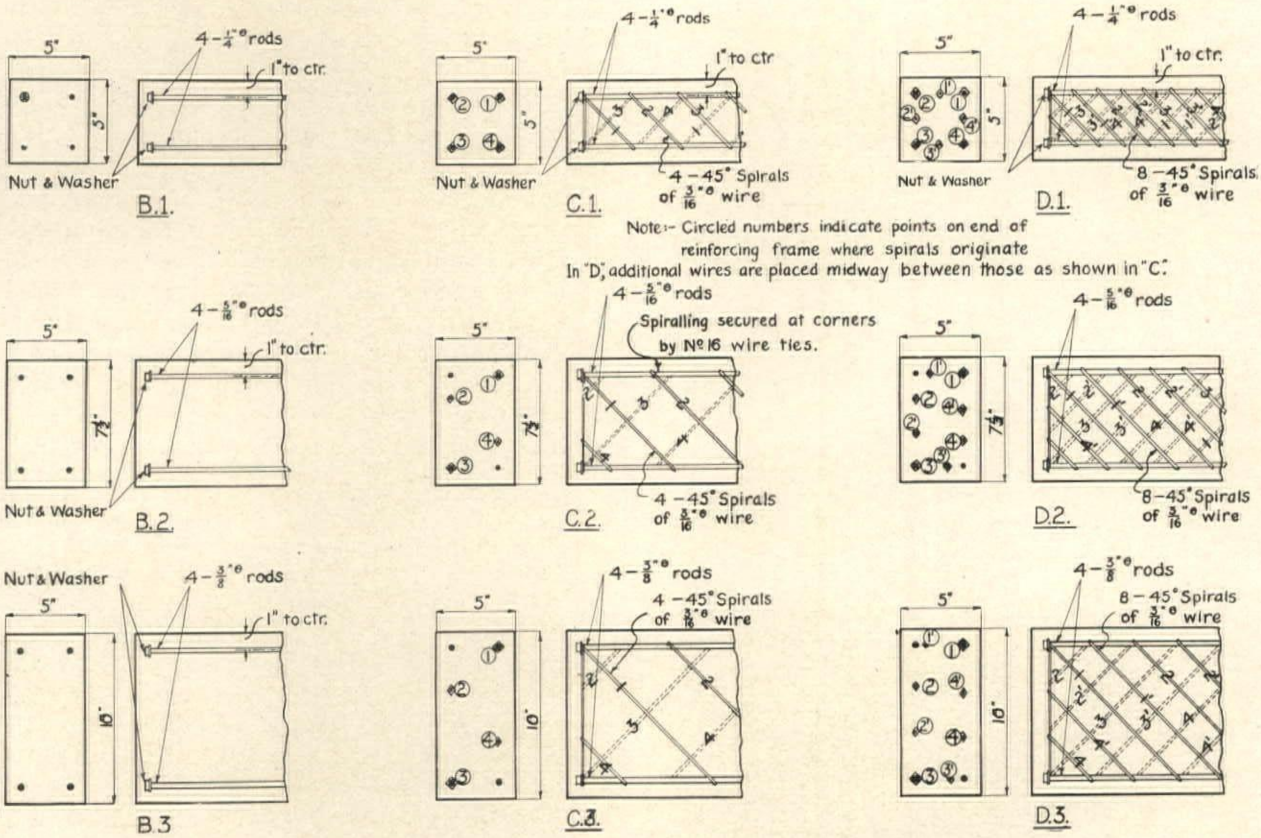


Fig. 1. Rectangular Torsional Specimens of Reinforced Concrete

rectangular section, as was implied in the common or older theory, but at those points on the boundary nearest the centroid, namely, at the centers of the long sides.

For practical purposes of design it is useful to employ a simplification of Saint-Venant's formula proposed by R. J. Woods in his Strength and Elasticity of Structural Members. His formula is:

$T = kb^2hq_1$

where k has values varying with the ratio of h to b as follows:

h/b	k	h/b	k
1	0.208	3.5	0.275
1.5	0.231	4	0.282
2	0.246	5	0.292
2.5	0.258	10	0.312
3	0.267		

In this formula, T is the torsional moment in inch-pounds; b is the short side and h the long side in inches, and q the maximum torsional shearing stress at the centers of the long sides.

Torsion on Reinforced Concrete Beams

Since from the nature of torsion, elongation of the edges of a rectangular section sets up, it might appear that longitudinal reinforcement in the corners of a concrete beam subject to torsion would be useful. In the lower corners of most beams, longitudinal rods running full length already exist, and these might conceivably assist in resisting the warping effect of torsion, as might top corner rods carried full length of the beam. What justification there is for this hypothesis will be shown forth below.

Torsional Shear Reinforcement

Provision for torsional shearing stresses on a given cross section should apparently be made in very much the same way as it is made for ordinary shearing or diagonal tension stresses. The inferior strength of concrete in tension as compared with shear naturally tends to bring about rupture of a torsion specimen of concrete along diagonal lines, and this is substantiated by actual experiment. Investigation has shown that rupture of concrete specimens in torsion is along a spiral surface inclined at 45 deg. with the axis. It is, therefore, reasonable to assume that spiral reinforcement at an angle of 45 deg. would be most effective, just as web reinforcement for vertical shear in beams is found to be best if inclined at this angle. Inclined stirrups or bent up rods in beams placed there for the purpose of resisting vertical shear, or diagonal tension, have some value, so far as they go, in resisting torsion. For torsional shear, however, they should run in oppo-[illegible]te directions on opposite faces of the beam. On [illegible] side next the loading, the usual bent up steel [illegible]vailable for the resistance of both vertical shear and torsion, but on the far side it runs in the wrong direction to resist torsional stresses. However, as the existing vertical shearing stresses operate against the torsional stresses, the steel on the far side may not be required at all for torsional stresses. Some designers have, for beams carrying a heavy torsional moment, placed all of the inclined steel on the inside of the beam, so that the combination of the vertical shearing and torsional shearing stresses on this side might be met effectively. Such practice assumes that on the far side the two kinds of shearing stress offset each other to such an extent that the net shearing stress is within the capacity of plain concrete.

For very heavy torsional stresses, additional reinforcement may be provided by placing steel in the top and bottom faces inclined to the axis of the beam, at, say, 45 deg. In such cases, the natural system of reinforcement to employ would be heavy wire, or light rods wrapped about the longitudinal steel at a 4 deg. spiral with a pitch such that at least one inclined rod would be cut on each face of the beam.

Although great care is customarily taken by designers of reinforced concrete to insure that shearing stresses in beams do not rise above a conservative specified limit, as, for example, 120 lb. per sq. in. under the Joint Committee specifications, torsional shearing stresses may, in certain instances, amount to over 100% of the vertical shearing stresses. Wall girders of comparatively short span supporting flexible beams of long span from the interior of a building, may be loaded with concentrations of 10,000 lb. or more on one side only. The torsional moment thus produced on a wall girder of, say, 10 by 20 in. section, would, assuming the torsion to be wholly absorbed by the girder, give rise to a maximum torsional shearing stress on the long sides of the girder of approximately 100 lb. per sq. in., or nearly as much as the limiting vertical shearing stress.

That no failures have been recorded through the neglect of torsion in designing rectangular beams, is no doubt due to the restraining effect of the slab and to the fact that the working stresses for shear heretofore employed have been very conservative. With the growing tendency to increase shear stresses to as much as 12% of the ultimate compressive strength of the concrete, greater care will need be taken to provide for torsion as well as for shear.

Tests on Concrete Sections

But little investigation of the torsional strength of concrete appears to have been carried out either on this continent or abroad. Mörsch, in "Der Eisenbetonbau," cites torsional tests to failure on a series of solid and hollow cylindrical specimens of plain concrete and on some hollow cylinders reinforced by spirals. The solid cylinders which consisted of 1:4 concrete from 79 to 98 days old gave an average computed torsional shearing stress of 243 lb. per sq. in. Hollow cylinders of the same material from 52 to 55 days old, gave an average strength of 247 lb. per sq. in. Addition of 45 deg. spiralling to cylinders, tested when 60 days old, gave computed ultimate torsional shearing strengths of from 513 to 736 lb. per sq. in., depending upon the amount of reinforcement. The increment in strength over that of the plain cylinders was in direct proportion to the reinforcement and ran from 31% to 124%.

Experiments carried out for the Deutscher Ausschusz für Eisenbeton comprising solid cylindrical, hollow cylindrical, square and rectangular specimens of 1:2:3 mix, 45 days old, gave ultimate torsional shearing stress of from 243 to 462 lb. per sq. in. with an average of 375 lb. per sq. in. The reinforced specimens included those with longitudinal rods only and some with longitudinal rods and spiralling. It was found that longitudinal reinforcement was in itself of little value, improving the resistance of the specimen by not more than 12%, even though rods were used in both the middle of the sides and in the corners. Sloping longitudinal rods were found to be of some value, providing they slope in the proper direction to resist the torsion. Spiralling to the extent of 0.5% provided with liberal longitudinal reinforcement increased the strength of specimens from 129 to 156%.

TABLE 1—SIZE AND REINFORCEMENT OF RECTANGULAR TORSIONAL SPECIMENS OF CONCRETE

Specimen No.	Nominal Size In.	Actual Vert X Hor'l In.	Longitudinal Reinforcement	Spiral Reinforcement	Percentage of Spiralling
A1	5X5	4.98X5	None	None	None
A2	5X7.5	5.0X7.5	"	"	"
A3	5X10	5.0X10.09	"	"	"
B1	5X5	5.06X5.0	4 rods ¼ in. dia.	"	"
B2	5X7.5	5.06X7.59	4 " 5/16 in. dia.	"	"
B3	5X10	5.0X10.19	4 " ⅜ in. dia.	"	"
C1	5X5	5.13X5.19	4 " ¼ in. dia.	4-45° spirals of 3/16" iron wire	0.94
C2	5X7.5	5.13X7.68	4 " 5/16 in. dia.	"	0.55
C3	5X10	5.18X10.31	4 " ⅜ in. dia.	"	0.39
D1	5X5	5.19X5.31	4 " ¼ in. dia.	8-45° spirals of 3/16" iron wire	1.88
D2	5X7.5	5.19X7.81	4 " 5/16 in. dia.	"	1.10
D3	5X10	5.13X10.38	4 " ⅜ in. dia.	"	0.78

UNIVERSITY OF TORONTO TEST SPECIMENS

In planning the investigation here reported, it was thought desirable to make up the test specimens so as to throw light on the following:

1. Effect of varying the ratio of the long and short sides of the cross sections
2. Effect of adding longitudinal reinforcement only
3. Effect of adding longitudinal reinforcement and light spiralling
4. Effect of adding longitudinal reinforcement and heavy spiralling
5. Value of torsional modulus of elasticity of plain concrete

Twelve test beams in all were made. They were of three sizes, 5 by 5, 5 by 7½ and 5 by 10 in., all beams being 5 ft. long. For each size, one beam was made of plain concrete; one contained light longitudinal reinforcement only; one contained medium longitudinal reinforcement and light spiralling; and a fourth heavy longitudinal steel and close spiralling. Details of the reinforcement are given in Table 1 and in Fig. 1.

The specimens were made of 1:2:4 concrete and were tested at the age of 28 days. The mild steel longitudinal reinforcement had a yield point varying from 34,600 to 37,200 lb. per sq. in.,

Fig. 2. Torsional Fracture of Rectangular Specimens of Plain Concrete

while the yield point of the spiralling wire was 31,550 lb. per sq. in.

Plain concrete specimens when broken in torsion gave the characteristic spiral fracture shown in Fig. 2. The first evidences of failure in reinforced specimens were diagonal cracks crossing the faces of the beam at approximately 45 deg. with its axis. These cracks, for the most part, originated near the center of the span, where, by reason of the combination of the torsional and flexural stresses they would be most likely to start.

TEST RESULTS

The three plain concrete test beams A1, A2, and A3 were made up and tested (1) to discover the torsional strength of plain concrete, and (2) to determine the torsional modulus of elasticity of this material. The torsional moment under which each of these members failed, together with apparent or computed maximum torsional shearing stress for both plain and reinforced specimens is given in Table 2. This apparent fibre stress at failure was calculated by applying the exact torsion theory to these rectangular cross sections on the assumption that the material was homogeneous and isotropic and that the proportionality of stress and deformation obtained up to the moment of failure. For rectangular cross sections, the maximum torsional shearing stress which arises at the center points of the long sides of a rectangle, or at the center points of each of the four sides of a square, may be conveniently expressed by the previously cited formula of R. J. Woods, rearranged:

$$q_1 = T/kb^2h$$

TABLE 2—ULTIMATE TORSIONAL SHEARING STRENGTH OF RECTANGULAR BEAMS

Specimen No.	Actual Ratio $\frac{h}{b}$	Torque at Failure in.-lb.	Computed Maximum Torsional Shearing Stress, lb. per sq. in.	Ratio to Average Torsional Strength of Plain Concrete Specimens	Average, or Secant Torsional Modulus of Elasticity, F, lb. per sq. in.
A1	1.00	13,900	539		1,580,000
A2	1.50	20,200	467		1,625,000
A3	2.02	37,400	602		1,352,000
			Average 536		Average 1,519,000
B1	1.01	14,000	532	0.99	
B2	1.50	22,700	506	0.95	
B3	2.01	36,700	584	1.09	
			Average 541	Average 1.01	
C1	1.01	19,000	668	1.25	
C2	1.50	29,000	621	1.16	
C3	1.99	36,000	530	0.99	
			Average 645 omitting C3	Average 1.21 omitting C3	
D1	1.02	25,000	838	1.56	
D2	1.50	35,000	740	1.38	
D3	2.02	53,400	790	1.47	
			Average 789	Average 1.47	

The values of the coefficient k for side ratios similar to those adopted in the present test specimens may be found from the table given in the first part of this article.

A comparison of the relative strength of torsional members variously reinforced may be made by considering the figures in the fifth column of Table 2. At the same time, the value of each type of reinforcement may be seen by comparing the strength of the member in which it occurs with the strength of a plain concrete member of the same size.

From the fourth column of Table 2, it is seen that the average computed maximum torsional shearing stress for the plain concrete specimens is 536 lb. per sq. in. Since the tensile strength of 1:2:4 concrete varies from about 180 to 440 lb. per sq. in. and the true shearing strength is over 1,400 lb. per sq. in., the torsional approaches the tensile strength more nearly than the shearing strength. This is to be expected when it is remembered that at any face of the specimen the stress condition resembles that in the web of a concrete beam, that is, the governing stress is diagonal tension.

A consideration of the results for the specimens of series B, which were reinforced with longitudinal steel only, shows that corner reinforcement has apparently little value, since the computed stresses developed at the points of maximum stress average but little higher than for unreinforced specimens. The same general principle was disclosed in the

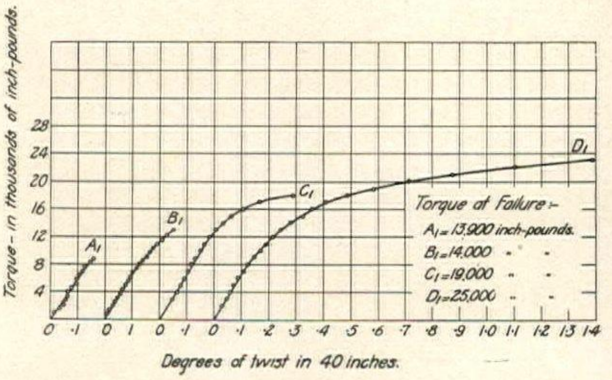


Fig. 4. Torque-Twist Curves for 5 x 5 in. Specimens, Plain and Variously Reinforced

Deutscher Ausschusz für Eisenbeton experiments, although side rods added materially to the strength of the specimens in the latter tests. The angular distortion of a concrete beam is not great enough up to the point of failure to bring corner longitudinal reinforcement into play as a factor in resisting the applied torque.

Some benefit is derived from spiral reinforcement, as will be seen by considering the results for the specimens of series C and D. The wide

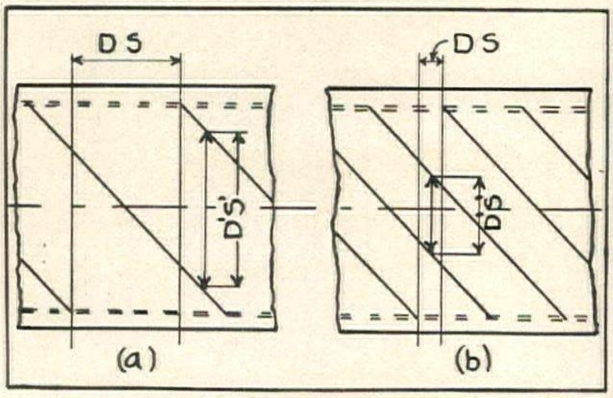


Fig. 3. Effect of Pitch of Spiralling on Torsional Strength

pitched spiralling of series C does not, however, strengthen the member to the extent that might be expressed, the strength as compared with a plain concrete specimen being only, on an average 21% more, excluding in the average the value for beam C3 which obviously is erroneous and unreliable.

The spiralling of series D, being only half the pitch of that of series C might be expected to strengthen the members proportionately. The addition averages 47% of the strength of the plain concrete members, or somewhat more than double the percentage increase for series C.

Considerably less benefit from spiral reinforcement is indicated in the series of tests here reported than was found in the tests for the Deutscher Ausschusz für Eisenbeton. With 8

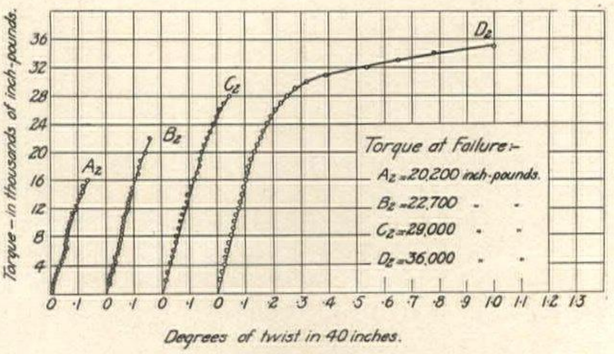


Fig. 5. Torque-Twist Curves for 5 x 7½ in. Specimens

spirals, giving a spiral reinforcement of about 0.5%, the latter tests gave an increase in strength of from 129 to 156%. In the latter tests there were from 6 to 8 longitudinal rods employed and the size of specimens was considerably greater than in the tests carried out by the authors. Doubtless the use of longitudinal rods in the middle of the sides of the German specimens contributed substantially to their torsional strength. The greater size of the specimens at the same time rendered the irregularities of the fabricated reinforcement units much less important. Particularly with the 5 by 5 in. University of Toronto specimens the difficulty of securing a reinforcement unit to full plan dimensions at the center cross section was great. However, no better work could be expected in actual practice, and probably it would be much worse. It is not known whether special care was taken in making the German specimens, but the authors' specimens were made under typical, commercial conditions. Attachment of the spiralling to the side rods may have further accounted for the high strengths given in the German tests.

Computation of the stresses in the spiralling of the specimens of series C and D shows, according to Table 3, that the breakdown is not necessarily coincident with the passing of the yield point which was 31,550 lb. per sq. in. For the 5 by 7½ and 5 by 10 in. specimens, however, the yield point in the spirals was closely approached at the point of failure.

Mörsch's method of calculating the stress in the spiralling was adopted. According to this, the steel spirals are assumed to develop the difference between the ultimate torsional moment of the reinforced specimen and the ultimate torsional moment of a corresponding plain concrete specimen. Half of the shearing resistance is assumed

TABLE 3—STRESS IN SPIRALLING AT FAILURE OF SPECIMENS

Specimen No.	Excess of Torsional Moment Over that for Corresponding Plain Concrete Specimen, in.-lb.	Stress in Spiralling lb. per sq. in.
C1	5,100	18,000
C2	8,800	31,000
C3	Unreliable	——
D1	11,100	19,500
D2	15,800	27,900
D3	16,000	28,200

to be taken up by the reinforcement which lies at an angle of 45 deg. to the torsional shear plane, and half by the compressive resistance of the concrete acting at right angles to the direction of the reinforcement.

The value of closer spiralling in series D is evident from an examination of Fig. 3. Where four spirals only are used, as in (a), there is a longitudinal zone of length DS, in which a transverse plane will cut only one diagonal wire or rod on the near face of the specimen. Further, there is

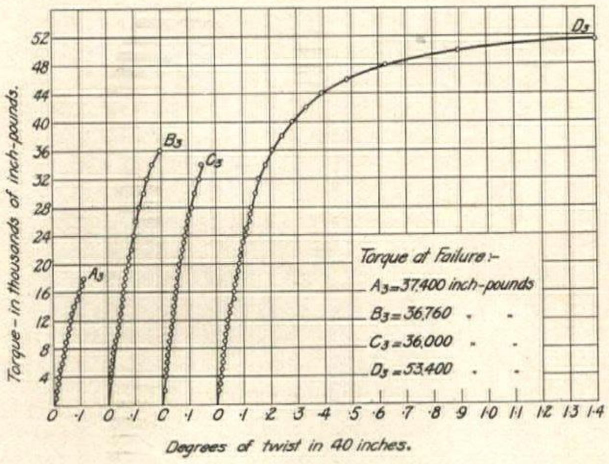


Fig. 6. Torque-Twist Curves for 5 x 10 in. Specimens

a depth D^1S^1 in which torsional shearing stresses may act on plain concrete. The corresponding distances for a specimen with eight spirals are shown in (b), and are very much less. As much smaller zones are left unreinforced with close spiralling, its advantage is evident.

Inclined stirrups or bent up rods in a reinforced concrete beam may be counted upon, if their area is in excess of ordinary shear requirements, to help resist the torsional shear on the face next the loading. On the other face, unfortunately, they run in the wrong direction. If the net shearing stress on this face due to the combination of vertical shear and torsion be in excess of the shearing strength of plain concrete, special torsional reinforcement would need to be added. Anchorage such steel is most readily provided by utilizing it in the form of a spiral, thus increasing the torsional resistance through the presence of steel on the horizontal faces.

Torsional Rigidity

The angular deformations observed for the various specimens are plotted in Figs. 4, 5 and 6. In these diagrams the degrees of twist in a length of 40 in. are shown for various torsional moments nearly up to the point of failure.

Examination of the curves shows that the rigidity of a specimen of any given size is but little increased by the addition of reinforcement, whether it be longitudinal or spiral. Such deformation as can occur before the breakdown of the specimen is apparently not affected by reinforcement of the type and quantity used in the specimens.

For plain concrete specimens the torque-twist curve is substantially straight. The average or secant torsional modulus of elasticity, F, has been computed for the portion of the curves up to practically the last plotted points and is given in the last column of Table 2. The formulae used were as follows:

$F = 410\ Tl/ab^4$, for square specimens

$F = 205\ Tl\ (b^2+h^2)/ab^3h^3$, for rectangular specimens

Where T=torque in in.-lb.

l=length of specimen in inches between gauge points

a=angle of twist in degrees

b=short side in inches

h=long side in inches

The curvature of the torque-twist curves for the spirally reinforced specimens is more marked than for the plain specimens for those containing only longitudinal reinforcement. For those containing the close spiralling the addition to the toughness of the specimen is marked.

Conclusions

Study of the behaviour of rectangular beams of concrete under torsion, as evidenced by the specimens tested by the authors, appears to warrant the following conclusions:

(1) Rectangular specimens of plain concrete with various ratios of long to short sides develop substantially the same computed maximum torsional shearing stress at the center of the long sides. For 1:2:4 concrete one month old this is about 540 lb. per sq. in.

(2) Longitudinal reinforcement alone is of little value in reinforcing concrete beams for torsion.

(3) Spiral reinforcement increases the torsional strength of beams, the increment in strength being approximately proportional to the amount of such reinforcement. Spiralling to the amount of from 0.4 to 1.0% may be expected to increase the torsional strength of a member with or without straight longitudinal rods from 20 to 50%.

(4) The torsional modulus of elasticity of plain concrete of 1:2:4 mix one month old averages about 1,500,000 lb. per sq. in.

New Lumber Standards

THE Consulting Committee on Lumber Standards, on which Emery Stanford Hall, A. I. A. represents the architectural interests, recently met in Chicago. It adopted resolutions which will undoubtedly be promulgated by the Department of Commerce within a few months. This is an important step toward the standardization of the manufacturing of lumber. At the same time the Manufacturers' Permanent Standardization Committee on Structural Grades made a recommendation which is also here given.

Resolution as Amended

(1) That the terms "Inch Board" and "2 inch dimension" be dropped and in the interest of sound business the terms "Standard Board" and "Standard Dimension" be adopted and applied to both hardwoods and softwoods.

(2) That 13/16" S2S (measured at standard commercially dry shipping weight and moisture content for each species) shall be adopted as the minimum thickness of the standard "factory" board and "box" board, which comprise lumber for remanufacture, graded on the basis of

(a) clear cuttings; or
(b) sound cuttings; or
(c) quality of the piece as a whole.

(3) That 25/32 S1S or S2S (measured at standard ...ercially dry shipping weight and moisture content for each species) shall be adopted as the minimum thickness of the standard "yard" board, which comprises lumber for general construction and other ordinary purposes, graded on the basis of the use of the piece as a whole.

(4) That 1-5/8" S1S or S2S (measured at standard commercially dry shipping weight and moisture content for each species) be adopted as the minimum thickness for all standard "dimension" not more than 12" wide.

(5) That 3-5/8", 5-5/8", 7-1/2", 9-1/2" and 11-1/2" S1S or S2E (measured at standard commercially dry shipping weight and moisture content for each species) be adopted as the standard finished widths of boards, dimension and finish.

(6) That consideration be given to the general production of 1/2" boards when not over 8" wide.

(7) That commercially dry lumber shall not weigh more than the present standard shipping weights of the regional groups of manufacturers for the various species.

Recommendation of Manufacturers' Permanent Standardization Committee on Structural Grades

The committee recommends that all structural timbers be divided into two general divisions to be known as "Standard" and "Common"; the "Standard" to include that timber commercially known as Merchantable Longleaf in Southern Pine and Selected Common in Douglas Fir; the "Common" to include those grades designated as Square Edge and Sound and No. 1 Common in Southern Pine and No. 1 Common in Douglas Fir and that the present specifications of the regional associations be revised along the lines of the Forest Products Laboratory's recommendation so that the grades may be given a definite working stress.

Decisions of National Board for Jurisdictional Awards

No Further Action On Metal Trim Dispute —Decision On Foremanship Over Concrete Work

THE two letters quoted below, dated May 26, have been sent out by Wm. J. Spencer, Secretary of the National Board for Jurisdictional Awards, and attested by E. J. Russell, Chairman. The former is addressed to John J. Hynes, President, Amalgamated Sheet Metal Workers' I. A., and the latter to the Associated General Contractors.

Metal Trim

"You are herewith advised of the action taken by the National Board for Jurisdictional Awards in the Building Industry at its meeting held at headquarters, May 21-25, 1923, in connection with the subject noted above:

"'Inasmuch as the Carpenters declined to participate in the first hearing on metal trim, notwithstanding their agreement to do so and the fixing of the date of the hearing to suit their convenience, and inasmuch as they did not participate officially in the rehearing in February held at the request of the American Federation of Labor, the Associated General Contractors and others, and inasmuch as they have severed all connections with the Board and previous affiliations, the National Board for Jurisdictional Awards in the Building Industry realizing that the matter at issue cannot be permanently settled until the Carpenters resume their former affiliations and agree to abide by decisions, the Board does not feel justified in taking any further action at the present time in the metal trim matter.'

"You will please accept this communication as official notification of the action taken."

Foremanship Over Concrete Work

"You are herewith advised of the action taken by the National Board for Jurisdictional Awards in the Building Industry during its meeting held at headquarters, May 21-25, 1923, in connection with the subject set forth in the above title:

"'Foremanship over concrete work on walls, foundations, footings, etc., below the first floor shall be done by laborers under the supervision of such skilled mechanics as the employer may designate.'

"You will please accept this communication as official notification of the action taken."

Other matters were also taken up by the Board during their five-day session, and the decisions rendered are as follows:

Corrugated Sheeting

"The erection of corrugated metal sheeting on steel frame construction when the sheets are simply end and side lapped is the work of the Iron Workers; the erection of all other corrugated metal sheeting of No. 10 gauge or lighter is the work of the Sheet Metal Workers."

Derricks, Erection and Handling for Setting Stone

"The Stone Setter shall have sole jurisdiction over hand derricks in connection with the setting of stone.

"The erection and operation of power derricks for setting stone shall be done by the Iron Workers under the direct supervision of the Stone Setter who shall determine the number of men to be employed."

Jurisdiction Over Cork Insulation and Substitutes Therefor

"The Board having been informed that the several parties to the agreement of May 1, 1918, relative to the erection and installation of cork and other insulations as substitutes have not, as suggested by the Board, renewed that agreement, and it being contended by some of the subscribers to the agreement that the same has been automatically abrogated so that no understanding is now in effect, the following decision is rendered without prejudice to any of the parties if circumstances make further consideration of the matter necessary or desirable."

"*Decision:* In the matter of the erection and installation of cork and other insulations used as substitutes the United Brotherhood of Carpenters and Joiners of America shall control all cork and other substitutes when laid dry, such as floors, partitions and ceiling insulation, including the cutting and fitting thereof; the Operative Plasterers and Cement Finishers' International Association and the Bricklayers, Masons and Plasterers International Union shall jointly control all cork and substitutes therefor when cement or other plastic materials are used, including the cutting and fitting thereof; on all jobs of cork laid in asphalt, it shall be permissible for the laborer to do the work of smearing the asphalt, under the supervision of the mechanic."

Artificial Stone-Granite, Dressing, Altering and Finishing

"In the matter of dispute between the Granite Cutters' International Association and the Journeymen Stone Cutters' Association relative to artificial stone, the dressing, altering and finishing of artificial stone, cast in imitation of natural stone is the work of the Journeymen Stone Cutters' Association except that when any such artificial stone, by reason of hardness or texture, requires the use of granite cutters' tools for the proper dressing, altering or finishing it is the work of the Granite Cutters' International Association."

Hollow Metal Window Frames and Sash

"A request for a rehearing was presented by the Sheet Metal Workers, of that part of the Board's decision referring to the so-called Campbell Sash and Window, which had been awarded to the Iron Workers, it was stated that the window was now being made of lighter material. Action was deferred until the next meeting of the Board and all parties are to be notified to be present and present evidence in the matter."

Vitrolite and Similar Opaque Glass

"At the request of the Painters a rehearing was granted and evidence submitted by the Bricklayers, representing the Marble Setters, and the Painters, representing the Glaziers. The Board in executive session decided to supplement its decision of March 11, 1920, with the following:

"It is the opinion of the Board that the foregoing decision of March 11, 1920, is intended to convey to the Bricklayers, Masons and Plasterers International Union all counters and lavatories constructed of vitrolite or carrara glass and such glass when used in mural decorations on buildings in place of marble or other stone or used in conjunction with marble or other stone as panels on counters.

"It is the further opinion of the Board that the foregoing decision is intended to convey all vitrolite, opalite, white opal and other opaque glass installed on false work or furring strips secured with screw rosettes, molding, putty, screws, expansion or toggle bolts, on walls, ceilings, partitions or columns to the Brotherhood of Painters, Decorators or Paperhangers of America.

"The agreement of December 5, 1910, which was concurred in by the Board of Awards on July 12, 1922, remains in effect, and any disputes that may arise in connection with the subject of the agreement and the Board's decisions shall be adjusted in accordance with the provisions contained in Sections 3 and 4 of the agreement."

ELECTRICAL WORK ON ELEVATORS

The Electrical Contractors requested an interpretation of the Decision of the Board regarding the installation of feed wires to controllers. The contention arose over the installation of new controlling devices. The Elevator Constructors insisted that the devices were not part of the feed wire system while the Electrical Workers claimed that they come within their version of the decision.

The Board in executive session decided: "That the work in dispute seemed to be covered by the present decision and it is the decision of the Board that the work belongs to the Elevator Constructor."

ERECTION OF CONDUO BASE

Conduo base is a new form of metal base with raceways for the insertion of wiring from which any number of outlets may be made and electrical connections provided in any part of a room by removing the face from the base.

The Electrical Workers contended that it was solely for the use of their wiring and that only an electrical worker could install it and make it safe electrically and commercially profitable to those using it. The sheet metal workers claimed that it was purely a metal trim base and that it could only be installed properly by mechanics in their trade. After a three-hour hearing of the evidence in the matter the Board decided to defer its decision until the next meeting.

FLAT-FACED TILE

The following agreement was entered into on February 21, 1911, and amended May 26, 1923, by and between duly accredited representatives of the Bricklayers and the Slate and Tile Roofers:

"Jurisdiction is hereby conceded the Bricklayers, Masons and Plasterers' International Union over the laying or setting of flat-faced tile of every description when laid in mortars on all flat roofs or promenade roofs.

"Jurisdiction is hereby conceded the Slate and Tile Roofers' International Union over flat-faced tile of every description, and corrugated tile, when laid in any preparation of asphalt on roofs, flat or otherwise.

"On motion the foregoing agreement was concurred in and declared to be the decision of the Board."

The two other disputes, involving the Bricklayers and Plasterers, were taken under consideration by the Board. One was "The Setting, Installing or Sticking of Artificial Stone," the other "Plastering Work for Preparation of Walls, Ceilings, etc., for Tiling." The Board decided to hear both cases, but subsequently deferred its decision until the next meeting to give the Plasterers an opportunity to present their side of the controversy.

Hearings upon the following subjects were unanimously deferred until the next meeting:

Rehearing of the decision on Low Pressure Heat, Rehearing on the decision on Asphalt Shingles, Installation of Zenithern.

Veneered and Solid Furniture

ALTHOUGH there is a public prejudice against veneered products, a large proportion of all the furniture manufactured has more or less veneered construction in it, according to the Forest Products Laboratory, Madison, Wis. The high grade finish woods are used almost entirely as veneers. More table tops, drawer fronts, doors, and side and end panels of all kinds of furniture are built up of three or five layers of wood than are made of single solid pieces.

Veneer construction has several advantages over solid wood, besides permitting the use of cheaper material in the core or on unseen surfaces. These advantages should be borne in mind by the purchaser who thinks that veneering cheapens the product.

Alternate piles in practically all built-up panels are laid with their grains running at right angles to each other; that is, in three-ply veneer the face veneers are glued at right angle to the core, and in five-ply material the face veneers and the core are parallel and the intervening layers or cross-bands are laid at right angles. A panel of this construction has the advantages that it is more nearly of the same strength in all directions, and that as it absorbs or gives up moisture it shrinks and swells about as much one way as another. Splitting along the grain in one set of plies is made impossible by the cross grain of the alternate plies, and rapid shrinking across the grain in the face veneers is offset by slow shrinkage along the grain in the core.

Veneered panels do not change dimensions as much as solid wood. Warping is largely eliminated in thick panels by plywood construction.

More care can be taken in the selection of surface wood in veneered furniture than can be taken in solid furniture. The manufacturer can dry veneer stock very quickly and cheaply, and he can utilize all of his wood to the best advantage.

Veneered furniture, if properly cared for, will last as long as solid furniture. The glued joints when correctly made are as strong as the wood under ordinary service conditions. Long exposure to very damp air or direct contact with water, of course will decrease the joint strength even when a very water-resistant glue is used. But such service conditions would be almost as detrimental to solid furniture as to veneered furniture, because even in solid furniture the members are joined together with glue.

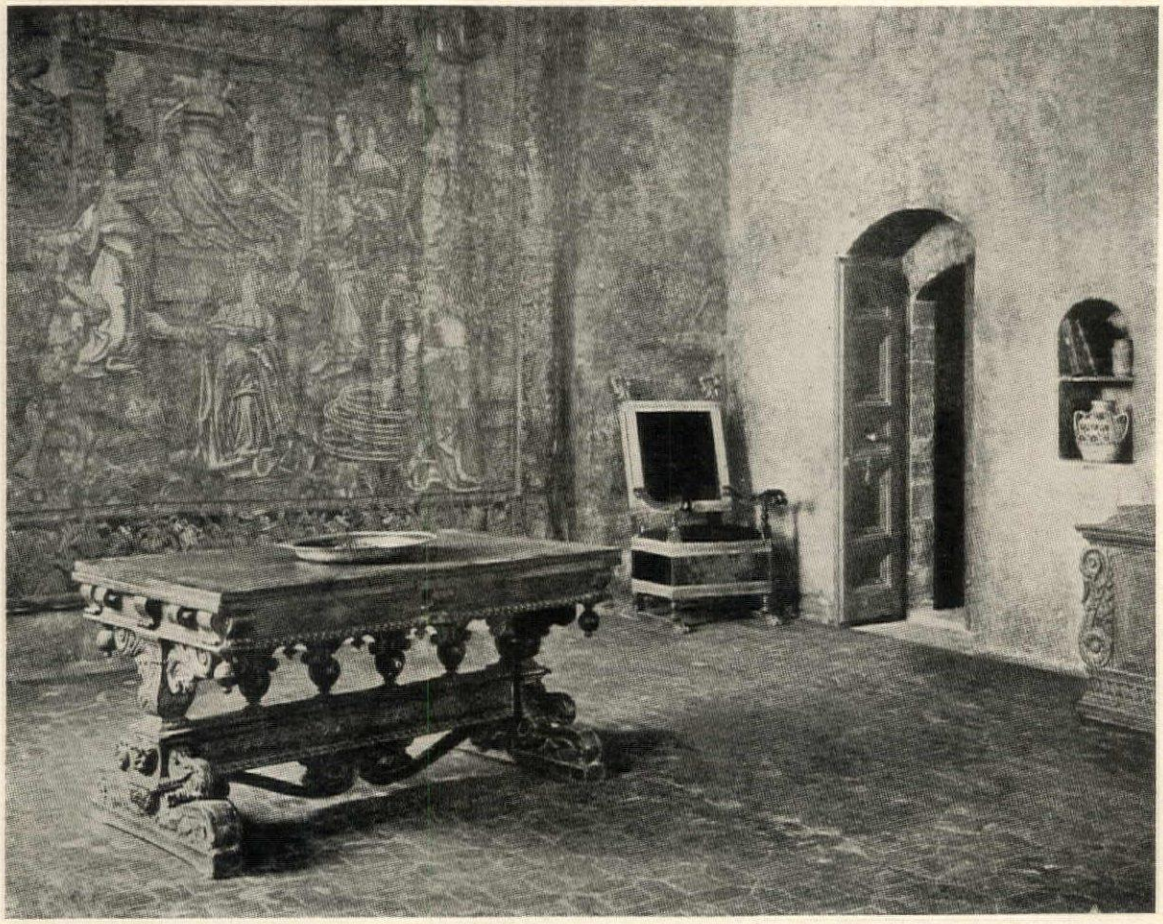


Fig. 1. Second floor hall, Davanzati Palace, Florence

DEPARTMENT *of* ARCHITECTURAL DECORATION *and* FURNITURE

The Italian Renaissance — Our Cultural Heritage

By . . . . . . Roi L. Morin

As the Metropolitan Museum of Art is currently presenting a special exhibition of the arts of the Renaissance in Italy, it is not amiss to reiterate a few words concerning the influence which this age has played upon our national culture, and how much we should treasure the splendid heritage of these bygone days.

Viewed now in the proper perspective of time, we can marvel at the splendor of the colorful pageant of the Italian cities in the flower of the Renaissance. The rapid transition from the simplicity and parsimony of the XIIIth century to the sumptuousness and luxury of the XVth, fires the imagination, with its parade of ostentation and display. It was an age the equal of which, at least in the field of decorative arts, the world has never seen, and probably never shall see again. It was the pure form of classic art made fantastic by the emotions of a romantic epoch.

Today we may decry the onward trend of civilization that strips the old world of its treasures, but we must remember that this pillaging enriches us, as collections like the Bardini and Davanzati are brought here. It is engaging to see familiar pieces from diverse collections which have been scattered, come together again at the Metropolitan Museum, for they are proud and lordly things, these carved and painted *cassoni, sedia Dantesca,* these blue and gold Madonnas by Della Robbia, these portraits by Tintoretto and Botticelli. This table was designed by the illustrious Vasari, while that *cassone* was moved for centuries, from place to place, through the stately halls of the Davanzati Palace. This statuette from Leonardo's studio is of Sforza, and must have been touched by Isabella d'Este, while that faldstool was used by no less a personage than Cosimo de Medici. All the glorious pageant of the *Golden Age* stalks majestically again before us; let us pause for a moment and trace it back to its origin.

While the Northern races were engaged in their feuds, the Italians were extending their far-flung commercial lines into regions never ventured, and the ships came back heavily laden with precious things, which, in the short space of a century, made the nobility and gentry of Florence, Venice, Sienna, Milan and other cities rich beyond dreams of avarice. This treasure happily fell into hands which made a dignified use of it, for art influenced and qualified every pursuit of these people. From the merest kitchen utensil to the most pretentious of armorial bearings, from the simplest of daily duties to the conduct of wars, the life, manners and possessions of the Italians of the Renaissance were graced with form and color.

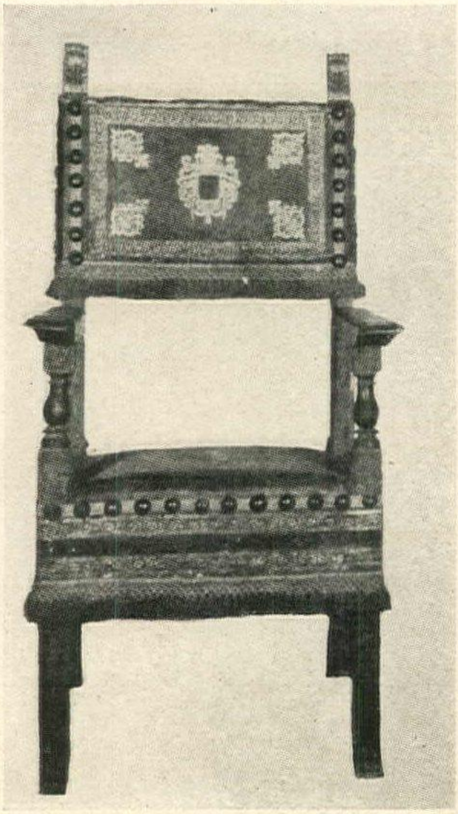


Fig. 2. XVIIth Century carved oak, tooled leather armchair, one of a set of six

(Formerly in the Henry Symons Collection)

The clothes they wore were of the most exquisite materials and workmanship, of blue and crimson silk velvet brocaded with gold and silver, while their belts, chains, trinkets and poinards were delicately fashioned of gold and silver, set with pearls and precious stones. Their villas and palaces, even those of patricians, surpassed in splendor and beauty those of any other people in Europe. The beauty and quality of the furnishings of these residences are still evidenced today.

The characteristic Italian interior of the early period was plain, with only a few pieces of furniture, such as *cassoni*, stools, benches and tables but the whole was highly colorful. The walls were covered with tempera frescoes, often with geo-

Fig. 3. Cassone, with painted and pastiglia decorations, Florentine, circa 1400

(From the Metropolitan Museum of Art)

FIG. 4. LIVING ROOM IN HOUSE OF MRS. ALICE McLEAN, NEW YORK

DeSUAREZ & HATTON, ARCHITECTS

metrical diaper patterns or conventional flower and foliage, with a rich frieze. The paintings were often made to depict hangings from regular points, forming festoon-like draperies. The main apartments on the lower floors sometimes had vaulted ceilings embellished with frescoes with arabesques. Every palace of note had its courtyard and arcade, with the stone stairway descending into it, and the sculptured wellhead. Most rooms had the plain beamed ceiling, the splayed and shuttered windows, as are found in the Davanzati Palace, and the plain tiled floors.

The use of gilt, pastiglia and polychrome, in other words painting as distinguished from carving, played the strongest part in the decoration of the early Italian interior. Fig. 3 shows a beautiful Florentine *cassone* enriched with a painted pattern of the conventional Florentine lily. These patterns were sometimes picked out in silver or gold on a background of ultramarine. Often *cassoni* were faced and flanked with painted panels, depicting tales, festivals, pageants, etc. Some of the most noted painters of the day were employed to execute this work and panels of this type are so valuable that they were often removed from the *cassone* and hung in famous European galleries.

Fig. 6. Corner of Music Room, "Shallow Brook Farm"
Benjamin Wistar Morris, Architect

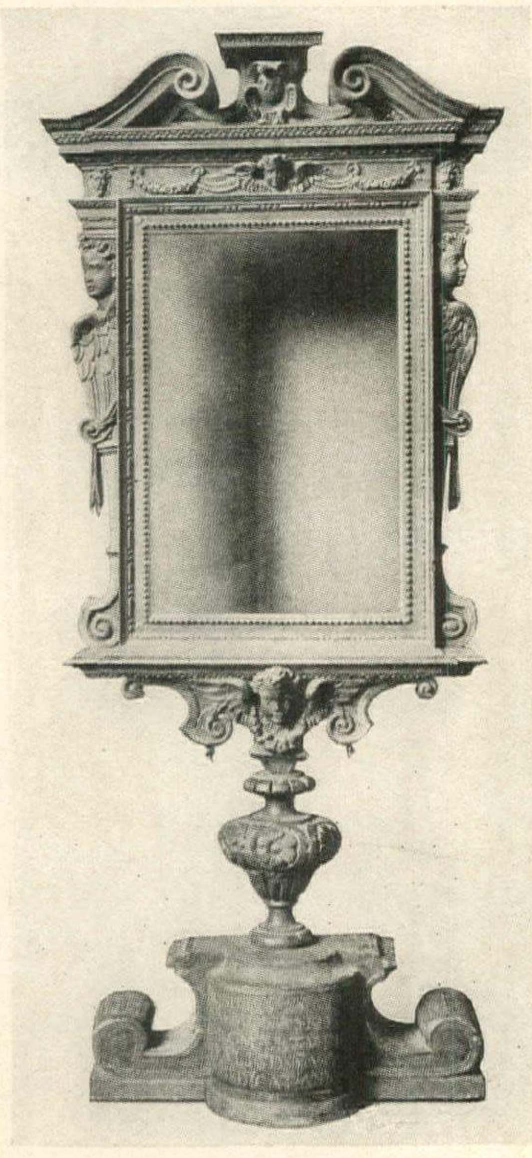


Fig. 5. Carved walnut and gilt mirror frame, XVIth Century, Florentine

(Formerly in the Davanzati Palace)

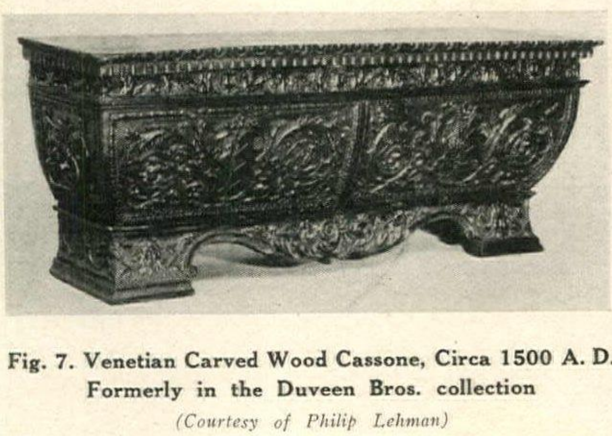


Fig. 7. Venetian Carved Wood Cassone, Circa 1500 A. D. Formerly in the Duveen Bros. collection

(Courtesy of Philip Lehman)

One of the earliest and principal achievements of the Italian Renaissance, at least in the field of decorative arts, is the introduction and extensive use of *intarsia*, or inlay decoration. It began with the simple use of stained woods in geometric pattern on objects of furniture, and developed into the fabrication of huge wainscots in mosaic, depicting landscapes, mythology, etc.

As the Renaissance of the classic arts gained impetus, decorative painting gave way to antique forms. There was a marked change in the manner of treating interiors,—pilasters, cornices, friezes of Greek and Roman character were introduced, though treated with polychrome decoration. The simple beams gave way to the coffered and panelled ceilings, treated, in the principal apartments, in gold and color. Chimneypieces of classic design, in stone and marble came into fashion. The mastery of perspective brought painting into extensive use for decorating huge wall surfaces with fresco.

There seemed to be no end to the pomp, luxury and display. Nobles and wealthy patricians kept open house, and vied with each other in the magnificence of their appointments and the splendor of their palaces. Laws were even passed to limit the expenditures at festivities. Florence reigned supreme in the arts. Venice, because of her safety and isolation of the canals, continued to build her fanciful Gothic palaces, of gay colored marbles, and did not succumb to the classic revival for nearly half a century later.

Furniture follows architecture in design and as it wasn't until the middle of the XVth century that the nobles of Tuscany began to build their palaces in the new manner, so it wasn't until the latter half of the XVth century that we begin to find the familiar *credenzas,* cupboards and *cassoni,* divided into the more nearly square classic panels, separated by fluted pilasters, supporting cornices, and carved in the now familiar Renaissance manner.

Fig. 10 shows a particularly fine example of the "Dante" chair, so popular in this age. This piece is of walnut, as was most Italian furniture, with intarsia in geometrical patterns, and a leather seat and back. It is in the collection of Mr. Philip Lehman, and was loaned to the Metropolitan Museum for this special exhibit.

The "Dante" and "Savonarola" chairs are folding, and were probably so popular because they could be so readily moved about. The richly embroidered velvet and silk cushions and backs, with fringes, were not substituted for the leather until a later period.

Fig. 8. Guest Room, "Shallow Brook Farm," Mt. Kisco, N. Y.
Benjamin Wistar Morris, Architect

Fig. 7, also loaned by Mr. Lehman, shows what is perhaps one of the finest carved *cassoni* in existence today. It shows the influence of antique sarcophagus in form and decoration. The low relief carving shows it precedes the florid, heavily carved Roman pieces with their mythical figures and grotesques.

The beds of the early period were designed with panelled head and foot boards, and raised on a dais or *predella,* and were painted, gilded or polychromed. At the close of the Quattrocento the richly carved and gilded beds as shown in Fig. 8 came into fashion. Counterpanes were of embroidered silks, damasks and other fine stuffs, of

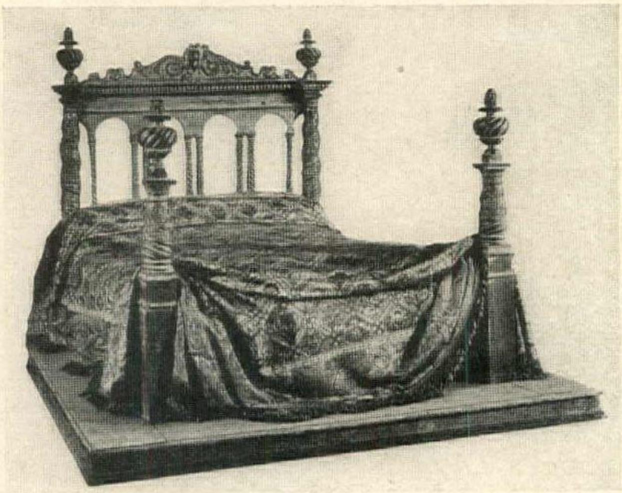


Fig. 9. XVIth Century Carved and Gilt Walnut Bed

generous size, with gorgeous fringes trailing to the floor. Some beds were high-posted, with lordly canopies of silks and velvets.

Tables were of the trestle, center and pedestal, and the monumental type, with stretchers secured by wooden pins, and supported with heavy ends inspired by antique models, with leaves and scrolls, and claw feet. The latter table became a distinct part of the Florentine interior.

In the high Renaissance, or period immediately after the Quattrocento, the art of this glorious epoch reached its zenith. Architecture was perfected. It was the age of Bramante, Peruzzi and Michelangelo. Furniture and decoration were at once elegant, dignified and imposing. Design was bold and vigorous, yet detail was delicate, suave and gracious. No period has ever been as inventive and facile in modelling and composition. It was the great climax of a wondrous epoch. Rome, heretofore in the throes of poverty and strife, now became the center of art and culture, succeeding first Florence, and then Venice*.

"The Venetians were magnificent by nature. Luxury became them like their garments of brocades. It has been said that they had the gift of being gorgeous without being barbaric, magnificent without being pompous, and dignified without being stiff.'—From "A History of Italian Furniture" by Wm. Odom.

The decorative treatment of interiors surpassed anything imagined heretofore. The walls of apartments were either hung with fine stuffs, tapestries, rich damasks and cloth-of-gold, panelled with wood or marble, with all-over patterns of intarsia, or covered with priceless frescoes. The coffered, panelled and beamed ceilings were elaborately carved and richly decorated in gold and colors. Vaulted ceilings were embellished with fanciful frescoes, a modern example of which is shown in Fig. 6.

In contrast to this sumptuousness of decoration is shown a restoration of an apartment of an earlier period, Fig. 1, a corner of the second floor hall in the Palazzo Davanzati. The plain stucco wall and simple tile floor belong to the first half of the Quattrocento, and though none the less refined, do not show the bold composition and decorative detail of the high Renaissance.

Fig. 4 shows a high (two story) living room in a New York residence, fashioned more after the manner of the smaller country villas of the Renaissance, the lesser known ones, of the type designed by Vasari.

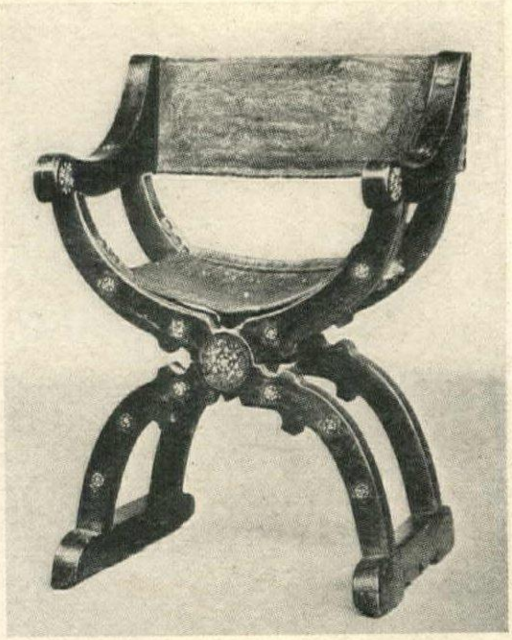


Fig. 10. "Dante" Chair, Venetian or Lombard, XVth Century

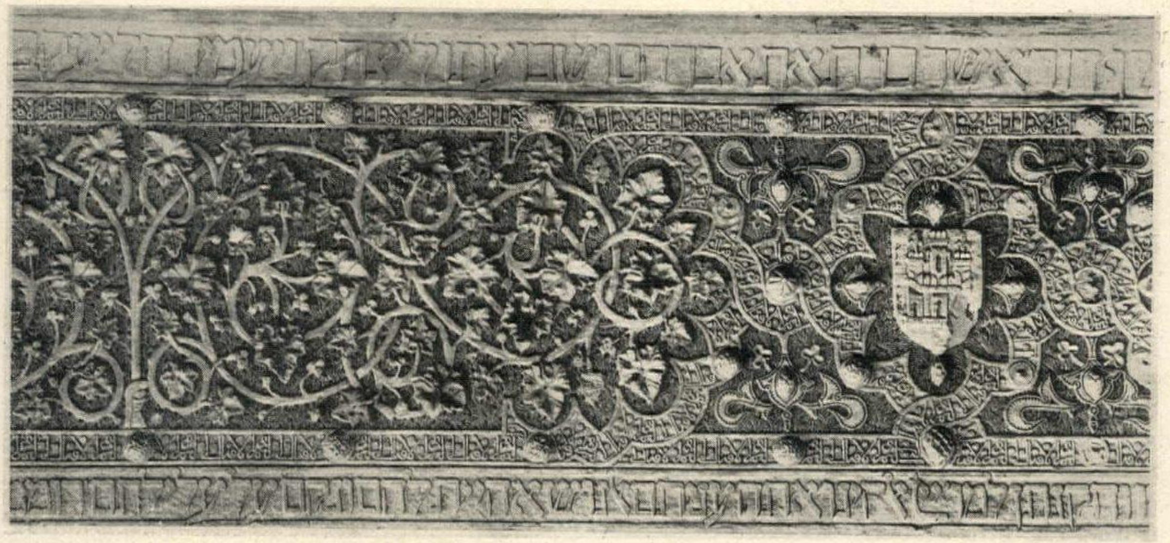
(From the Philip Lehman Collection)

Fig. 2 shows one of a set of rich tooled leather armchairs, of the later, or Baroque period, which were sold during the past season at the Anderson galleries.

Fig. 5 is one of the finest relics collected by Prof. Volpi, after restoring the Davanzati Palace. This piece, of distinct classic pattern, showing how freely designers copied parts of antiques, is of the early XVIth century, but being of Florentine origin, shows more restraint in design than was manifest in Roman furniture.

The present exhibition at the Metropolitan Museum only serves to recall again how the riches and splendor of the art of the Renaissance in Italy have directed our national cultural development since the days of the ascendency of McKim, Mead and White. It is common knowledge now that the majority of praiseworthy structures, both public and private, town and country, that have been built since 1890 were inspired by Italian models. It has been said that the American country house had little character and no convictions until Charles A. Platt began to rear his stately Renaissance edifices.

And it is gratifying to know that an extraordinary interest is being manifested by the public in the exhibit.



Early Spanish Plasterwork

WILLIAM HOLABIRD

THE death, on July 19, 1923, of William Holabird, F. A. I. A., marks the passing of one who has been an outstanding factor in the art of building construction during the past four and one-half decades. During that period more advances have been made than in the entire previous existence of the world. To Holabird and Roche can be attributed the invention and designing of the first steel-skeleton frame building, the Tacoma Building in Chicago, which revolutionized building construction. They also devised the multi-basement level building and successfully solved the construction difficulties involved. With this leadership in structural development they have maintained a most enviable position as planners and designers of important buildings.

William Holabird was a commanding figure. Large, physically and mentally, he possessed great energy and indomitable persistence in combination with an ability to secure and retain the confidence and respect of his fellows.

Born in New York State on September 11, 1854, Mr. Holabird was graduated from the High School in St. Paul, Minn. In 1873 he entered West Point, remaining there two years. Afterward he came to Chicago and entered the office of W. B. L. Jenney, remaining there a number of years before organizing the present firm of Holabird and Roche.

Mr. Holabird is survived by his widow, Mrs. Maria Augur Holabird, one son, Colonel John A. Holabird, and two daughters.

FORTY YEARS AGO

Excerpts from THE AMERICAN ARCHITECT, August 4-11, 1883

AT the last convention of The American Institute of Architects a committee was appointed "to consider the matter of enlarging the number of Fellows of the Institute to a greater number than seventy and to prepare amendments to the by-laws, to be submitted to the next convention for consideration." The proposed changes abolish all restriction upon the number of Fellows of the Institute, restoring the regulations for admission to that grade substantially to the old form. The character of candidates for Fellowship is to be officially investigated and a three-fifths vote of the Trustees is requisite for an election.

* * *

The object of these amendments is to assist the Institute "to increase the number of its Fellows so that it shall embrace a large majority of the able and honorable members of the profession who have been long enough in practice to have made a record for themselves;" adding further, that in providing for the continuance of the present rules, which require that members of the Institute shall be notified of the candidacy of applicants for Fellowship, and impose upon them the duty of interposing objections to the admission of men whom they know to be incompetent or unworthy.

* * *

Another "invitation to architects" has been issued for plans of a building to be used as a cotton exchange. Complete plans and details with a "full detailed bona fide estimate" are to be submitted by the first of September. The program gives in detail the number and size of rooms which gives the idea that a plan has already been prepared. "No premium is offered to competitors" and a careful search through the whole document fails to reveal any promise or suggestion whatever that those who accept this extraordinary invitation will be regarded or treated otherwise than as simple gudgeons, who do not know enough to see whether there is any bait on the hook before biting at it.

* * *

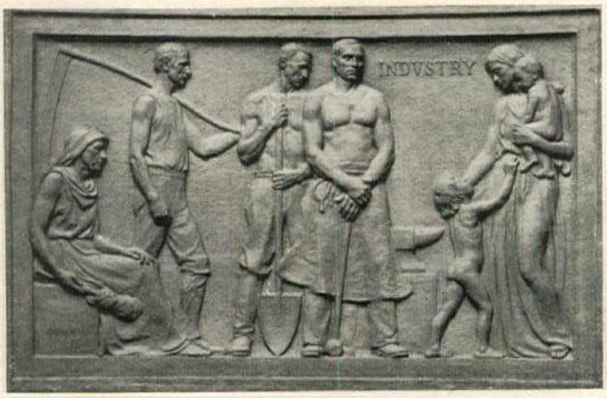
The new bridge across the Niagara River will possess unusual interest as being the first example of the modern "cantilever" system to be completed in the United States, although another is now building in British Columbia which will be finished at about the same time. The first, and only example of this construction yet actually completed, was the ill fated Tay Bridge in Scotland, but its advantage in point of economy is so great as to lead engineers to regard it with favor, and the Tay Bridge itself is to be rebuilt in the same manner.

* * *

Another novel form of bridge construction has been offered in London by the City Architect, Mr. Horace Jones. He proposes a low-level bridge, the main span of which would consist of straight lattice girders hinged at ends nearest the shore and meeting in the middle. Their outer ends are to be hung by chains from immense arched girders overhead. To open the draw it would only be necessary to wind up these chains, which would be quickly done, when the two halves of the draw would rise, leaving a wide, clear waterway between them.

* * *

Illustrations: The "Berkshire," New York, Carl Pfeiffer, architect, New York. The Sigma Phi Chapter House, Williamstown, Mass., James G. Cutter, architect, Rochester, N. Y. House for Dr. W. Finley, Denver, Col., F. J. Sterner, architect, Denver, Col.



DEPARTMENT *of* SPECIFICATIONS

THE specifications for mixing mortar should be explicit with respect to the kind of mortar to be used for the various portions of the work if more than one kind is involved. Generally speaking, the average mortar is one of the following kinds: Neat cement mortar, gauged cement mortar using lime as the gauging agent, lime mortar, gauged lime mortar, one of the patent brick mortars, of which there are several now available, and special pointing mortar for exterior stone work. Quite often it may be necessary to use a mortar that has been waterproofed integrally by one of the several available waterproofing mediums. Fire clay mortar sometimes enters into consideration. Grout is often used in masonry work for the filling of joints, and is especially valuable where a watertight mortar is desired. Any other kinds of mortar would be a combination of two or more mortars mentioned here.

In the mixing of mortar the ingredients should be specified in their proper proportion with the same care that is given similar specifications for concrete. All mixing preferably should be done by machine, but, of course, in the smaller operations hand mixing is usually resorted to. For all except the patent brick mortars, it is believed that the contractor usually can be depended upon to mix the mortar in good fashion if the specifications and the superintendent control the measuring of the ingredients and the period in which the mortar is allowed to soak if it is a mortar which has no Portland cement in it. This, of course, applies more specifically to lime mortar which should be allowed to soak in the boxes for at least three to four days instead of using within two or three hours after mixing has commenced. The longer soaking period is especially desirable where quick lime is used, and is not so necessary when hydrated lime is used.

For cement mortar the usual proportion is one part of cement to three parts of sand. This mortar is an exceedingly stiff or "short" mortar which unless very carefully handled, will produce a poorer wall than if a gauged cement mortar were used. Probably the only idea involved in the use of a neat cement mortar is to insure what one might wish to believe is the most substantial construction possible to obtain. However, the addition of lime either in paste form obtained from the quick lime, or in the dry powdered hydrated form, is more desirable because of the plasticity given the mortar and its resultant easier spreading qualities, thus insuring actually more mortar between the brick than where the "short" neat cement mortar is used. The lime gauging usually is made ten per cent by weight of the cement used. Note that this proportion is by weight and not by volume and refers only to the cement used. In many cases the use of the cement mortar with twenty per cent gauging is considered economical and serves some purpose in making a cemented joint that will permit thin joints and the correct amount of slushing.

In the lime mortar classes in these days of hurried construction work it is customary to specify a generous gauging of cement where lime mortar is to be used except in the case of one or possibly two story buildings or similar work, where about the only actual load on the wall is that of the masonry itself. Many masons prefer the use of lime mortar gauged with ten to twenty-five per cent of cement proportioned to the amount of lime used. For average work where possible settlement in the joint mortar is of no great consequence, the use of lime mortar with this gauging is considered good practice, especially so if the lime, where quick lime is used, has had a sufficient time to soak.

The pure lime mortar without any cement admixture is generally used for the setting and backing of limestone and other stone masonry that may be stained by cement, and for minor purposes, especially where no weather exposure exists.

The use of the patent brick mortars is coming more into vogue as the years pass, but it is peculiar to find that while some masons are violently opposed to its use and will go to any subterfuge to prove its inefficiency or difficulty, other contractors with equal vociferousness, will claim that they would not revert to the "old-line" mortars under any circumstances, and will be equally as adept in attempting to force the architect to approve their use. The mixing of these patent mortars generally is controlled by the printed instructions of the manufacturer, but it is well to caution the specification writer against the use of a great amount of sand, that is, a greater amount than the manufacturers of the mortar recommend. Many good mortars either cement, lime, gauged mortars, or the patent brick mortars, have been ruined by over-sanding, and the architect who does not control the mixing of the mortar to a proper conclusion, may be influenced against the use of any certain kind of mortar in such cases.

Waterproofed mortar is made by a cement or a cement and lime mortar, into the mixing water of which there has been added a waterproofing chemical that at times really has accomplished the desired object. There is no doubt that the mortar may be made watertight, and that the resulting wall will be watertight if proper care is used in filling all joints and doing careful pointing of exposed faces after the work is laid up. The specification writer's careful investigation will so form his judgment that almost any one of the waterproofing agents that really waterproof and not dampproof the mortar will produce a mortar that will serve any watertight purpose that may be involved in such masonry work.

Pointing mortars may be made of non-staining cement of the domestic or foreign brand, or may be simply lime clay soaked a long time, and that has been gauged with a small amount of non-staining cement. In this connection it may be well to remark that some of the patent mortars may stain limestone where others may not. Personal experience is the best judge for this as some mortars that should be staining mortars because of the iron oxide content, in actual use have not stained stone, while the same mortar used in other places has done so. Of course, the kind of sand used may have influenced the staining properties of the mortar. For pointing mortars it is quite often customary to use a fine sand, and especially a white sand for giving the mortar a plastic body and making it lean enough to work into the joints to the proper depth required for good pointing.

Fire clay mortar, of course, is used only where fire brick or fire clay flue linings are provided. The fire clay mortar has to be mixed to a "creamy" consistency, and generally should be mixed quite carefully in accordance with the instructions of the manufacturer. The character of mix is especially important in the case of fire brick settings for boilers, but one should agree that if fire clay is to be used, the motive for such use is to provide a fireproof mortar, and in this case even though it is used only for filling joints in flue linings, the mixing of it should be done carefully.

Grout, which may be termed one of the mortars without much chance for argument, is quite desirable for filling the masonry joints to insure the solid bedding of the masonry in walls where such work is required. Of course in this case the brickwork first must be laid in one of the stiffer mortars not only to provide a good foundation for the grouting but to hold the grouting within the wall while it is being poured. The grout in this case as in all cases where grout is used, requires a "creamy" consistency.

As indicated above, the details of mixing the mortar, while they should be known to the specification writer and the building superintendent, need not necessarily be explained in the specifications. It is believed that if the specifications call for good mortar, and indicate the purpose for which it is to be used, the contractor when accepting the award of the contract undertakes to accomplish these results and he may be required to use the method or methods necessary to do this, regardless of whether or not specific clauses are given.

If the reader will refer to the very excellent publication of the Common Brick Manufacturers' Association, entitled "Brick," he will find all the information needed, which of course must be supplemented by actual work experience.

Where walls have both sides exposed to the weather such as parapet walls, the mortar should be gauged cement mortar. For underground work and especially for brick foundation walls where one side retains earth, similar mortar should be used. In either of these cases a waterproofed mortar may be substituted with every assurance of more complete satisfaction. Any care expended in the construction of such walls is well spent for the extreme uses to which they are put, place a heavy demand for substantiality on the mortar. This is especially so in the case of parapet walls, numbers of which anyone can see in local inspection that are breaking up through frost action.

The lime mortars and the gauged lime mortars are used in general construction work, but not where heavy concentrated loads are to occur. In such cases, gauged cement mortar should be used, and the intervening walls may be laid either in lime mortar or in gauged lime mortar. However, in such case, and in cases where new brickwork on an extension is to be joined into existing brickwork, cement mortar, gauged, should be used to provide equal settlement through the length of the wall. The settlement in lime mortar, or even in gauged lime mortar is greater than in gauged cement mortar.

Many of the patent mortars are used in all cases where the gauged cement mortars are used, and are of course permissible in the usual straight wall work where no severe exposure or concentrated loads will be present. Some of the patent mortars will be used for setting stone, but their staining qualities must be investigated, and if this is not done, it probably would be far safer to use lime mortar without cement gauging.

The pointing mortars are of course restricted to certain definite uses.

The specifications should be explicit regarding the use of mortar colors making sure that the distribution of its use throughout the work is quite clear. Also the addition of gauging mediums should be specified to be made on the mortar board or in the mortar box where the quantity that is gauged, especially with cement, is sufficient to run the work through before setting of cement is started. Retempering of cement is not considered the best thing to do, but sometimes it is permitted if the tempering is done immediately upon the minute that setting has commenced. As it is rather impossible to expect any workman to watch the setting of mortar gauged with cement, and immediately retemper when setting has started, it is far safer to prohibit the retempering of mortar. Ordinarily this does not apply in the case of the patent mortars, most of the manufacturers of which claim that the ability to retemper the mortars is the one desirable feature above all others that should call for the approval of the architect for its use.

OLD HOUSE IN ROUEN

(From the original sketch in color by Samuel Chamberlain)

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THE TEMPLE CITY *of* BAALBEK

BY PAUL WORTHINGTON COPELAND, Architect

HISTORY and archæology shall ever go hand in hand. History, comprising the written records of mankind whether on clay, papyrus, paper; engraved on granite cliffs or scratched on the rock walls of caves, is the major science and archæology is its humble handmaiden. For archæology fills in the gaps of the written record with intimate details gleaned from pots and pans; weapons and dress; houses and temples.

The kindred art of architecture is not totally dependent on either history or archæology for it is a living art indissolubly connected with the very life of the human race and will endure as long as civilization endures. Yet architecture, as we think of it as an artistic expression of the great, underlying human desire for beauty in life, owes a great deal of its science and knowledge of its own nativity to archæology. While we had ever with us examples of the finest works of the ancients and their presence and precedents had consciously or unconsciously influenced our constructive progress, it was not until the comparatively recent excavations in Italy, Greece, Asia Minor and the Levant that we acquired a scientific knowledge of earlier construction and an æsthetic appreciation of architectural development.

The ancient glories of Athens, Rome and Luxor are familiar to us as memories of golden periods of early architectural progress. Yet to the trained mind, there is often as much interest in the rising, transitional and decadent periods of historic art for they show the struggles and triumphs, the ebb and flow of human endeavor. Such an example lies in the little frequented city of Baalbek in Syria. As the name obviously indicates, it is solely a temple city. In fact, its creation was due to religious zeal, its present ruinous condition due to religious bigotry.

Temple of Jupiter

As you leave the Syrian seaport of Beirut, cross the barren mountain range and drive the sixty miles up the broad level valley of the Ba'kah flanked on either side by the snow covered ridges of the Lebanon and Anti-Lebanon, you are gradually taken back through the centuries to the dawn of history. You pass lumbering, grunting camel trains laden with roughly quarried building stone from the hills or huge bales of cotton from the interior; flocks of sheep guided by bearded, patriarchal shepherds garbed in the Biblical coats of many colors; slow moving oxen plowing the field with a sharpened crooked stick; Fella women working in the fields, grotesque in their blue cloth robes and bright red trousers, hideous with their tatooed faces, blackened teeth and red stained fingernails. As you go winding through little villages of square adobe or dirty brownstone houses, unadorned save where a primitive artistic impulse has painted them blue or pink, you are taken back to the beginning of human endeavor. The primitive beginnings, the crudities, and yet withal the humanness of life that underlies civilization and culture as we boast it, are most vividly brought to mind.

So that by the time the great Temple City of Baalbek rises to your view, you are, as I was, in a truly sympathetic state of mind to trace its history down through the ages.

History fails us and archæology helps but little to solve the riddle of its origin, but undoubtedly the spot had had a sacred significance from the dawn of man, due to the presence there of an ever-flowing, life-giving spring called Ras-el-Ain. Primitive religions placed local gods or Baals (masters) over this precious spring and though cult followed cult its sacred significance was never lost to the desert people. Certain it is that Baalbek was a shrine from the beginning of human occupancy and as man's power of expression developed, so we find greater and more pretentious shrines expressing his reverence to a protecting deity. A persistent native tradition mentions Cain as the founder of the first city, saying he built himself a refuge there after fleeing from the wrath of God. His fear must have been great if he laid the massive foundation stones existing today, but archæology ascribes that work to the indefatigable efforts of the early Phoenicians dating perhaps as far back as 2700 B. C.

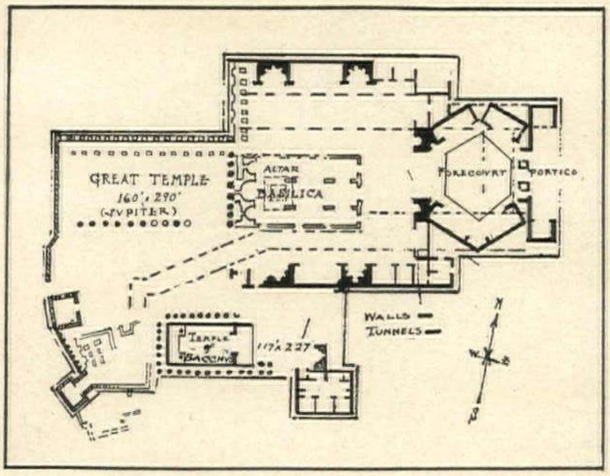
Temple of Bacchus, View of Front

Early Egyptian and Assyrian records refer to the sacred city of Balbiki. Solomon is reputed to have built a temple there for his heathen wives. Early Greek and Roman coins show the temple of Jupiter and are stamped Heliopolis—city of the Sun God.

Today, little remains to tell of its ancient, pristine glory. Yet that little, surviving centuries of fire and sword; conquest and iconoclasm; earthquake and the disintegration of neglect; stands a majestic monument to early ideals and stupendous achievement.

As you approach the city, six Corinthian columns topped by a beautiful entablature rise to view and fling themselves, like a triumphant bar of music against the sky. They are part of the peristyle of the Great Temple of Jupiter and spring from a platform raised nearly fifty feet above the level of the plain, and thirty feet above the level of the general temple area.

Driving through the dirty little village sprawled at its side you soon reach the Eastern portico of the Acropolis. Originally approaching by a grand staircase long since quarried away, you now enter by an inclined causeway to the propylæa measuring 260 ft. by 36 ft. deep and flanked at each end by square towers of cut masonry. At one time these towers were embellished with pilasters and decorative friezes but they are a sad mess now due to the ruthless expediency of countless wars. They were formerly connected by a double row of columns, twelve in number, only the bases of which remain.



Plan

Entering the forecourt by a makeshift opening you gasp at the waste of broken masonry lying before you. Your eyes slowly sweep across the two large courts, littered with fragments of all descriptions, until they rise and rest on the towering columns of the Great Temple seven hundred feet away. The forecourt is hexagonal in shape, measuring 195 ft. by 249 ft. and was paved with marble slabs terraced toward the outer walls. These outer walls, composed of large cut blocks of the native rusty-yellow granite, are set close without mortar. The inner facing stone, probably marble, has disappeared. Small exedræ or chambers of the priests, jut from the walls and show somewhat of the early decoration of classic mouldings and panels but all are in poor condition. The walls have been pierced for catapult and cannon and many granite boulders, missiles of ancient war machines, lie about in mute testimony.

Pass on to the Great Court through a waste of broken columns, pediments, lintels, etc., lying in great confusion. This large court measuring


The Hexagon and Great Court, with Altar

440 ft. by 370 ft. or about 3½ acres, has outer walls and exedræ similar to the forecourt but is in a more ruined condition. At the far side of the Great Court you find the massive foundations

Mask formed of Acanthus in frieze of Temple of Bacchus

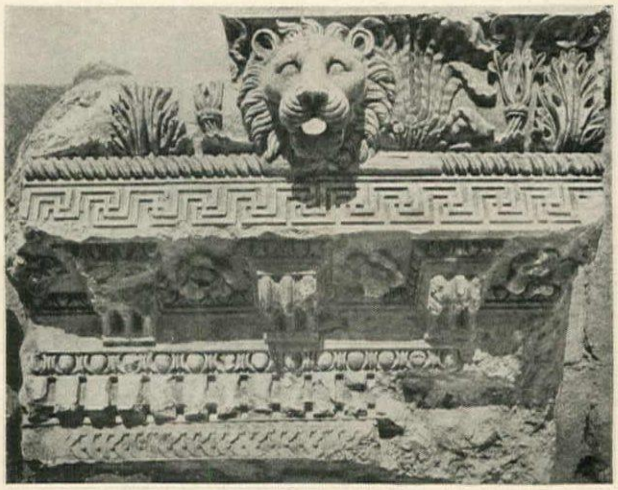
of the Great Altar of Burnt Offerings. Excavations here show several layers of slab pavement presuming many alterations around this old altar, which probably antedates the existing temple structures by many centuries of worship.

Surrounding the Great Altar lie the foundation stones of a later Basilica built of blocks torn from the great Pagan temple by the order of the Christian Emperor Theodosius. This "Philistine" structure clutters up the great stairway that rises from immediately behind the altar to the platform of the Great Temple of Jupiter. There you trace

Architrave of the Colonnades in the Court

the rectangular plan measuring 160 ft. by 290 ft. and count the column bases, nineteen on each side and ten across each end. Only six of the enormous Corinthian columns remain but with their aid you can mentally reconstruct the temple in all its original glory. The columns are unfluted and graceful, 65 ft. high and 7½ ft. in diameter. The shafts consist of only three drums originally clamped together by inset bronze straps long since dug out by vandals. The capitals are of heavy, unrefined Corinthian and the entablature, 13 ft. high is similarly of a decadent craftsmanship, but the great height hides the defects of detail very successfully, leaving only its majesty to impress you.

History gives us the meager facts that Antoninus Pius began the Great Temple in 140 A. D.; that Septimius Severus later dedicated it with a great feast and procession; and that the mad Caracalla finished it about 215 A. D. Constantine started its destruction in the third century and he was ably seconded by the vandal armies of history and great earthquakes of the twelfth and eighteenth centuries. We owe much of our



Detail of Cornice, Temple of Jupiter

knowledge of details and accurate measurements to the efforts of Professor O. Puchstein who excavated the site in 1900 for the Imperial Museum of Berlin.

To the South of the Great Temple and on a much lower platform, stands the Temple of Bacchus in a remarkable state of preservation considering its vicissitudes. One can't help but wonder if it is not the great God Bacchus rather than Mars who is the patron deity of conquering armies. As was usual, the Temple stands on a low basement with a flight of steps rising to the portico. The roofless cella walls, measuring 87 ft. by 74 ft., are mainly intact and are surrounded by a colonnade of Corinthian columns, octostyle, with fifteen on each side. They are 47½ ft. high and support an entablature 7 ft. in height. The North row stands intact but only a few of the rest are in position.

The aisle, ten feet wide, is covered by an arched ceiling coffered in rhomboids, triangles and hexagons out of which peer the richly sculp-

Frieze ornament, Temple of Bacchus

Interior, Temple of Bacchus, Baalbek

tured heads of gods and men surrounded by elaborate wreaths and garlands. The pronaos 25 ft. deep, has a cluster of columns on each side, the outer pair plain as the main peristyle and the inner two fluted. The familiar portal decorated with the lavishly carved trim of white marble has had its famous hanging keystone replaced. The inner walls of the cella are decorated by eight fluted Corinthian semi-columns supporting a heavy composite entablature consisting of a Corinthian architrave; Doric frieze of triglyphs; and a most elaborate cornice. The space between columns is broken by two sets of panels capped by circular and classic pediments. A marble tablet was placed in one of these panels to commemorate the visit of the Emperor Frederick Wilhelm, but it didn't survive the later visit of the Anzacs in 1918.

As mentioned before, the entire acropolis, measuring roughly 1,000 by 700 ft., rests on a heavy substructure of titanic masonry twenty feet above the plain. It is pierced by two huge tunnels, barrel-vaulted and connected by lesser chambers some of which are richly decorated. Huge blocks of varying sizes and periods dating as far back as the Phoenicians, go to make up this massive foundation. Many of these blocks, nicely fitted without mortar, measure 10 by 10 by 30 ft. But it is in the Western wall that you meet one of the greatest feats of ancient engineering. There, 19 ft. above the plain, rest three Cyclopic stones 13 ft. in height and 64 ft., 63½ ft. and 62 ft. long respectively. Still awed and incredulous, you walk a mile to the ancient quarry and find, cut and dressed except for one under end still fast to its native bed, an even greater brother measuring 13 ft. by 14 ft. by 70 ft. long. How these primitive builders lost in the shadow of antiquity conceived and actually achieved the cutting and moving of such blocks to their final resting places must ever remain a mystery. Yet there they lie, a reverent tribute to the Titanic Gods of old; a silent mockery to our boasted strength and skill.

"Technical Terms"

STILL those technical terms continue to be the bugbear of the general public, including (perhaps one should say "especially") our popular novelists, and other writers, states *The Architects' Journal,* London, in one of its recent issues. Still we read of people sliding down "banisters," receiving "coping stones" upon their unsuspecting heads, and in other extraordinary ways outraging the decencies of technical phraseology. "Banisters" for "balusters" is an offense of long standing; we imagine it is ineradicable. It has become one of those inexactitudes that time and usage sanctify and make more expressive than the correct word. "Coping stone" is rather more difficult to understand, though its literal meaning is intelligible enough. But it is surely unfair to a harmless necessary term that the pedestrian upon whom some part of a building falls should always be injured by the "coping stone." Why not the balustrade or the corona of the cornice? These technicalities should be used cautiously, or unknowingly the layman may find himself performing impossibilities. Only recently we heard of a gentleman who, a victim of odd habits (like Dr. Johnson, who made a point of touching every street post he passed), confessed that he always trod on the "lintel" of the doorway as he passed into a house. He was astonished to find that to do this he would have to turn a high somersault in the air!

Restoration of French Homes

A SOCIETY has been formed, with headquarters in Paris, with the object of restoring and preserving the historic old homes of France, states a recent issue of *The Architects' Journal,* London. The lead was set by Dr. Carvallo, an architectural expert and art connoisseur. It is realized that the efforts of the State to keep the old chateaux, farms, and cottages in repair are not sufficient. The officials will include some of the foremost authorities on historic art and architecture in the country.

Charles Dickens' Last Home to be Sold at Auction

GADSHILL PLACE, near Rochester, England, formerly the residence of Charles Dickens, is shortly to be offered for sale by auction, it is learned.

Gadshill is represented by Shakespeare as the scene of the exploits of Prince Henry and Falstaff. It was here that Dickens set up his Swiss chalet, in which he did much of his later work, and where he wrote the last page of his unfinished novel, "Edwin Drood," only two or three hours before his sudden death.

After his death the chalet was presented by the family to the Earl of Darnley and it now stands in the grounds at Colham.

REBUILDING AMERICAN CITIES

Two Notable New York Examples

IT is characteristic of American cities that they are always in a state of reconstruction which consists of either demolishing old buildings and erecting new ones or enlarging or rehabilitating existing structures. It is the enlarging of existing buildings that generally presents the greater difficulties in designing, planning and construction. In this case the existing building naturally has a controlling influence on the final design. The undertaking is far-reaching in all its ramifications.

Two notable examples of the enlargement of existing structures are the New York Times Building, originally designed by Buchman & Fox, architects, and the Johns-Manville Building, originally designed by Augustus N. Allen, architect. The additions and alterations are made by Ludlow & Peabody, architects. They are good examples of the successful accomplishment of such undertakings.

The New York Times Building was originally 143′ x 100′ in size, the Eastern 43′ frontage being four stories high and the balance eleven stories high. The addition consists of a structure 100′ x 100′ in size, eleven stories high, and a three story set-back structure, with tower, 200′ x 43′ in size extending over the old and new sections. In the rear, the old portion sets back at the second floor level and the new section sets back at the second, sixth and ninth floors.

Except for the space occupied by the boilers, pumps and switchboards, the entire sub-basement is used for paper storage, and as the newsprint reel room from which the paper is fed to the presses which occupy the entire basement. From the basement press room the papers are automatically transported to the delivery department which occupies the first story. At this place the papers are delivered to the motor trucks at a wagon dock, the trucks being entirely within the building when loading. The second to ninth floors inclusive have been largely rearranged to accommodate the business, composing rooms and other departments of the paper. The tenth floor is given over to the editorial writers and library. The eleventh floor contains a kitchen with restaurant for employees and private dining rooms. The twelfth and thirteenth floors are given over to library, classrooms, recreation rooms and a small hospital for employees. The executive offices are located on the fourteenth floor. A new double entrance is provided, the architectural treatment of which extends through the second story. The smokestack terminates in the lantern which surmounts the tower. The set-back portion and tower will be illuminated at night by flood-lights projected from the back of the parapet wall at the twelfth floor level.

The limitations of the Building Zone Resolution require the new portion to set back above the ninth floor level. It would be impossible to incorporate the addition with the old building under these requirements and produce a structure having any semblance of architectural unity. This was so satisfactorily demonstrated to the Board of Standards and Appeals that permission was given to make the front eleven stories high throughout. An outstanding feature of this design is its harmonious ensemble, the set-back portion being in fine relationship to the lower part and particularly well done as a unit.

The Johns-Manville Building presents an entirely different problem. The old building was about 48′ x 64′, twelve stories high. An L shaped property was acquired which surrounded the old building, having a frontage of about 32′ on Forty-first Street and 48′ on Madison Avenue making a total of about 96′ x 96′. The old building fronts will be extended to these limits. The existing copper cornice is removed and the attic space converted into a thirteenth story with a new terra cotta and brick cornice and parapet wall.

The principal set-back is at the fourteenth story with this section extending up to the twenty-first story inclusive. Other set-backs occur at the twenty-second and twenty-fifth floors, twenty-six stories in all. The stairways, elevators and main toilet rooms are removed from the old building. All of these utilities are located in the new portion and in the less well lighted spaces as much as possible. The new elevator plant consists of four passenger elevators to the thirteenth floor and three passenger and one freight elevator to the top. The passenger elevators are equipped with an automatic device to level the platform with the floor at stops, thus permitting a more quick operation. Without this device it is estimated that two additional passenger elevators would have been required properly to serve the building. The roof and back of the parapet wall at the fourteenth story are used to display, in actual service, the materials made for that purpose by the Johns-Manville Company.

Structural difficulties were encountered because of the new upper portion of the building extending over the old portion. This necessitated the reinforcing of some existing steel columns. This work was done during the night in order not to interfere with the occupants of the building. The first

BUILDING OF THE NEW YORK TIMES, WEST 43rd STREET, NEW YORK

BUCHMAN & FOX, ARCHITECTS

ALTERATIONS AND ADDITIONS BY LUDLOW & PEABODY, ARCHITECTS

BUILDING FOR JOHNS-MANVILLE CO., MADISON AVE., NEW YORK
AUGUSTUS N. ALLEN, ARCHITECT
ALTERATIONS AND ADDITIONS BY LUDLOW & PEABODY, ARCHITECTS

story is divided into three stories, one of which will be occupied by the owners.

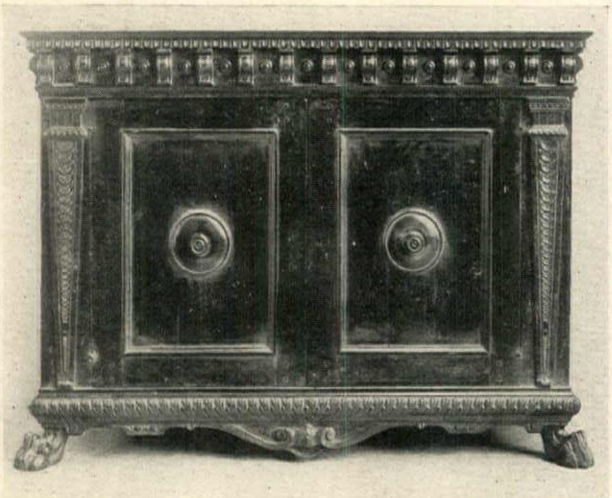
The old building was designed in a Venetian style while the new portion is designed along Lombardic lines. The new thirteenth story, cornice and parapet afford a satisfactory transition. A feeling of harmony is secured, in fact. It is a most happy solution of a difficult problem. The adaptability of the Lombardic to set-back conditions is well exemplified in this building.

What will eventually become of our tall steel frame buildings is a speculation at once interesting and of value. Does it often pay completely to demolish a skyscraper like the old Gillender Building, for instance, and erect on the site a complete new structure or is it not likely that on account of the durability of the steel frame building as now erected that most of such structures will be altered and added to? The average architect usually groans when he finds that he must have his pace set by an existing design with which he has no sympathy, but it may be open to question whether the same architect receiving a challenge of this sort does not do fully as well in adapting the style imposed and so modifying it and weaving it into a new design as if he had a building to design with free hand from the ground up. To bend himself to the style and conditions imposed by any problem is the first duty of an architect rather than to attempt to impose the style and conditions himself.

The modifying and glorifying of an old building, when well done, is an achievement perhaps more to be proud of than the unhampered solution of a problem. At any rate it is quite evident that this kind of thing must be done more and more as time goes by and the solutions of such problems are of considerable interest to our architects today.

In comparing the solution of the architectural problems involved in the New York Times and the Johns-Manville buildings it is to be noted that as the Times Building was raised vertically only a few stories and those set-back stories, it was possible and proper to maintain the heavy horizontal lines of the original cornice. In the Johns-Manville Building, on the other hand, as the building was to be raised vertically from twelve stories to twenty-six stories, the heavy cornice shadow at the twelfth story imposed by the overhanging Venetian cornice was impossible as it would cut the building nearly in two, horizontally. In the latter building, therefore, it seemed wise to remove this heavy cornice and also alter, somewhat, the architecture of the story directly under it and to give this portion a "vertical cornice" which would lead comfortably up into the thirteen stories superimposed. This change also made more easy a real harmony between the imposed architecture of the lower stories and the superimposed architecture of the thirteen story tower. As the building will now rise, the zoning set-backs melt one into the other with a sense of continuity to the very topmost member.

Walnut Credenza



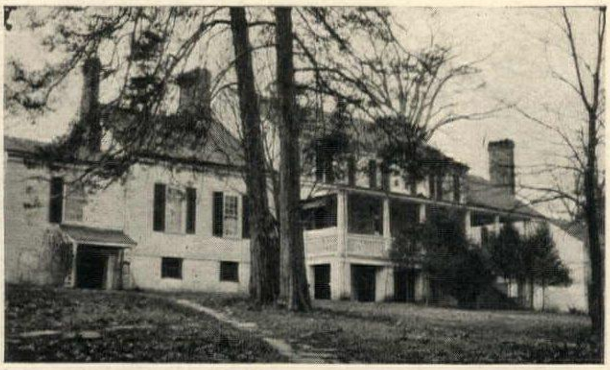
Italian Renaissance

Executed by Kensington Co.

AN ARCHITECTURAL RAMBLE *in* VIRGINIA PART II

BY CARL A. ZIEGLER, Architect

JUST North of the James River at Esmont, Virginia, lies what in Colonial days was one large plantation, taking in most of "Green Mountain." This plantation was the property of the Coles family, a name well known in that section, and from the high ground a splendid view is obtained over the famous "Piedmont" toward the East while to the West looms the Blue Ridge with the celebrated Shenandoah Valley just beyond. This splendid old plantation has been divided into a number of estates on some of which the old farm buildings still remain and are especially interesting because of their departure from the classical proportions generally associated with the mansions on the James.



Rear view in "Tallwood"

These old farm buildings like similar buildings in Pennsylvania and New England convey an atmosphere of real "dirt farming" but unmistakably they also express something of the gentility of the families who occupied these old estates. Architecture before it degenerated was always perfectly true in its expressions and in its sober moments it still is, although the signs have become very much confused in these latter days.

One of the most interesting of these old farm houses is "Tallwood" which is illustrated herewith. The original building was erected early in the eighteenth century and was intelligently enlarged in 1803.

The central building with its wings forms a very pleasing mass and the detail is just primitive enough to make one feel its nearness to the soil. The chimneys are an important feature of the design and it will be noted in the illustrations that these are built entirely free of the frame gables.

It was the custom in the early days to design the fanlights over the entrance door with just the same number of panes of glass as there were states in the Union. This led to some curious subdivisions, not always harmoniout with good design, but the date of the buildings can be calculated from these fanlights quite accurately, although the method in not infallible.

Entrance front, "Tallwood," Esmont, Va.

The Tenant House, Slave Quarters, Ice House and other out-buildings on this estate are of particular interest and give a very comprehensive idea of the character of farm buildings found upon the old plantation.

These white buildings seen through the huge box trees and sturdy sycamores which abound in this section, give a character to these old Virginia farms that is quite different from any other expression of the Colonial type in this country and so true is its record, that one may with very little stretch of the imagination picture the plantation life of early Virginia as it existed in the days when George Washington was practicing the surveyor's art in that vicinity.

At Tallwood are two gigantic yew trees, probably two hundred and fifty years old. Standing beneath these trees, whose outer branches touch the ground, one feels entirely cut off from the world and the flickering of the sunlight through the leaves combined with the notes of the cardinal recall the beautiful "Waldwaben" music of Wagner.

Lady Astor on her recent homecoming to Virginia visited these trees which were associated with her girlhood days spent in these parts and stated that she had not seen finer specimens of the yew anywhere in England. That so brilliant a personage should have remembered a tree known in childhood, despite the turmoil of political life abroad, in which she has played so intimate a part, is evidence that nature's signboard still reads true and has not been altered by the trend of modern thought.

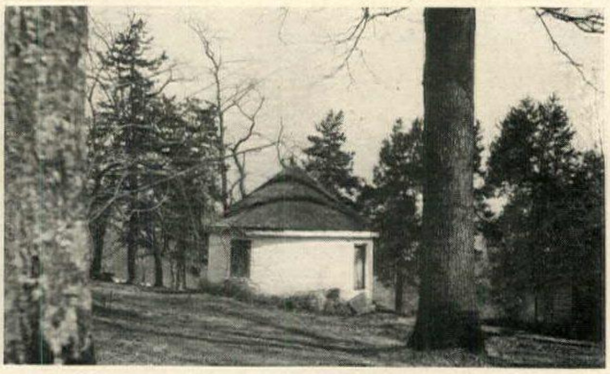
Detail of Entrance, "Tallwood"

Owing to the fact that architectural publications are prone to use for illustrations only the more pretentious buildings of the "Colonial Period" the minor work of the epoch is apt to be neglected and the architectural student who must confine his research entirely to books, very often has no knowledge at all of the very charming small buildings that form so important a part of the early American work.

In a ramble through Maryland the writer was able to secure many photographs of buildings that had never been published in any architectural publication, although several such as "Beverly" on the Pocomoke River were quite important examples of the Maryland Colonial type.

Photography has opened the architectural storehouse of the world to any one who will inquire and the well conducted magazines of the country are becoming each year more efficient in bringing into the household information that is causing the public and particularly the younger generation to build up a more intelligent appreciation of architecture. This contention is proven by the demand for better design in the smaller houses that represent the portion of the building industry in which most people are personally interested and the architect who is too "sot" in his ways or too tired to conform to this demand is gradually falling by the way, along with the village doctor who finds that modern fiction fills in his spare time better than treatises on new methods of diag-

Typical out-building on one of the old plantations



The Ice House, "Tallwood"

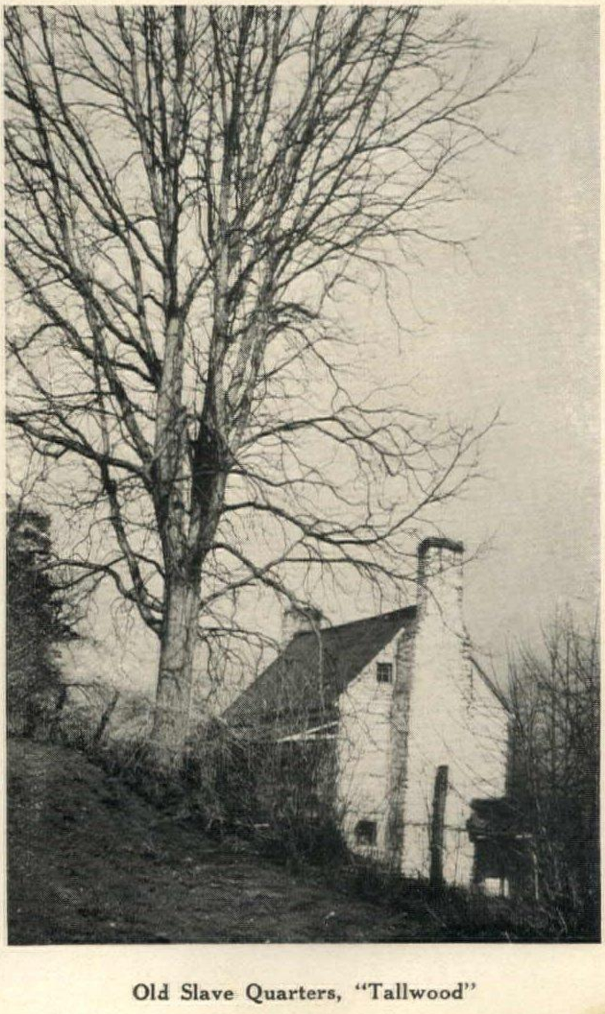
Tenant House, "Tallwood," Esmont, Va.

nosis and the farmer who "reckons that Burbank is another one of them college chaps."

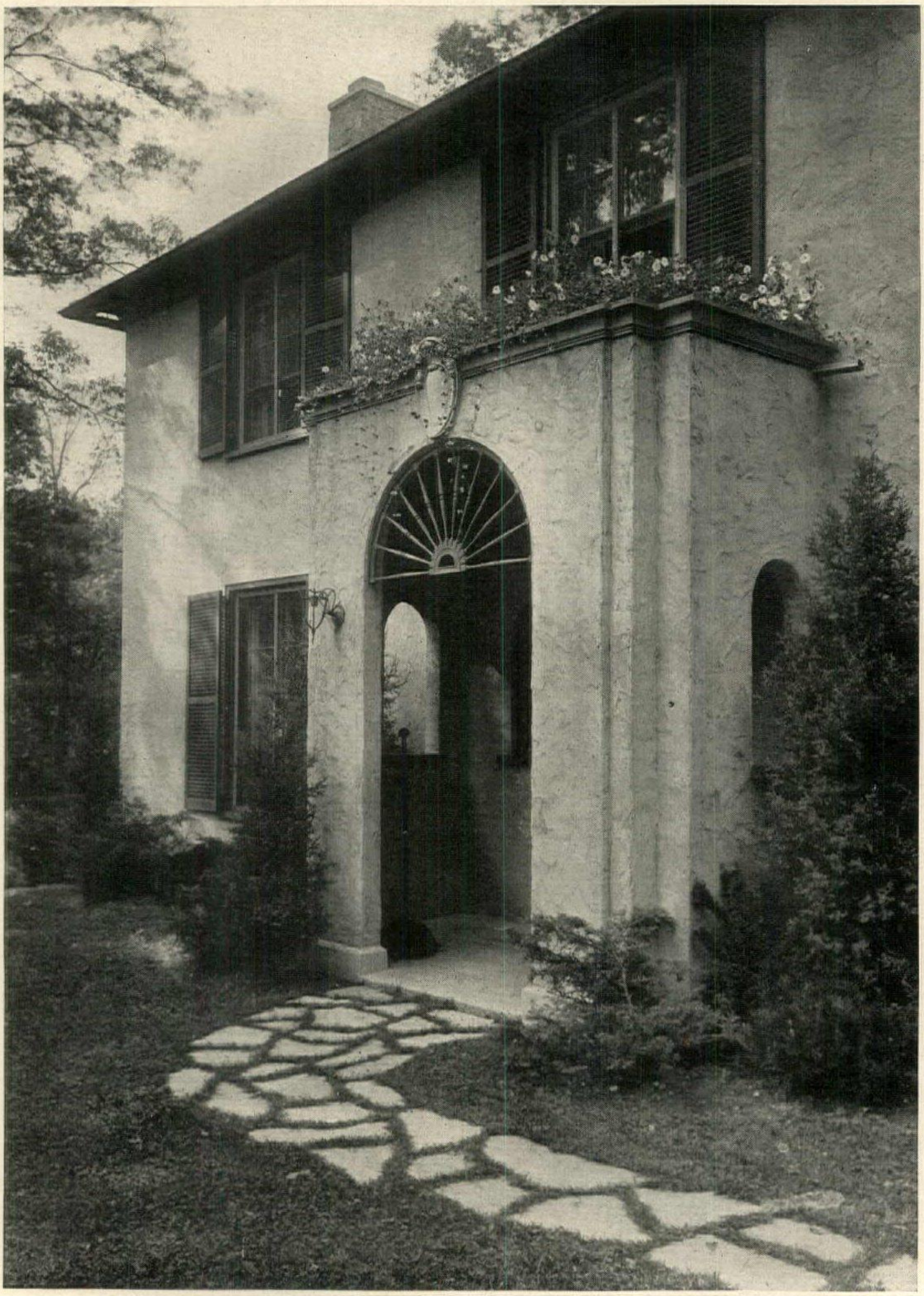
Although photography has undoubtedly been of the greatest assistance to the professional architect as well as to the layman, it cannot be too strongly impressed upon the student of architecture that only by the closest kind of study of the buildings themselves may he hope to gain the information that will enable him to have something more than a mere superficial knowledge of the subject. This may make it possible for him to meet the demands of his clients for the present but the public which is fast learning to differentiate between the varying moods of Chippendale, Hepplewhite and Sheraton are even now demanding a more sincere expression of the old manner of building in their country houses.

Even the operation builder who probably has his ear closer to the ground than most architects, realizes that he may no longer paint one of his stock designs white and call it "Colonial" and advertise the same house painted a chocolate brown as of the best "English" traditions.

There was a time not long since when the glaring signboards of the illiterate builder (one who uses bad grammar in building) deceived the general public as to the architectural merits of their wares, but the advent of the motor and with it the feasibility of going back to the source and there learning how true craftsmanship expressed itself, have revealed to the thinking public that the "jerry builder" with his architectural monstrosities, even though he may flood the mails with elaborate magazines and pamphlets on the subject of "stock designs" etc., etc., is really no more advanced in civilization than the ignorant painter referred to in the first part of this article who unwittingly changed the sign of the old "Bachanallian" Inn to the "Bag of nails."

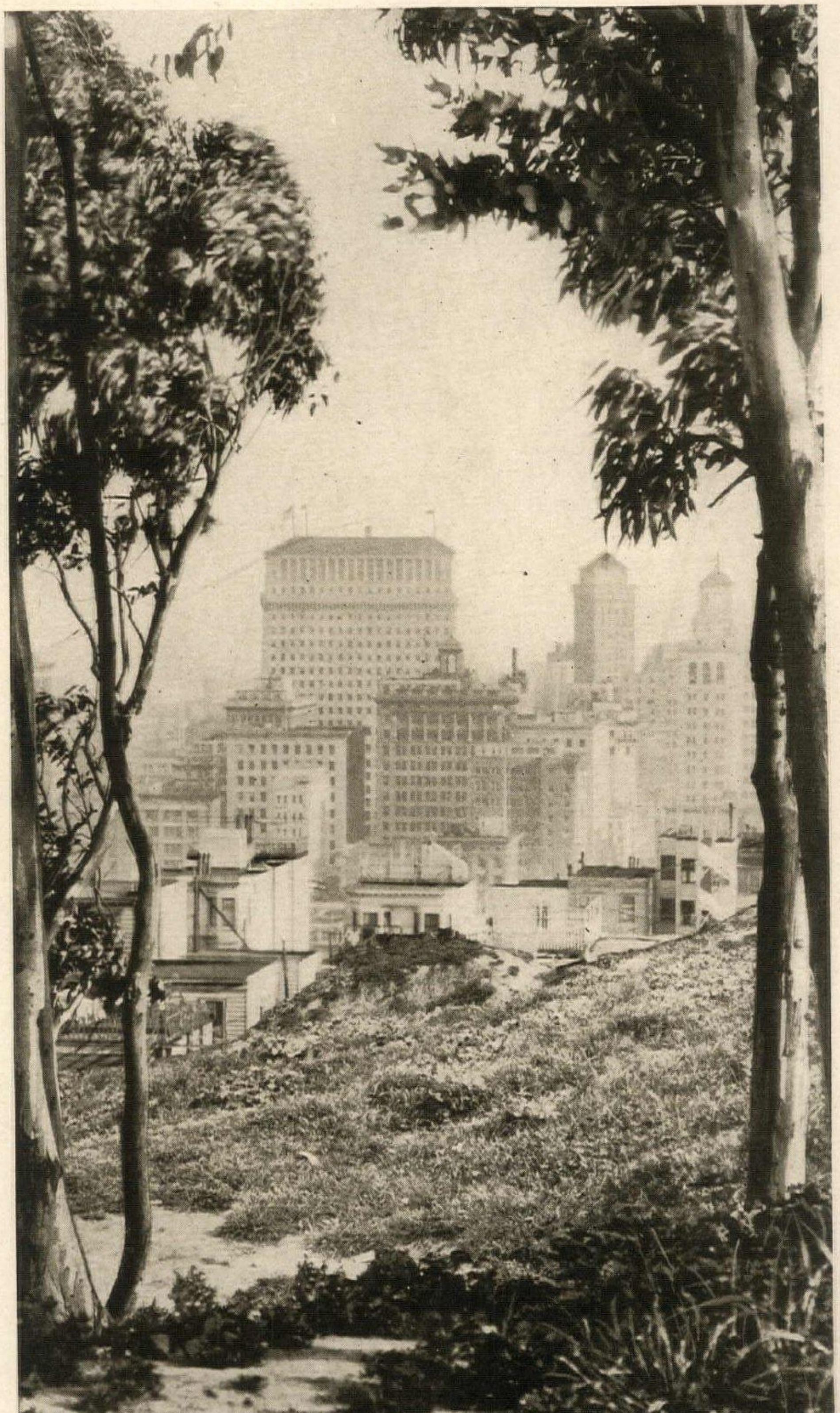


Old Slave Quarters, "Tallwood"



ENTRANCE DETAIL, HOUSE OF C. E. MAXWELL, JR., WINNETKA, ILL.

RUSSELL S. WALCOTT, ARCHITECT



VIEW FROM TELEGRAPH HILL

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT

MAIN ENTRANCE

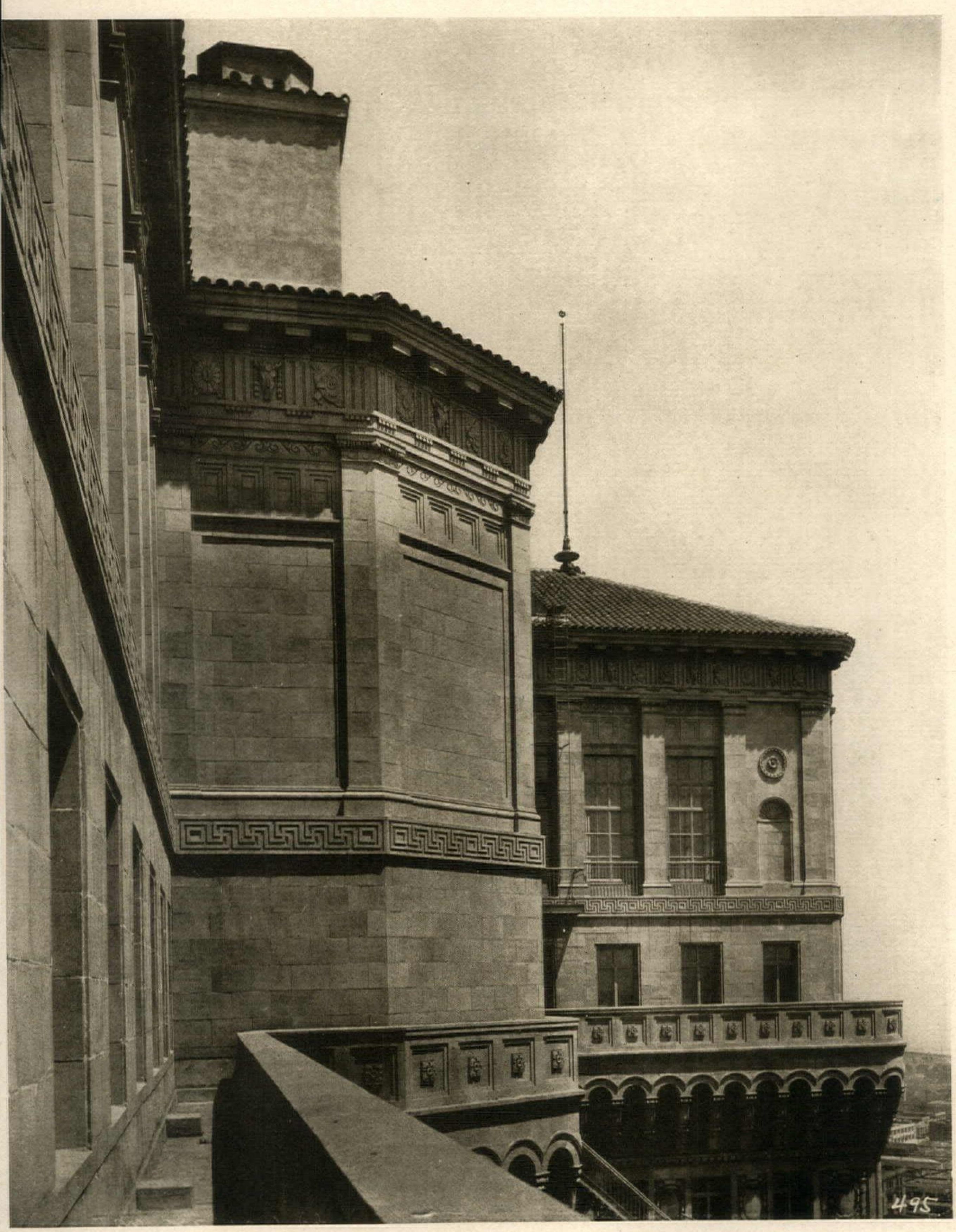
BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT

THE COURT FAÇADE

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

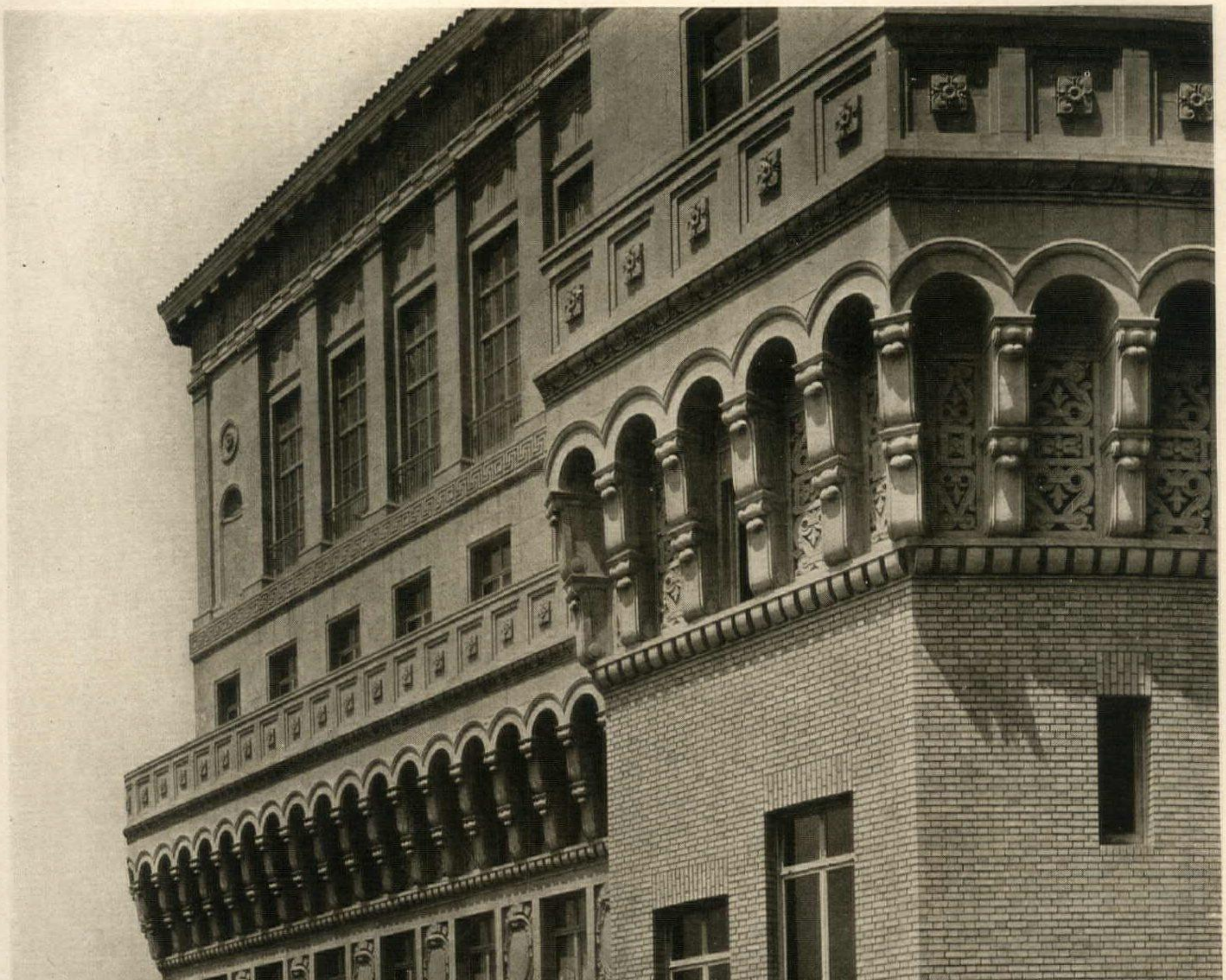
GEORGE W. KELHAM, ARCHITECT



COURT DETAILS ABOVE 18th FLOOR

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT



DETAILS IN COURT

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT

ROOF GARDEN, 22nd FLOOR

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT

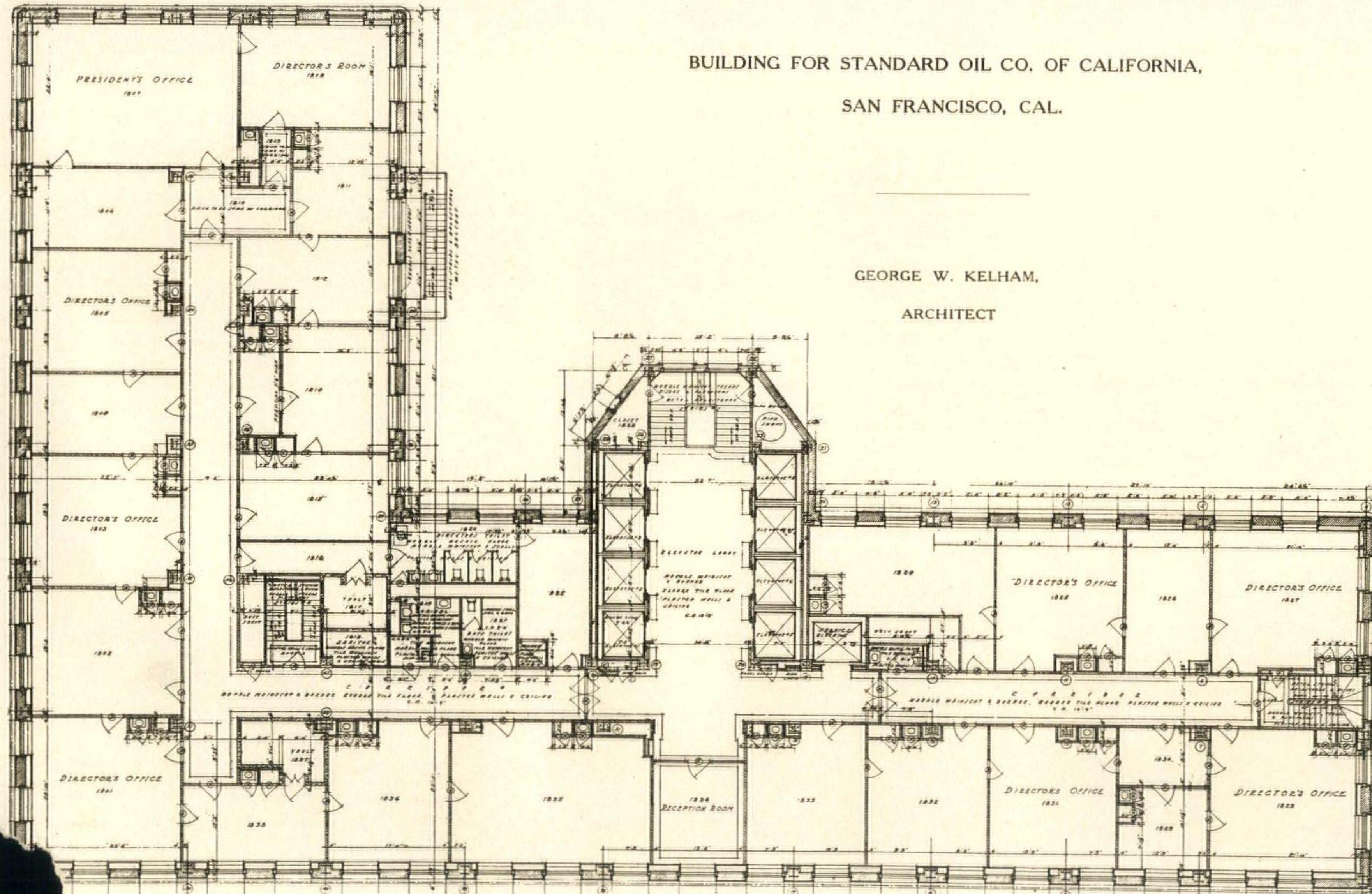
PRESIDENT'S OFFICE

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT

BUILDING FOR STANDARD OIL CO. OF CALIFORNIA, SAN FRANCISCO, CAL.

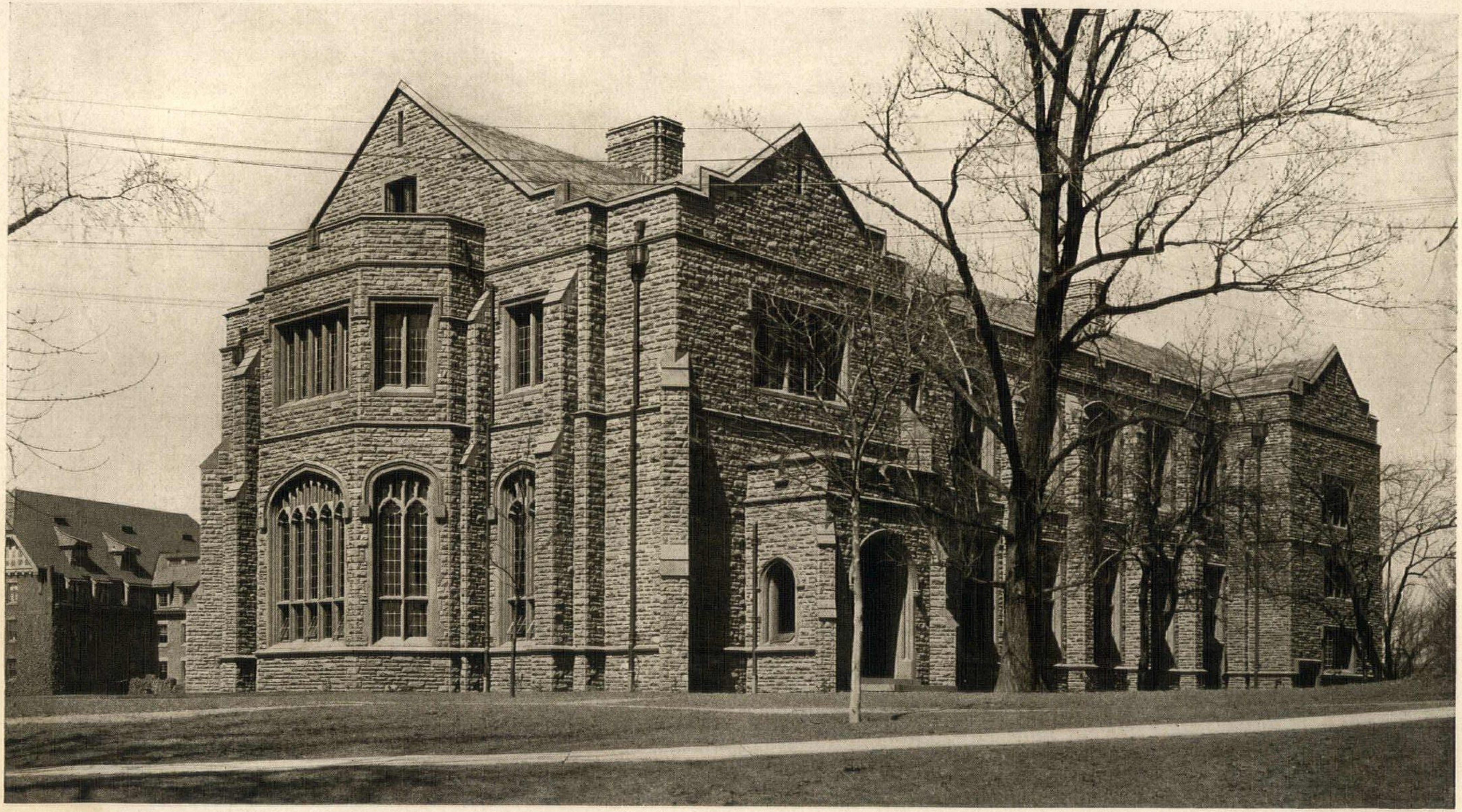
GEORGE W. KELHAM, ARCHITECT



EIGHTEENTH FLOOR PLAN

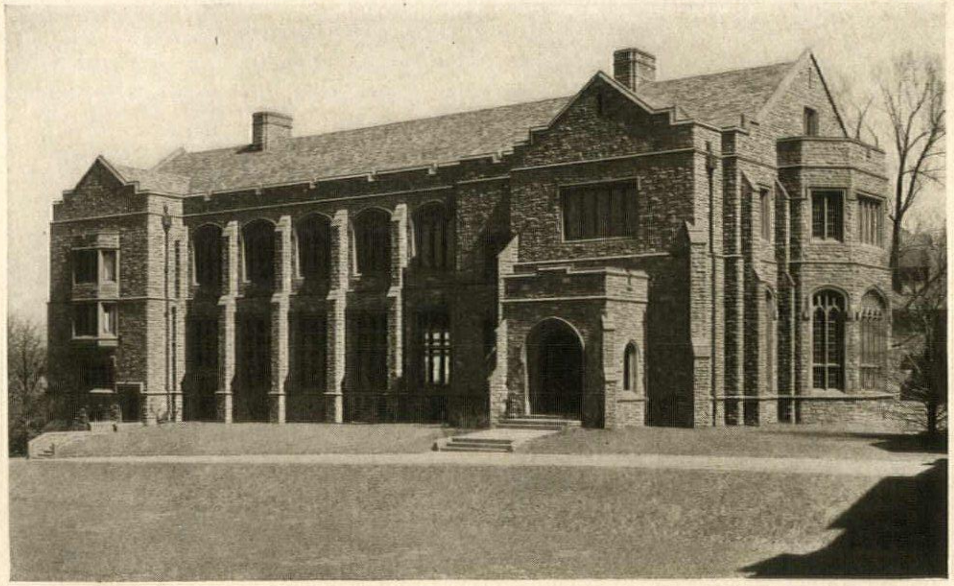
TOWN HALL, LITTLETON, COL.

J. B. BENEDICT, ARCHITECT



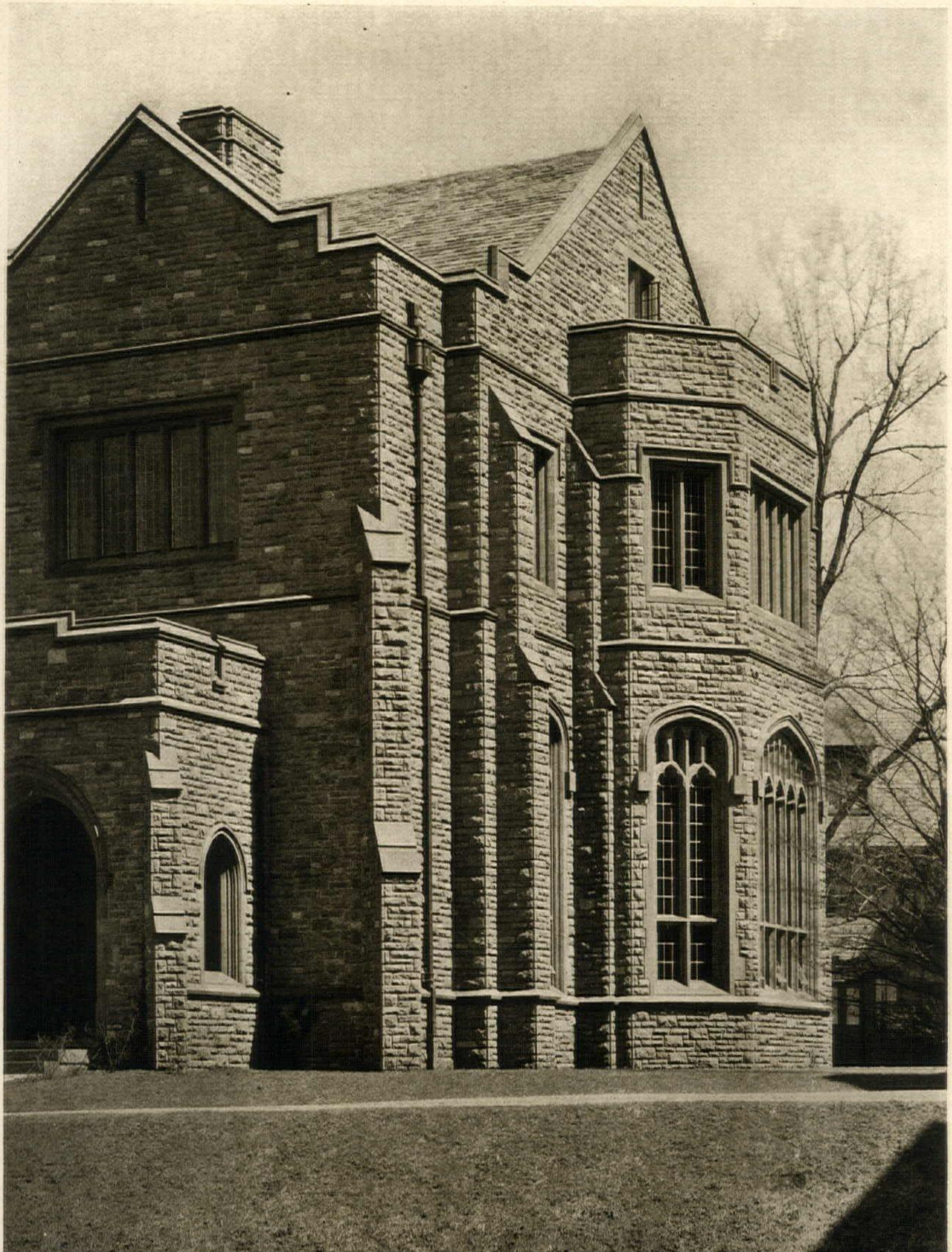
MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.

HEWITT & ASH, ARCHITECTS



MEMORIAL HALL,
THE HILL SCHOOL, POTTSTOWN, PA.

HEWITT & ASH, ARCHITECTS



BAYS IN MEMORIAL AND CLUB ROOMS

MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.

HEWITT & ASH, ARCHITECTS

BAY IN MEMORIAL ROOM

MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.

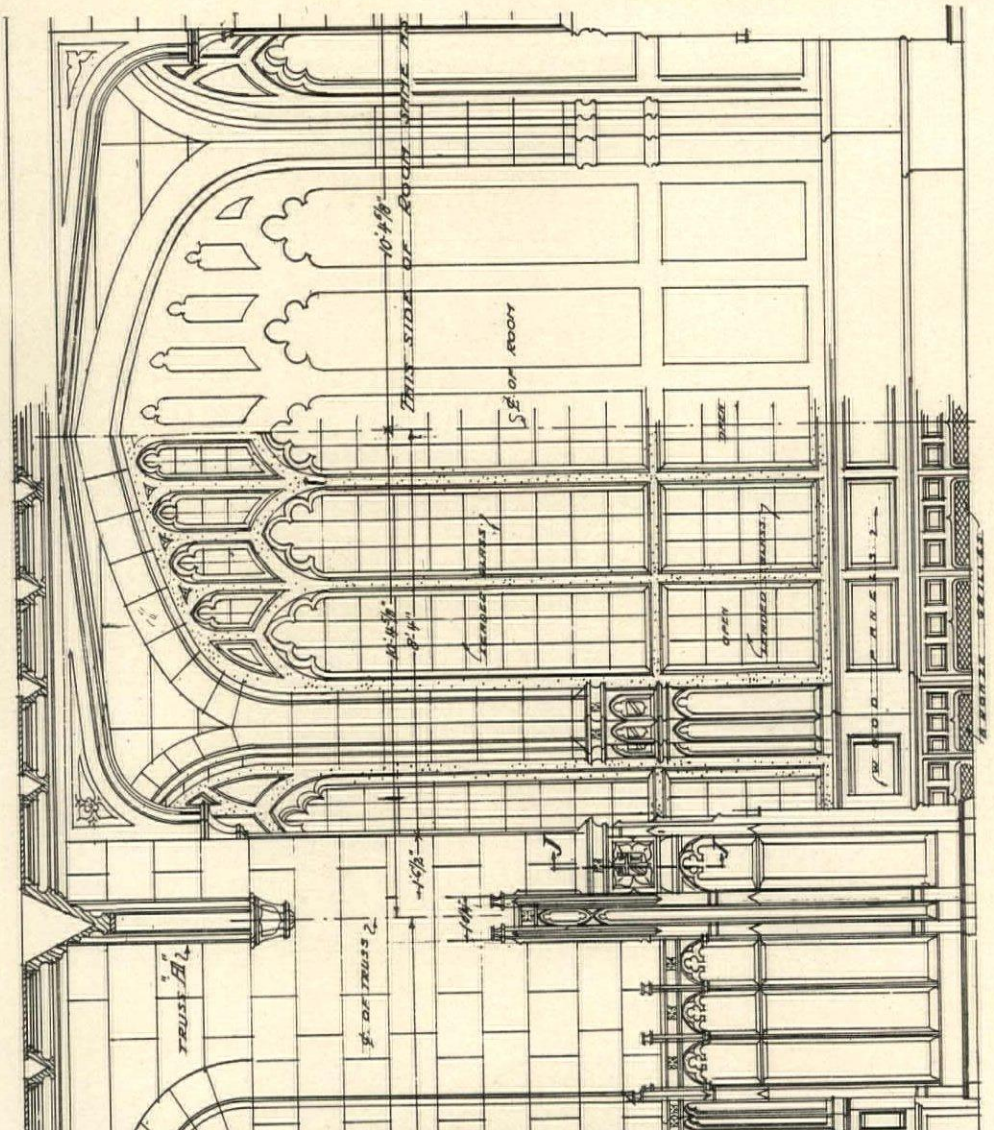
HEWITT & ASH, ARCHITECTS

LIBRARY
MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.
HEWITT & ASH, ARCHITECTS

FACULTY CLUB ROOM

MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.

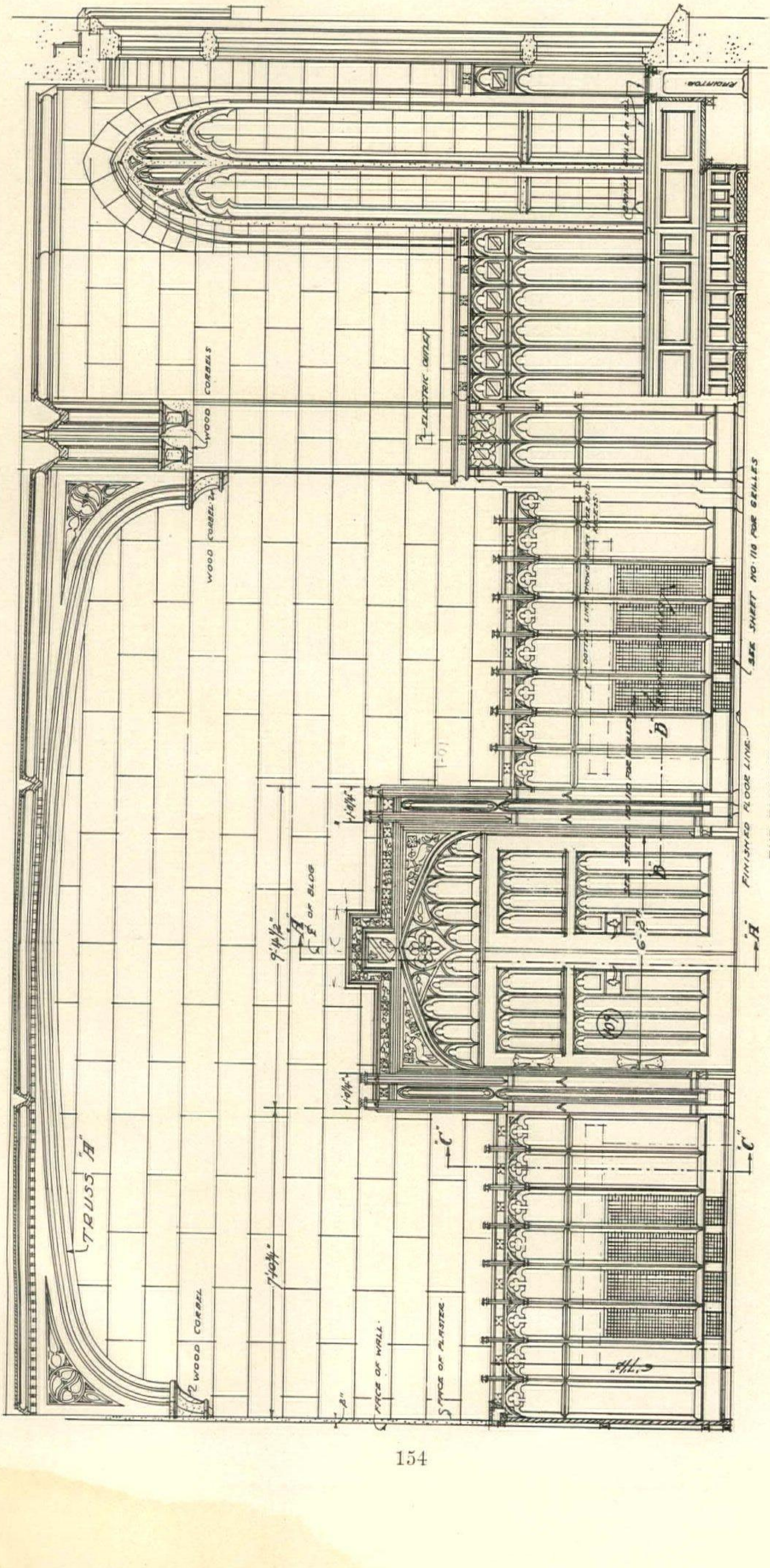
HEWITT & ASH, ARCHITECTS



ELEVATION, SOUTH SIDE, MEMORIAL ROOM

MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.

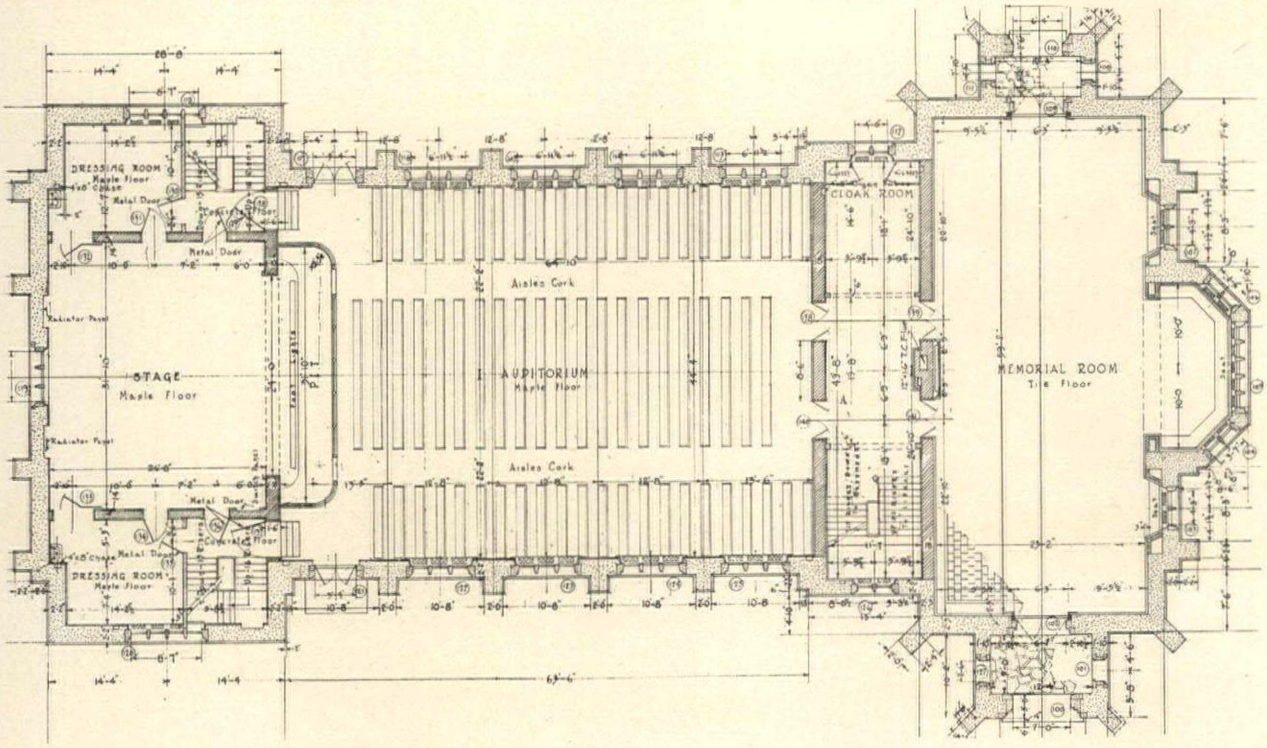
HEWITT & ASH, ARCHITECTS

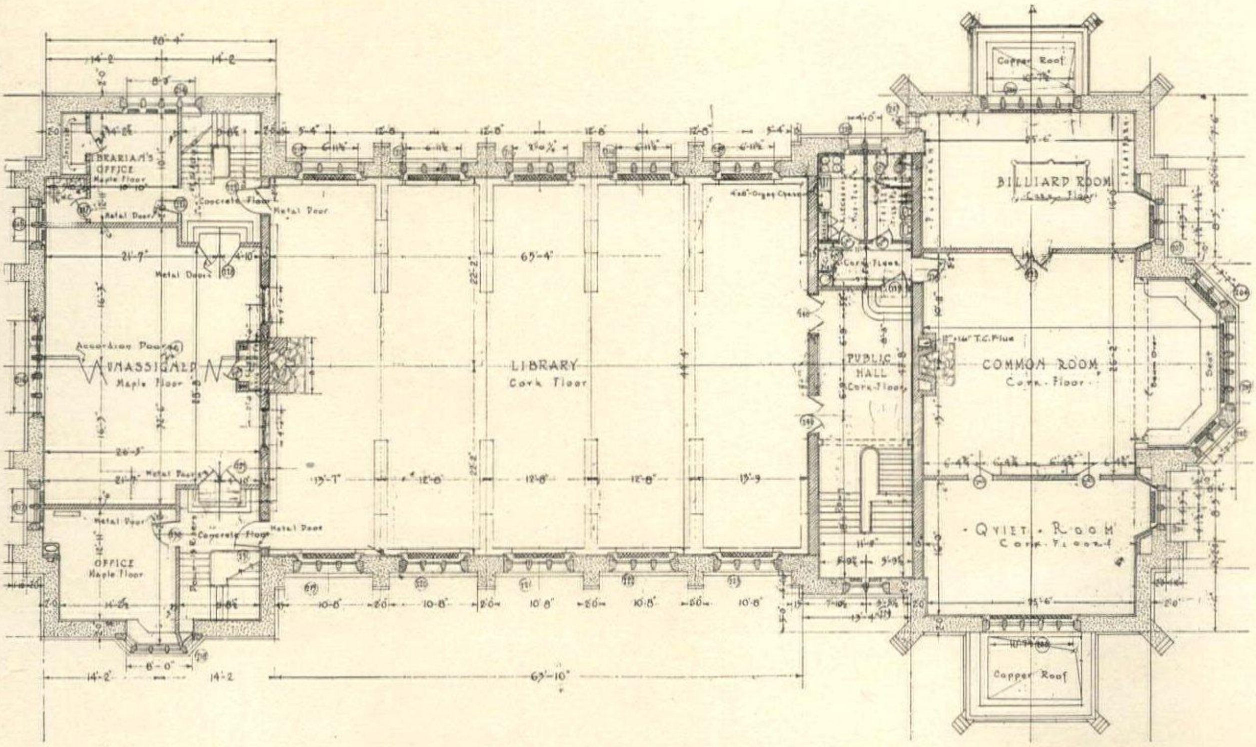


END ELEVATION, MEMORIAL ROOM

MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.

HEWITT & ASH, ARCHITECTS





MEMORIAL HALL, THE HILL SCHOOL, POTTSTOWN, PA.

HEWITT & ASH, ARCHITECTS

BEAUX-ARTS INSTITUTE *of* DESIGN

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BY special arrangement with the Society of Beaux-Arts Architects, there appears in each issue of THE AMERICAN ARCHITECT *an average of five pages devoted to the presentation of drawings selected from the Beaux-Arts Institute of Design exhibitions, and also the listing of awards and the promulgation of all notices to students. These matters will be exclusively presented to students of the Beaux-Arts Institute of Design through the pages of* THE AMERICAN ARCHITECT. *By arrangement with the publishers of* THE AMERICAN ARCHITECT, *a special student subscription rate of* $5.00 *per annum has been secured. Further particulars with reference to this service to Beaux-Arts students may be obtained by addressing* THE AMERICAN ARCHITECT, 243 *West 39th Street, New York City.*

SOCIETY OF BEAUX-ARTS ARCHITECTS

OFFICIAL NOTIFICATION OF AWARDS

JUDGMENT OF JULY 17th, 1923

FINAL COMPETITION FOR THE 16th PARIS PRIZE

of the

SOCIETY OF BEAUX-ARTS ARCHITECTS

PROGRAM

The Annual Committee on the Paris Prize proposes as subject of this competition:—

"AN OFFICE AND RECEPTION BUILDING FOR THE PRESIDENT OF THE UNITED STATES"

Facing the White House, but separated from it by a public park, is a rectangular plot of ground, 600'-0" long by 450'-0" deep. One long side, looking towards the White House, faces a broad avenue; the other three sides are bounded by streets.

It is proposed to erect on this site a building to house the executive offices and to provide a suite for the governmental receptions. The building, with its main entrance facing the White House, shall not exceed 300' in any dimension, exclusive of steps and terraces. An underground passage will connect it with the White House.

The building, serving two distinct uses, will require:—

(1) THE EXECUTIVE OFFICES on the first or ground floor, which will be in continual use.

(2) THE RECEPTION SUITE on the second floor, which will only be opened for great receptions.

It is essential that the circulation (particularly to and in the reception suite) should be of the simplest and most direct kind, to facilitate the handling of great crowds.

THE FIRST FLOOR REQUIREMENTS ARE:—

(1) Spacious entrances.

In connection with the entrance to the reception suite, there should be elevators and ample dressing, toilet and coat rooms for both ladies and gentlemen. The space necessary for coat storage is so great that it may be placed either in the basement or in a mezzanine with mechanical arrangements for transporting articles back and forth.

(2) A staircase of honor leading to the reception suite on the second floor.

(3) Ample waiting rooms for the executive offices.

(4) Offices for the President.

(5) Offices for the secretary to the President.

(6) The cabinet room with anteroom and conference room adjoining. Nos. 4, 5, and 6 should form an intercommunicating unit, and should communicate with the other services without passing through public spaces.

(7) Space for telegraphers, telephone and radio operators.

(8) A large space for the clerical staff, which may be subdivided.

(9) A press room.

THE REQUIREMENTS FOR THE SECOND FLOOR consist of a great reception suite composed of rooms of varying sizes communicating one with another in the most direct manner. One of these rooms will be the Presidential Reception Room and a private stair from the first floor should allow him easy access. No state banquet hall is to be provided, but arrangements should be made for a buffet service, placing the kitchen and service so as not to interfere in any way with the arrangement and character of the suite.

JURY OF AWARDS:—James Gamble Rogers, Raymond M. Hood, Joseph Howland Hunt, John M. Howells, J. Otis Post, Whitney Warren, Benjamin W. Morris, Henry Bacon, Charles A. Platt, M. B. Medary of Philadelphia, Benno Jansson of Pittsburgh, G. A. Lansburgh of San Francisco, and H. Oothout Milliken—Chairman.

NUMBER OF DRAWINGS SUBMITTED:—5.

AWARDS:—

PLACED FIRST—(FIRST MEDAL):—Lee Rombotis, University of Pennsylvania, Philadelphia, Pa.

PLACED SECOND—(FIRST MEDAL):—Harry K. Bieg, Armour Institute of Technology, Chicago, Ill.

PLACED THIRD—(SECOND MEDAL):—I. Jerry Loebl, Armour Institute of Technology, Chicago, Ill.

HORS CONCOURS:—R. Banks Thomas, Sr., Atelier Hirons, New York City, N. Y.

HORS CONCOURS:—Rudolph DeGhetto, Atelier Hirons, New York City, N. Y.

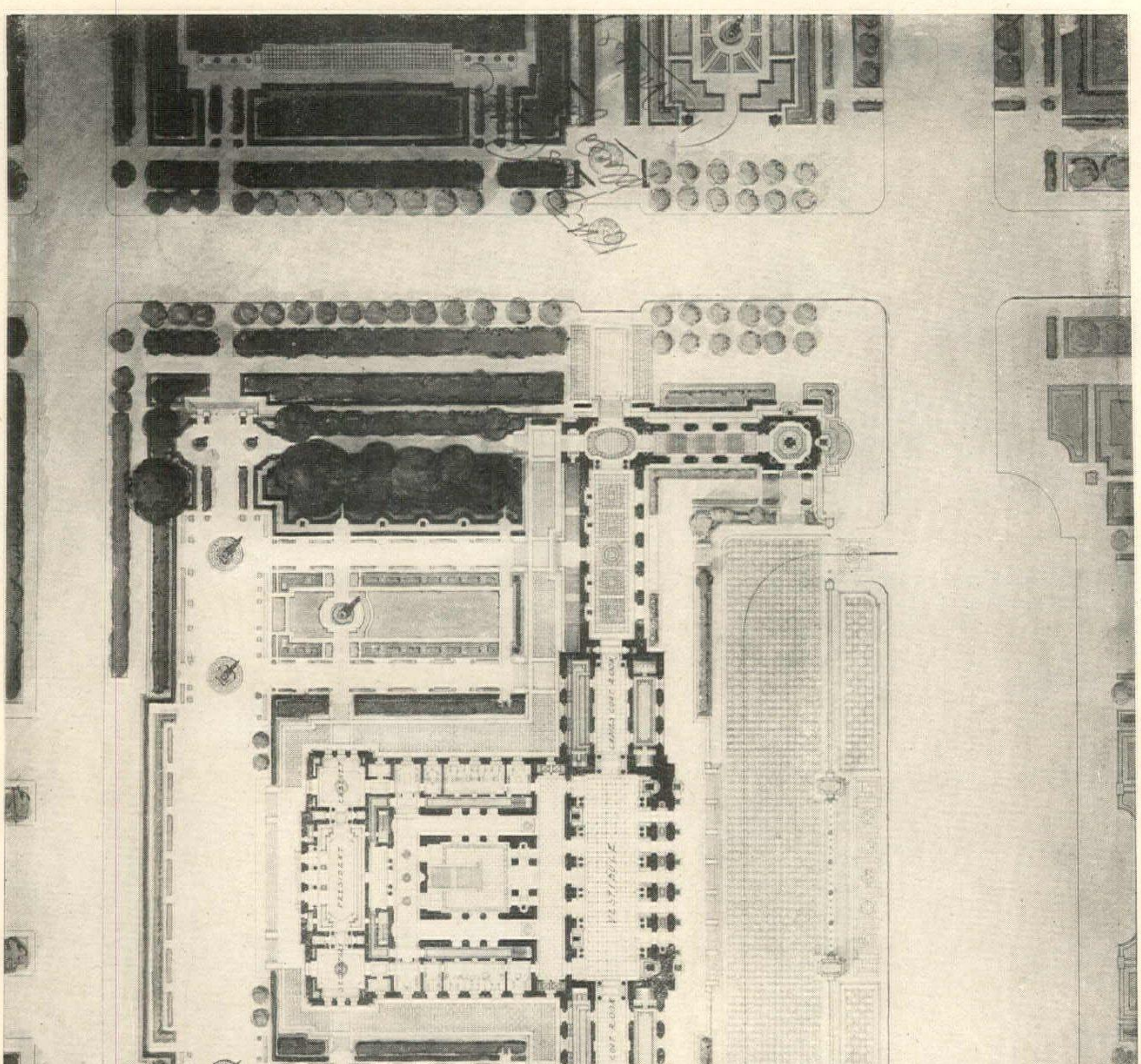
Note: The jury regretted that it was necessary, on account of changes from the sketches submitted, to place two competitors Hors Concours.

The fact that a sketch is demanded presupposes that the competitor should express in it the germ of his solution and indicate in it the disposition of his main elements and masses.

LEE ROMBOTIS — PLACED FIRST AND FIRST MEDAL — UNIVERSITY OF PENNSYLVANIA

FINAL COMPETITION FOR THE 16th PARIS PRIZE

"AN OFFICE AND RECEPTION BUILDING FOR THE PRESIDENT OF THE UNITED STATES"



LEE ROMBOTIS — PLACED FIRST, FIRST MEDAL — UNIVERSITY OF PENNSYLVANIA

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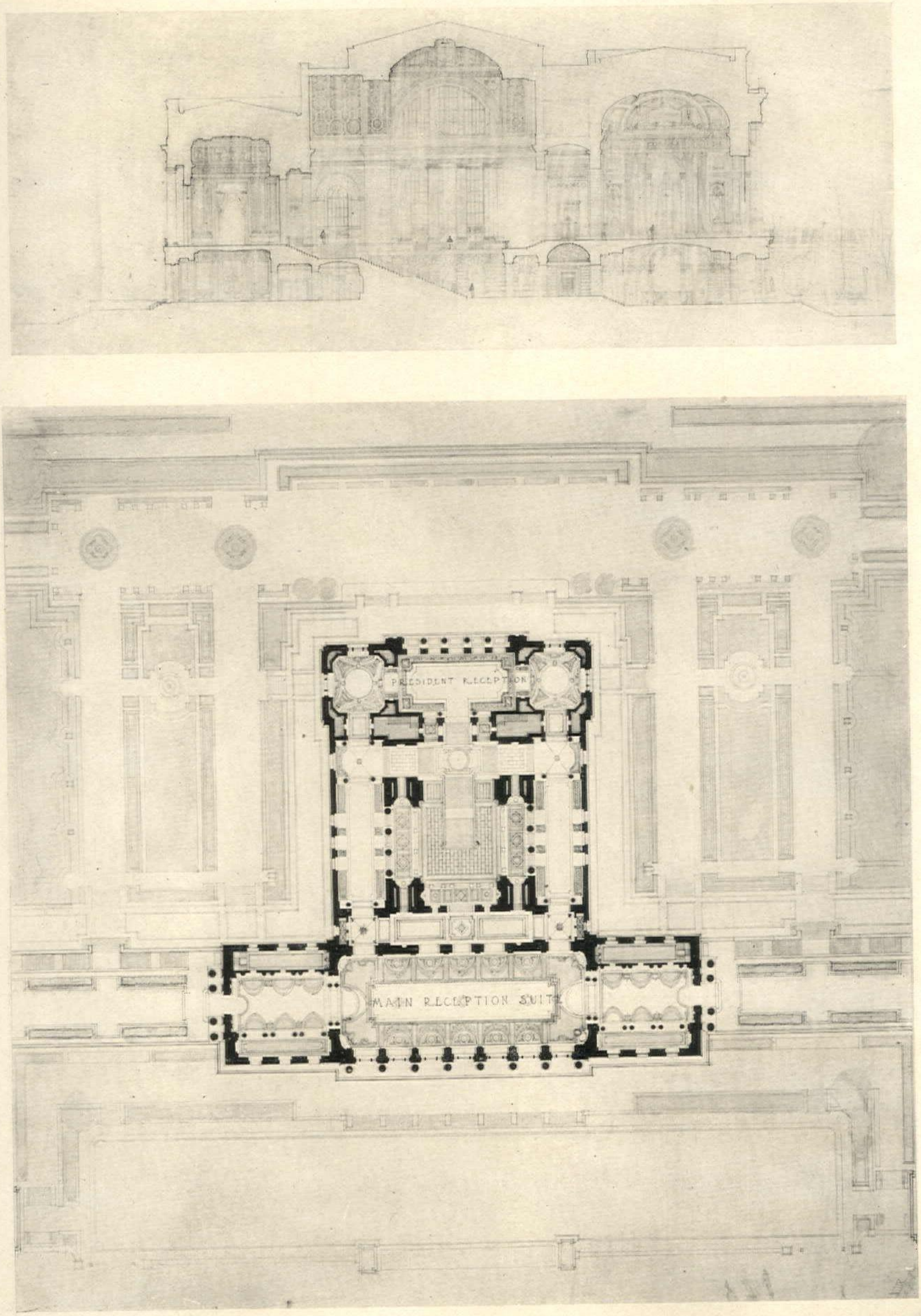

LEE ROMBOTIS | PLACED FIRST, FIRST MEDAL | UNIVERSITY OF PENNSYLVANIA

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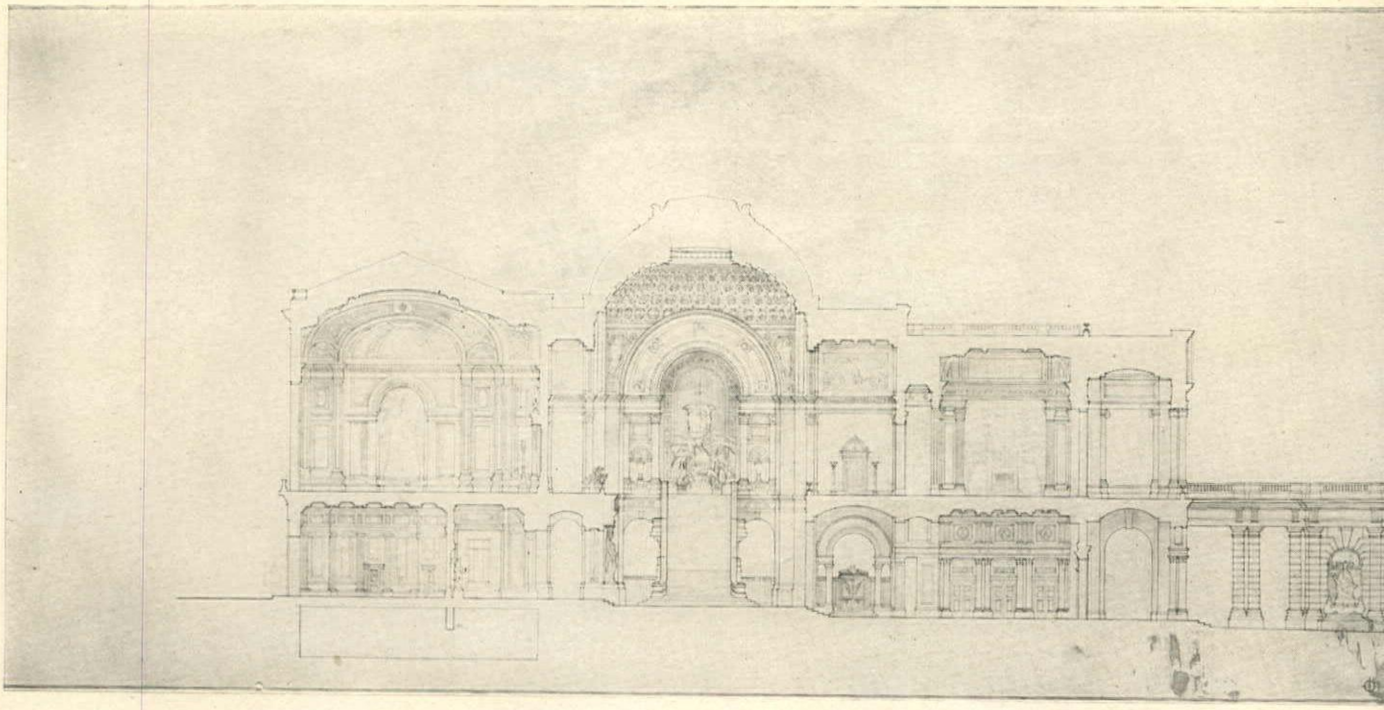
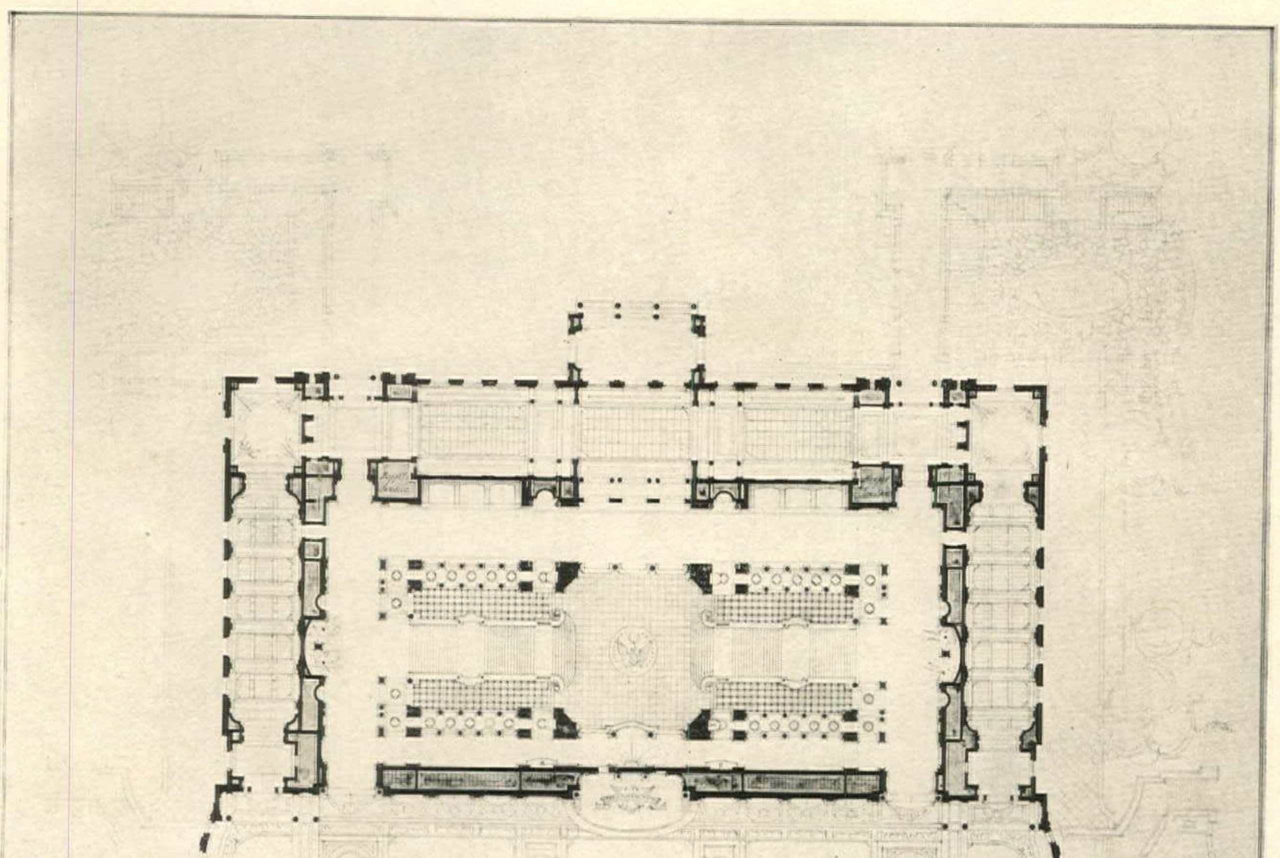
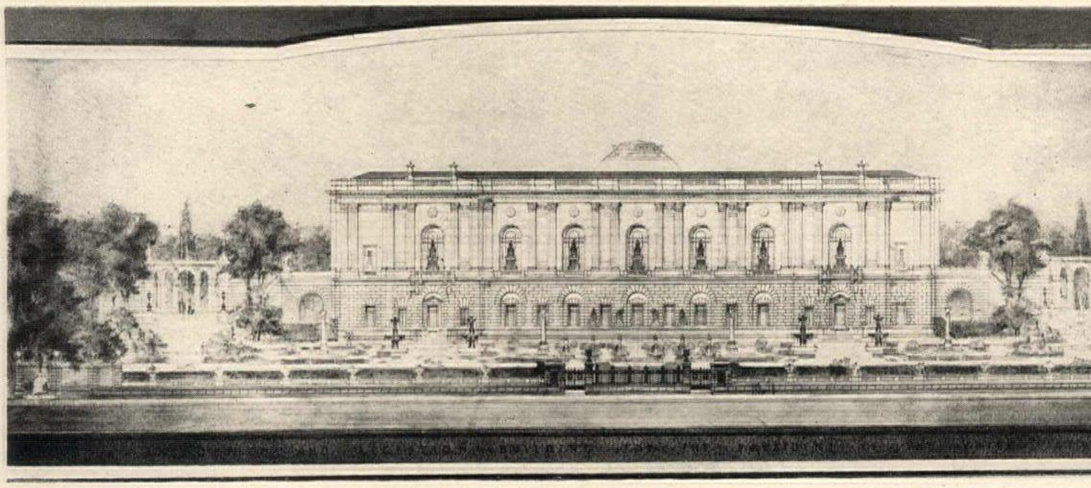


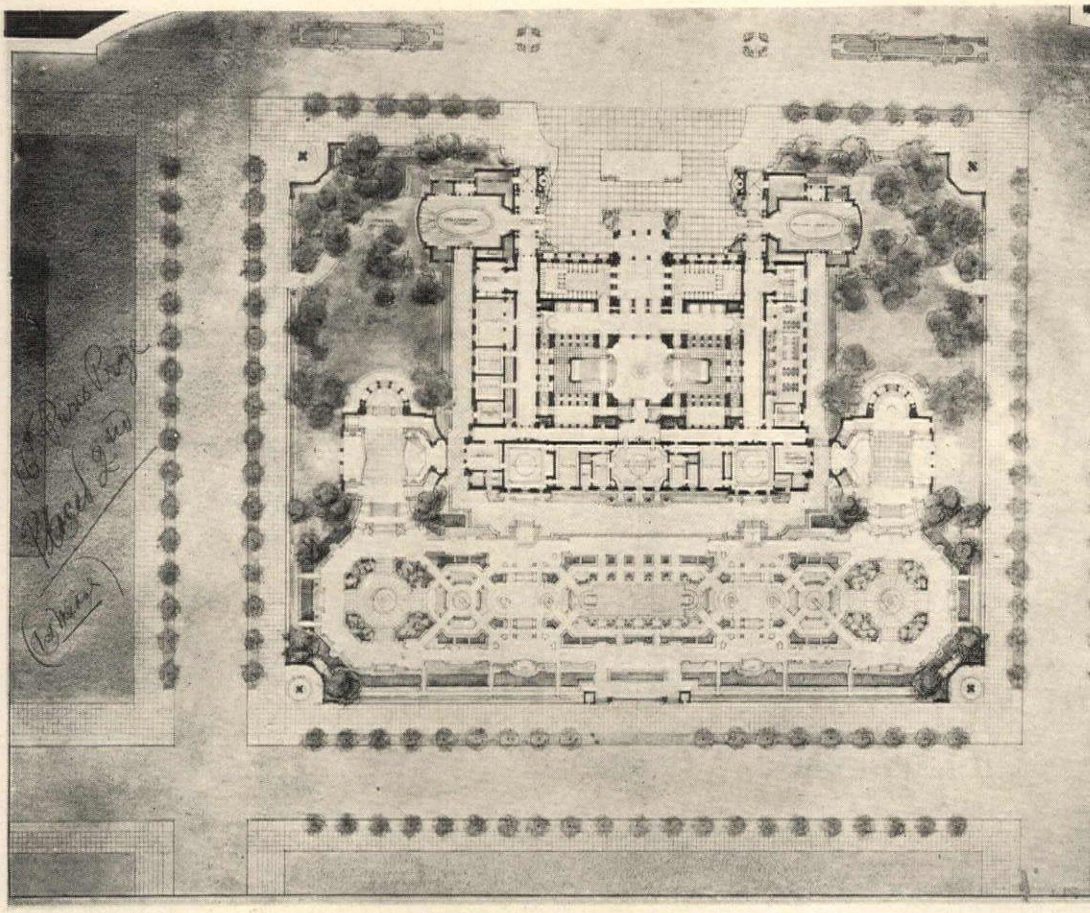


HARRY K. BIEG—PLACED SECOND, FIRST MEDAL—ARMOUR INSTITUTE OF TECHNOLOGY, CHICAGO

FINAL COMPETITION FOR THE 16th PARIS PRIZE

"AN OFFICE AND RECEPTION BUILDING FOR THE PRESIDENT OF THE UNITED STATES"





HARRY K. BIEG—PLACED SECOND, FIRST MEDAL—ARMOUR INSTITUTE OF TECHNOLOGY, CH

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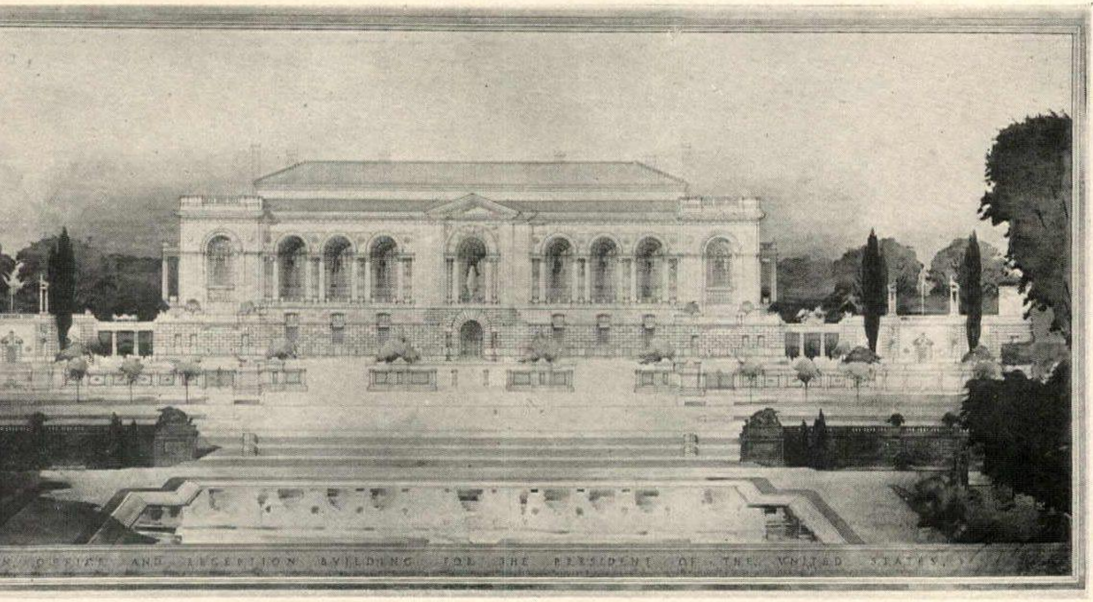

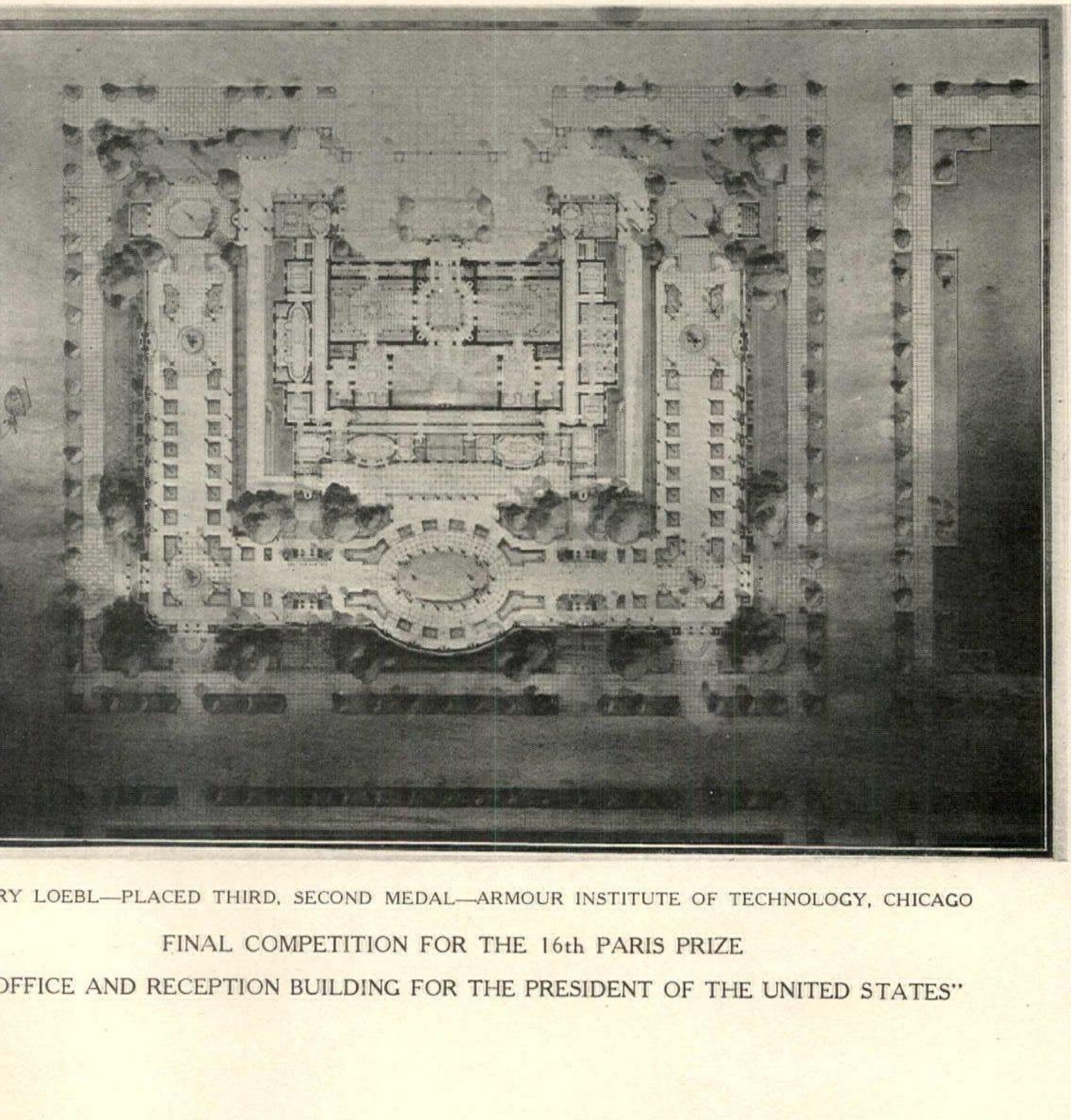

RY LOEBL—PLACED THIRD, SECOND MEDAL—ARMOUR INSTITUTE OF TECHNOLOGY, CHICAGO

FINAL COMPETITION FOR THE 16th PARIS PRIZE

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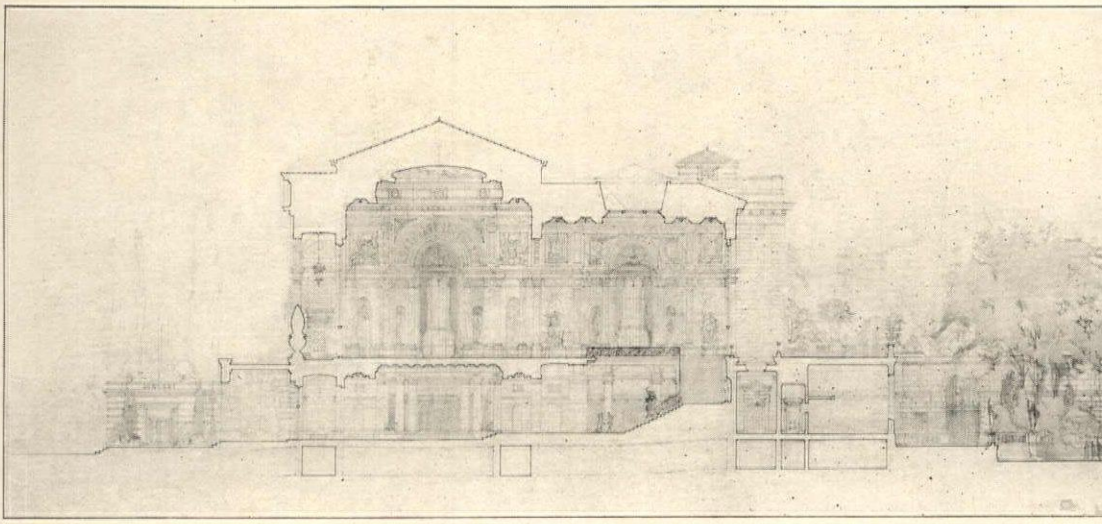
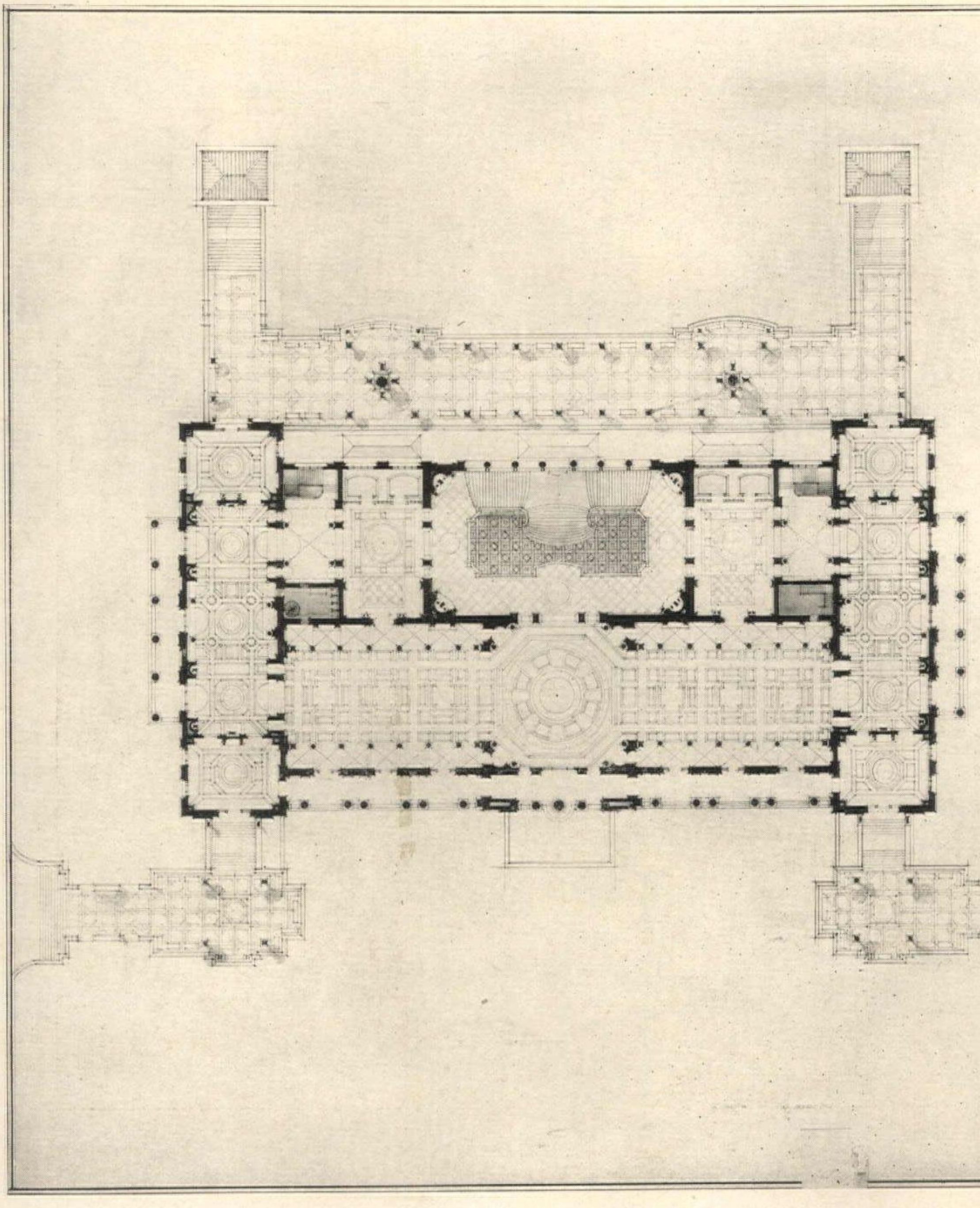




I. JERRY LOEBL—PLACED THIRD, SECOND MEDAL—ARMOUR INSTITUTE OF TECHNOLOGY, CH

FINAL COMPETITION FOR THE 16th PARIS PRIZE

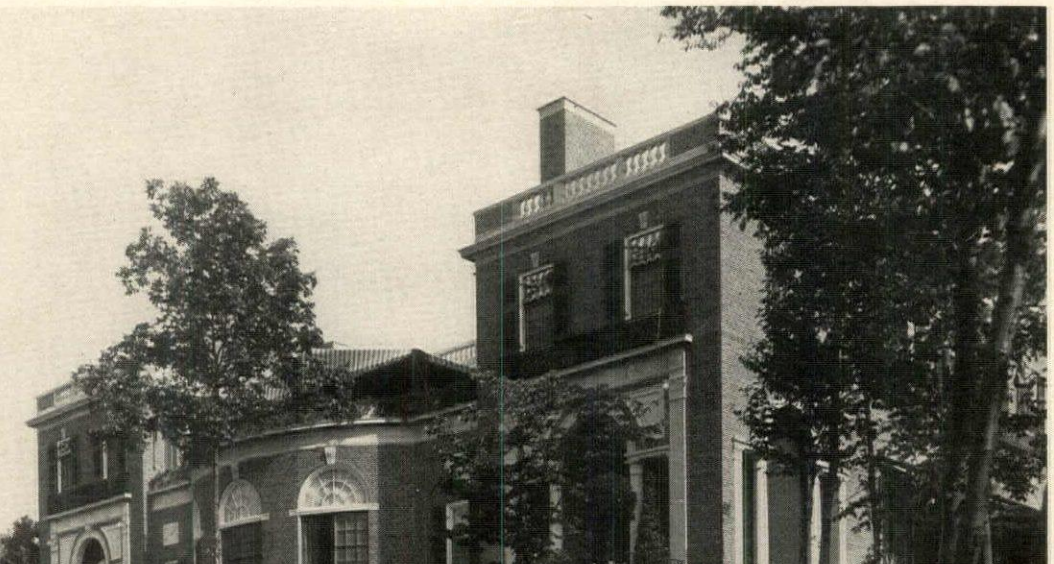
"AN OFFICE AND RECEPTION BUILDING FOR THE PRESIDENT OF THE UNITED STA

IV. BRICK—ITS ARTISTIC VALUE

BY G. C. MARS, Ph. D.

seem that the first requirement of an
t in designing the color scheme of a
face, is the plasticity of his material,
ding to every required change. Here
s with a fitness hardly found any-
The small parallepipeds of very pleas-
ns, which expose one face in the wall,
practically convenient for the hand
rength of the workman, but are suited
se of the colorist, who may choose, if
peat them in uniform tones, or at any
ify their color relations as readily as
mosaic insets. In other words, in this
has the plasticity of pigments which
on in broad masses of uniform tone,
he will, in setting the smallest ele-
logous or contrasting colors in closest
. He is as free in handling his mate-
weaver or the painter, and his work
stic brick units may be, considering its size and scale, as rich in varied harmonies and overtones of color as a Persian rug or a canvas of Giorgione.

During the past generation, there has occurred, as in many other industries, a veritable revolution in the manufacture of brick. The American brick manufacturer has developed a range and variety of color that never before existed in the product, and exists nowhere else in the world. Not only do the brick differ widely among themselves, but each brick may be played upon in the kiln in such a way as to have a dozen beautiful varied tones and shadings of its own. Aside from a few colors, secured by the introduction of mineral substances into the clay, the vast majority of brick colors and color tones, running into many hundreds, are the natural outcome of the kiln burn. And what gives them their essential merit is that they are fixed as an integral and permanent set in the brick substance itself.



House at Locust Valley, L. I., N. Y.

Guy Lowell, Architect

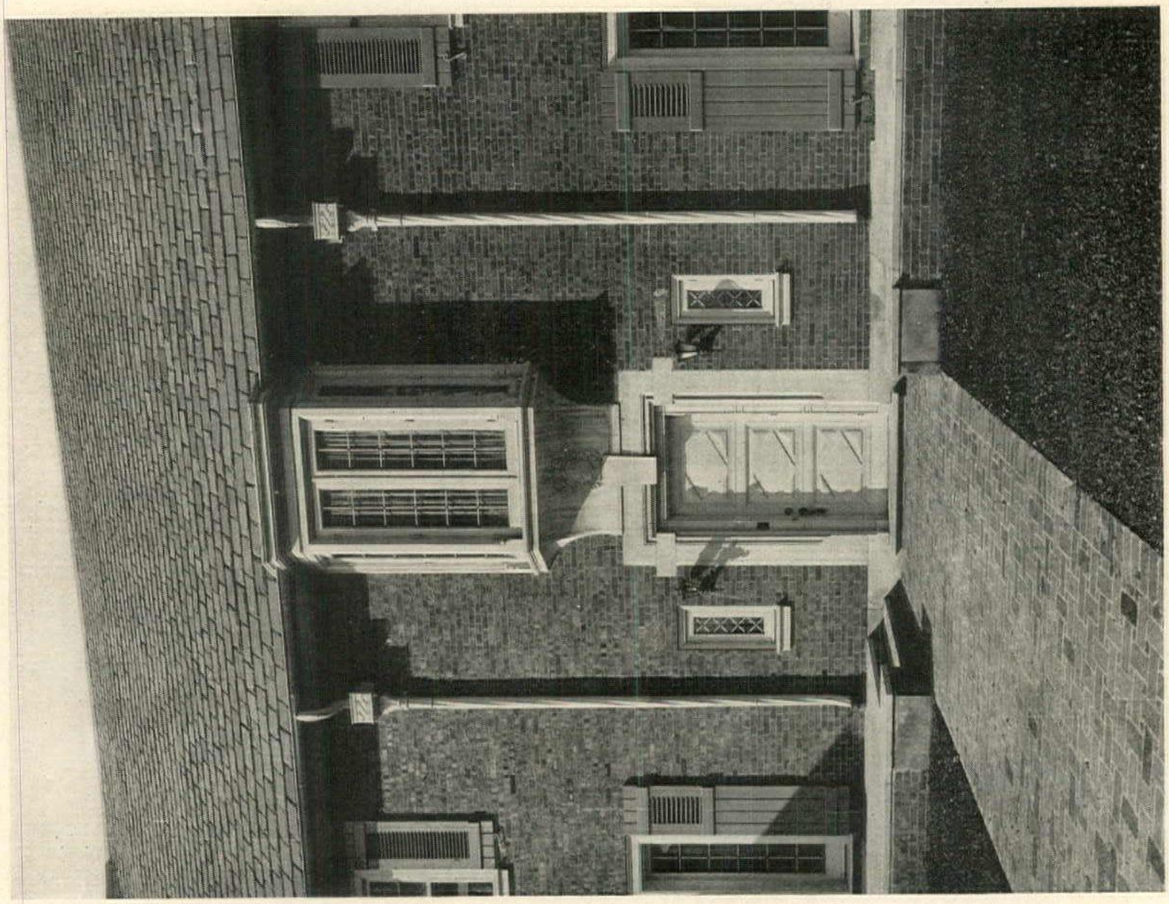
A House in Detroit, Mich.
J. Ivan Dise, Architect

As pointed out in a previous article, brick clays, due to the presence or absence of certain ingredients, burn to three fundamental colors, gray, buff, and red. But upon these simple backgrounds there develops in the burn a bewildering variety of hues, tones, and shadings.

In addition to the colors themselves, the surface textures of the brick, from the smoothest satiny finish to the roughest, exert a subtle and profound shadow effect on the color tone, only less important than the basal color itself. In a scale of textures, beginning with the smoothest surfaces, with sharp true arrises, the first step may be taken to be the sand mold brick with its slightly roughened surface. Then comes what is commonly known as the mat brick with a soft, velvety surface produced by the drag of a wire over the fresh clay surface, leaving fine vertical or horizontal scorings upon the brick. Beyond that, a great variety of scarifications is used, all for the purpose of getting shadow effects.

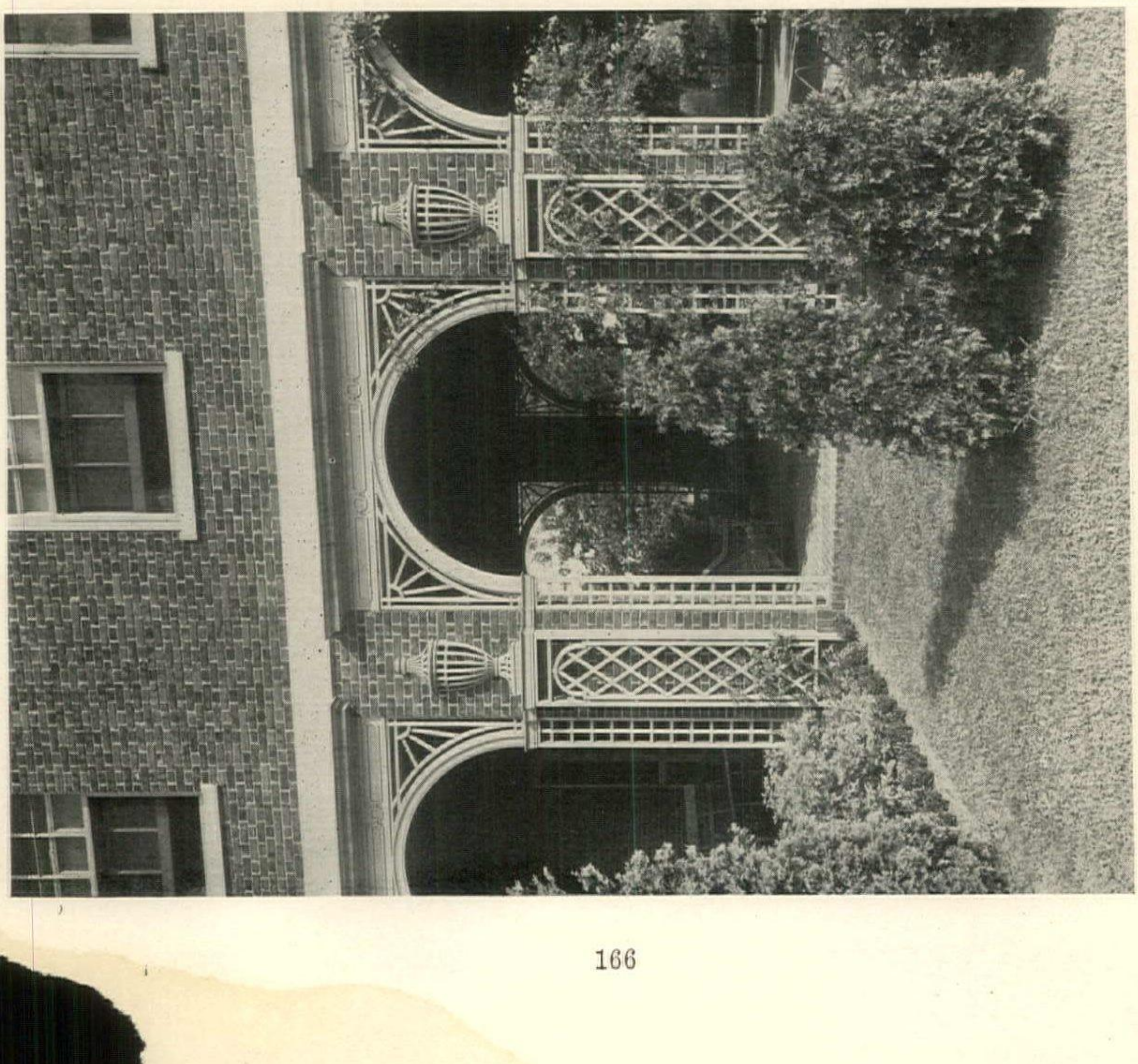
The writer is occasionally asked what is a face brick. The answer is simple. Any brick which, by reason of its color, texture, or burn, is selected or specially manufactured and carefully laid to enhance the attractiveness of the wall surface is a face brick. In the old days,—and even now in certain localities,—where manufacture was more or less haphazard, the best brick in the kiln were selected for use on the exterior surface of the wall. In time this suggested a little more care in the process of manufacture. Careful molding of the clay and setting in the kiln brought out what were known as "stretchers" or facing brick, and then with a growing and diversified demand the methods already described in these papers were gradually introduced until the production of "face" or "facing" brick has become a nation wide industry.

What kind of a structure is to be erected and what is its purpose; where is it to be placed; what will be its surroundings; how will it be oriented to catch lights and shadows; what is the resulting effect desired; are some of the questions that must be answered in making choice of a brick, aside from any question of individual taste. And always the brick must be visualized, not as held in the hand but as built into the wall and seen from a reasonable distance. There will arise instances where the light effects of the creams, buffs, or grays, smooth, semi-smooth, rough or very rough, either in uniform or mingled shades, will alone answer the architect's aim. Then again, nothing will be so fitting as the warm, darker colors, the reds, the browns, the purples. There will always be a wide range of personal taste to



DOORWAY OF A HOUSE IN DETROIT, MICH.

J. IVAN DISE, ARCHITECT



DETAIL OF A HOUSE AT RED BANK, N. J.

JOHN RUSSELL POPE, ARCHITECT

THE ARTISTIC USE OF BRICK

be sure, but essential to the choice will be such factors as the environment, the color and texture of the stone or terra cotta trim, if used, and the demand either for sharp, clear upstanding surfaces and lines or vaguely outlined masses.

Then, most important of all, so far at any rate as the æsthetic reputation of the brick is concerned, is the question of the mortar joint. More good brick have lost their character and reputation by associating or being associated with a thoroughly depraved mortar joint than for any other reason. According to "Building Construction" (In The Architect's Library, Longmans, London, 1910, Vol. I, pp. 93-94), while in mediæval brickwork our modern methods of bond were approached by the use of black headers, the thinner brick and thicker mortar joint lowered the artistic effect of the real bond. It was not, writes the same authority, until the XVII and XVIII centuries that the character of brickwork notably changed by a reduction of the joint to a minimum. The mortar thus ceased to form a disproportionate part of the wall surface, and the brick itself came more into view, leaving the mortar joint as a delicate tracery over the background of the wall. This permitted the architects of the time to seize both the color of the bricks as well as the modifying effect of the joints, to enhance the beauty of the mural surface. With the limited material they had, we all know what fine effects they produced not only in developing such bonds as the Flemish, Dutch, and English, but in designing beautiful pattern traceries for the embellishment of the wall.

It is a matter of common observation that any spot of color is greatly modified by a border of a different color tone and that the modification varies with the color and width of the border. In brickwork the mortar joints are colored borders around each neat little parallelogram, and, with the great variety in our American product, it is evident what an infinite variety of color effects may be produced. The architect in designing the color scheme of a brick wall has an artistic task about as delicate as that of a Persian rug weaver, or of a landscape painter. Having the purpose, size, and location of the structure in hand, he first selects his brick in regard to their texture, rough or smooth, and their color, uniform or blended. Then he considers the joint. And here he has four distinct factors to consider. (1) Its width, which will depend first on the smoothness or roughness of the brick, and, secondly, on the amount of modifying color per unit of surface desired. (2) Its surface texture, that is, whether finished rough or smooth. (3) Its kind, whether cut flush, struck, rodded, raked, or tooled, depressed or raised. (4) Its color, whether that of the natural mortar, or tinted to contrasting or analogous tones with the brick. All of these factors, in one way or another, necessarily enter into the problem of the mortar joint, and each exerts a subtle and determining effect on the entire color scheme of the wall surface. To convince the doubtful, it is only necessary to select a certain brick, let it be of any color, uniform or blended, and of any texture, smooth or rough, and then lay it up in the different possible joints as to width, texture, kind, and color, and the observing layman will assert that the walls are built of totally different brick.

But just because of the fine possibilities in the right handling of the mortar joint, there are the possibilities of wrong handling which result in concealing or perverting an otherwise beautiful brick wall surface. It is needless to say that, from an artistic point of view, the color and design of bond and pattern traceries of the mortar joint should always be subordinated to the whole mass or the total impression sought. The pattern designs should never be allowed to become obtrusive and vulgar like the bars and stripes of a gambler's breeches. They should produce their effect without anybody knowing why the wall is so charming. Of course, there are times when the pattern should be allowed frankly to declare itself but generally speaking, it should, as it were, like good children, be seen and not heard.

It is gratifying to note that able American architects have shown, in many examples, rare good taste in the designing of beautiful wall surfaces of brick, but it must be said that the possibilities along this line have hardly been more than touched and that it remains for some color genius to make the most of them. Brick offers a present day opportunity to American architecture such as it has never before had for the development of colorful design that will relieve the dull, drab, monotonous tendencies of traditional inertia or indifferent indolence, and more fully express the optimistic and progressive character of our American civilization.

There are not only the possibilities of dealing with the single structure but with entire groups of buildings. Instead of the haphazard and cacophanous atrocities of many a city street, it is not hard to picture a row of buildings not only with a pleasing variation in the design of the elevations, but with a harmonious scheme of different colors that would fairly make the street sing with beauty. Of course, no individual designer would have control over such an extensive scheme, but where rows of tenements or large groups of houses for workingmen are undertaken under single ownership, it would be possible for the architect to make a name for himself, and confer a lasting benefit on the community, by availing himself of the color possibilities in the brick wall.

The American architect should realize that brick as an artistic facing material is peculiarly an American product and possibility. We have had brick of a kind, marble, and stone of every variety from time immemorial, but the rich and infinitely varied colors and textures of facing brick we have never had,—and they still do not have in Europe,—before the present generation. Here is a rare opportunity for a strictly American architecture to create, in the material offered, substantial and enduring structures that, granting distinctive design in form, will glow with colorful life and beauty.

In conclusion, the æsthetic appreciation of the brick wall by Mr. Christopher L. Ward, as found in The Yale Review (April 1921) is too appropriate to omit. After praising "the softening, enduring, ennobling work of Time which, as a master artist, takes the new house in hand and with infinite inimitable art, in his own leisurely fashion proceeds to make a picture of it," Mr. Ward continues:

"Brick yields to the touch of time so willingly, so graciously, that it mellows with the passing years into a masterpiece of color. Its texture becomes beautifully accentuated, its coloration varied but always harmonious. Year by year it grows better to look at, better to live in. No art can counterfeit the beauty of old brick masonry."

(The End)

FORTY YEARS AGO

Excerpts from THE AMERICAN ARCHITECT, August 18-25, 1883

WE HAVE observed with grief that the quoted price of shares in the Keely Motor Company has fallen of late to about one-third of that for which they were sold soon after publication of those glowing letters from newspaper correspondents. * * We can, however, encourage the stockholders in this great enterprise that if their investment enthusiasm has not waned, another opportunity presents itself. Another inventor has discovered a "new mechanical law, the application of which will enable him to increase a hundredfold the power of any machine, from a clock to a steamship, without using an ounce more fuel than usual." To a reporter of the *Philadelphia Record,* the inventor "could not at this time disclose the details" except to say that the application of the new law "consisted in combining the action of the screw, inclined plane, and one other form." Hitherto, the combination of a screw and an inclined plane has hardly been thought of as an efficient mechanical device, and its application to clocks and steamboats is, we venture to say, wholly new.

* * *

The seventeenth annual convention of The American Institute of Architects will be held in Providence, R. I., August 29. Aside from the address of President Thomas U. Walter and the reading of reports of officers, Prof. Lanza will present an illustrated paper on the Strength of Materials; Mr. John A. Fox, of Boston, will discuss Architectural Competitions; Mr. W. A. Potter, of New York and former Supervising Architect of the Treasury Department, will describe the conduct of that office; Mr. Arthur Rotch, of Boston, will present a paper on a subject to be announced, followed by Mr. T. M. Clark, of Boston, on the Architect as a Sanitarian.

* * *

According to the *Scientific American,* a conduit supplying water to Virginia City, Nev., follows the contour of a deep valley and has a hydrostatic pressure of about eight hundred pounds per square inch at the bottom. The tubes are of the lap-welded and riveted type. The latter kind frequently fail and the fine stream of water, almost invisible, will cut anything in its way, and if it falls upon another part of the pipe will soon perforate it.

* * *

A very interesting recital of a visit to Viterbo with fine description of its architectural features is contributed by Mr. C. Howard Walker.

* * *

Illustrations: United States Signal Station, Pikes Peak, Col., designed by P. P. Furber, representing Peabody & Stearns in Colorado Springs. "Brookside," house for Walter Jones, Esq., Schenectady, N. Y., Franklin H. Janes, architect, Albany, N. Y. Sketches at Viterbo, by Mr. C. Howard Walker, architect, Boston.

EDITORIAL COMMENT

THE ANNOUNCEMENT in our issue of August 1st, of the proposed joint exhibition of architecture, to be held in 1924 in New York, under the auspices of The American Institute of Architecture and the Architectural League of New York, is of more than usual interest.

An exhibition such as was held by the Institute in the Corcoran Galleries in Washington, during the 1921 Convention, combined with one equally as good as the League has presented in recent years, would undoubtedly result in an epoch marking presentation of architectural work.

At this writing it is, of course, too early to even hint at an outline of this exhibition, but it is safe to assume that these representative organizations will present a showing of architecture that will be an object lesson to the general public and attract professional observers from the four quarters of the globe.

The great pity is, that New York has no adequate gallery to house so important an undertaking. The choice of buildings is practically confined to the Fine-Arts Building on Fifty-seventh Street, the Metropolitan Museum of Art —if space there is available,—or the Grand Central Palace.

It seems that the occasion of this important showing of Architecture and the arts allied to it, would afford an opportunity to revive, and satisfactorily settle, the often debated question of a representative Fine-Arts building in New York. It is an artistic scandal that there is no such building in this large City. Its lack has retarded our art advancement. It is earnestly hoped that during this exhibition, the Institute and the League will revive this important question, seek co-operation with allied societies, and vigorously inaugurate a campaign for an adequate building to house both permanent and transient exhibitions of art. Why not a permanent exhibition of Architecture? Every exhibition of the League has disclosed work that might fittingly become a part of a permanent exhibition of our architectural development.

* * *

DURING FIVE STRENUOUS years Frank E. Davidson of Chicago has served as president of the Illinois Society of Architects. And, in addition, he has edited the Society's *Monthly Bulletin*, making of it one of the best official publications in the field of architecture.

It is impossible to conceive how any man could more unselfishly give of himself than has Mr. Davidson during this long period.

Ill health, possibly in part due to unceasing activity in Society matters,—has forced Mr. Davidson to refuse to further serve as president. The recent annual meeting of the Society was marked by the presentation of an engrossed testimonial, setting forth the Society's appreciation of Mr. Davidson's long and valuable services.

This testimonial was presented by Mr. Irving K. Pond in, to quote from the Bulletin,—"his usual inimical manner."

In the course of his remarks Mr. Pond stated,— "Mr. Davidson has, throughout the long years of his service, kept the Society keyed up to an unprecedented pitch, and the memory of his ardent activity will remain as a stimulus."

Not only is this true, but Mr. Davidson has been actively prominent in every movement that has had for its object the best interests of architectural practice throughout the country.

As a rule, tasks such as Mr. Davidson set himself have been thankless ones and but little appreciated. It is therefore encouraging to note how thoroughly the Illinois Society appreciates the work Mr. Davidson has accomplished. And, it is quite certain that Mr. Davidson will always recall with a large measure of satisfaction that he has been able to command the respect and affectionate regard of a group of men so prominent in a profession he, himself, has so splendidly served.

* * *

FOR MANY REASONS, the second Pan American Congress of Architects, the details of which were set forth in our issue of August 1st, should prove of exceptional interest to architects.

The special inducements offered by steamship lines makes it possible to economically undertake a voyage that affords a comprehensive trip along both coasts to the more important cities of Latin America. As far as American architects are concerned, South America is an undiscovered country. It competes with Europe in old world interest, and it offers a field for architects, in which opportunities are many and large.

The larger cities in South America are growing architecturally in an erratic way. The people are however receptive of ideas of design and plan that will work toward improvement. The Avenida Rio Branco, in Rio de Janeiro, is an example of a great opportunity that was lost. The native architects failed to solve the problem. A group of architects from the United States would have made that splendid thoroughfare,—practically built all at one time,—one of the architectural marvels of the world. As it is now, there are a heterogeneous lot of buildings with no inter-relation of design or style, and one turns with a sense of relief to the "old city" and its Rua de Ouvidor where all the traditions of Portuguese settlement are strictly maintained.

In the "old town" of Rio de Janeiro the streets are so narrow that there is only width for one person on its sidewalks and the roadways are mostly one way thoroughfares. The Avenida Rio Branco, with a fine central park strip and roadways for different speed traffic, is more than 100 feet wide, but through neglect of its architectural possibilities has never reached a satisfactory status.

As in Rio, so in most of the larger cities in South America. They need there the efficient assistance that architects in the United States could give. It is a wonder that this beautiful country with its history and tradition of more than four centuries should so long remain an architectural *terra incognita,* and that architects in planning jaunts abroad should not seriously consider a visit to South America.

* * *

"**WE HAVE LEARNED** by sad experience," writes Lawrence F. Abbott, in a recent issue of *The Outlook,* "that beauty talks, as well as money." "The fact is," he continues, "that beauty can be capitalized and is a money making asset to any community."

Mr. Abbott is moved to these remarks as the result of an inspection of the proposed Bear Mountain Bridge designs. As a rule the opinions of the laity in these matters may be taken *cum grano salis,* but Mr. Abbott undoubtedly knows whereof he writes. To Mr. Abbott the photograph of the design for this bridge "looks like a piece of tin trumpery." And, in this emphatic expression of disapproval he is in accord with many architects and engineers. To Mr. Abbott, the steel piers that carry the cables suggest the aerials that are used for high powered electric transmission.

Engineering-News Record commenting on the criticism, and holding of course a brief for its profession, regards Mr. Abbott's statement as an "arbitrary dictum" and "extravagant enough to be its own answer."

Undoubtedly this bridge is structurally fitted to do its work, and undoubtedly it lacks so much of even casual architectural treatment as to ruin a location long known for its scenic beauty. This work if undertaken and supervised by competent architectural service would have received a monumental design that would have conserved the scenic grandeur of its location. The material for monumental piers is right at hand, tons of it, and a bridge might have been designed that would have become a part of the landscape and a source of pride to every beholder.

Mr. Abbott makes the good point that in a certain sense the Hudson River belongs as much to the people of Oregon and California as it does to New York, and if the people of New York do not conserve the scenic beauty of that river the rest of the United States should raise an outcry. It is not too late to make strenuous objection to the present design, or more properly speaking, lack of good design, and there arises an opportunity for the New York Chapter and the Architectural League to vigorously protest.

* * *

AND, THIS SUGGESTS a further matter, the proposed tunnel between Manhattan Island and New Jersey. It was recently stated in the daily press that the long and elaborate approach and Plaza to this tunnel would be designed under the present State Architectural Department, or what is now left, after political expediency has torn down the structure so finely erected under a previous administration.

For years architects in New York have unselfishly contributed time and money to the making of designs for proposed municipal improvements. A large number of these designs, long buried, were brought to light and shown at the architectural exhibition held during New York's recent "Silver Jubilee." A great many of them were illustrated in Mr. Van Pelt's article published in this magazine on July 4, 1923. Their architectural value is unquestioned, their artistic merit beyond criticism. What New York City should do, and it will be a crying shame if it does not, is to hand over to the New York Chapter and the Architectural League, the conduct of a competition for this approach and the Plaza. Then we would be sure of a dignified and appropriate treatment of one of the most important architectural opportunities New York has ever known.

We lost the Dewey Arch because of politics, and the proposed Hendrik Hudson water gate never was undertaken through similar causes. We lack public rostrums where the people may meet on patriotic holidays and civic occasions of importance. These have been designed and carefully buried by new political parties, jealous of any credit that might be taken by opponents. The Bear Mountain bridge is commonplace through apathy and the approach to the new Hudson River tunnels may and probably will suffer from a similar cause. Isn't it about time the American Federation of Arts, the National Academy, the Scenic Preservation Society, to say nothing of the architectural societies in this state, should wake up from a present moribund condition, and let their voices and influence be heard and felt?

DEPARTMENT *of* ARCHITECTURAL ENGINEERING

Van Buren Station, Chicago Post Office

Graham, Anderson, Probst & White, Architects

VAN BUREN STATION, CHICAGO POST OFFICE

Mechanical Conveyor System Installed *to* Handle Large Tonnage *of* Mail

IT is a combination of modern conditions which has developed the automatic machine and the mechanical conveyor systems usable for almost every purpose. These are the outgrowth of the scarcity of labor, its high cost and in many instances its unreliability; the ever increasing bulk of things to be made and handled due to a growing population and extensive transportation systems which make possible wide distribution from centers of industry; the necessity of quick handling to avoid congestion and the necessity of concentrating certain operations within a limited space. The plan of a building is the essential element in successful operation and regardless of the nature of the undertaking the same factors are present. These consist of the receipt of material, its distribution for fabrication or classification, assembly into shipping units and delivery to means of transportation. In the majority of cases it involves also storage or warehousing immediately preceding the last two operations. The variations of service demand particular planning although the basic principles employed are unchangeable.

A most excellent example of a mechanical conveying system is that recently installed in the new Van Buren Station of the Chicago Post Office. This is a special plant designed for the exclusive purpose of consolidating the distribution of outbound parcel post matter, paper mail and catalog matter formerly handled at the Main Post Office, Quincy Station and the five Chicago R. P. O. terminals and the large mail order houses where post office employees are stationed. At this building direct loading at track level is made into storage and mail cars of the Chicago, Milwaukee & St. Paul, the Chicago and Alton, the Pennsylvania and the Chicago, Burlington & Quincy railroad systems of approximately forty-five per cent of the parcel post and paper mails schemed to those lines from the Chicago standpoint. The remaining fifty-five per cent of the mail arrives over belts and spirals at the street level for transfer by government owned motor trucks to the Chicago & Northwestern, the Baltimore & Ohio, the La Salle, the Dearborn Street and the Illinois Central terminals which accommodate the remainder of the twenty-four great railway systems terminating at

Chicago. It is possible to transfer all of this mail to the various stations without entering the congested loop or business district.

The building is located along the East side of the Union Station property about 320′-0″ East of Canal Street and extends from West Van Buren to West Harrison Streets, a distance of 796′-0″ with a width of 75′-6″. The building is eight stories high including basement and sub-basement, served by railroad tracks on the basement level and by a teamway on the street level. This teamway is along the East side of the building, is 30′-0″ wide and extends the entire length of the building. It affords 580′-0″ of clear tailboard space or enough for 60 motor trucks at one time. The platforms at track level will accommodate 61 mail cars. It is a steel frame structure with concrete floor slabs, faced with tan-colored brick and trimmed with sandstone to conform with the general appearance of the Union Station now under construction.

The plant represents an increased efficiency of more than 600 per cent over former methods and is a further development of the scheme employed at the Quincy Station, both of which were originated and designed by P. J. Madigan, Assistant Superintendent of Mails in the Chicago office.

Under the previous system of handling parcel post mail, it was sacked and loaded into trucks at the business houses and transported to the Quincy Station. The sacks are unloaded onto small hand trucks, about seven truckloads to each motor truckload, and pushed to the dumping platform and emptied one at a time. It requires one-half hour to load and the same time to unload each motor truck. Under the new system this delay is overcome by delivering parcels unsacked in the non-damage parcel dump truck.

This truck, which was invented by Mr. Madigan, is a vertical receptacle, side-pivoted to vertical supports and mounted on casters. It has a tilting device which is released by a foot pedal. The top swings toward the operator, the bottom opens and the parcels slide out gently into the chute designed to receive them. Six or eight of these dump trucks are loaded into the motor truck at the business house in from three to five minutes and at the station unloaded in the same time, resulting in a saving of time for each motor truck of at least fifty minutes per load. An important item is the decreased dockage space required at each end of the haul.

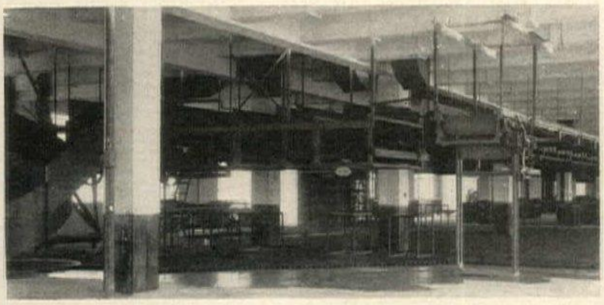
At the station the dump trucks are dumped singly by hand or quickly coupled together and attached to a small electric tractor and hauled to a trough 50′-0″ long and 45″ wide below which is a 42″ four-ply belt. A ridge or curb at one side of the trough marks the route of the train and prevents its slipping into the trough. As the train passes, employees tilt each truck, the bottom opens and the contents slide to the feed belt below. The belt travels in the opposite direction and thus clears each truckload in time for the next. The tractor and train of empty tilting trucks return to the platform and the trucks are loaded on the motor truck in which they were received. The total time of the motor truck at the dock does not exceed ten minutes. Other trains in the meantime are dumping on the feed belt. To provide for peak loads there is another trough and feed belt so that the capacity can be doubled at will.

The building is equipped with 14 freight elevators and 3 passenger elevators, 5 sets of spiral

Detail of Entrance, Van Buren Station, Chicago Post Office

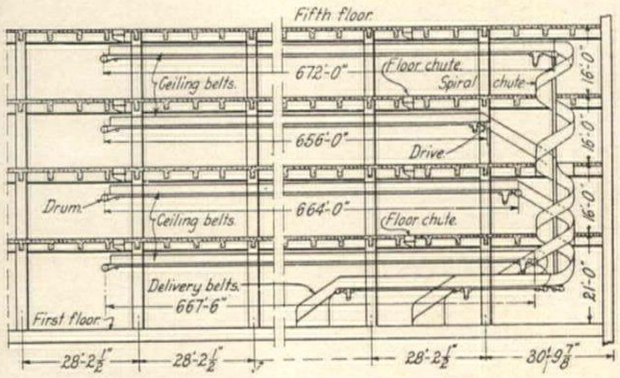
Graham, Anderson, Probst & White, Architects

chutes, some of which are double. Eight and one-half miles of conveyor belting are installed. There are 73 of these belts making 82 conveyors (both strands being used on 9 belts), all driven by 71 motors of the multi-polar semi-enclosed type designed for 220-volt direct current service. The belts, of various widths, are of four and five thicknesses of canvas, each ply untreated, weighing two pounds per square yard, traveling on rollers con-



Floor chutes to ceiling belts and spiral chute

sisting of cold drawn seamless steel tubes, 3½″ to 5″ in diameter, made of No. 10 gauge material. This tubing is spot-welded to pressed steel heads that support turned steel shafts ¾″ in diameter, turning on roller bearings. The spiral chutes are made of No. 12 gauge steel plates. Mail chutes leading to the ceiling belts are given a quarter turn so that the mail sacks can slide to within 3′-0″ of the belts instead of dropping the full vertical distance of 7′-0″ from the floor level to the belt.



A part longitudinal section, showing how the ceiling belts deliver mail to the spiral chutes

The mail handled as described above is all pre-canceled. Uncanceled mail, in separate tilting trucks, is taken by elevators to the second floor, where it is dumped on a slide leading to the mezzanine below the second floor, where it is canceled and the larger parcels placed on an auxiliary 36-inch four-ply belt, which delivers them to the feed belt leading to the primary separation on the third floor. Leading from the mezzanine floor in the opposite direction is the return of the belt. An interesting feature in connection with the work done on the mezzanine floor is that the return of the belt for the reverse strand is utilized for small packages, delivering them to a distributing section for hand separation into mail bags. Another belt on this floor takes care of first-class and other matter not to be handled at this Station, delivering it in a tilting truck to a section from which it is sent to the Main Post Office.

The two 42-inch feed belts in the trough of the floor deliver the mail from No. 1 trough on the first floor, which is 100 feet in length, to an incline belt 48 inches wide, which delivers and acts as the feed belt for Primary Separation Unit No. 1 on the third floor; from trough No. 2, which is

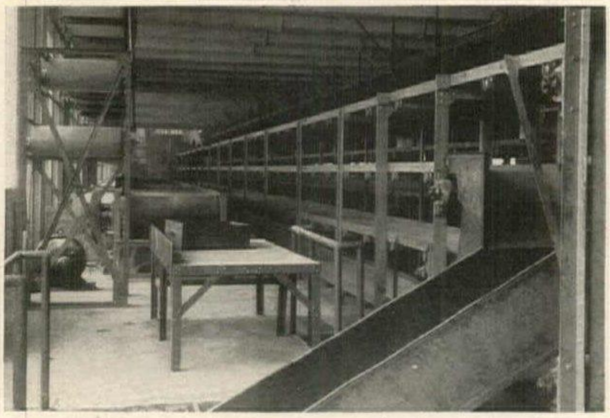
Spiral chutes leading to the wagon space and track floor

50 feet in length, also on the first floor, it delivers the mail onto a 44-inch incline belt, which in turn deposits packages onto a horizontal 48-inch belt on the third floor, which acts as feed belt for Primary Separation Unit No. 2, adjoining No. 1, with a tier of belts common to both between.

There are nine belts in Primary Separation Unit No. 1, one feed belt and eight separation belts, the separation belts being 30, 32 and 36 inches wide and parallel to the feed belt. The 48-inch feed belt, which carries mail from trough No. 2, and three more separation belts, make up the twin unit due to the common tier, consisting of four belts, in the middle.

There is another Primary Separation on the fourth floor, also composed of two units. Two Primary Separations, one on the third and one on the fourth floors, were designed because complete primary separation on one floor of this building was not considered practicable.

The primary separation system on the fourth floor has the same number of belts as the system on the third floor, excepting that the fourth floor system is 60 feet long while the third floor system is 120 feet long. The fourth floor separation is fed from two separation belts, one in each unit, on



Separator unit, showing the main feed belt with distributing belts on each side

the third floor, which serve the double purpose of separation and feed belts.

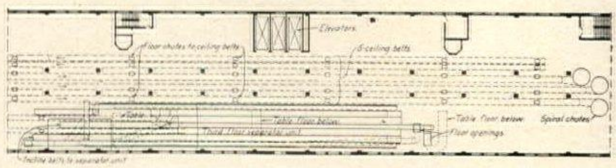
All belts on the third floor, excepting the two belts which act as feed belts to the fourth floor units, deliver to chutes leading to the second floor, where the parcels are packed and dropped through openings in the floor to ceiling belts on the first floor, which carry the mail to spiral chutes that deliver to the train level. All separation belts on the fourth floor likewise deliver to chutes that deposit the mail on the third floor for sacking, and the sacks are then dropped through the floor to ceiling belts on the second floor, which deliver to spiral chutes that deposit the mail at the first floor, or train level, or sub-basement.

The system on the third floor, which is the most important, accounts for 65% of the primary separation, the separation belts being for those States which receive the most mail.

In each unit of the system a platform extends between the two tiers of belt conveyors, with room for forty men each at the feed belt, with 3 feet of space to each man, and from the feed belt the men pick up packages addressed to various states and throw them onto the various belts for these states. There are canvas flares at the sides of the belts, which prevent packages from dropping on the floor and at the same time deflecting them to belts and breaking their fall.

Located on the third, fourth and fifth floors, as well as on the first and second, there are ceiling belts fed through floor chutes, which carry the sacked mail to the chutes which deliver to the trains; there are five belts to each floor, each belt 42 inches wide, five-ply, with centers averaging 655 feet, excepting the fifth floor, where the centers are shorter.

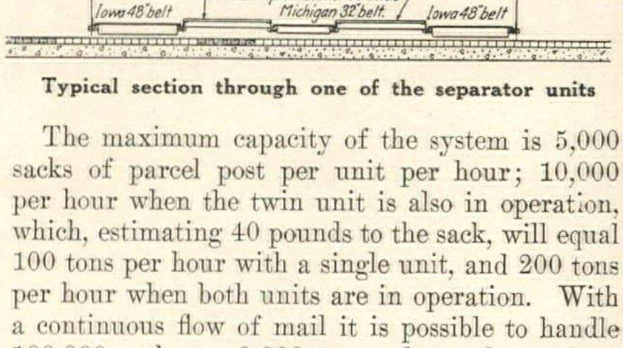
The fifth floor is occupied by the Railway Mail Service for the handling of incoming parcel post that must be re-routed, trade journals, magazines and catalogs. This material is separated by hand, although the sacks go through the floor to ceiling belts on the floor below. Some paper mail is also handled on the sixth floor, being dropped through the floor when sacked for ceiling belts on the fifth floor to distribute. This floor, however,



Part of the third floor, showing the separator unit and the floor chutes and ceiling belts

is principally for the offices, first-aid station, Nixie section, machine shop, rest rooms and cafeteria.

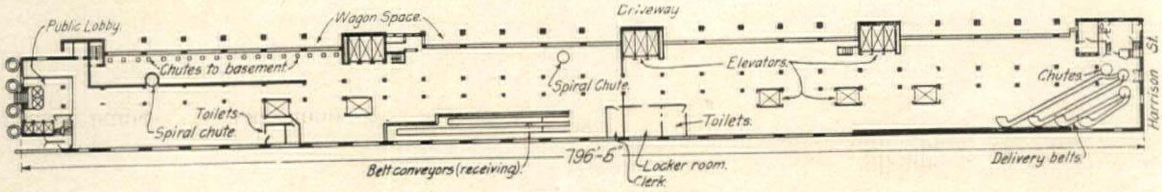
The roof of the building is well adapted to, and it is proposed to have, outdoor rest and recreation rooms on it. The idea is to have that part of the roof devoted to rest and reading rooms roofed over, without side walls, while the rest of the roofing space will be devoted to hand and volley ball, basket ball and indoor baseball floors and varied gymnastic apparatus. It is believed that this innovation will more than pay for itself in the improved health of the employees, with a consequent improved spirit and efficiency.



Typical section through one of the separator units

The maximum capacity of the system is 5,000 sacks of parcel post per unit per hour; 10,000 per hour when the twin unit is also in operation, which, estimating 40 pounds to the sack, will equal 100 tons per hour with a single unit, and 200 tons per hour when both units are in operation. With a continuous flow of mail it is possible to handle 100,000 sacks, or 2,000 tons, of parcel post in a 10-hour period, a rate which could be maintained for the 24 hours if men and material were available.

Beginning with 1915, when the parcel post became somewhat steady, the figures for October in each year show that there has been a constant increase in the amount of parcel post received at this office, the figures for October, 1915, showing 7,660.4 tons, and for October, 1922, showing



Plan of the building at street level

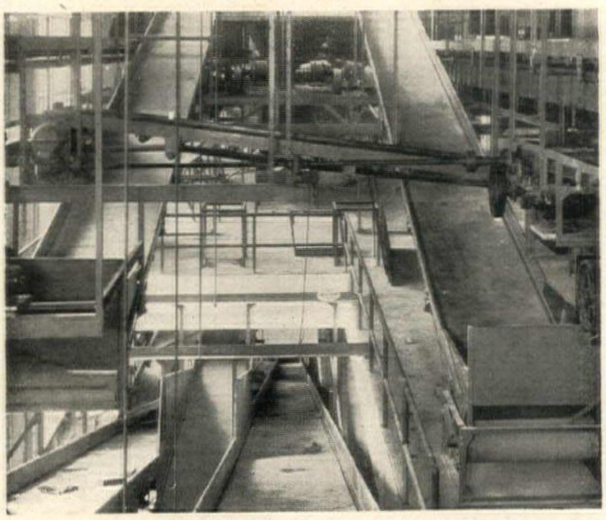
22,308 tons, or, nearly three times as much as that handled in 1915. At the present time, there is handled more than 1000 tons of parcel post and newspapers daily, an amount greater than that handled even during the holiday season in any previous year; allowing an average of 15 tons of parcel post matter to each 60-foot storage car, about 67 railway cars are required daily to handle this volume of mail.

While the capacity of the new system is greatly in excess of the demand that will be made upon it at present, the actual output will be controlled by the number and efficiency of the clerks assigned to the final distribution. Experience with the system at the Quincy Station, which has been in use since May 9, 1921, shows that 1,200 pieces per man per hour is not too much to expect on the peak loads from the distributors on the primary separation. This is an average of approximately 20 pieces per minute per man; but many of the distributors handle 25 to 35, and some even 40, pieces per minute on the peak loads.

The approximate cost of the conveyor system is $560,000; the total appropriation for the purpose of equipping the building, including the conveyors, with racks, tractors, dump trucks, etc., is $812,000. The rental for the building is $500,000 per annum for the first five years, and $350,000 per annum for the next fifteen years thereafter. Heat and light, which are on a metered system, are not included in this rental.

This building, devoted solely to post office purposes with its elaborate equipment, marks a new era in the handling of bulky mail, and its importance and value to the postal service, not only in Chicago, but throughout the nation, can scarcely be overestimated. It is, indeed, an engineering masterpiece.

The interests of the government in this work were in charge of the late E. H. Shaughnessy, Second Assistant Postmaster General, and W. H. Riddell, General Superintendent of the Railway Mail Service. Graham, Anderson, Probst and White were architects for the Station Company. The building was constructed by R. C. Wiebold



Conveyor belts from floor to floor with separator unit and distributing belts

& Company under the direction of J. D'Espositeo, chief engineer and A. J. Hammond, assistant chief engineer of the Station Company. Acknowledgment is made to *Railway Age,* R. C. Wiebold & Company, and the Lamson Co., for courtesy of use of illustrations.

Radiator Traps

THE members of the National Association of Building Owners and Managers* own and operate practically all of the principal office buildings in this country. The maintenance and operation of the steam plants in these buildings are matters of great importance to them. The efficient and economical operation of these plants is influenced to a great extent by the radiator traps used in connection with the vacuum or vapor systems of steam heating which are usually installed in such buildings. The purchasers of these traps have been compelled to accept the claims of the manufacturers as to performance or the testimony of various users. As the opinions held by users are necessarily based on non-uniform conditions, they had little real value.

Some tests have been made by the Bureau of Standards for some manufacturers but the results were not made public. In order to have a record of performance under uniform conditions the Association induced fifteen manufacturers to agree to have their appliances tested and for them nineteen traps were so tested.

The tests were made under conditions prescribed largely by the Bureau of Standards. They were made at The Lewis Institute, Chicago and conducted by Prof. Julius Wolf, observed and recorded by Messrs. L. Berman and S. Phatakwala of the Institute staff. The traps were selected from stock by Mr. B. K. Read, Engineer of Committee. The tests determined the amount of water condensed in the radiator and passed through the trap to condensation pots and the amount of steam which passed through the trap and passed from the return pipe through a condenser coil to steam-passed pots. The total amount of water collected both in the condensation pots and in the steam-passed pots (measured in pounds) is evidently equal to the amount of steam received by the radiator (also measured in pounds). The amount of water collected in the condensation pots alone, in proportion to that collected in both sets of pots, the total, is obviously the percentage of steam which the radiator has condensed and which the trap has trapped until so condensed. It is the measure of efficiency of the trap in its duty of trapping steam and is called the condensation ratio.

It is stated clearly that these laboratory tests must be accepted as such and that performance in buildings develops their faculty to operate satisfactorily under working conditions. The presence of dirt, scale, oil and other effects of operating conditions affect the efficiency of the traps. These conditions will be observed by the various users and reported as "experience" to the Committee at a later time.

*Lewis B. Emerling, Executive Secretary, The Edison Building, Ill.

The laboratory tests are reported in detail in a recently issued bulletin entitled Radiator Traps. There is an introduction consisting of an explanation of the properties of steam, sensible and latent heat, types of boilers, types of heating systems and radiating units. It concludes with a memorandum of suggestions to operators. The bulletin contains 68 pages and is adequately illustrated. It is of value to those interested in the design and operation of efficient and economically operated steam heating plants.

Color of Slate

WHY Americans always demand a non-fading slate is a problem. Possibly the word "fading" conveys the idea of inferiority. This should not be the case as long as the qualities of durability and structural strength remain constant. It is true that the action of sunlight, snow and rain causes the color of some slates to change. This is to be expected of almost any material which was formed and unexposed to these things for untold ages. The fading or changing of color does not necessarily injure its beauty but rather, in many instances, increases it by destroying the deadly monotony of uniformity.

The Department of the Interior issues the following memorandum concerning the color effects in slate, by Oliver Bowles, mineral technologist of the Bureau of Mines:

Slates differ in color, and some colors are much more in demand than others, the preference being based more on tradition than on artistic taste or actual qualities of the slates. A wider market for colors not now in demand depends, therefore, on the cultivation of public taste. Architects and builders can widen the field of utilization of roofing slate by judicious efforts to popularize new colors or combinations of colors.

Slates are classed as fading or non-fading according to their color stability. The fading of green slates is probably due to the presence of iron carbonate which seems to be present not as pure siderite, but as an isomorphous mixture of the carbonates of iron, lime, magnesium, and possibly manganese. The hydrous iron oxide formed by decomposition of the carbonate through action of certain solvents carried in rain water destroys the green color and causes fading. The black and gray slates usually contain small amounts of such constituents and are therefore nearly permanent in color. Bluish slates commonly turn grayish, and red slates may turn brown. The green slates are the most uncertain; some are practically permanent in color, but others fade and discolor badly.

A moderate and uniform fading may not be detrimental, but may produce a more pleasing effect, though in replacing broken slates it may be difficult or impossible to match the colors. Non-uniform fading results in spots or streaks and is undesirable. The formation of some spots is due to the weathering of grains of the iron sulphides, pyrite, or marcasite.

Spots and blotches are very objectionable in slates. Many of the red and purple slates contain pale green spots, some bordered with purple. The spots range in size from minute specks to spots 2 inches or more across; some are circular or oval and others are irregular. In places the spots form bands or ribbons.

It appears that the pale green spots in the red and purple slates are due to chemical changes caused by the decay of organisms embedded in the clays from which the slates were formed.

Preventative Sanitation

THE responsibility of architects for the welfare of the occupants of the buildings they design is not always appreciated. Legal requirements are followed cheerfully in most cases and the thought of further obligation is dismissed. But this limitation is not sufficient in some instances—in fact, an architect must keep in close touch with the development of hygiene in order to render complete service to his clients. In a paper read before the Western Society of Engineers January 5, 1923, and printed in the *Journal* of that society, May, 1923, Charles Atwood Kofoid, Ph. D., Sc. D.*, called the attention of engineers to the necessity of certain precautions to be taken when in the field to preserve their own health as well as that of the construction forces under their control. He also went further and spoke of certain requirements for correct sanitation in public places. This phase of the discussion is more applicable to architects than to engineers.

Among other parasitic invasions of the human body he described that of amoebae. The presence of this parasite in the human body results in Hodgkin's disease and a complex of diseases known as arthritis, commonly known as gout or other painful diseases of the joints. It is also responsible for certain forms of dysentery and diarrhea as well as a wide range of chronic ill health. Dr. Kofoid's remarks applicable to architects, follow:

> In urban life with all its sanitary conveniences there still exist certain unsanitary aspects of our expensive sanitary installations. One of these is the close proximity of the toilet and the wash bowl. The soiled hand of the infected person, soiled, it may be, by imperfect toilet paper, is cleaned in the wash bowl. Cysts may adhere to its surface and contaminate the lips of subsequent users and thus gain admission to the mouth. The common towel and bath tub may also add to this risk. Clothing soiled with infected faeces carried through the laundry process in the home or at the public laundry without long enough exposure to temperatures high enough to destroy the cysts, becomes a source of contamination whereby cysts are transferred to handkerchiefs and towels, and thus ultimately to the lips of uninfected persons.
>
> Our systems of sanitation in the home, and especially in all places of public resort should eliminate the spring (self-closing) faucet which hinders the use of running water in washing hands and face. Do away with the standing water in the wash bowl, and substitute the shower bath for the tub. Towels and handkerchiefs should be segregated from underwear in laundries and sufficient heat employed on the latter to insure sterilization.

Thoughtful architects should insist on eliminating the self-closing faucet. Its use is incompatible with decent conditions. The combined hot and cold water fixture is the only one that can be used comfortably under running water conditions. The most insistent client demanding the self-closing faucet is the hotel keeper and above all he should protect his guests from possible infection. This idea is based on the experience of olden days when guests were unused to the lavatory and would forget to shut off the water with a consequent flooding of the room. Today the traveling public is acquainted with the use of sanitary conveniences and the self-closing faucet is as anachronous as the old time sign "Don't blow out the gas."

Building Disaster Responsibility

ARCHITECTS and engineers continually face the possibility of disaster to their work. Even though the plans and specifications are entirely adequate, inefficient supervision with improper construction, change in character of intended occupancy or alterations made after completion, are sources of danger. Even though the utmost care has been taken in producing proper designs, providing good supervision and obtaining a successful completion of the project, a disaster occurs and a suspicion is aroused as to competency to design. Such a thing is deplorable and every effort should be made to fix the responsibility for disaster and as vigorously defend the innocent.

A recent disaster developed some unusual features. The Fuller Brush Company had completed a new factory building, to one side of which was attached a brick tower 28′ square and about 113′ high above the ground. About 65′ above the ground supports were provided for a 50,000 gallon water tank which, when full of water, weighed about 250 tons. On each of these concrete and steel grillage foundations in each corner of the tower at the fifth floor level, was placed the foot of an inclined steel column which supported the tank. The outward thrust of these steel columns was resisted by horizontal channels connecting the columns about 1′-6″ above their bases. These channels connected the adjacent columns; no provision was made for diagonal horizontal connections. Eight 1″ square diagonal rods connected the tops and bottoms of the adjacent columns. These were upset [illegible]

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*Professor of Zoology and Assistant Director of Scripps Institution of Biological Research of the University of California and Consulting Parasitologist of the California Board of Health.

for turnbuckles. The design had been approved as adequate.

After the tower was nearly completed the owners decided to use this fifth story for the instruction of branch managers and assistants. As the horizontal channels and the diagonals interfered with this arrangement, the owners proposed to the architects and engineers that these be removed. The engineers approved the proposal. Twenty-four hours after their removal the tower collapsed, resulting in the death of ten workmen. The coroner has held certain members of the firm of architects and engineers and their superintending engineer criminally liable. The contractors appear to have followed the plans and specifications without deviation and are not in any way responsible.

It is extremely unusual for architects and engineers, apparently, to wreck their own projects. It is easily understood why they should wish to satisfy their clients and to what extent clients will exert pressure to secure approval of foolish requests. No one should enter these professions unless he has judgment and stamina sufficient to resist such requests. Owners generally look upon building regulations as an invasion of their rights and to almost as great an extent they consider good engineering as foolish, inconvenient and extravagant. In this case the owners are not criminally liable. What their conscience may suggest to them we do not know.

Soundproof Rooms

ONE of the chief social objections to multiple dwellings, even to the high grade apartment house of our large city, has been the lack of privacy due to the transmission of sound from floor to floor and from apartment to apartment, says *Housing Betterment*. Methods by which these defects can be overcome have, therefore, considerable value for persons interested in the improvement of housing conditions.

Some recent experiments in this field carried on by the Western Electric Company in the Bell Telephone Laboratories in New York in order to develop soundproof telephone booths, are of especial interest. To shut out the vibrations which would be transmitted by the floor, the rooms are built on foundations of three alternating layers of one inch thick special all wool felt and sheet iron. It is said that the results achieved have been highly successful and that when first entering one of these booths a person accustomed to the city noises, has the sensation of almost suffocating stillness such as might be experienced in the depths of the woods on the stillest of nights.

The foregoing evidences the fact that the subject of soundproofness is being studied principally by commercial organizations. The conclusions of many of them are widely variant. This is to be expected, especially those of manufacturers. With the several properly equipped laboratories available in this country, it should be possible to determine the methods of construction best adapted to overcoming sound transference. A great deal of valid data is at hand and more can be secured. the problem is how to evaluate and co-ordinate it and apply it in a practical, workable and economical way to building construction.

This entire matter can only be handled satisfactorily by a committee of persons not interested in manufactured products but which would seek and accept the co-operation of those interests. No suggestion is made at this time as to the constitution of such a committee. That such a thing should be done must be apparent. With the tremendous improvements made in building construction, this matter of sound prevention and control has made the least progress.

REVIEW *of* RECENT ARCHITECTURAL MAGAZINES

BY EGERTON SWARTWOUT, F.A.I.A.

THERE has been a good deal of comment in the English Architectural papers lately on the subject of competitions. There always is a good deal of comment everywhere on that subject, and I suppose there always will be, as upon any subject on which no two people ever seem to agree. The provocative case at this time is the abandonment by the Manchester War Memorial Committee of a competition for a proposed War Memorial because the commission on the one hand and the assessor on the other could not agree as to the right of final decision. The assessor, Mr. Worthington, backed by the Royal Institute of British Architects and the Society of Architects contends that the assessor's award is final; the Commission exhibits a certain restiveness at this condition, and feels that since it pays the piper it should be allowed to call the tune, all this being well brought out in an editorial in the *Architects' Journal,* London, of July 11th, from which I quote the following:

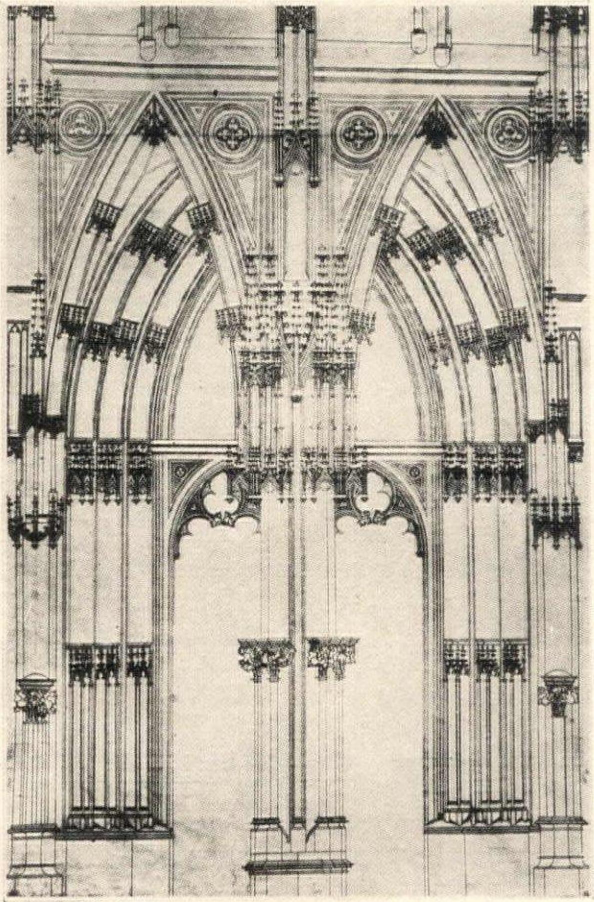
> "Competitions, from the architects' point of view, are a very doubtful blessing; some, indeed, regard them as an unmitigated evil. That they are extremely wasteful of time, talent, and money is generally conceded. The disadvantages of the system are wholly felt by architects; the benefits entirely by promoters, who frequently have the advantage of the ideas of a hundred or more architects, of whom only three receive any sort of financial recognition. This is admittedly a grievance, but one that competitors must be content to endure, since they are under no obligation to enter a contest, and mostly do so in the sporting spirit of the man who tries his luck on the Derby. Little can really be said, from the architects' point of view, in favour of competitions. Their one virtue of giving unknown men a chance of proving their mettle under conditions that favour nobody cannot, however, be denied, and for this reason alone the system should be perpetuated. If it had done no more than discover Harvey Lonsdale Elmes it would still be entitled to our respect. An evil, perhaps; but a necessary, occasionally a benignant evil. The question of the assessment of competitions, however, sometimes provides a real grievance. Occasionally a wrong assessor is appointed, as is only to be expected in this very imperfect world, and in this event there can be little satisfaction for either competitors or promoters. In the case of the Manchester competition this complication was, of course, entirely absent, for Mr. Worthington's taste, ability, and fairness command universal respect. Hence the bewilderment that everybody feels at the abandonment of the competitions."

Now, the question at issue in this case is not the old, the very dead question, as to whether there shall be competitions at all, but the very vital question as to the method of decision. If John Smith is going to build a house for himself he naturally expects to select the architect and to tell that architect what kind of a house he wants, just as he expects to select the material for his clothes and have something to say as to their fit and c[...]

From "The Architectural Record"

Residence of James A. Burden, Esq., Syosset, L. I.
Delano & Aldrich, Architects

From "The Architectural Review," London



The High Porch of Regensburg Cathedral— Late XV Century

tainly this expectation of his is a natural one. He has to live in the house and he has to wear the clothes. Just so a commission who are acting for a municipality, a State or a nation. Theirs is a responsibility much greater than that of the individual, for they represent many who are the owners, and they are dealing with matters of much

From "The Architectural Record"

Residence of James A. Burden, Esq., Syosset, L. I.
Delano & Aldrich, Architects

more importance than a house or a suit of clothes. Their success as a commission depends upon the architectural value of the operation they control, its fitness for its purpose and its proper and economic construction. They are the ones upon whose shoulders will fall the blame if the thing is a failure. They are the ones to whom their constituents look, and they have to live in the locality the rest of their lives. And bearing this responsibility a certain restiveness is natural when they are told that the selection of the design and the architect are matters beyond their control, and they must abide without question the decision of one man, the assessor, who is not a member of their commission and is perhaps foreign to their locality and unsympathetic to their ideas. Then, too, there is the point of delegation of authority. Have they the power to delegate this right of final decision to others? In this country it is gen- [illegible]ceded they have not. In fact, such delegation of authority is often made illegal. Where then, is the way out? In this country there have been attempted solutions, first by a sort of gentleman's agreement between the commission and a jury of architects that the commission will accept the decision of the jury unless there should appear good and sufficient reasons against it, and in such case the commission agree to reduce their objections to writing and put on record their reasons for disagreement; and second, the formation of a mixed jury composed of the commission and one, or preferably more professional architects, who shall arrive at a conclusion by majority vote, the members of the commission naturally forming the majority. Both these schemes have met with general success. I don't know of an instance in which the commission has failed to approve the decision of the jury; such cases may exist but they are rare. If a jury has been appointed partly by vote of the competitors themselves, and partly by the commission, and all the proceedings are under the auspices of the Institute, or in accordance with its established practice, few commissions are willing to accept the responsibility of overthrowing the decision of that jury. They may not secretly approve of it, but they accept it, and generally, by the same token, the scheme also. In the case of a mixed jury the results are generally good.

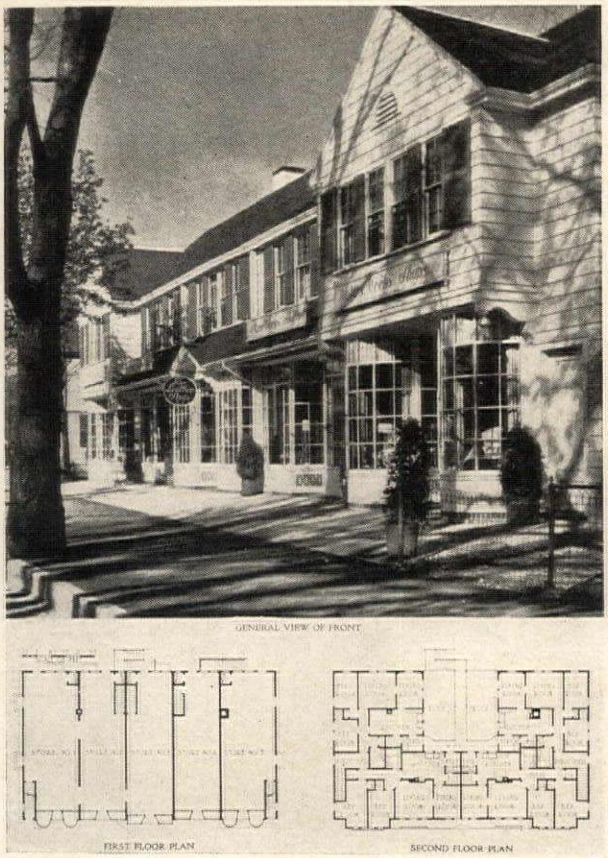
From "The Architects' Journal," London

Headquarters of Theosophical Society, London
Sir Edward L. Lutyens, R. A., Architect

I have been a competitor in a number of competitions under this method and have never had occasion to be dissatisfied with the decision, and I have served as a member of several mixed juries in whose proceedings the opinions and ideas of the laymen were rational and constructive. In such a jury it is natural that among the laymen there is at first a lack of understanding of the drawings, but a careful explanation by the professional members soon dispels that, and I have often found that laymen, being without prejudice, are apt to grasp the big essential features of a scheme better than a professional who is often unduly influenced by small details of presentation and preconceived ideas of design.

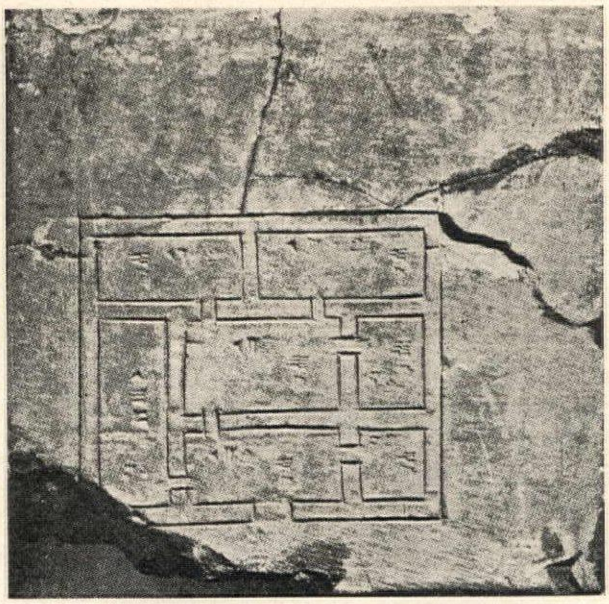
It is difficult to suggest any ideal solution; in fact there is no ideal solution, but there are some things which may be disposed of with a certain degree of finality. In the first place the commission should at the outset secure a competent professional advisor. I am now, of course, discussing a competition for an important work. This professional advisor should be a man of wide experience, with an intimate knowledge of monumental architecture and a thorough acquaintance with the conduct of competitions. He should be in sympathy with the commission, with the project and with competitions in general. There is more individual responsibility upon him than upon any member of the commission or any competitor. Unfortunately, such a man is hard to find, and he seldom is found. But he can be found, and his selection is the most important thing the commission had to do. It is the duty of this advisor to study the problem, adjust the divergent views of the commission and advise them as to the probable cost. Generally a competition is held for a building for a specific purpose and generally there is a definite sum of money at the disposal of the committee. If, in the opinion of the advisor, this sum is not sufficient he should place this condition squarely before the commission, supporting his arguments with definite statements as to prices from reliable contractors. He should in no instance shirk his responsibility and set such a low cubic foot price that the successful architect can never hope to complete his scheme within the limits of the appropriation. Unfortunately this is a condition which often exists. The advisor takes the easiest way out, with a feeling of "let George do it," and the unfortunate George, the receiver of the buck, the successful competitor, has, colloquially, a hell of a time, and so incidentally has the commission. And again if the competition is held for a building which has a specific purpose, the absolute requirements must be laid down in hard and fast terms. If it is considered an absolute essential that a hall should seat four thousand people, it is idle to say it in those words in the program. It's too vague, and no two competitors will use the same dimensions. The area of the room must be given, and the size checked by the jury, or else the width of aisles, the back to back dimensions and the width of the individual seating and the stage or platform sizes given, and these must be checked, otherwise one competitor may come through with a corking scheme just inside the cube which, when built, will not give the needed accommodations. Generally in a compe-
tition for a specific scheme the more det

From "The Architectural Forum"



Shop and Apartment Building, Falmouth, Mass.
Hutchins & French, Architects

From "The Architectural Review," London



A Plan of a Babylonian House
Size of original, 11.3 x 12 cm.

positive instructions the better, provided of course these instructions are for essentials and are intelligently given. It is often said that a tight program kills the imagination and produces a type. This statement is rot. On the contrary, a tight program provides a definite basis, a starting point. Each competitor knows everybody else is working from the same information, and that every hall has to seat four thousand, and he starts with confidence to solve the problem. And the same thing applies to methods of indication. It

From "The Architectural Record"

Residence of Otto H. Kahn, Esq., Cold Spring Harbor, L. I.

Delano & Aldrich, Architects

is idle to say that the drawings can be either in ink or in pencil on tracing paper. Everybody then does it in ink. Personally I would carry it much further. I would say, and I have said, that the windows in this building are real windows and, as the building is probably of light stone or marble, they will count in reality as dark holes and they must not be disguised with marble grilles or rendered out, and the professional advisor reserves the right to use a little charcoal on any window that seems to need it. If these things are clearly and firmly said in the program nobody objects, nobody could object, for they all tend to [illegible] and to put all on the same level, and the best design will then clearly show, and the issue will not be obscured by tricks of rendering. And the rendering should be made simple by obligatory clauses. An elaborate rendering is not necessary, nor is a black background; and the permission of extreme elaboration gives an unfair advantage to the few offices who have skillful draughtsmen or to those who get the prior claim on the services of the professional renderer. Such things as large scale rendered details are ridiculous, unnecessary, and put an undesired premium upon mere draughtsmanship. And the scale of the drawings should be small. Sixteenth scale is big enough for any elevation and for a large building one thirty-second is enough for the plans.

Another thing in favor of a tight program is the ultimate value of the competition. It has been said often enough that a competition is only for the selection of an architect, a quaint little fallacy which still persists. It is on the contrary the selection of a scheme, as well as an architect. I know of no instance in an important competition in which there has been a radical departure from the competition scheme. It is restudied, possibly reduced on account of expense, to be sure, but it is always the same scheme, and this being so the program should state definitely the requirements and not be so clothed in ambiguity that the theme of a telephone book would seem clear beside it. It has been said often that one of the advantages of a competition is that it gives the owner a number of schemes from which to select the best, but what avails that opportunity if most of the schemes are impossible of selection? And such ambiguity places a very heavy burden on the jury. If no two schemes are based on the same idea, how can they decide which is best? How can anyone decide which is the best building, Notre Dame or the Parthenon?

As to the jury, a large jury is better than a small one, and a small one is better than the English system of one assessor. The decision is not a matter of fact as would be the answer to a question in mathematics, nor is it a matter of law, as a case before a judge. It is a matter of taste, judgment and common sense. The jury must be governed by two things—the program and the drawings submitted. Personally, I think the decision should not be made at the site. The professional advisor should so describe the local conditions that anyone from the program, which should be illustrated by photographs, could get an accurate idea of those conditions. Most of the competitors do not visit the site. Granted that they ought to, this is often impossible in a large compeition, particularly an open one. If, then, the jury makes the decision on the ground and it is not obligatory for all the competitors to go there, the jury is apt to be influenced by some fancied local condition of which the competitors know nothing. It is unfair. The program should be enough, and the program should govern. It seems to me in some ways comparable to a court of law. Nothing can be considered that is not evidence, nothing that is not in the program. And along that line it is much better that the professional adviser be not present at the judgment, otherwise he may be inclined to emphasize some point he has forgotten to put in the program. Such things have happened. To my mind the ideal jury is a triple jury; three separate juries of three each, making their judgments on different days or, in any case, entirely separate. After these separate judgments are made they should meet and, if it happens they agree, which they would not six times out of ten, then they can argue the matter out and decide by majority vote. It is a rather cumbersome method to be sure, and expensive, but I am convinced it's the best. A jury of three may have one dominant personality; the effect of that would be lost in three separate juries, and again any jury is apt to decide one

From "The Architectural Forum"

View of LaRoquette from Approach to the Town

way, on one day, and quite the opposite on the next. Such a large jury would do away with the danger of the competitors playing up to the jury, which they all generally do, and quite naturally. If, for instance, it is known that Mr. Goodhue is a member of a jury for a church, the designs will all be Gothic and most of them an attempt at that free expression of the style that Mr. Goodhue is fond of; if, on he contrary, Henry Bacon is on the jury it would be, as Mr. Potash says, something else again. This all is considered highly immoral by some, and to prevent it the names of a small jury are not given out until a few days before the drawings render. This is a mistake, an injustice if there is a small jury. It simply means that half of the submissions are hopelessly out of it from the start, if it happens that the jury or a substantial part of it are stylists. This condition could hardly happen in a large jury and never in a mixed jury, nor would it happen to a great extent if there was a tight program. In other words, anything that tends to put all the competitors on an equal footing is good, and anything that is ambiguous is not. People have queer ideas of fairness. I remember a competition some years ago in which most of the competitors had a very definite idea of the character of the scheme required. It had been talked of pretty generally in the institution that the building would be a parallelogram around a closed court, but just before the program was issued the local authorities frowned on that scheme, and it was proposed to say this definitely in the program. Oh, no, said some, that would not be fair. Give no information. It would stunt the imagination of the competitors. So nearly three quarters of the schemes presented had a closed court and were promptly thrown out. It's a queer idea of fairness. In the same way, if a committee wants a Gothic church let them say so frankly; it's fairer to themselves as well as to the competitors, for they are sure then of getting ten schemes from which to choose instead of three Gothic schemes and seven Colonial ones.

To show what might happen to a War Memorial where no competition for it is held, here is a neat, new bas relief for Leeds University, the result, we are assured, of the method of direct selection.

From "The Architects' Journal," London

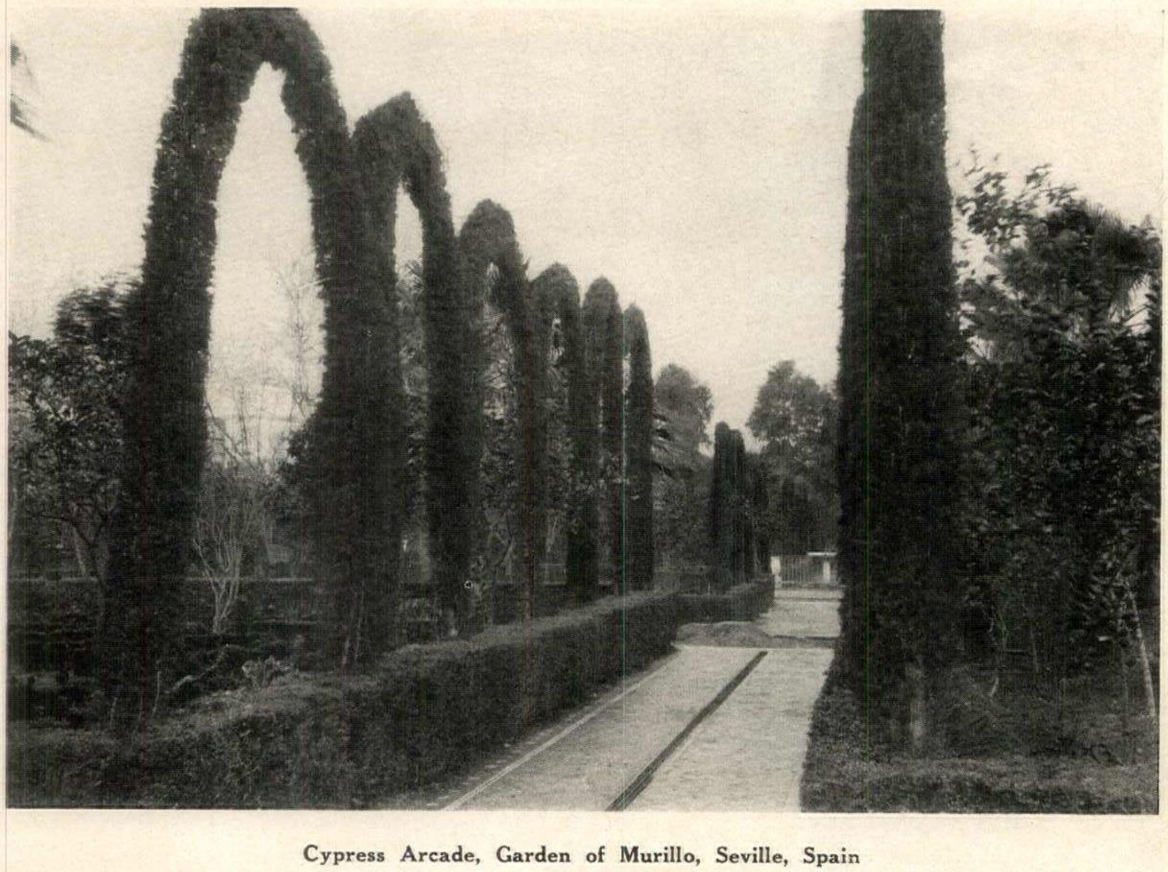
Leeds University War Memorial
Christ driving the Money Changers out of the Temple
Eric Gill, Sculptor

In *Architecture,* London, for July, there is added to their list of distinguished contributors Mr. G. K. Chesterton who writes on the Impossible Cathedral, regretting that no one ever builds a real Gothic Cathedral nowadays and says

> "Nobody supposes that the modern world is incapable of producing anybody who can really carve saints in niches or gargoyles on roofs. Yet we have no gargoyles on our roofs and very few saints anywhere. Nobody supposes we are actually without the technical talent that could produce a lively devil to dance for us. Yet we look over the walls of all our public buildings, and have to lament a deplorable absence of devils. In short, when I say Gothic I mean the fulness of Gothic, the freedom, the fantasy and the caricature. It [illegible] well known that the sculptors of the old ch[illegible]

often satirists even of their own employers, as well as of the abuses of the age; and would present pleasing pictures of bishops with the heads of asses or foxes, abbots agreeably tormented by demons, or generally of hypocrites going down to hell. If we lack these things, it is not so much, I fancy, because we have no hypocrites to go to hell, as because we have no hell for them to go to. But it is pleasing to think how much might be done with the modern patrons of public buildings, the modern employers of labour, or the modern moralists and preachers of various philosophies, if only this defect and difficulty could be overcome. For it must be confessed that this defect is the difficulty. In however detached and secular a spirit we approach the problem, it remains true that the architectural system, rested on an intellectual system. Indeed the intellectual system was itself very architectural. It had a great affinity to architecture in its love of balance and of series. This architectural spirit marked the mediæval mind, even when it was not dealing with religious classifications like the Seven Sacraments of the Seven Deadly Sins. It was apparent in its secular humors, as when it talked of the Nine Worthies or the Seven Wonders of the World. The difficulty therefore is not only the absence of well distributed individual craftsmanship, but also of well-defined philosophical classification. It would be interesting to speculate on whether a new sort of cathedral could really be built in the modern world, if ever there really was a modern philosophy. It would be great fun to sketch out a fanciful scheme of such a symbolic edifice, flanked with allegorical statues of Eugenics and Psycho-Analysis, with complexes flung forth from the walls instead of demons, and angels rejoicing over a birth-control instead of a birth. Whatever form of mediæval extravagance it might exhibit, I fear the building would fall short in the quality of humour."

There is an editorial in the same paper which starts off by calling attention to the improved condition of Hyde Park corner, now that St. George's Hospital is painted, and goes on to comment on the distressing effect of the blackened London stone, and that it might be better to paint it all, and so on. Now, I find myself usually in entire accord with Mr. Barman, but I sincerely regret this point of view. To me those blackened buildings of Portland Stone were always singularly attractive, and when I've seen people painting them, as unfortunately they do, I consider it rank vandalism. It's a question, of course, what material is best in the grime of a modern city; stone blackens and marble grows dirty; brick is better, but buildings can't be all brick; glazed terra cotta had its advocates, but to my way of thinking it is worst of the lot for it dirties up soon enough and with the glaze underneath its appearance is no better than a dirty tea cup. I'm inclined to think granite has a more respectable appearance when dirty than any other stone, for example, the University Club here in New York and some of the older buildings in St. Louis and Chicago. They are blackened, especially the latter, but they seem to have gained an air of permanency and dignity that they lacked when new. Let us hope they will never be cleaned, and as for painting them, God forbid!



Cypress Arcade, Garden of Murillo, Seville, Spain

(From the photography by Francis Howard)

MOORISH FOUNTAIN—THE ALCAZAR, SEVILLE, SPAIN

(From the photograph by Francis Howard)

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FOREWORD

TO THOSE who plan and construct buildings, they are living things possessing individual character and expression. Their personality is as varied as that of humans. They utter a voiceless message that is clear to us who would listen and endeavor to understand. But like us humans, they can have form and substance and be without life—like the statue of supreme beauty, a thing of lifeless marble, or as an embalmed cadaver.

The building is finished, equipped and furnished. It stands in all its beauty and strength, a thing of dignity and simplicity and yet intimate and engaging where appropriate. But it is without voice and life. Those organs that constitute life are not functioning. It is not habitable. And yet it has all of the elements of life.

When the boiler is fired and steam generated, the power generators in turn activate the motors—then is felt the quickening pulse of life. Heat and light are born to make brightness and warmth; frigidity is made to serve our needs; absent friends talk to us; we listen to the word, the song and the music from far places; we are elevated to high places without effort; food is prepared and served to satisfy us; cleanliness is everywhere; food and shelter make life possible and desirable.

All of these elements of life are hidden from us—to most of us they are not attractive. Perhaps they are uncouth, crude and barbarous looking things—noisy and ill-smelling. Or they may be things that revolve with incredible speed—silent, shapely and beautiful. Some of the parts move, open or close without the intervention of man. They do this to serve the needs of the moment, do this automatically even as some of our parts do without effort or direction. All are as well balanced, proportioned and harmonious as are the life giving elements of a normal man. From them radiates all that vast network of pipe and wire that circulates life to the remotest parts.

What constitutes the analogy? The huge, ungraceful, hot and greedy furnace and boiler is the source of all this life. The pulsations of the generator are as the heart from which flows the life giving currents that energize the structure even as the life blood in the arterial system energizes the human body. Those hidden wires are as nerves bearing messages from one part to another, activating those organs and things that otherwise would be lifeless.

To those of us who have learned the unskopen language of the building that lives, these things are a source of wonder and beauty because they serve—serve faithfully without evasion, serve in fullness of power and when well cared for they sing of power, joyousness and constancy in harmony with themselves and those who are fit for their service.

Even as we care for and maintain those parts of our bodies that make normal living possible, we should care for those similar parts of the correctly constructed building so that it may have a normal life and serve us as well. To do this, these parts must have room in which to do their work, for they do work. And in working they expand and contract, push and pull, raise and lower, all under tremendous strain and stress. We never hear them complain except when we neglect them; then they speak in an unmistakable language that is plain to the ear that is properly attuned.

With these things in mind and having an appreciative understanding, why do we relegate them to improper quarters, engage in false economies in vital and minor parts, leave untended to hasten decay—these things that serve well and faithfully to their utmost?

That you may better know them, the following pages are presented to you.

The MECHANICAL EQUIPMENT *of* HOTELS

Its Relationship *to the* Total Cost *of the* Building

BY F. S. MARLOW, *Architect, S. W. Straus & Co.*

DO architects as a whole appreciate the relative importance and cost of the mechanical work for plumbing, heating, ventilating, electric wiring, laundry equipment, etc., in investment buildings? The majority undoubtedly do, but apparently only a few give it the office attention its initial cost justifies or its ultimate importance makes imperative.

Architects fully realize the importance and value of the steel framing and, as a rule, give it proper attention. Yet the plumbing installation, the elevator equipment or the ventilating system seldom receive their share of his attention and are usually accepted as recommended by the individual contractor. It is not expected that an architect should have the knowledge necessary to cope with the details of specialty problems but it is essential that he should know the relative costs, values, and importance of the principal equipment in order to complete his store of information indispensable to an efficient development of all investment projects.

The analyses of many different types of buildings develop startling figures as to the importance and cost of mechanical equipment when compared with those of other necessary parts. We find this equipment responsible for 20% to 35% of the total net cost of many modern fireproof investment buildings such as lofts, offices, apartments and hotels. Naturally, the individual item cost varies for each type and class but the fact to be realized is that the total percentage in any case is much greater than many seem to appreciate.

Consider these facts. The plumbing in the average modern fireproof hotel will cost approximately the same as the steel frame. The heating and ventilating equipment for this building will just about equal in cost the face brick curtain walls having a fair share of limestone ornamentation. The interior marble work will hardly exceed the cost of electric wiring, nor will the interior doors, trim, etc., exceed the cost of an efficient elevator installation. The equipment for the kitchen and laundry will demand a greater expenditure than a normal amount of sheet metal work.

The following table presents the low and high percentages of net cost for mechanical equipment for several hotels. Naturally, none conform in detail to the low or high list. For example, a hotel only a few stories high with a bath for every room will be high in plumbing but low in elevator cost. Much of the equipment depends upon the class of hotel under consideration. However, the table presents general averages that should impress us with the importance and cost of the mechanical equipment when compared with the other material required in their construction.

Plumbing	7.0%	to	11.0%
Heating and ventilating	5.0%	"	9.0%
Electric wiring and fixtures	3.0%	"	4.0%
Elevators	3.0%	"	5.5%
Refrigerating Plant	.5%	"	1.2%
Laundry Equipment	.2%	"	.3%
Kitchen Equipment	.3%	"	.5%
Finishing Hardware	1.0%	"	1.5%
Miscellaneous	0.0%	"	2.0%
	20.0	"	35.0%

While the above table is compiled from hotel data, analyses of relative cost of other types of investment buildings produce equally impressive results. It is a poorly equipped and an inferior class of office, loft or apartment buildings which shows mechanical equipment costing less than 18% of the net cost of all labor, material and equipment. Subnormal equipment very often nullifies the value of other superior qualities and generally reacts harmfully on both rental value and operating expense. The saving of 1% in building cost by the installation of an inferior elevator equipment or an inadequate service may prove not only expensive in annual operation but may easily lower the income. Immediately upon the completion of buildings of every type there is daily evidence that the equipment directly affects both the operating cost and the building's reputation.

As a rule, so much time is spent on plans and architectural design without any preliminary consideration for the equipment installation that often investors are actually proceeding with their operation without adequate facts concerning their equipment requirements. When we consider that this equipment, unlike much of the other material used, is constantly affected by use and that its maintenance and operation absorb a large percentage of the annual operating cost, we should be doubly impressed with its value and its relation to the ultimate worth of the building.

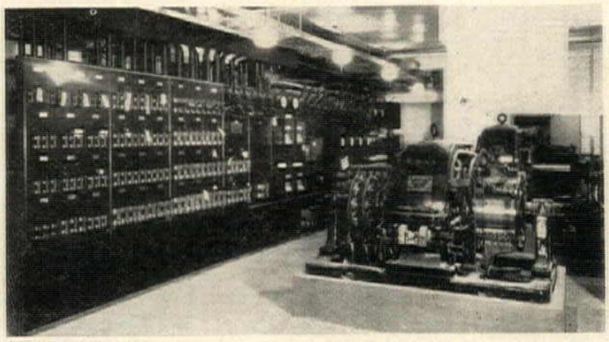
While the architect's efficiency in planning may produce the estimated gross income, his apathy in dealing with the mechanical equipment may not only increase the initial cost but also the expense of operation and thus to a greater extent than is usually appreciated, tend to decrease the otherwise satisfactory ratio of income to cost.

ELECTRICAL EQUIPMENT *for* MODERN HOTELS

*BY OTTO E. GOLDSCHMIDT**

THE rapid progress in the development of electrical equipment is naturally taken up by our modern hotels and now requires a most careful study to insure the equipment meeting the special demands of the hotel service. The electric wiring equipment for light and power service pertaining to our modern fireproof hotels is therefore of particular interest.

The current supply for a modern hotel is one of the first problems that should be given consideration. There are generally two sources, that is, either the current is obtained from some power company and the current is paid for on a meter rate or a generating plant is installed in the building itself for producing the electric power. The advantages of either one of these systems are entirely dependent upon local conditions and vary with almost every hotel operation. The cost of current supplied by the local power company is, of course, the basic factor. The size of the hotel is also a very important factor. The dependability of outside supply, the cost of coal and labor, the possibility of using exhaust steam for heating during the winter months and for producing hot water throughout the year are all important factors which enter into the consideration of this problem and very careful study must be given each to arrive at a correct final analysis. As a general proposition there is no building which lends itself so favorably to an electric generating plant as a hotel, principally owing to the fact that all or at least a considerable amount of the exhaust steam can be utilized throughout the year for which, without a generating plant, live steam would have to be furnished. During such periods when all the exhaust steam is utilized the electric power is really a by-product. In some localities a very satisfactory arrangement has been worked out where the hotel was able to purchase its electric power during the summer months and to generate its own power during the winter months when all exhaust steam can be utilized for heating purposes. The necessity of a break-down service, where a power plant is installed, is now not considered essential as with reasonable care by the operating force there should be no occasion for a shut-down of any kind in the generating plant. Where current is supplied from hydro-electric plants and the power is transmitted by overhead lines an occasional shutting off is unavoidable especially during the summer months while electrical storms prevail as lightning frequently strikes the wire and poles and causes power to be shut off for periods from a few minutes to several hours.



Main Switchboard, Hotel Statler, Buffalo, N. Y.

Where the service is taken from some outside source the system of electric light and power wiring as now usually installed consists of the necessary service mains from the street which are brought in to a main distribution switchboard. When the current supply is 220 volts, 3 wire, direct current, is carried directly to this main switchboard and distributed from the same by feeders to the various panelboards for light and power distribution.

Where the current supply is alternating current, the supply may be brought in in two different ways. If the power company furnishes its own transformers mounted either on a pole or in a street vault the supply is carried in from these transformers at low tension through service mains which are connected into the main distribution board as in the case of direct current supply. If the current supply is brought into the building as high tension current, above 500 volts, it must be transformed in the building itself to low tension current. It is then necessary to provide in the basement of the building or some adjoining separate building a transformer vault in which the various transformers for light and power are placed and in which all the high tension connections are made. The low tension service mains are carried from these transformers to the main switchboard as above described. The selection as to whether the current is to be brought in as high tension or low tension is generally dependent upon the difference in rate at which the local company supplies its power. The high tension current can usually be purchased more cheaply than the low tension but the added first cost of transformers, connections, etc., must be given consideration. The transformer vault must be of fireproof construction, provided with outside ventila-

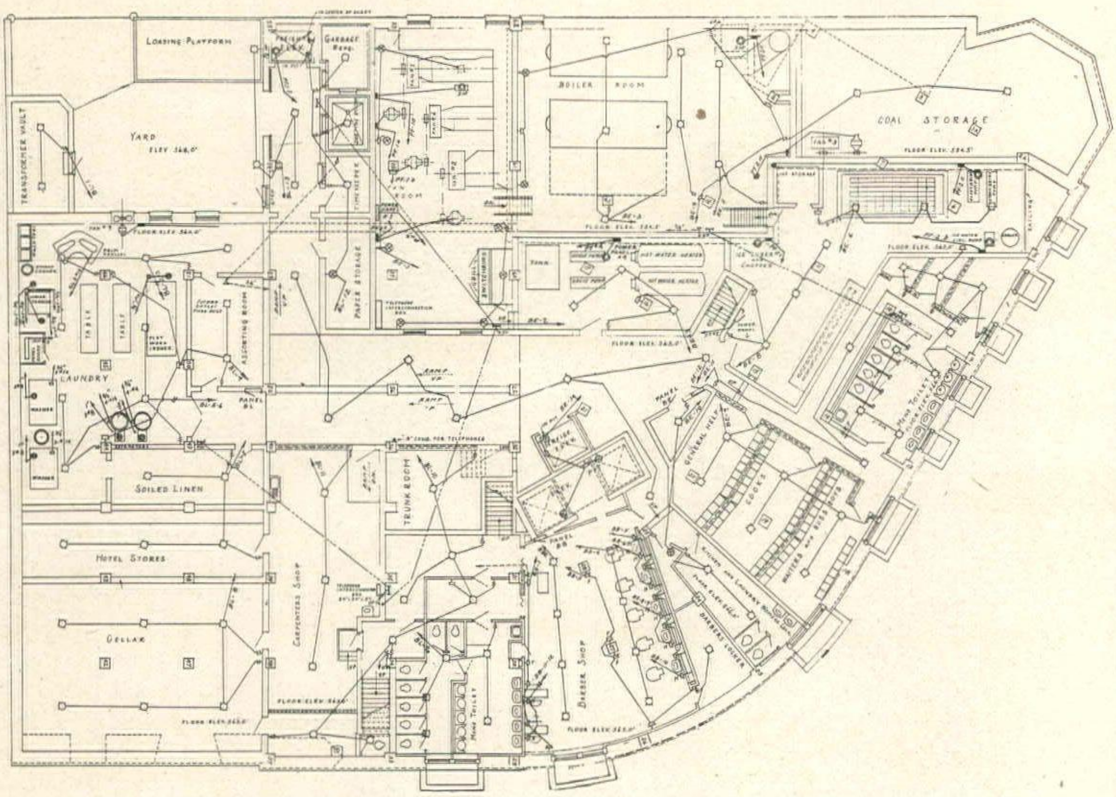
**Consulting Engineer, New York City.*

tion, fitted with a fireproof door and have a suitable floor drain connected to the sewer in order to meet the requirements of the Underwriters' Association.

The main switchboard placed in some convenient point in the basement is usually constructed of slate or marble panels mounted on an angle iron frame set far enough from the wall to give working space behind the board. On the panels are mounted the switches, circuit breakers and instruments to control the distributing feeders to the various panelboards throughout the building. The bus-bars and connections for the feeders are placed on the back of the board and should be worked out so that there will be no confusion in the arrangement or unnecessary joints. The size of the switchboard, the number of switches, circuit breakers and instruments are dependent upon the size and character of the hotel building and whether the current supply is taken from an outside source or from a generating plant within the building. Where alternating current is supplied to the building and a transformer vault is provided the switchboard can sometimes be placed directly outside of the transformer room wall and the control levers for the oil switches on the high tension lines can be mounted on the main switchboard.

The distribution system from the main switchboard is, of course, very largely dependent upon the size of the hotel. The number of panel boards to a floor varies with the floor area on the typical floors and with the departments or character and size of the main rooms on the public floors. In the working departments and public floors the panelboards are usually placed in such positions as are most practicable for access and so that the branch runs will not be too long. For the public rooms the locations of panels are again dependent upon the size of the room and the general arrangement of the same. It is usually desirable to have a separate panel for a ballroom, for a main dining room, for a grill room and so on, if these are sufficiently large to warrant the same. These panels are placed in an inconspicuous location, as a passage just outside, so as not to mar the architecture of the room itself. Yet, if possible, they should be located in such a position that the room is visible by the person operating the boards, as for instance, just outside of a service door to a ballroom. These panels, in the working departments and public rooms, are very frequently used for the control of the lights and what is known as the safety type of panel is desirable for these locations.

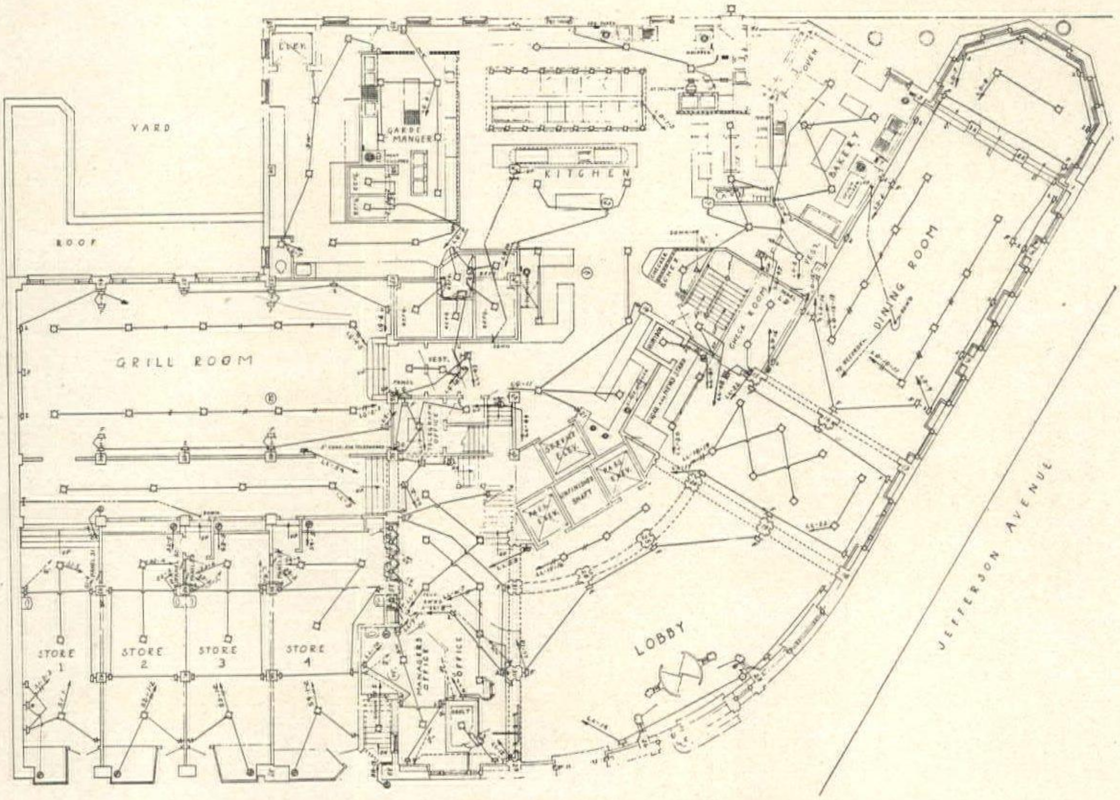
On typical floors the panelboards are usually located in the corridors, preferly on a shaft so that the panels will be one above the other and the shaft then makes it possible to carry the feeders straight up and down. Care should be used in



Electric Wiring Plan, Basement, The Niagara, Niagara Falls, N. Y.

locating these feeder shafts so that it is possible to carry the main conduits supplying the panels down to the basement and main source of supply. Very frequently the lobby and dining room ceilings are furred down for other purposes, which permits of carrying conduit to different shafts for this purpose. The number of panelboards on typical floors is dependent upon the size of the floor, but each floor should have at least one panel. These panels are usually of the knife switch pattern with cartridge fuses as they are not used for the control of lights. They should be locked and only accessible to the house electrician. Generally, panels in a hotel many of these switches are operated by an unintelligent class of help. A very desirable arrangement is to provide separate meters on these group panels as this enables the owner to determine the cost of current required for operating the variout departments which, in hotels, are frequently operated on a separate basis and the meter readings are a great aid for the bookkeeper in the distribution of his costs.

The sizes of feeders for the various panels are, of course, dependent upon the size of the panels. On typical floors it is very general practice to include from three to five panels on one vertical



Electric Wiring Plan, Lobby Floor, The Niagara, Niagara Falls, N. Y.

are placed from seventy-five to one hundred feet apart.

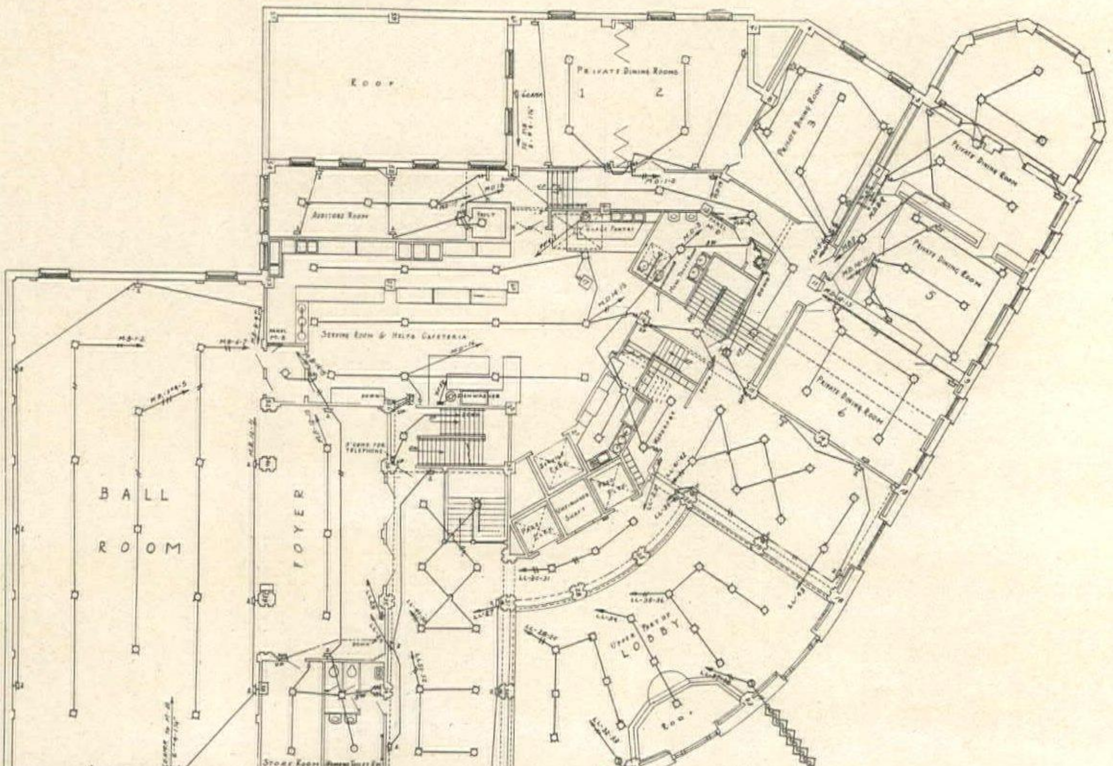
Separate lighting panels are installed for each store or similar rentable space and these are arranged for separate metering. It is customary to install a meter for each tenant in a hotel as very generally the cost of the electricity is not included in the rent and the tenant pays the customary rate for whatever current he consumes.

Separate power panels are generally provided for various groups of motors, such as elevators, fans, kitchen motors, laundry motors, etc. Feeders are carried to these panels and sub-feeders from the panel to each motor. These sub-feeders are controlled by switches and fuses on the panelboards and two main switches which should preferably be of the safety type are provided at each motor. These safety type switches are desirable because feeder. Thus if it was determined that three panels should be on one feeder the panels on the first three floors would be supplied by one feeder, those on the next three floors by another and so on.

A very desirable arrangement is to have the corridor lights on the guest room floors on alternate cicuits so as to obtain half or full illumination as may be required. It is also desirable to have the control of these lights under the supervision of the room clerks. This is obtained by having the circuits supplying the corridor lights independent of the main bus-bars of the guest room floor panel on which they occur. These circuits will then be supplied by two sub-feeders from the lobby panel, each sub-feeder supplying half of the corridor circuits. Local wall switches should also be used on each floor. In arranging the alternate circuits in the corridors care should be used to insure that the lights near the windows may be cut out in the daytime when one-half the illumination is used in the corridors and thus save current. A separate feeder is generally carried up to the roof of a hotel building to supply the electric sign. This feeder is controlled directly from the main switchboard.

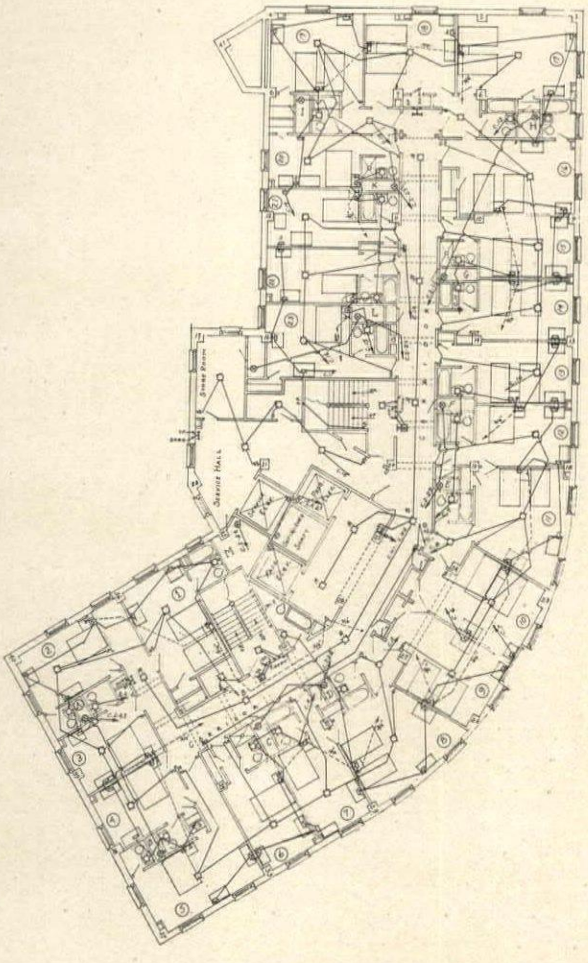
There are many special outlets which are necessary in modern hotels and great care must be taken to get these properly located so as to avoid changes when the construction work is completed. Exit lights are required by law over all doors leading to fire stairs and similar fire exits. These exit light circuits should be placed on one of the lower panels which is accessible and the control of all exit lights in the building should be from this point. Fan outlets for the use of electric fans in the public rooms should be provided and located seven or eight feet above the floor. The arrangement of rooms should be studied and these outlets installed in the most suitable locations for electric fans. Small electric signs are now very generally used to indicate location of, for instance, the barber shop, the public stenographer, the cafeteria, the cigar stand, etc., so that the public may be directed more readily, and outlets for these must be provided. Portable vacuum cleaners are used to a considerable extent in some hotels and it is the practice to install special receptacles at various points on the typical floors where these may be used. Special heating outlets are required in the barber shop to operate the various devices which are now in very common practice, such as the electric sterilizer, at each chair, for the barber's razor, and for the manicure instruments at the manicure tables. Outlets are also necessary for the vibrator which the barber uses and special receptacles should be provided for both the sterilizing unit and the vibrator for every barber chair. In the valet's room and in the laundry where hand work ironing is done, electric irons are now in general use and outlets for this purpose should be provided. These heating outlets should always consist of the combination unit made up of a switch, a receptacle and a small pilot lamp which indicates whether the electric current is switched on or off.

The lighting of the public rooms is a matter which requires a very considerable amount of study if good results are to be obtained and it is necessary for this purpose to have the co-operation of the architect, the electrical engineer and the fixture designer. The results which are to be obtained are, of course, dependent upon the size and character of the rooms and the amount of money available for the furnishing of lighting fixtures. Every room must have individual study and great care should be given to the location of outlets to meet the requirements of the particular room and the architectural treatment of the same.



Electric Wiring Plan, Mezzanine Floor, The Niagara, Niagara Falls, N. Y.

In our modern ballrooms and dining rooms it is now frequently necessary to provide special lighting effects and outlets for spotlights, moving picture machines, etc. Dimmers are also installed in the lighting circuits of these public rooms so that the lights may be thrown on and off gradually. It is good practice also in ball and assembly halls to provide extra wall receptacles for special affairs and displays during conventions, fairs, or other



Electric Wiring Plan, Typical Floor, The Niagara, Niagara Falls, N. Y.

similar attractions. One or two floor receptacles in the center of the room for table decorations, during banquets or similar festivities, are also provided. Careful study should be given in each case for the proper switching and control of lights in these public rooms. Large lighting fixtures are very generally supplied by two or more circuits. These should be on separate switches so that partial or full illumination may be obtained as desired.

The illumination of guest rooms should also be given very careful study. General practice is to provide a center outlet in each guest room controlled by a switch placed just inside of the corridor door. Care must be used to locate the switch in accordance with the correct swing of the door. The lighting fixture in the guest room should be such as to avoid direct rays and the lighting effect should be cheerful and without glare. There are many fixtures on the market now which give very satisfactory results in this direction. Outside of the center light there are usually three receptacles provided in each guest room, one of these being used to supply a bed light, the fixture of which is directly attached to the head of the bed, another is used for supplying a fixture attached to the dresser and a third for a fixture attached directly to the desk. Where a dressing table is provided in a room it is desirable to provide a separate duplex receptacle for this to supply two small candelabra lamps placed directly on the dressing table. It is also possible to utilize brackets for the illumination of bedrooms but the location of outlets must be very carefully determined so as to be central over the furniture which they are supposed to serve or if the walls are paneled that they will be located properly within the panels.

The bathroom illumination now generally consists of one electric outlet directly above the mirror and over the lavatory. This outlet is fitted with a very simple fixture and shade which may be controlled by a pull switch on the socket. In some cases where the bathroom is large a ceiling outlet is provided controlled by a wall switch in addition to the bracket outlet over the mirror.

Electric cooking apparatus of all kinds is now on the market and is coming into use to a considerable extent where the low cost of electric current will warrant its adoption. This includes the large kitchen ranges, bake ovens, pastry ovens, broilers and similar appliances. All of this apparatus requires a considerable amount of current especially in starting, and particular care must be given to the fact that the feeders for these appliances must be heavy enough to carry the maximum demand in current. Separate cabinets for the necessary circuits, switches and fuses should be provided for these heating units and these should be independent of the panels for light or power.

In conjunction with the telautograph and teletype installations a pneumatic tube system is now practically essential. Such a system is used in many different ways such as for the transmission of charge slips between the restaurant cashier and the front office cashier, from the telephone switchboard operator to the front office cashier, for the distribution of mail to the floor clerks and other similar purposes.

Owing to the general use of rugs and carpets in every hotel it is necessary that some form of vacuum cleaning equipment should be provided. Vacuum cleaner installations where the machine is placed in the basement have undergone a considerable change and of this type the only systems which are now considered desirable are those which operate with a centrifugal exhauster and utilize pipes not less than two and one-half inches in size. This type of vacuum cleaner handles a very considerable amount of air and the pipes are of such size that hair-pins, matches and other similar objects which may be picked up by the operator will not lodge in the pipe at the turns or any other point. Vacuum cleaning systems of the high vacuum type have practically been eliminated. This is due mostly to the fact that the pipes which were considerably smaller than two and one-half inches were continually becoming stopped up and the time and expense in cleaning them out was such that the installation was out of service for a considerable period. The centrifugal exhauster system above described and as now installed gives very satisfactory service providing a sufficient number of riser lines are provided so that the length of hose is not excessive.

The portable type of vacuum cleaner has been adopted by a number of hotels and a sufficient number of units are provided so that several cleaners may work simultaneously. These portable cleaners consist of a small vacuum cleaner equipment mounted on a portable truck and the current requirements for the same are such that it can be operated from the ordinary lighting circuit providing no lights are burning at the same time. The best practice is to provide special receptacles for these cleaners in the corridors providing a considerable length of flexible cord so that the machine may be wheeled into the adjoining rooms without difficulty. While this type of machine has a number of advantages over the central type of installation it has the disadvantage of creating some noise when in operation which may bring about the complaint of a guest who is sleeping late in the adjoining room. The cleaning is not quite so effective as with the other form of machine, yet very serviceable results are obtained from the portable machines.

The small portable vacuum cleaner as used generally in the home is also used by some hotels but only to a very limited extent.

Outside of the light and power wiring there are a considerable number of other electrical appliances for which provision must be made in our modern hotels. A telephone is required in each guest room, in a number of the working departments and provision must also be made for public telephones. These telephone installations in our modern hotels are equal to the telephone exchange in a moderate sized city and a very considerable amount of study must be given to the proper arrangement for the equipment in the larger hotels. It is customary to provide a separate room for the telephone switchboard. This should preferably be in a location where there is ample light and air for the operators. A location on or near the roof of the building is frequently now selected for this purpose. All calls from guest rooms and other parts of the house except by public telephone are handled on this switchboard. The public telephone operators are usually located in some convenient place in the lobby.

In the smaller hotels where only one or two operators are required the switchboard is very frequently located convenient to the front desk of the hotel and the operator handles all room as well as the public calls. It is customary practice for the owner to provide all conduits and boxes for the telephone cables and wires. The telephone company provides and installs all its own cable and wires and furnishes its own instruments. In some parts of the country it is necessary for the owners to furnish and pay for cables, wires and all telephone apparatus but this work must be installed in accordance with the telephone company's requirements.

The telephone outlets in the various guest rooms are usually located so that the telephone instrument which is now always of the desk type is placed on the somnal adjoining the bed and if no somnal is to be used it is located so that the instrument will be on the writing desk. If the instrument is to be placed near the bed care must be taken to locate the outlet so that the bell box of the instrument, if placed on the wall, will not interfere with the space required for the bed.

It is again desirable to provide a vertical shaft which is free from plumbing or steam pipes and extending through the guest room floors of the building for the main telephone risers. The number of risers is dependent upon the size of the floors and as in the case of electric light panels it is desirable to place them about one hundred feet apart. Access from the corridors to the telephone cable shafts should be provided. It is preferable in these shafts to arrange them so that the cable can be carried through without any conduit as it simplifies the telephone construction.

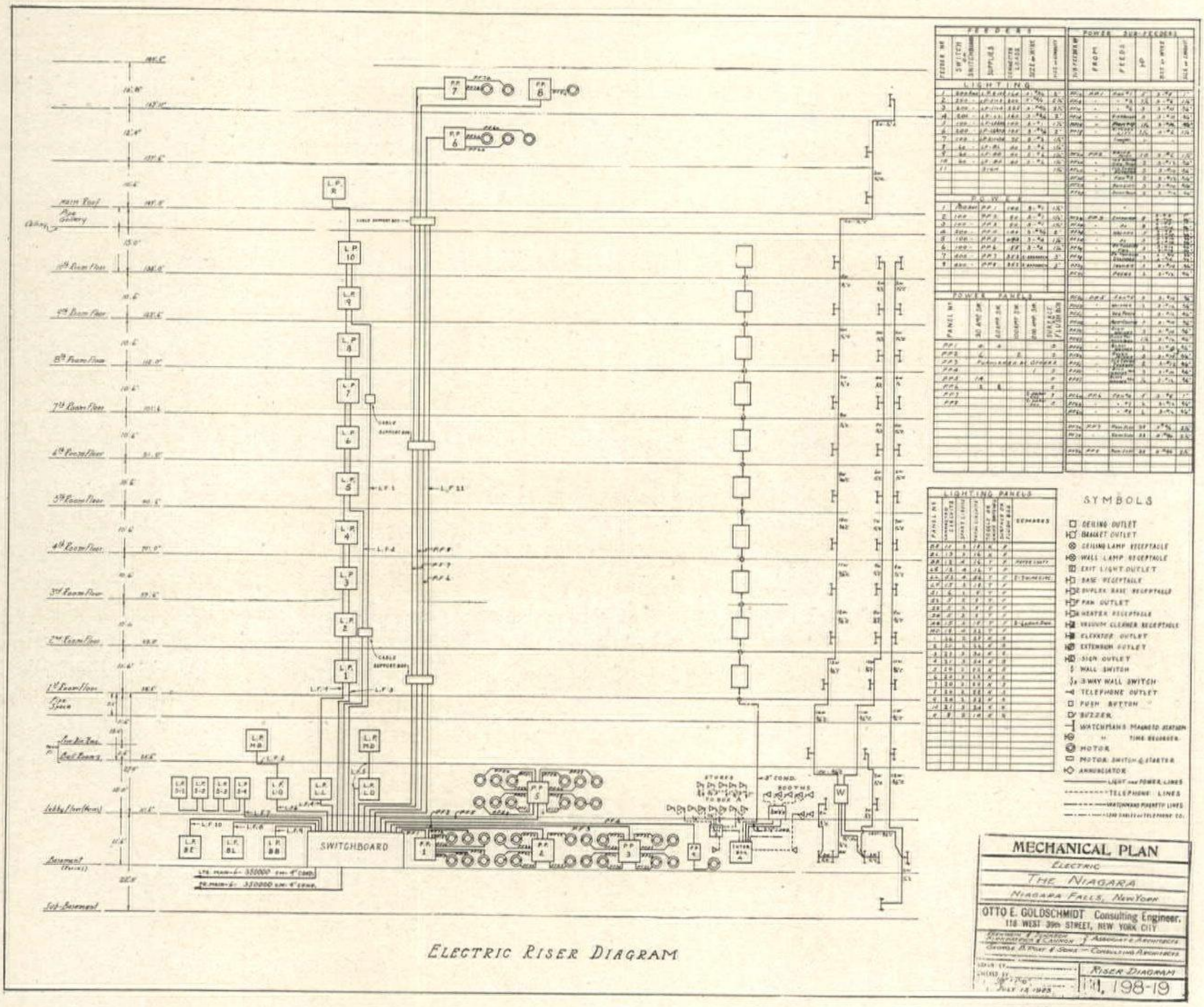
In the larger hotels it is often desirable to relieve the main switchboard of the inter-department calls. In such cases an interior system of telephones is installed. These systems may be one of two types, the push button type or the switchboard type. The push button telephones can only be used for a limited number of stations. The switchboard systems are divided into two types, the manually operated switchboard and the automatic switchboard. The latter type is very desirable as it does not require any operator and is, therefore, less expensive to run and the service is quick and dependable. This system also has the advantage that as the switchboard operator is eliminated the conversations are private. Push button types of telephones may be arranged so that the manager and other departments may hold strictly private conversations.

Interior systems reduce the possibility of employees in the working departments making or receiving outside calls which interfere with the house service. Some hotels install a coin box instrument for the exclusive use of the employees.

Conduits and boxes must be provided for telegraph service as required by the telegraph company who will provide all wire and instruments.

In the smaller houses which are operated without floor clerks on each floor it is desirable to have some form of maids call system on the guest room floors. A very simple system to enable the housekeeper to call a maid on any floor should be provided.

Telautograph and teletype systems are now in very general use and one or the other is essential in all of our large hotels. Special wiring provisions must be made for either of these systems. Both telautograph and teletype systems are used for transmitting messages from one department to another where it is desirable to have a record so as to fix responsibility in the case of neglect or that a message may be delivered even if the person in charge of this department may be out of his office. The use of this apparatus is very diversified and a number of stations necessary. The location and arrangement of the same require very careful study. This apparatus is used for transmission of messages between the various departments, such as the front office, the housekeeper, the laundry, the chief engineer, the cashiers, the telephone switchboard, etc. All the conduit, terminal boxes, wires, etc., for this apparatus are usually provided by the owner and the company which furnishes the instruments will install and connect same.



ELECTRIC RISER DIAGRAM

Each of our modern hotels should be equipped with a watchman's time recording system, in fact it is demanded by insurance requirements. The watchman's system consists of stations placed throughout the building on which the watchman must "ring up" on each of his rounds through the building. The stations are placed so that it is necessary for the watchman to travel over the entire public space of the building. Each station is connected to a central time recorder placed either in the manager's office or in the chief engineer's office which contains a paper chart on which is recorded the exact time at which a watchman "rang up" at each particular station. The entire apparatus is automatic and the only attention required is that the paper chart be changed at regular intervals and that the clock be wound up once a week. In locating these stations on the guest room floor it is desirable to place them vertically one above the other to reduce the conduit and wire expense to a minimum. The entire watchman's clock system is installed by the owner.

Electric time clocks and time stamps are most generally installed in our modern fireproof hotels. The number and location of these are, of course, dependent upon the size of the hotel. There are a number of companies who furnish this equipment which usually consists of a master clock placed in the manager's office or the chief engineer's office which is regulated to keep accurate time and sends out the regular impulses to the various secondary clocks and time stamps and keeps them in unison with the master clock. A storage battery equipment with necessary charging devices is necessary for this installation. With a small amount of attention these systems are now very dependable.

Push buttons, annunciators and similar equipment are used only to a small extent in present hotel installations. The telephone has come into such general use for purposes of this sort that the very elaborate annunciators and call systems which were formerly in vogue has been practically eliminated. Push buttons for the private dining rooms to summon a waiter or in the manager's office to summon office help is about the extent of their use.

In our large hotels, especially those which cater to social functions, the carriage call should not be overlooked. The carriage call is usually placed directly over the marquise or in some other location visible from the thoroughfare convenient for the taxi and automobile service. This carriage call is operated from a position located just inside of the entrance and indicates the number of each call in illuminated numbers outside.

It is evident from the above that the requirements of the electrical equipment of a modern hotel are such that each particular installation must be given thorough study so that there may be no confusion in the work as it is installed nor in the mind of the contractor who bids on the work and who is to execute the installation. The location of all outlets with symbols indicating their use, the size of all feeders and conduits, the location of panels, the number of circuits on the same, the number of wires in conduits, all of these and many more items should be clearly shown on the plans and described in the specifications. Another very important factor is that this equipment be planned so as to be in conformity and consistent with the general character of the building itself. For instance, it would be out of place to have a very elaborate electrical equipment where the hotel is to be built on an economical basis. While the equipment in all cases must be made so that it will be safe against all fire hazards and must be practical in its operation, certain economies can be followed to meet the general conditions upon which the architect is planning the building. The execution of the work should be carefully supervised to see that the equipment which is called for by the plans and specifications is installed in accordance therewith. In all cases this should be under the direction of an engineer who is thoroughly familiar with this class of work.

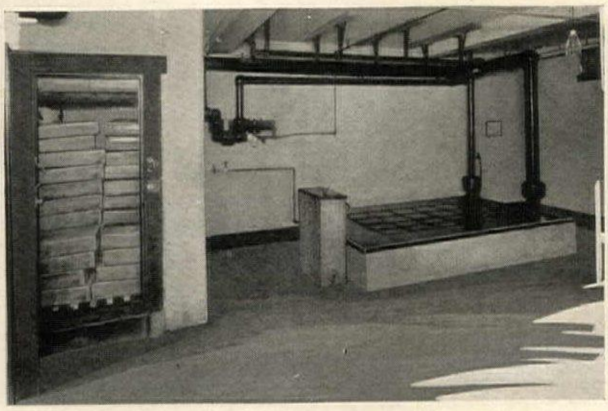
REFRIGERATION *for* HOTELS

BY *STEWART T. SMITH, Architectural Engineer**

THE installation of a refrigerating plant is becoming the universal practice in new and old hotel buildings. Even though natural ice may be comparatively cheap in some localities, it is generally found that a refrigerating plant proves to be a good investment. Aside from the investment aspect, there is the matter of convenience in having the service within the building and under control at all times as well as the dependability of modern installations. Natural ice refrigerating involves the handling and distribution of a bulky commodity, whereas mechanical refrigeration can be distributed and redistributed to other points at will.

The refrigerating requirement of any hotel is particular to itself. It cannot be standardized on any unit basis of number of rooms or persons to be served in the dining rooms. These requirements are based largely on the character of the dining service which is to be rendered. This service has no fixed relation to the size of the hotel, it is rather a thing apart. The refrigerating requirements do have, however, a distinct relation to the kitchen equipment and layout. In fact the two, the kitchen and refrigerating equipment, have an intimate relationship and are best planned together in order to secure a satisfactory result.

It is then apparent that the first step is for the hotel operator to decide on the character and extent of the dining service and with this in mind, the architect will be able to develop a satisfactory

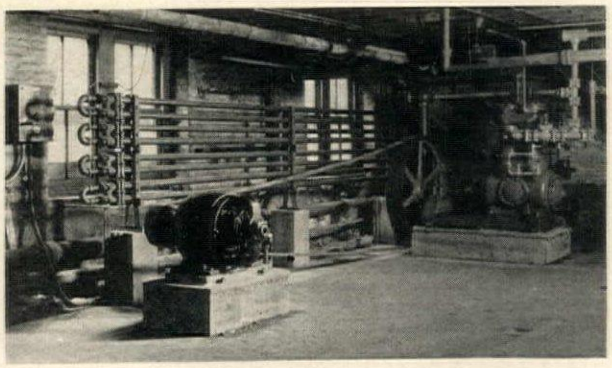


Freezing Tank and Ice Storage Room

scheme with the collaboration of the refrigerating and the kitchen equipment engineer. Like the other mechanical features involved in hotel construction and operation, these factors must be fully considered in the initial planning of the building. Their importance is so great that they cannot be made to "fit in" at a later stage of the project development.

**Of Van R. H. Greene, Refrigerating Engineer, New York City.*

Mechanical refrigeration is accomplished by the vaporization of a chemical which is called the refrigerating medium. These mediums are chosen for their ability to absorb a large amount of heat during their vaporization and for having a low liquefaction point—in other words a low temperature at which the gas or vapor will be converted to a liquid. For commercial purposes ammonia



Refrigerating Plant, with Compressor, Condenser, Receiver and Electric Cabinet

(NH_3) and carbon dioxide (CO_2) are the mediums most used.

The objection to ammonia is its odor if leakage occurs and the danger if present, through accident, in sufficient quantity in the air. In modern and properly designed and installed plants this danger is practically overcome. The advantages of using ammonia are a slightly lower initial and operating cost and the fact that leakage from the system is easily detected. The objections to carbon dioxide are its slightly higher initial and operating expense due to the high pressures required, not easily detected loss of the refrigerant with the attendant danger of asphyxiation. The advantages of this medium are that it is odorless, nonexplosive and noninflammable. Ammonia has been used much longer and to a far greater extent in this country than carbon dioxide and is more familiar to architects.

The purpose of a refrigerating machine is to recover the medium and to again make its use possible. They are of two types, absorption and compression.

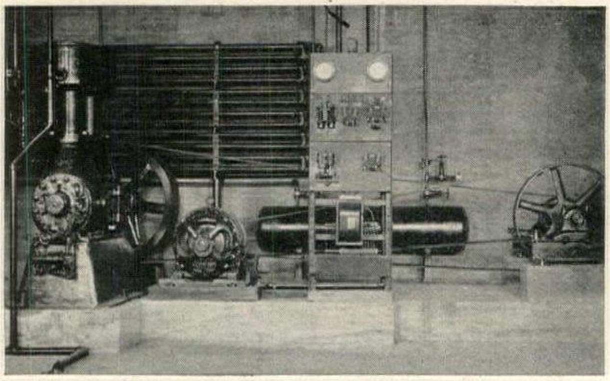
The principle of the absorption method is that ammonia is soluble in water and can be driven therefrom by heat. The absorption machine has an absorber where the ammonia comes in contact with water, a generator where the ammonia and water is heated by exhaust steam derived from other apparatus and a mass of pipe used for rectifiers, coolers, heat exchangers and condensers. This mass of pipe, the generator and absorber take up a considerable amount of space. This type of apparatus is rather complicated in construction and operation and requires a more skilled operator.

The compression system is the more generally used. In this method there is employed a compressor very similar to an air compressor. The compressor receives the gas from the cooling coils and puts it under pressure and then passes it to the condenser where it is cooled by water. In cooling, the ammonia is reduced to liquid form. The condenser consists of a group of horizontal pipes in which the ammonia is circulated through a large pipe in the center of which is a smaller pipe through which passes the cold water. This form of condenser is commonly used in hotels. Other forms consist of a set of ammonia pipe coils placed on the roof usually and over which water flows and is collected in a pan. This form is used largely in ice making plants. In this case the large volume of warmed water is cooled by passing through a cooling tower. Tubular condensers are used and they consist of a round tank in which is placed a coil. The double pipe type of condenser, first described, is the most practical for hotel use. The condenser water is heated to about 80° F. and is perfectly good and is usually piped to the hot water heating and storage tank for use in the hot water supply system.

From the condenser the liquid ammonia passes to the receiver, still under pressure. The cooling or refrigeration work is done by allowing this liquid ammonia to flow into the refrigerating pipes and coils at a reduced pressure through an expansion valve. This sudden release of pressure causes the ammonia to boil away in the pipes and in so doing heat from the air or brine is absorbed.

There are two methods of applying refrigeration for hotel work, they are known as the direct expansion and the brine circulating systems. In the direct expansion system the expansion coils are placed in the refrigerator boxes or cold rooms. There is an economy in this system compared with the brine circulating system in that no circulating brine pump is required. The machine can operate at higher back pressure and greater efficiency in both capacity and power consumption and eliminate the waste of refrigeration of the brine pump, brine tank and additional lines. The elimination of this equipment reduces the operating and maintenance cost. Lower temperatures can be produced in the refrigerated spaces. This is particularly desirable for the ice cream box where a coil can be submerged in still brine and easily held at 10° F., which would be difficult to accomplish with the same brine circulating system that would be used for the higher temperature rooms. When the system is not under automatic control, a brine hold-over tank in the cold rooms is used to maintain the temperature when the compressor is not operating.

The brine circulating system is that one in which cold brine is circulated in pipes to the various cold rooms and refrigerator boxes by means of a brine pump. In this system the expansion coil is submerged in an insulated tank full of brine. This brine is reduced to any desired temperature and distributed to the various cold rooms and boxes by the pump. Lower temperatures are produced in certain rooms by providing additional brine coils. This is, in a way, similar but converse to a heating apparatus where higher temperatures are secured by using additional radiating surface. This system is usable for cooling remote boxes on upper floors in which ice is sometimes used in lieu of mechanical refrigeration. Sometimes in far distant places, such as roof gardens, a small plant is installed and operated with less expense than that incurred by the long line of circulation piping with its loss in temperature



Refrigerating Plant, Showing Compresor, Condenser, Receiver and Switch and Gauge Board

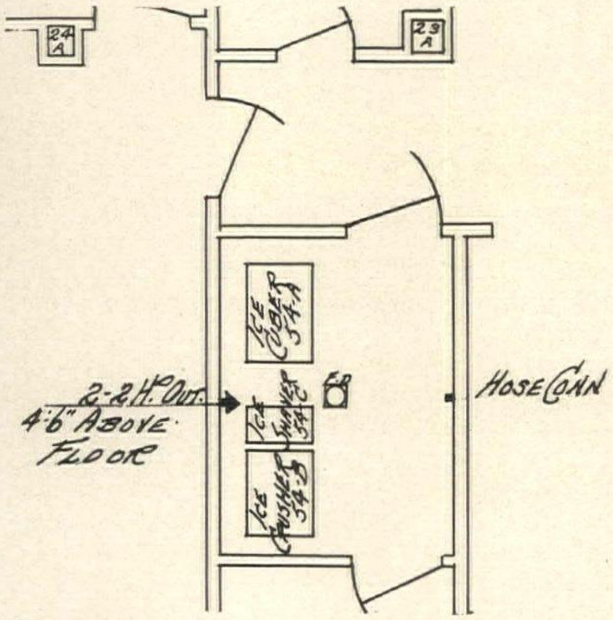
and cost of pumping against the hydrostatic pressure. Due to its high specific gravity brine changes temperature quite slowly. Usually the brine pump is operated continuously.

Ammonia compressors are of the vertical and horizontal types operated at either high or low speed. In these the principle of compressing is the same but there are variations in the details of construction and kinds of metal used in certain parts. The liquid receiver is a horizontal cylindrical tank and should be of sufficient capacity to hold the entire charge of required ammonia. Brine pumps are usually of the centrifugal type and have the motor direct connected on the same base plate. For high heads a triplex pump is sometimes used. The centrifugal pump is quiet in operation and requires little attention. Like all other operating machines, they should be installed in duplicate. The units in a refrigerating plant requiring power to operate are the compressor and the pumps. These are generally motor driven. Compressors are either direct or belt connected. The belt connected drive is usually the more quiet in operation and better adapted to medium and slow speed machines.

The installation and operation of a carbon dioxide system of refrigeration is practically the same as the ammonia system above described.

The refrigerating machine room should be separated from the boiler room by a fire-resisting wall in which doors, if any, should be approved automatic fire doors. This room should be ventilated by a ventilating duct or preferably windows. Fire departments usually regulate the layout of these plants and in planning them the architect should inform himself as to these regulations.

The cold rooms are generally three or four in number for the average hotel. The vegetable room is kept at a temperature of 35° to 40° F.; at this same temperature is kept the milk, butter



Ice Preparation Room, Ambassador Hotel, New York

and egg room; the meat room is kept 34° to 36° F.; a fish room has a temperature of 30° to 35° F. These rooms are usually located in the basement and often so located as to open to an insulated vestibule. The rooms should be insulated on all six sides with two layers of 2″ cork board laid with broken joints in cement mortar and plastered with Portland cement. Over the floor insulation place a 3″ concrete finished floor. Refrigerator doors, frames and hardware are built to standard dimensions and details. The rooms should be high enough for storing and placing the contents with added height for the cooling coil bunker or brine tank as the case may be. The smallest practical dimension for these rooms is 4′ x 6′. Rooms 6′ x 6′ or larger are better. In the larger hotel rooms sufficient to hold carload lots are often installed.

Where a hotel makes 75 gallons or more of ice cream per day a hardening room should be provided. But where a less quantity is used a hardening box is satisfactory. The hardening room is usually about 4′ x 6′ in size with the butter, milk and egg room often used as an anteroom or vestibule. The larger hotels have another cold room used for the storage of garbage thus eliminating flies and disagreeable odors.

In addition to the refrigerated rooms there are numerous refrigerator boxes in different places but generally in or about the kitchen and pantries. Each of these boxes should contain a pipe coil connected with the refrigerating plant. The sizes of these boxes vary with their use and location, from the small household refrigerator to the many section refrigerator 20′-0″ or more long. Each kitchen has a main refrigerator, in addition each baker and chef has a box with additional short order box for the latter. Salad boxes, the cold bain marie, soda fountains, ice cream cabinets and floral stands require refrigeration as well as the serving room for each banquet hall. The number, size and location of the refrigerator boxes vary with each installation and each should have its own coil and be provided with a drain connected with the drainage system. Ample and accessible space should be provided for installing the connecting lines of the piping, all of which must be heavily insulated.

When a cold drinking water service is installed in each guest room, a cooling tank with the circulating pumps is located in or near the machine room.

When cake ice is made, the freezing room should be in the basement and used for no other purpose. Ice is made by filling cans with water and immersing them in a tank of cold brine until the ice is formed. The brine is kept cold by means of a cooling coil placed in the tank. The ice may be pulled as needed or pulled when frozen and placed in ice storage rooms. These latter are usually found in medium and large sized hotels. Sometimes the ice making brine tank is also used as the brine cooler, thus serving a double purpose. In this case a larger tank is required but the temperature may vary considerably due to the filling of the ice cans and affect the temperature of the extreme low temperature rooms.

The methods of determining the amount of refrigeration needed for various purposes are set forth in such works as Hool and Johnson's Handbook of Building Construction to which the writer of this article contributed the section devoted to Mechanical Refrigeration and to Harding and Willard's work on Mechanical Equipment of Buildings, Volume II. In these the units of heat transmission through walls and materials, losses due to opening and closing of doors, line losses, the specific heat of materials to be cooled and other data is given. The architect can well afford to have a usable knowledge of these things to aid in analyzing and evaluating the data submitted by the persons with whom he collaborates in the designing of the refrigerating plant.

HOTEL ELEVATORS

THE designing of the modern hotel is a complex problem due to the present day standards of living which require, not only adequate housing facilities, but also every comfort and convenience for the benefit of the guests. Every hotel owner and manager realizes the necessity of having the mechanical equipment of his hotel absolutely safe and reliable so that there shall be no interruption of service to the guests. The elevator installation comes into closer contact with the guests than any other portion of the mechanical equipment and, therefore, the selection of the elevators should be given most careful consideration when designing the hotel, so as to provide guests with the best type of vertical transportation.

The elevator installation in the modern hotel is an individual engineering problem rather than the mere duplicating of an installation for a somewhat similar building. This is due to the various features which must be considered, such as the height of building, floor area, character of patronage, that is, whether entirely transient or only partially so, or partially or wholly residential. The immediate neighborhood surrounding the hotel also has its influence, due to the fact that in business districts the hotel may be used as a meeting place by outsiders. Another important feature in connection with the modern hotel which must be given careful consideration is the location of ball rooms, private dining rooms and restaurants, and whether there is a roof garden in the hotel, as such features may require additional elevator service.

Modern hotels of the larger size require elevators of moderate capacities, traveling at high speeds and operating at frequent intervals. The capacity best suited for most hotel elevators is about 2,500 pounds and for all except the smaller hotels, the speeds should range from 400 to 600 feet. In the largest modern hotels it has even been found that the elevators should travel at least 700 feet per minute. In residential hotels the speed should be more moderate as the traffic conditions are not as severe. The elevator car platforms should be comparatively broad and shallow with wide opening doors so as to facilitate movement of the passengers in and out of the car.

All hotel elevators should be provided with every possible safety device to protect passengers and prevent possibility of injury. These devices should include car safety device to prevent falling of the car in case of breakage of the ropes, speed governor to operate the safety device, hatchway slowdown and limit switches to prevent overtravel of the car, emergency switch in the car, safety potential switch on the controller, and car and counterweight buffers in the pit. A most important safety feature is also a gate on the car platform, which should be equipped with an electric contact to prevent starting of the car until this gate is closed. An additional safety feature which should be provided is a system of electric contacts for the hatchway doors, so arranged that the car cannot be started until the hatchway door is closed. This is very necessary as practically all accidents which occur on passenger elevators are due to attempts of passengers to enter or leave the car while it is in motion. With these two safety features and consequent necessity for closing both the hatchway door and the car gate before the car can be started, possibility of accident at the doors is almost entirely eliminated.

One of the latest improvements in elevator service is an automatic leveling device which is rapidly coming into general use and which is peculiarly suitable for hotels. This device automatically brings the car platform to an exactly level landing with the floor, independent of the operator after he has centered his car switch to stop within the leveling zone above or below the floor. When the car does not land exactly level with the floor there is a tripping hazard which is quite serious, especially in the case of women and children. Accurate leveling eliminates this hazard, the disagreeable fluctuations in movement often encountered at a floor level stop, speeds up the service and reduces power consumption. It premits the operator to devote his entire time to the handling of the gates and passengers. After the elevator has stopped at the floor, the car floor level is maintained.

In modern hotels the service elevators perform an important work which is large in proportion to the passenger service. The nature of service transportation is such that the installation varies from the passenger installation only in the size and shape of the platforms, design of the cabs and enclosures. The same safety devices, speeds and other characteristics are employed. Indicators are common to both services except that those showing the location and travel of cars is confined, when used, to passenger service.

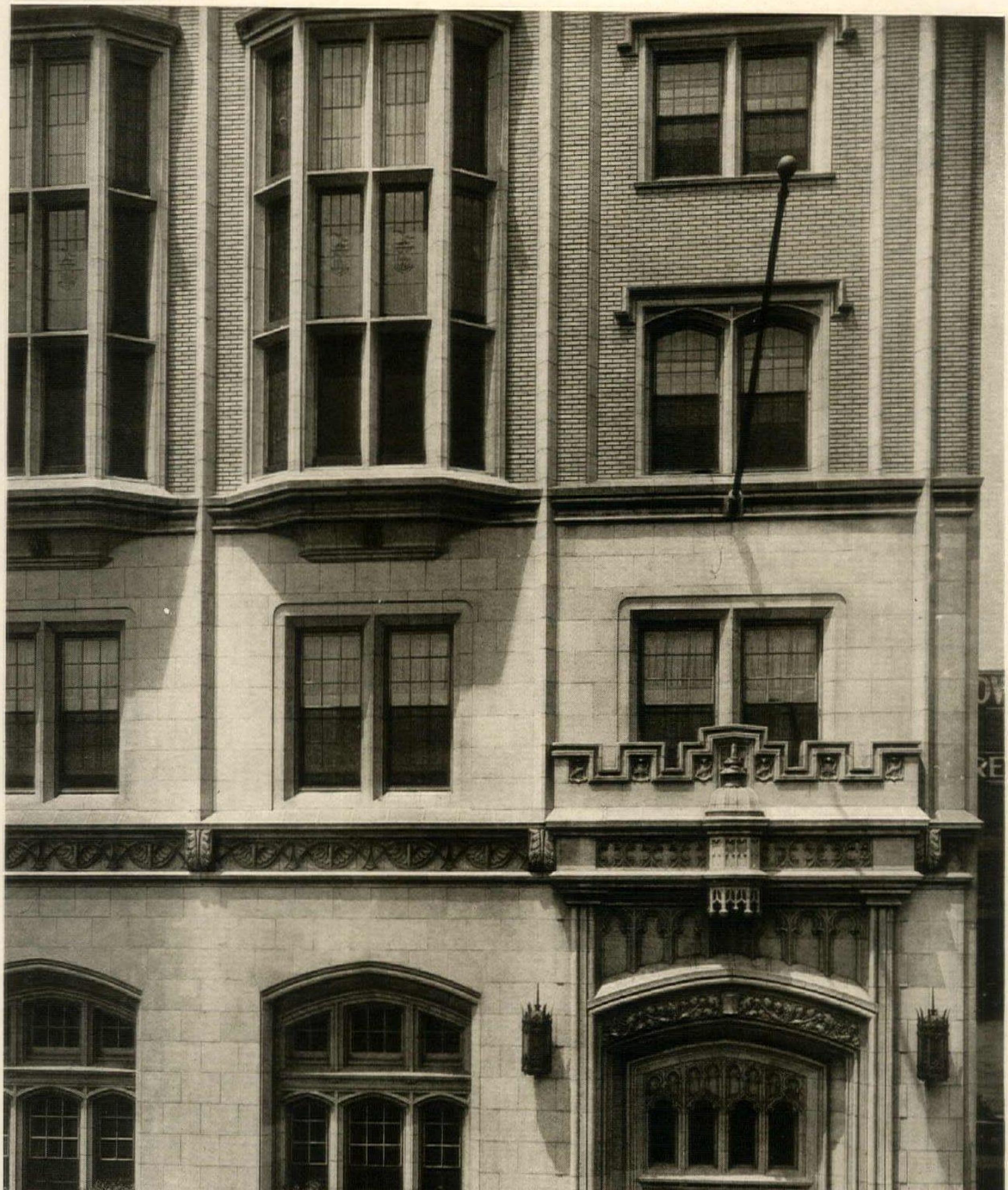
In many instances there is a service which can be accomplished by a dumbwaiter installation. The high speed and automatic electric control of movement which characterizes the best installations make their use satisfactory and economical.

The larger elevator companies have accumulated much valuable information on the various problems involved in selecting types of equipment for different classes of hotels, and they are always ready to assist architects and owners in solving problems.

KANSAS CITY CLUB, KANSAS CITY, MO.

SMITH, REA & LOVITT, ARCHITECTS

(Erected under the direction of Chas. A. Smith, Successor)



MAIN ENTRANCE

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MAIN LOBBY

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DETAIL IN MAIN LOBBY

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THE LOUNGE

KANSAS CITY CLUB, KANSAS CITY, MO.

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MAIN DINING ROOM

LADIES' DINING ROOM

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BANQUET ROOM

LADIES' PARLOR

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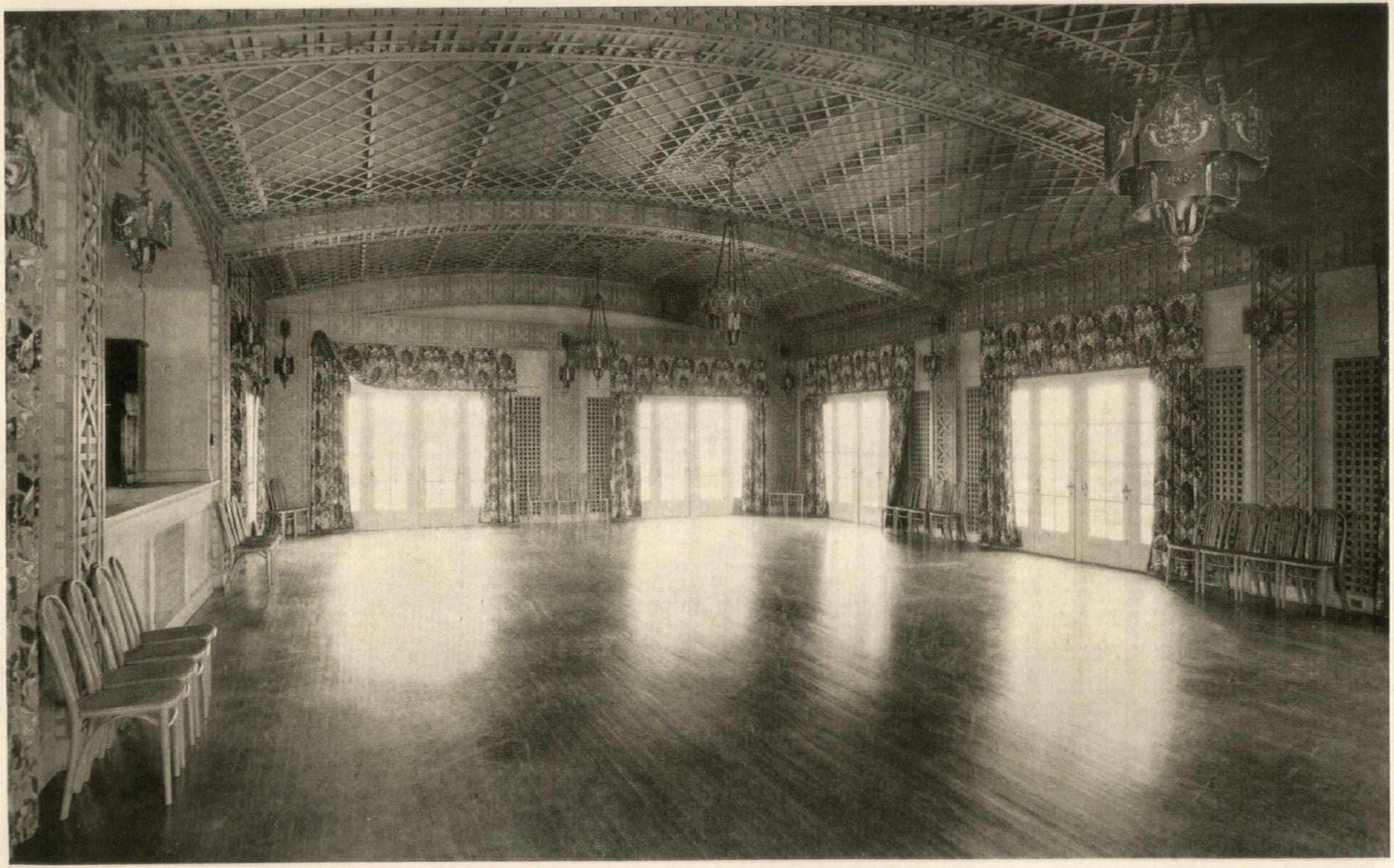

BALL ROOM AND ROOF GARDEN

KANSAS CITY CLUB, KANSAS CITY, MO.

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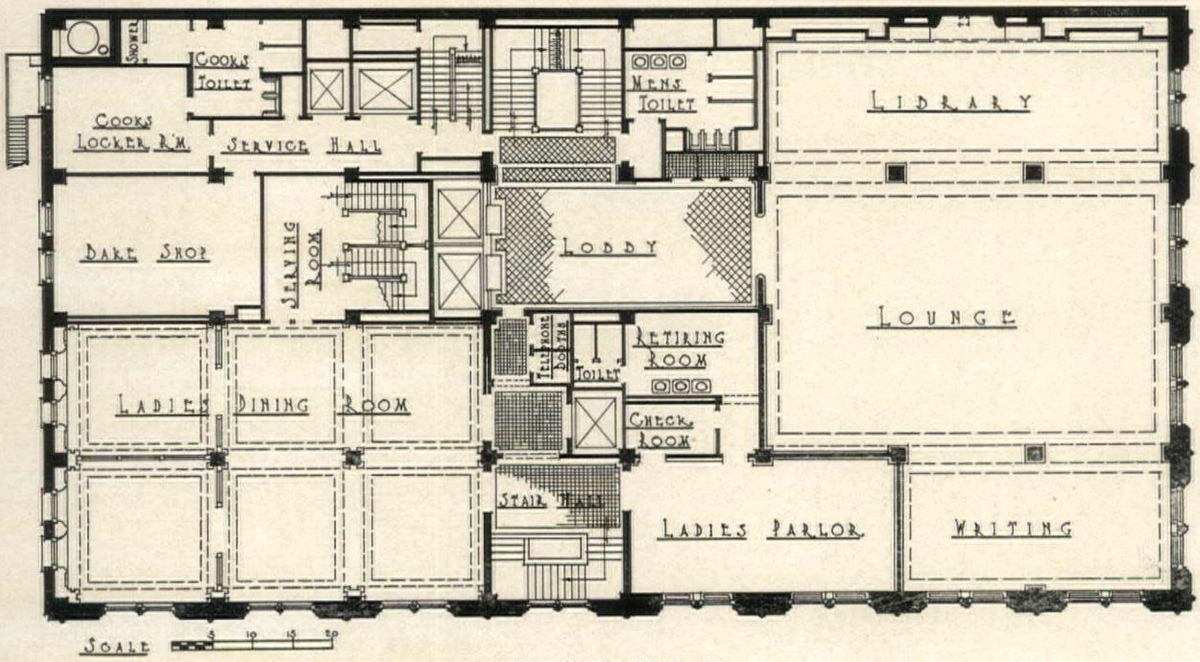
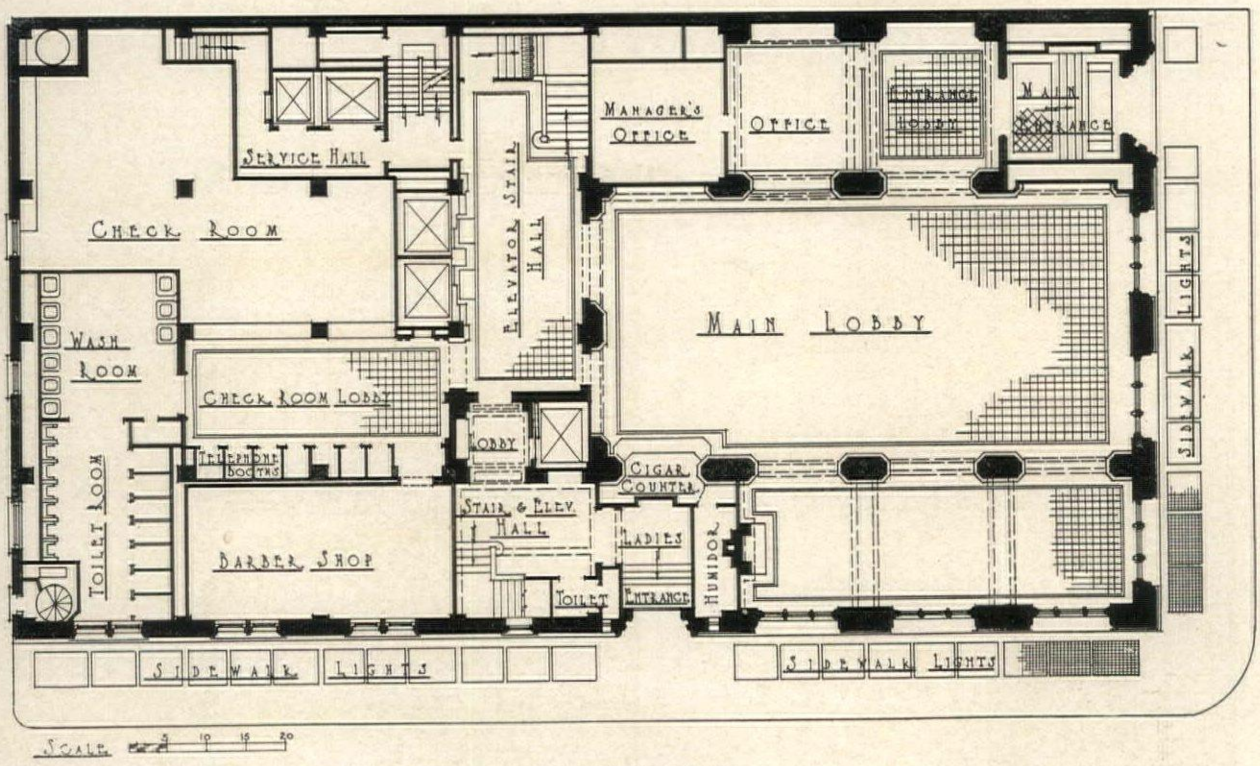


SECOND FLOOR PLAN

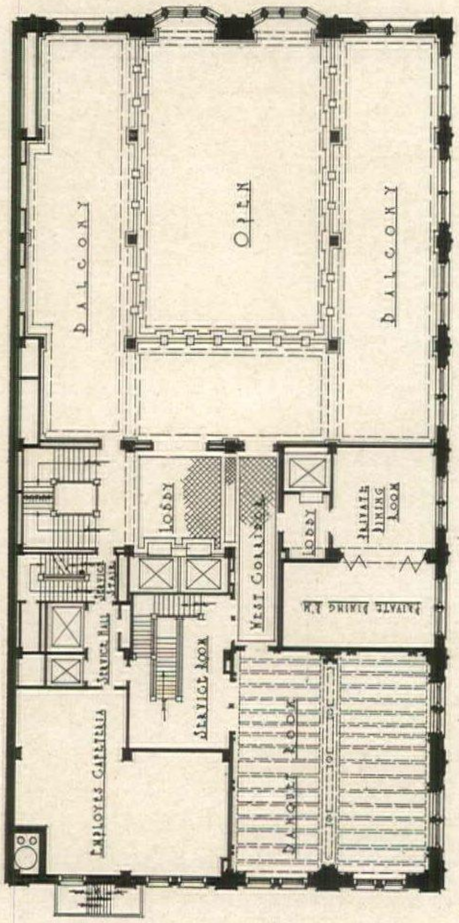


FIRST FLOOR PLAN

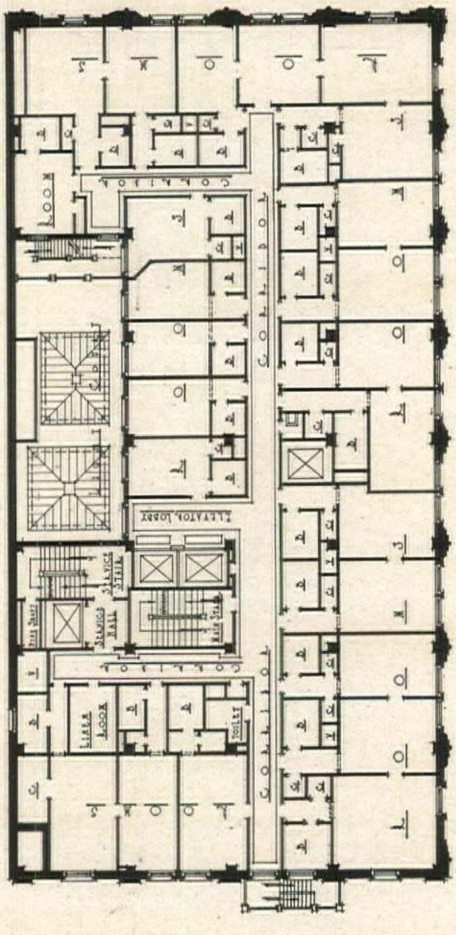
KANSAS CITY CLUB, KANSAS CITY, MO.

SMITH, REA & LOVITT, ARCHITECTS

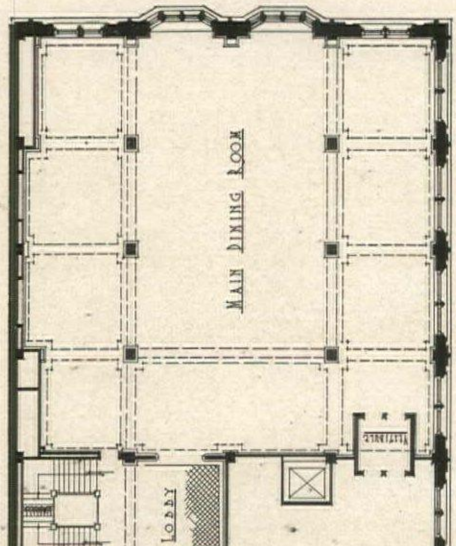
(Erected under the direction of Chas. A Smith, Successor)



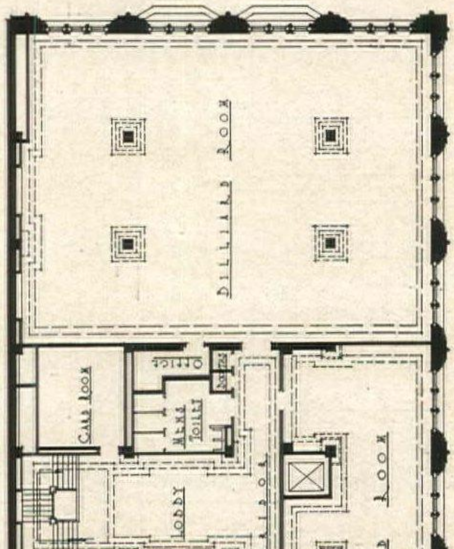
FOURTH FLOOR PLAN



6th TO 10th FLOOR PLAN



THIRD FLOOR PLAN

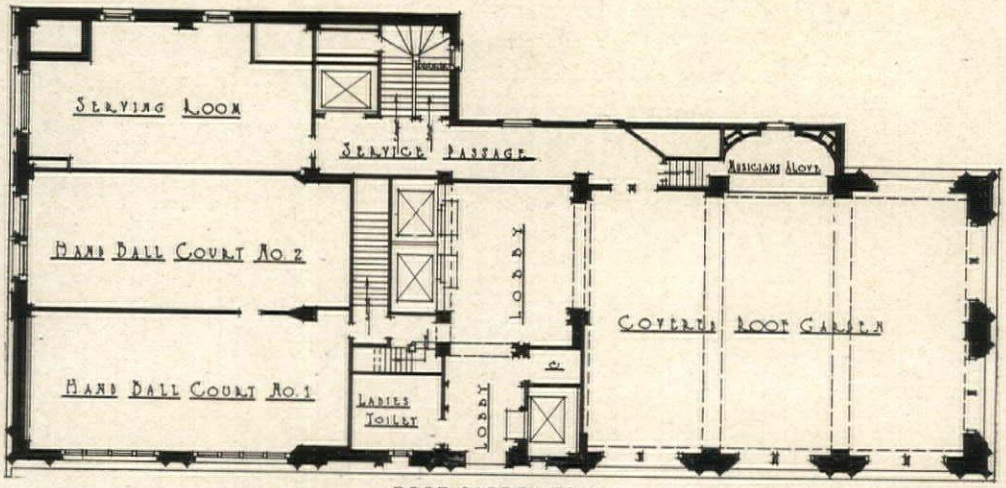


FIFTH FLOOR PLAN

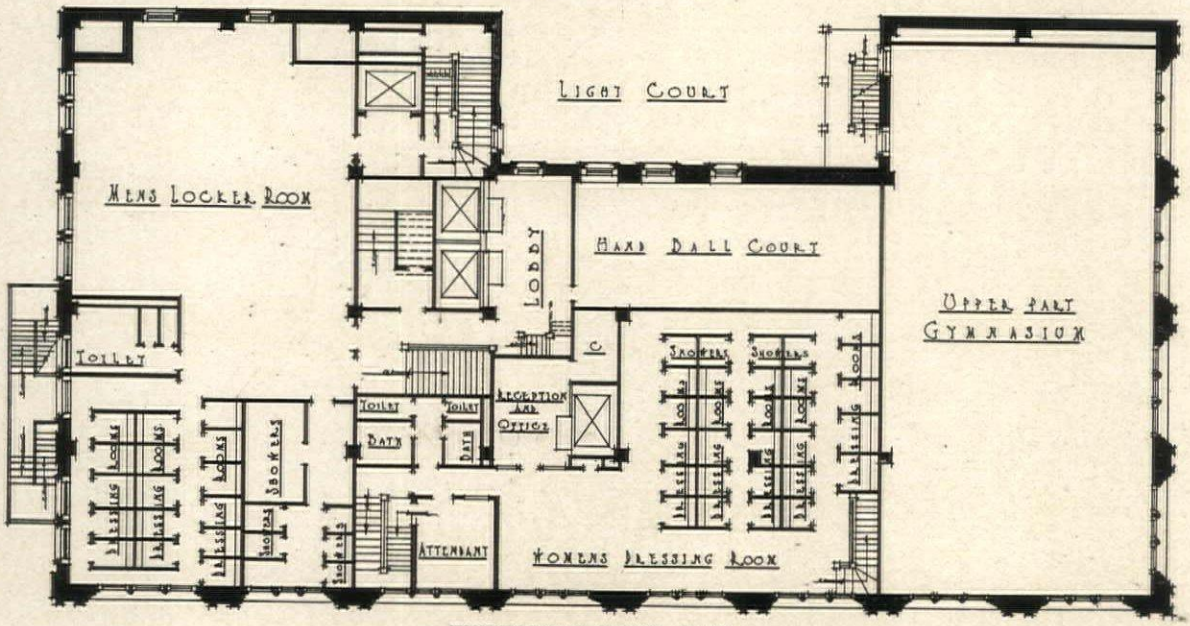
KANSAS CITY CLUB, KANSAS CITY, MO.

SMITH, REA & LOVITT, ARCHITECTS

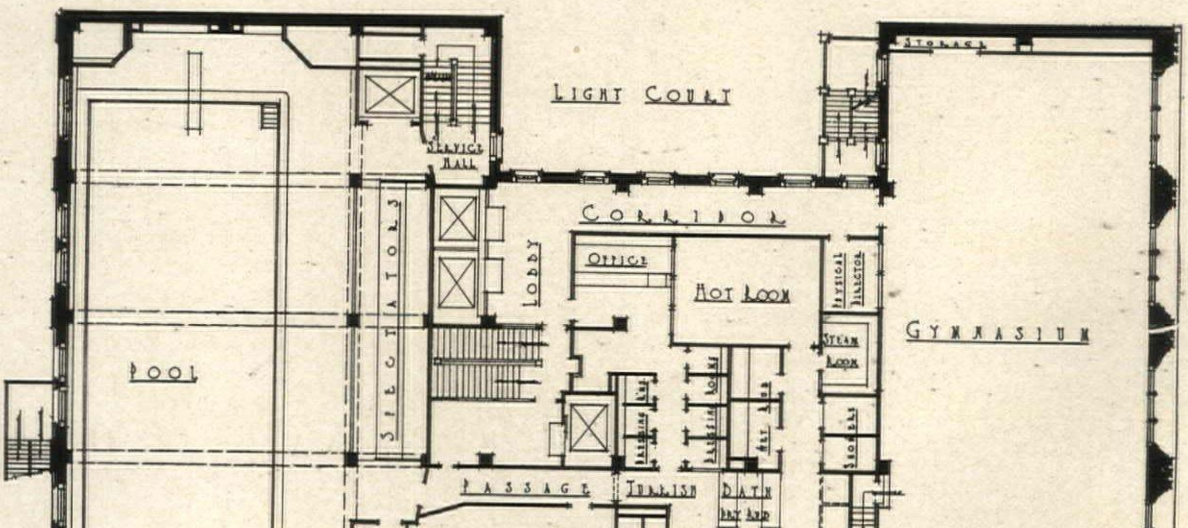
(Erected under the direction of Chas. A. Smith, Successor)



ROOF GARDEN PLAN



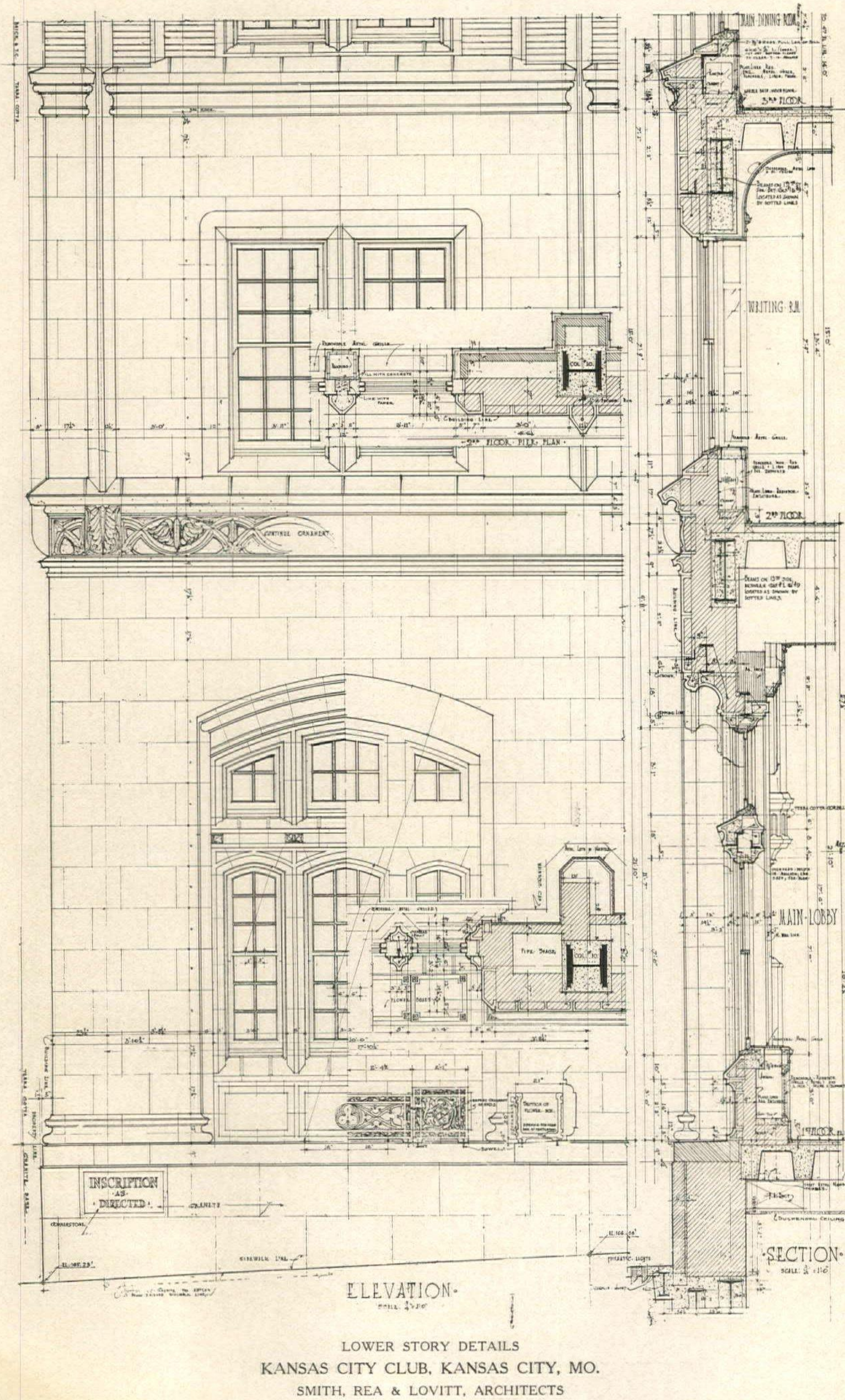
THIRTEENTH FLOOR PLAN



TWELFTH FLOOR PLAN

KANSAS CITY CLUB, KANSAS CITY, MO.

SMITH, REA & LOVITT, ARCHITECTS



LOWER STORY DETAILS

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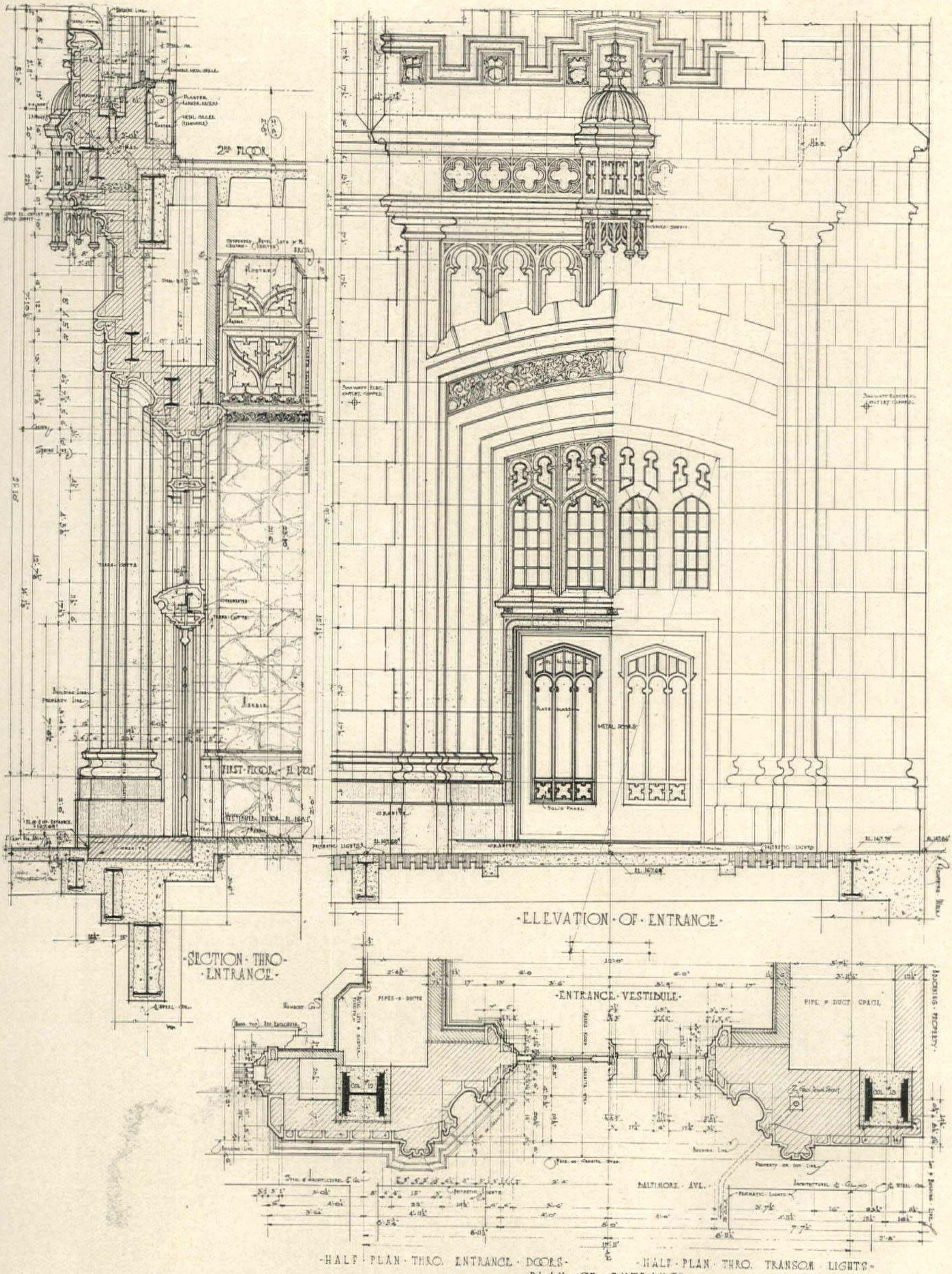

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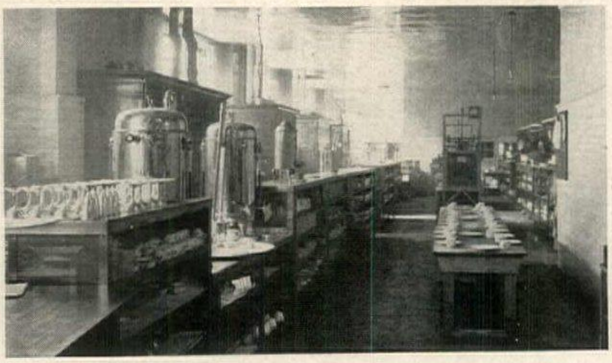
KITCHEN EQUIPMENT FOR HOTELS

MANY hotels, not particularly attractive in some respects, are very successful owing to the dining room service which is maintained. This service is of such importance that it finds a prominent place in the hotel scheme. It is impossible to standardize kitchens for hotels rated by the number of rooms or seats in the dining rooms. This is because the dining service varies with the class of guests that patronize the hotel, the amount of patronage attracted from nearby places of business and service given to organizations, banquets and conventions. It is reasonable to expect that the equipment and service necessary to satisfy patrons who average twenty-five minutes for a meal will be entirely different from that needed for patrons who will average one hour for a meal. So many things enter into this phase of hotel operation that each case must be considered individually.

There are, however, certain underlying factors that are common to all cases and it is to these that attention will here be given. The kitchen is similar to a manufacturing plant where raw materials are received, processed and distributed. To do this, various kinds of cooking apparatus are employed, storage space for foodstuffs provided and facilities for food distribution and consumption furnished. The three elements involved in this service are mechanical, human and food material. With the latter we have nothing to do in this article. The mechanical element has been so developed that suitable apparatus for every purpose is procurable. The efficiency of the human element, while influenced by proper mechanical devices, is controlled largely by a plan arrangement which permits of an easy and rapid execution of the orders. With these two requirements satisfied, economical operation is assured.



Kitchen in Chase Hotel, St. Louis, Mo.

The square kitchen is ideal as in it the travel of the employees is reduced to a minimum. It is possible, however, to secure very satisfactory results from a rectangular plan. For economy of operation the kitchen should be on the same floor as the main dining room and adjoining it. When the size and shape of the room are determined, the height of the room, the kinds of finish for floors and walls, the location of doors, windows and flues are to be considered. All of these have important bearing on the arrangement of fixtures. The kitchen should be 14′-0″ high, but 12′-0″ would be the minimum for satisfactory results. Temperature, ventilation and light are important. High temperature and odors must be prevented from escaping to other portions of the building. This is best effected by providing sufficient height to permit the instal-

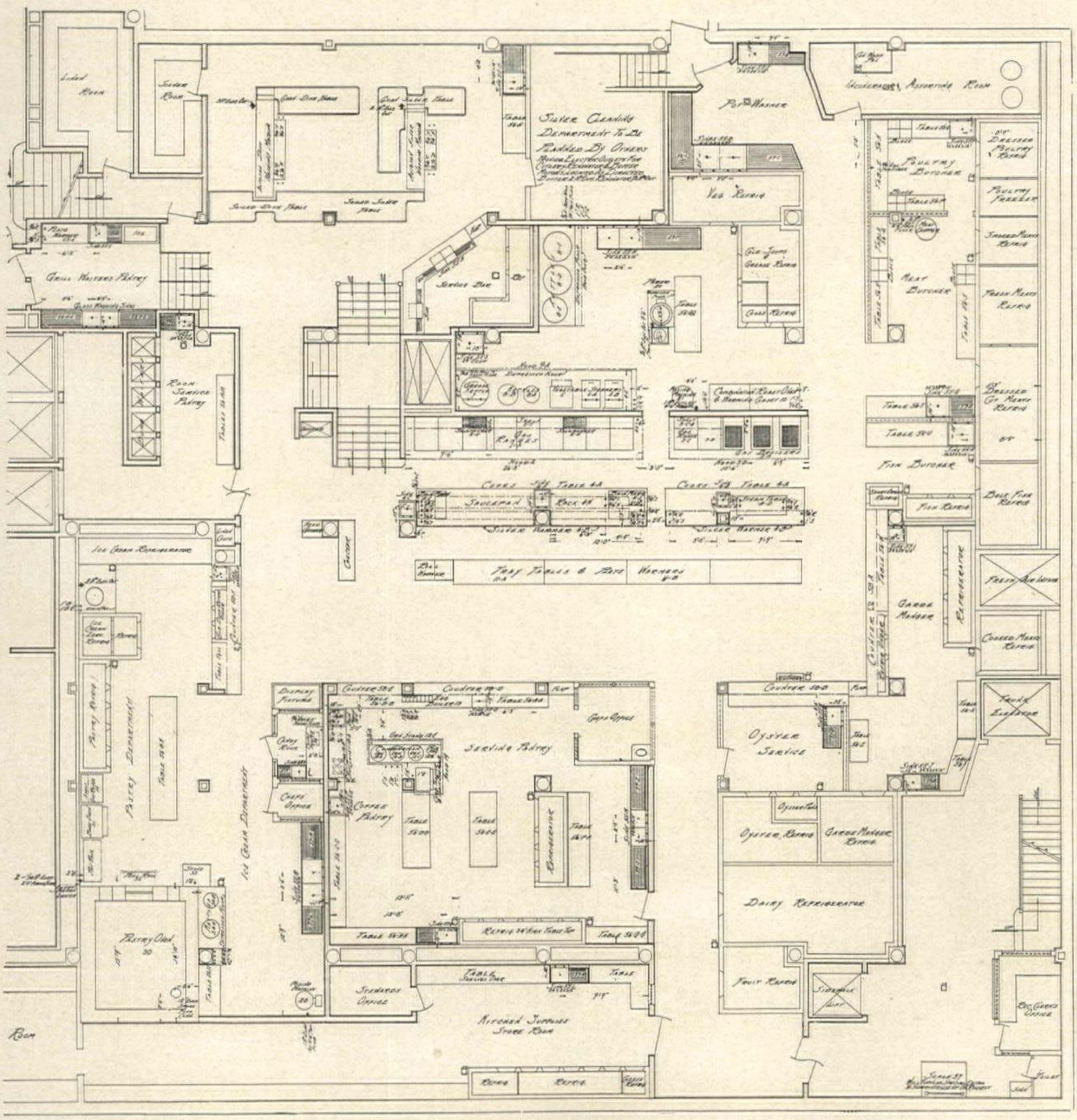
Kitchen in Chase Hotel, St. Louis, Mo.

lation of suitable hoods over all ranges and steam tables which are connected by ducts which discharge into a suitable vent shaft. In most cases inducted draft is necessary and is produced by exhaust fans.

The range is the most important feature of a kitchen, the greater part of the food is cooked on it; every waiter must come to its serving table; everything in the kitchen must have a correct position in relation to it. The location of the range has an important relation to the doors leading to the dining rooms and to the smoke and vent flues. These three features must be considered together in order to secure the best results. The location of a dining room door leading to the kitchen is of far more importance in a business sense than the location of the door in relation to the symmetrical development of an architectural decorative scheme in the dining room. The position of the range is of paramount importance and is the objective of all kitchen operations.

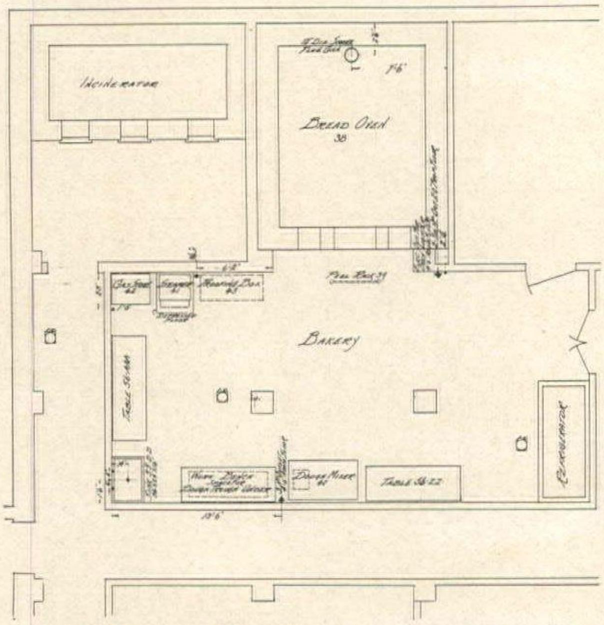
In front of the range is located the cooks' steam table. There should be at least 4'-0" between this table and the range to allow the cooks ample working space. In front of the steam table and about in the center of the kitchen is located the waiters' tray table, heaters for silver and plate warmers. This should be accessible from both sides.

To the back or side of the ranges should be located the vegetable preparation department pro-



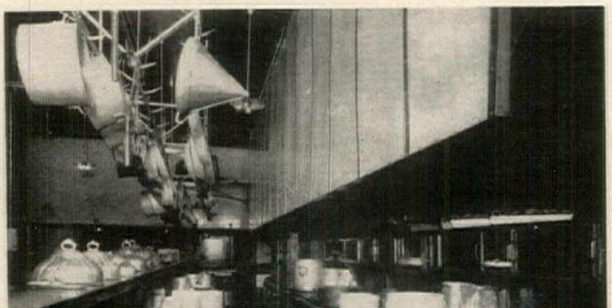
Main Kitchen Plan, Ambassador Hotel, New York

vided with as much light and ventilation as possible. Here are located the vegetable parer and steam cooker. Near the range and as close as possible it is desirable to locate the pot and pan sink. Here the big pots, pans and kettles are cleaned and passed on to the range with a minimum of travel.



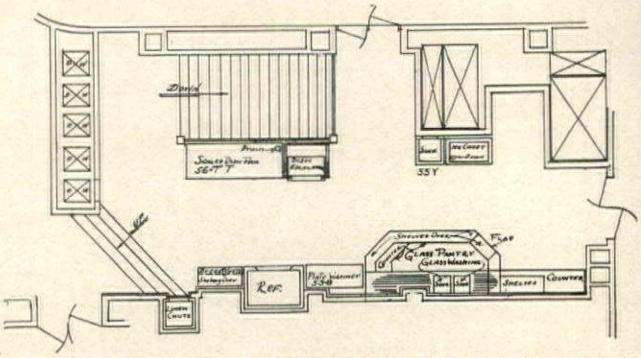
Bakery, Ambassador Hotel, New York

The accommodations for the butcher should be conveniently located. His refrigerators should be as close to the kitchen as possible and on the same floor. This also applies to the general refrigerator. In small and medium sized hotels the butcher is also an assistant chef and convenient location of his refrigerator is necessary to efficient operation.



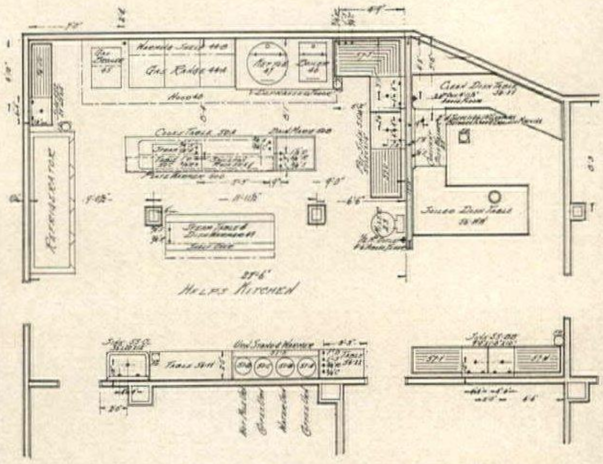
Battery of Electric Ranges, Chicago Athletic Association

Ample space should be allowed for the dishwashing department. A large soiled dish and scrap table is essential. In this department there should be ample storage space for clean dishes



Main Dining Room Pantry, Ambassador Hotel, New York

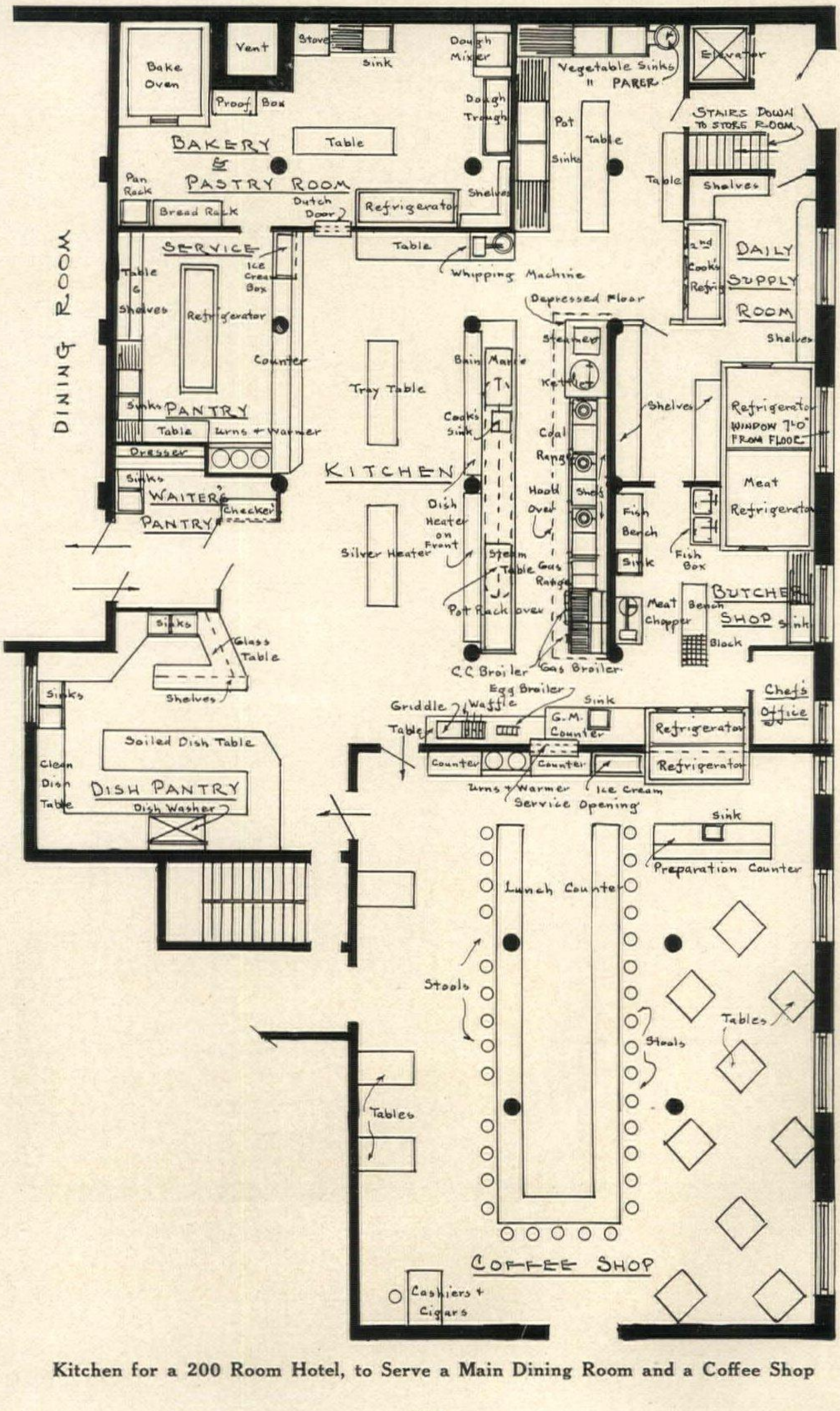
from which they are distributed to the plate warmers and other places. When dishwashing is not done in the banquet hall serving room, the storage capacity for dishes in the kitchen department should be ample for all banquet requirements. The glass and silver washing department, the silver cleaning and storage department should adjoin and connect the dishwashing department. The ideal situation for the dishwashing department is in the far end of the kitchen. This may mean more travel for the bus boys, or waitresses in the small hotel, but this labor is more than compensated for by the facility with which the cleaned silver and dishes may be distributed to their proper places.



Help's Kitchen, Ambassador Hotel, New York

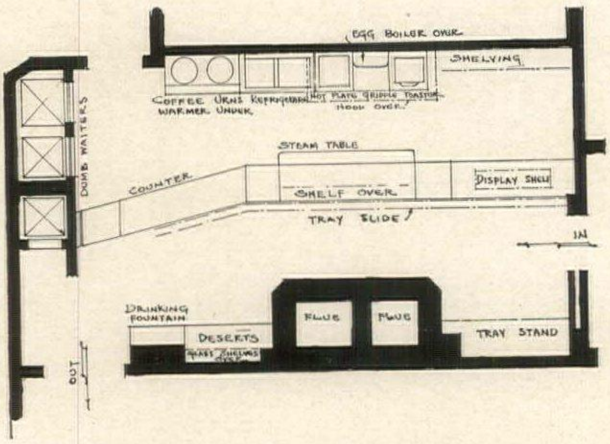
In large hotels the pastry and bake shop are entirely separate departments from the kitchen and operated by separate crews of help. In moderate sized hotels the bake and pastry shops are controlled by the same person and located within the kitchen space. The output of these shops is served to the waiters through the pantry in which are placed refrigerator boxes. The pantry is essentially a serving place from which ordinarily is distributed all of the pastry and bake shop provisions, ice cream, salads, coffee, tea and other foods not originating at the range.

The ranges are heated with coal, gas or electricity. All are equally efficient. The selection is sometimes controlled by the chef's department which usually has personal preferences. With equal efficiency in producing a satisfactory product, the selection of kind may depend on the cost of operation based on fuel consumption. In some localities electric ranges and cookers are more cheaply operated than gas or coal consuming ranges. There are other features of operation other than the cost of fuel, which are important



Kitchen for a 200 Room Hotel, to Serve a Main Dining Room and a Coffee Shop and should be considered in the final selection of this important equipment.

Banquet hall service pantries have various amounts of equipment. It should have refrigerator boxes in which the cold foods and desserts are stored. Often a steam table service is installed and in large hotels certain cookers and ranges are used. If there is no dishwashing equipment, the cleaning and scraping table is provided. In any event this serving room must have close connection with service elevators which are also convenient to the main kitchen. Often the subveyor equipment is sufficient to transport the food and dishes from the main kitchen to the serving pantry and thus eliminate the steam table and cooking equipment. In that case refrigerators and coffee urns with serving tables constitute the equipment.

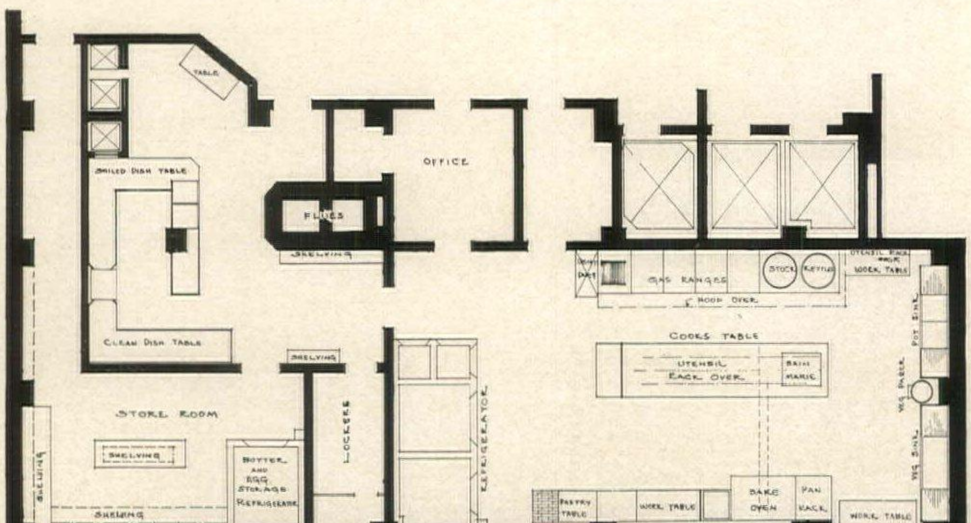


First Floor Cafeteria. Allerton House, Lexington Avenue and Fifty-seventh Street, New York City

Of late years the coffee shop has become an important feature of hotel operation. In the majority of hotels this department operates after the main dining rooms are closed and affords an entirely different kind of service. The coffee shop should be located with a direct connection to the main kitchen if possible. The service pantry is the principal feature opening into the shop and also into the kitchen as near the main pantry as possible. This effects certain economies of operation. For this service are usually provided an electric stove and hot plate for griddles and waffles, coffee urn, complete pantry and refrigerator facilities sufficient to carry over after the main kitchen is closed.

There is a great variety of equipment which enters into the furnishing of a complete kitchen. As before stated, its selection depends on the kind of dining service to be rendered. Economies in cost of installation and in available space demand the utmost care in selection and planning. While architects should possess a certain general knowledge of what constitutes essential kitchen equipment and its arrangement for use, it is reasonable to expect them to avail themselves of the services of those expert in this work. Competent engineers are employed by equipment manufacturers for this purpose.

Acknowledgment is made to Bramhall Deane Company and Duparquet, Huot & Moneuse Company of New York and the Edison Electric Appliance Company of Chicago for data and illustrations.



Basement Floor Kitchen, Allerton House, Lexington Avenue and Fifty-seventh Street, New York City

PLUMBING *and* WATER SYSTEM *in* HOTELS

BY E. A. BERNSTROM, *Sanitary Engineer, of Clyde R. Place, Consulting Engineer**

WATER in some form is used in the hotel solely for sanitary purposes. Its use for the extinguishment of fire is the exception. It is thus apparent that the treatment and distribution of water are things of the utmost importance. While a multitude of things is done to and with water, a water system is made up of but a few general divisions. Although a vast amount of material and machinery is used in such a system, its designing is a logical process of analysis of the two elements—the required service and the means of its accomplishment. It may be thought by some that the selection and placement of the usually visible plumbing fixtures are the most important things that constitute the design of a water system. This is not true either from the consideration of cost or operation.

Before a design can be outlined two points must be established: the normal dependable water pressure in the street mains and the necessity or desirability of softening and filtering the water. There is sometimes sufficient initial water pressure to flush sanitary fixtures up to certain elevations and if the water is soft and clean, with this pressure it can be circulated direct to all points where cold water is used. This condition is not usually found.

Most sources of water supply, except from some deep wells, are such that filtering is necessary at the building. Municipal filtration plants remove the bulk of the mineral, vegetable and bacterial impurities to the extent that the water is sanitary but even with this condition it is often advisable to install filters better to prepare it for use.

Unless the water is practically free from hardness, it should be softened. Water hardness affects every portion of the system where hot water is used and every place where cold water is used except the flushing of water closets and urinals. Hard water deposits scale in steam boilers, causing the heating value of the coal to be greatly reduced, liability of burning out flues or boiler sheets and a continual expense of removing accumulated scale. Hardness also deposits scale in the hot water heater or generator and in the hot water system of piping leading therefrom and affecting the action of all hot water valves. This results in slowing up the heater or generator, retards the circulation of hot water and the eventual necessity of installing a new system of piping in order to secure satisfactory circulation. Hard water makes necessary the use of an excessive amount of soap and fabric destroying chemicals in the laundry. Hard water in the lavatory and bath is never satisfactory to guests. It is a source of expense in that the cleaning of these fixtures requires the use of strong cleansing compounds which quickly destroy the enamel or glaze finish. Water softening apparatus employing the use of zeolite in some form is well adapted to hotel use, but sometimes conditions warrant the use of a lime-soda system.

The water usually will pass from the meters to the water softening plant, thence through the filters to the surge or suction tanks. Such water as may be used for flushing the lower story water closets and urinals can be piped direct from the meters. From the surge tank the water passes to the house pumps and the Underwriters' fire pump, all of which discharge into the house tanks which are located in the penthouses on the roof or elevated above the roof on a supporting structure.

Typical Bathroom, Hotel Statler, Buffalo, N. Y.

The house tanks are then the source of supply for all water service except as mentioned. At this point the water is separated for the cold and hot water service.

The cold water service is drawn from the house

**Grand Central Terminal, New York City.*

tank through overhead mains from which runouts connect with vertical service pipes which supply the water closets, baths and lavatories. These pipes decrease in size toward the bottom and terminate at the lowest fixture. A service pipe is installed to supply cold water to the kitchen, barber shop, laundry, refrigerator condenser and ice freezing cans and drinking water cooling tanks and coils. From the overhead cold water supply connection is made to the fire standpipes to which fire hose is attached on each floor. These standpipes are also connected at the bottom with a main to which is connected the Underwriters' fire pump and the Siamese valves placed on the exterior walls at the sidewalk for the Fire Department connection. Check valves are placed in the connections from the Siamese valves to the main which supplies the standpipes, having a drip valve between them so as to drain this intervening pipe. Check valves are placed at the head of the standpipes and in the discharges from the fire pump to the house tank and to the standpipes. They are set so that when the pressure from the fire pump and the fire engines exceeds that of the house tank, the house tank is closed to the standpipes.

Dry standpipes are often installed on the outside of the building, usually on fire escapes. They have a Siamese hose connection at the sidewalk, hose valves at each floor and extend over the top of the wall with valve at the top.

The drinking water system consists of water coolers located near the refrigerating machine. These coolers are steel tanks in which is placed a coil into which ammonia is expanded or through which cold brine is circulated. The cooled water is drawn from the cooler by circulating pumps which discharge into a main riser to the attic from which point it is distributed through mains, branches and supply risers to each faucet which is usually installed at each lavatory. Connections are also made to public drinking fountains in the corridors, lobbies, kitchens, laundries and other work places. The bottoms of the risers connect with a return system of piping to the coolers. At the base of each riser a check valve is installed against the circulating pumps to insure the proper movement of the water. A balancing tank with ball cock, vent pipe and overflow is provided in the attic. In this system the cold drinking water is continuously circulated by the pumps, insuring service at each outlet.

A water service is furnished at the sidewalk and in the alleys with sill cocks to which hose is attached for washing the sidewalks and pavements.

A separate cold water pipe connects the house tanks with the hot water heaters. The hot water heater is a large steel cylindrical tank in which is inserted a removable steam coil usually made of copper tubing. The work is based on heating a certain volume of water from 50° to 180° F. per hour with steam at 50 pounds gauge pressure at the heater. The heater should be large enough to provide sufficient storage capacity of hot water to supply the demands of the peak loads. From the heater a hot water riser extends to the attic at which place horizontal mains and branches connect with the vertical hot water supplies to the lavatories and baths. The bottoms of these vertical supplies are connected into a return system of piping to the heater. In this way the hot water is made to circulate continuously by house tank pressure and provide immediate hot water service at all fixtures. Hot water service is extended to the kitchen, barber shop, laundry and other places.

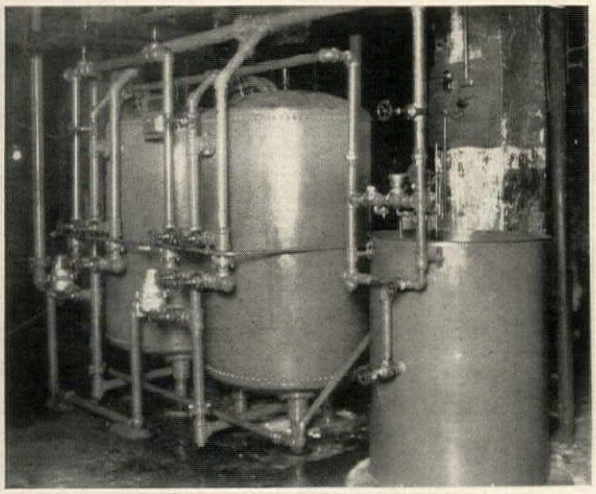
In addition to the hot and cold water service to the laundry, high pressure steam is supplied to the washers, tumblers, flat work ironers and presses. Steam is also supplied to the kitchen steam tables, serving pantries, warming ovens and garbage can sterilizer.

If a sprinkler system is installed in the boiler room and basement carpenter, paint and repair shops the supply can be taken direct from the street supply. If a system is installed for shops and storage rooms in the attic the supply can be taken direct from the house tank. In either case the minimum required pressure must be maintained. If this pressure is not furnished for an attic sprinkler system by the house tank, it is necessary to furnish a storage tank maintained under a specified pressure by an automatic air compressor.

The plumbing, in general, consists of two parts: the supply and waste systems. The supply system has been described. The waste system consists of two services, sanitary and storm water.

The storm water drainage conducts the rain water from the roofs, open loggias, balconies and marquises to the street, alley, storm sewer or cistern as the final disposal demands. At the top of each of these downspouts or leaders is installed a suitable downspout head with strainer. These should be selected with care, the principal requirements being ability to strain out all solid matter washed off the roofs and a construction that permits of a perfectly watertight connection to the roofing material and a removable gravel or sediment basin.

The drainage from the sanitary fixtures is made through traps into the horizontal wastes leading to the vertical soil pipes. Each trap is ventilated through a pipe connecting with a vertical vent pipe which enters the soil pipe above the highest fixtures, the soil pipe extending through the roof as may be required by local regulations. The soil pipes are connected under the basement floor with an underground drainage system discharging into the sewer. When the sewer level is above the basement floor level, the drainage system is suspended from the first floor construction, discharging into the sewer. Under these conditions the waste from toilet fixtures containing solids and from the laundry washers and extractors is conducted to automatic ejectors operated by compressed air discharging to the sewer. Liquid waste from the refrigerating machinery, boiler blow-off and seepage is conducted to a sump from which it is discharged to the sewer by automatic sump pumps. The compressed air storage tank also serves as a source of supply for the pneumatic tube system, the elevator door operating devices and for cleaning machinery. The laundry washers and extractors usually waste into a trough or gutter formed in the concrete floor and pitched to the outlet. This waste with the water used in washing base-



Water Softening Plant, Hotel Patten, Chattanooga, Tenn.

ment floors is conducted to a trap with strainer. The connection between these drain traps and the floor must be watertight.

The wastes from the showers and urinals are important. These, of course, have strainers covering the opening. Under the receptacles there is usually placed a safe made of sheet lead or a built-up membrane. The better types are known as double drainage fixtures. The bottom of all pipe shafts which are not carried through to the basement should have waterproof floors with drains, to provide for any leakage from the hot or cold water supplies. Imperfect drainage results in unsightly stains and damage and is usually extremely difficult and costly to correct.

Where vacuum cleaning systems are operated from a central plant, pipes must be run to stations on the various floors with outlets generally located in the corridor baseboards or in utility closets opening to the corridors. This system of piping must be tight, made with long sweep fittings to prevent obstruction and clogging and have special caps on the outlets. At the machine in the basement is installed a dust separator. In some hotels an electric cleaner is used with the dust receptacle and motor on castors, operated through electric outlets placed in the baseboard of the rooms.

The plumbing fixtures, in the main, consist of those in connection with the bathrooms. The lavatories are either made of vitreous china or enamelled iron. The cost generally decides which kind is to be used. They should be of ample size to permit of comfortable use. The pedestal or wall bracket type is used, the selection depending on the cost. Sanitary open overflows, combination single stream hot and cold faucets, chain and plug stopper, with ice water faucet when used, are most satisfactory. The plug and stopper with running water are essential to the most sanitary conditions. A combination of faucet discharge and lavatory bowl such as will prevent splashing is essential and best determined by trial. Less expensive lavatories are usually provided for the help. Special shaped lavatories with shampoo fixtures and manicure tables with bowl, faucets and waste are provided in the barber shop.

Bath tubs of the built-in corner or recess type are used to save space. They are made of either vitreous china or enamelled iron. The open overflow and waste with chain and plug are preferred as being more sanitary. The style of faucets is immaterial as their durability is the important factor. The shower should have a properly designed receptor of tile, terrazzo or porcelain with non-slip features. It should be so shaped that water cannot escape to the adjoining floor. Waterproof safes should be placed under the receptor made either of sheet lead or membrane waterproofing and a non-leaking floor drain with strainer should be used. A hot and cold water mixing device is used which discharges the water through a spray head which should have a removable face so that it can be cleaned of corrosion. If the compartment is of sufficient size, fixed heads are desirable as jointed heads require care to maintain in working condition. The mixing mechanism and floor drain are the important details of the shower bath. The plate glass door with brass frame and jamb, in lieu of the canvas curtain is desirable in every way.

The water closets should be of the extended-lip siphon jet type with maximum water surface and minimum soiling surface and operated with a flush valve. The seat should be of the two piece open front and back type. The flush valve is the important feature and should be durable, economical in water and noiseless in operation. If tanks are used, the low down tank is preferable.

Urinals are of two types. One is the siphon jet vitreous china one-piece stall with receptor, flush valve and drain. In this type the floor drain is very important and it should be of the double drain type to prevent leakage. The other type consists of urinal bowls in stalls made of marble, slate or metal, having concealed wastes and supplies. In some localities water is so inexpensive that automatic flushing apparatus is used in lieu of the hand operated flush valves. A very important factor in connection with the urinal is so to detail the floor that perfect drainage is secured.

All water supplies of whatever kind should have valves at the fixture, all service risers should have valves at the top or both top and bottom so that they can be cut out for repairs. All heaters, filters, water softeners, pumps and other equipment should be by-passed so that service can be maintained at all times.

The gas piping system connects with the street mains and from the meter is distributed to the stairways for exit illumination; to kitchens, baking ovens, garbage incinerator, serving pantries and grills; for cooking, warming and destruction purposes; to cigar stands and the machinery rooms.

The kind of pipe used depends largely on the cost. Galvanized steel or wrought iron is used for the cold water service, fire standpipes, pump discharges, downspouts or leaders, soil and waste pipes, vent stacks, house drains, cooled drinking water system and compressed air system. Black pipe is used for the gas and vacuum cleaning systems. Brass pipe used for the hot water service is annealed seamless drawn tubing subjected to test. The brass fittings are usually of the extra heavy pattern. Lead pipe is only used for short length wastes from water closets and back vents. A deactivating device is used to eliminate oxygen from the hot water service, thus preventing corrosion in pipes other than brass.

Horizontal downspout lines and drains and horizontal cold water lines between street and house tanks and water lines exposed anywhere or in ceilings over rooms should be enclosed in a covering designed to prevent sweating. All hot water pipes and fittings should be covered in order to prevent loss of heat through radiation and all cooled drinking water pipes should be covered with a cork covering made and finished for this purpose.

The SUBVEYOR SYSTEM

*BY F. W. HEATH, Mechanical Engineer**

SERVICE is the one thing paramount to all others upon which the successful restaurant manager depends to attract patrons to his dining room. Each type of restaurant has its standard of service. Whatever can be added to this service to expedite the handling of trays to and from the tables, without adding to the cost of the service pleases the patron that much more. Quiet, efficient serving of the food; the attention of the waiter or waitress during the meal, and the removal of used dishes without confusion are some of the things to be desired. Probably the most important item being the elimination of the noise occasioned through the rehandling of soiled dishes by the bus boys. It was to facilitate the latter operation that led to the designing of the subveyor.

It was formerly thought necessary to have the kitchen and dishwasing department located adjacent to the dining room, where the noise, confusion, and odors necessary in such a place was transmitted direct to the dining room. It has been the aim of all architects and engineers, when designing new hotels and restaurants, to eliminate as far as possible these unpleasant conditions.

The subveyor has made it possible for the kitchens, bakeries, and dishwashing department to be located on floors below or above the main dining room. Serving pantries take the place of the kitchen. The materials are brought from the kitchen to the steam tables by means of the subveyor. Trays, pans, bus boxes, etc., are conveyed to the serving pantries and are returned again to the kitchen by the same means. The clean china

Descending Subveyor at the Left, with Conveyor to the Scrap Table; Ascending Subveyor at the Right

and silverware are conveyed by the same method from the various dishwashing and silver cleaning departments to the pantry. The soiled dishes are returned to the scrapping table where they are sorted, the china going to the dishwasher and the silver to the department for cleaning, buffing, etc.

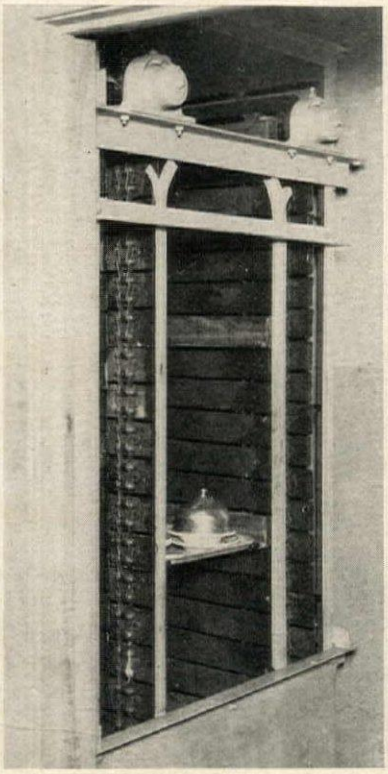
The subveyor systems are so flexible that all conditions arising as to the locations of subveyors and dishwashing department can be met satisfactorily. The machine itself runs continuously, being motor driven and direct connected to worm and worm wheel operating in a cast iron housing, subjected

**Samuel Olson & Co., Chicago and New York.*

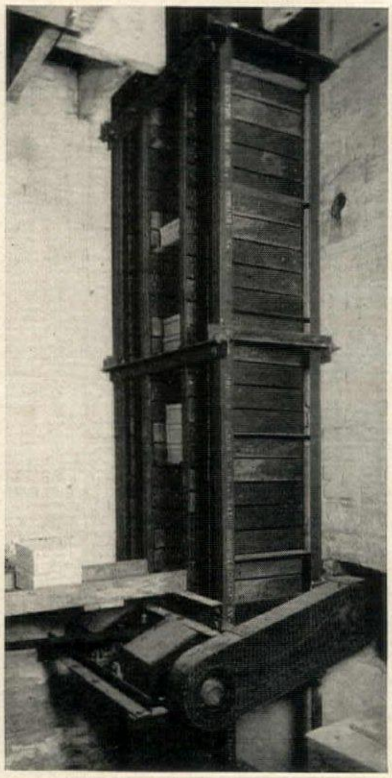
to a continuous oil bath. The subveyor is built as fool proof as it is possible to make it after years of experieence. The trays, pans, bus boxes, etc., are centered on the carrying flights automatically and limit switches, so located at top and bottom of the vertical travel, automatically stopping the machine in event the trays or boxes do not deliver off or are not removed at the various discharges.

A new device in connection with the subveyor has recently been perfected so that trays can be loaded or unloaded automatically. This permits of locating the subveyor in the most convenient place in or near the dining room for the removal of soiled dishes. The waiter or bus boy delivers the trays to the subveyor and the trays are then lowered to the floor below or elevated to the floor above as desired. If the dishwashing department is not located immediately under or over the subveyor, the trays are conveyed by means of belt conveyors to any part of the building. This also permits of having the dishwashing department on the same level with the restaurant in which case the subveyor is located at the most convenient point in the dining room for the reception of trays, the waiter depositing the tray of soiled dishes in the subveyor; the trays are lowered to the underside of floor, transferred to belt conveyor and in turn the belt conveyor redelivers the trays to another subveyor located in some other part of the building by which means the trays are elevated to the level of the soiled dish table and delivered to same automatically and without rehandling. All belts and other mechanisms can be hung from ceiling without interfering with head room.

Top of a Subveyor Before the Enclosing Partition is Installed



Top of a Subveyor



Bottom of a Subveyor Before the Enclosing Partition is Installed

Cost of operating is dependent on the size of the system. The power cost for one subveyor will not exceed thirty cents a day. The cost of upkeep is almost negligible. All bearings are either of the babbitted type or roller bearings equipped with "Alamite" grease cups throughout.

The fact that most of the larger hotels planned and built in the last year have installed systems of subveyors and that the smaller restaurants working on a small margin of profit find them necessary, proves that the subveyor is the most efficient means of transferring materials between the kitchen, pantries and restaurant.

The Fire Loss in 1922

THE current report of the Committee on Statistics and Origin of Fires of the National Board of Fire Underwriters gives the estimated fire loss in the United States for 1922 as $521,-860,000. This is a per capita loss of $4.75. The fire loss and the per capita loss for 1922 surpass any fire loss figures yet recorded, even exceeding the loss in 1906, the year of the San Francisco conflagration. No large conflagrations occurred during 1922, but the reports bear evidence that there were more fires last year than in any preceding year.

As a striking contrast to the losses in the United States, the Committee presents the three-year record for Great Britain, as compared with the United States:

Year	*Great Britain*	*United States*
1920	$42,445,000	$447,886,677
1921	38,820,000	495,406,012
1922	30,812,000	521,860,000

From the best information obtainable, the population of Great Britain in 1922 was approximately forty-three million people, and the population of the United States for the same year was about one hundred and eleven million. The per capita loss in Great Britain last year was 72 cents and that of our own country for the same year was $4.75. These figures are interesting as showing a continuing decrease in the British loss, while the reverse is apparent with respect to losses in the United States.

Tests Point Way to Safer Elevators

ABOUT three-fourths of all fatal elevator accidents are found to occur at the hoistway door, either because of the door being open when the elevator is not there or because of the elevator starting when the door is open. These accidents can be prevented by a reliable interlock, as when such a device is used the elevator must be stopped at the floor before the door can be opened, and the door must be closed before the car can be started again.

During the past year the Bureau of Standards has been conducting tests to determine the reliability of the various types now on the market. The devices have been given endurance tests under normal conditions, they have been tested in a corrosive atmosphere, in a dust laden atmosphere, without lubricaion, and under conditions of misalignment likely to occur in practice.

The tests were conducted at the request of the City of Baltimore, and will permit city governments to base their approval of such devices on actual performance tests instead of on visual inspection alone. The results have also been made available to the manufacturers of the devices tested, and in most cases they have improved their designs in accordance with the suggestions offered.

Heat Transmission and Paint

THE aluminum or bronze paint generally applied to radiators greatly reduces their effectiveness and makes it necessary to have a larger surface for the same heating effect, according to experiments performed by Dr. W. W. Coblentz of the Bureau of Standards. Dr. Coblentz finds that the heat radiated from an aluminum painted radiator surface is less than a third of that emitted by a radiator of the same size painted with a non-metallic paint, enameled, or simply allowed to rust.

On the other hand he finds that aluminum paint is a very effective means of reducing the amount of heat transmitted through a thin material. Applied to the under side of a tent or awning it reduces by three-fourths the amount of heat from the sun which gets through the cloth, while if used on the cover of an automobile or ice wagon it cuts in half the heat let through and makes the temperature inside the vehicle more nearly that found in natural shade, thereby making it much more comfortable.

THE CHASE HOTEL, ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT

DETAIL OF LOWER STORIES

THE CHASE HOTEL, ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT

DETAIL OF UPPER STORIES

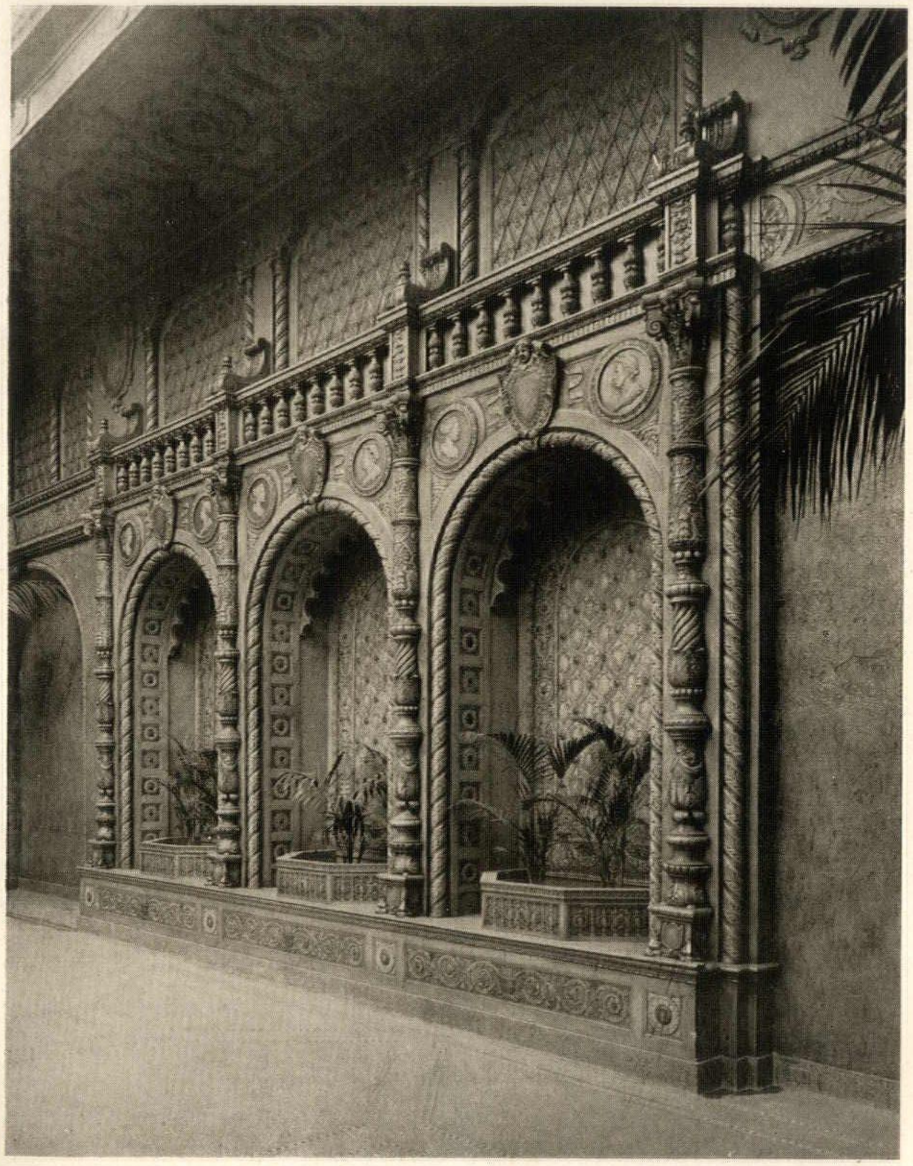
THE CHASE HOTEL, ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT

DETAIL IN COURT

THE CHASE HOTEL, ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT



THE CHASE HOTEL, ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT

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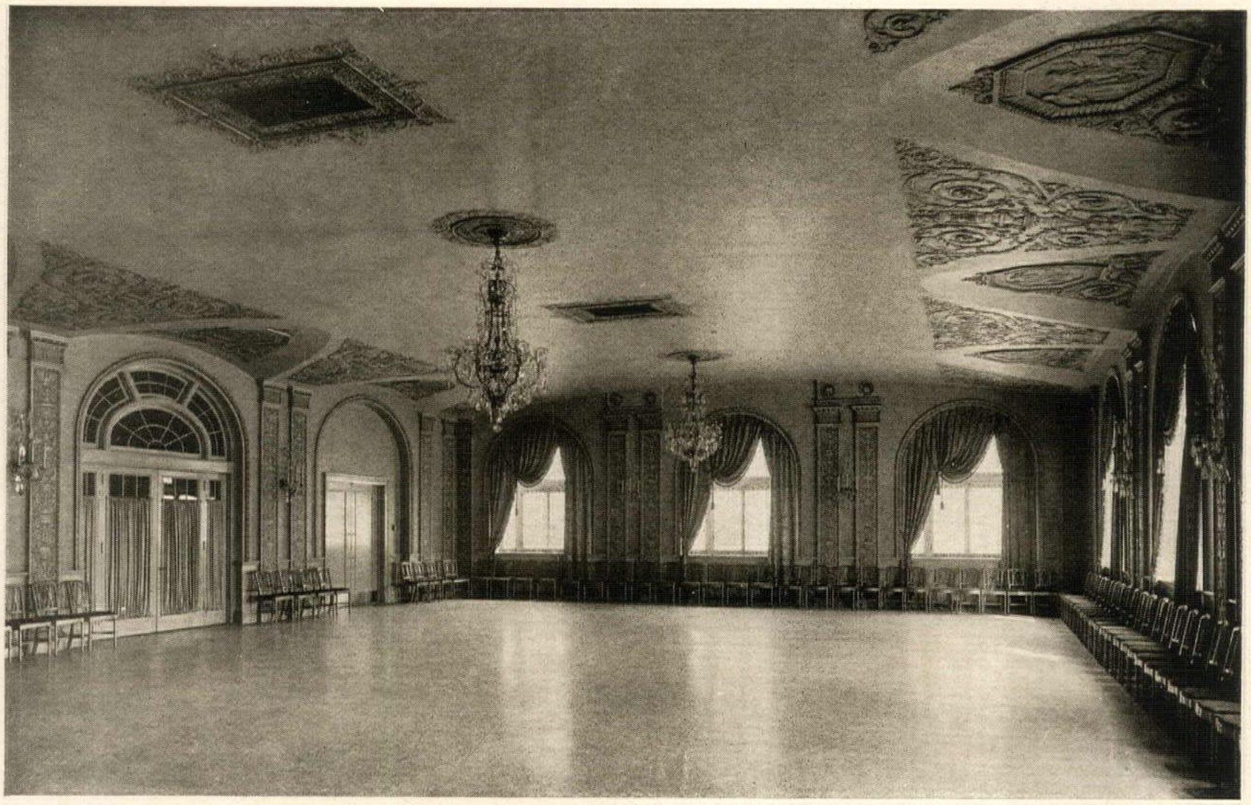
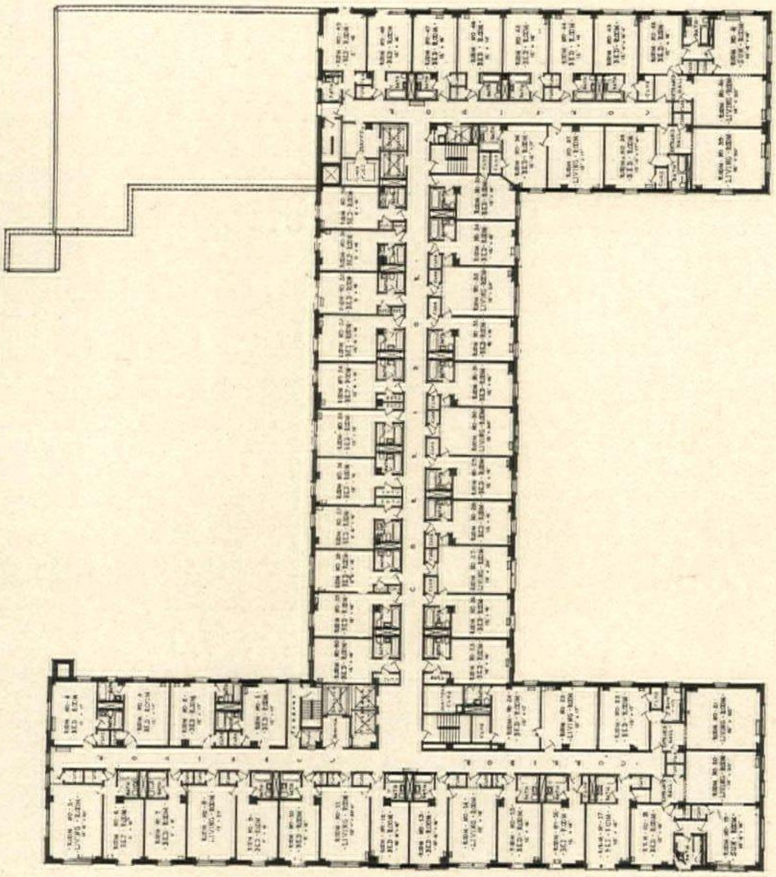


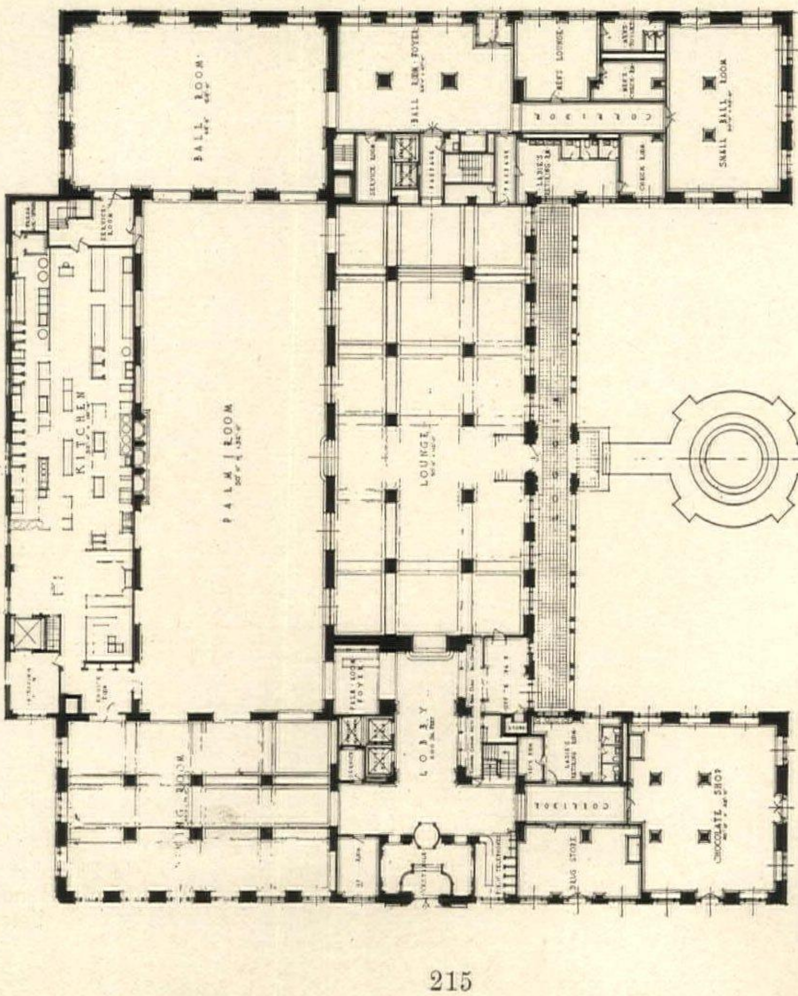
THE BALL ROOM

THE CHASE HOTEL, ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT



TYPICAL FLOOR PLAN



GROUND FLOOR PLAN

THE CHASE HOTEL, ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT

BEAUX-ARTS INSTITUTE *of* DESIGN

ACTING DIRECTOR OF THE INSTITUTE—WHITNEY WARREN
ARCHITECTURE, RAYMOND M. HOOD, DIRECTOR—SCULPTURE, JOHN GREGORY, DIRECTOR
INTERIOR DECORATION—ERNEST F. TYLER, DIRECTOR
MURAL PAINTING—ERNEST C. PEIXOTTO, DIRECTOR

OFFICIAL NOTIFICATION OF AWARDS

JUDGMENT OF JUNE 5, 1923

CLASS "B"—V PROJET

"BUILDING FOR THE BEAUX-ARTS INSTITUTE OF DESIGN"

There are three interrelated departments of the B. A. I. D.—Architecture, Sculpture and Painting. The exhibition room and the services are used in common.

The site, which is rectangular, is the end of a block; the length on the avenue is 200'-0" and the depth on the side streets is 150'-0". In addition to this there is a public service alley at the rear of the property running from street to street and 10'-0" wide.

The requirements are:

1—An entrance vestibule giving easy access to all floors and direct access for the public to the exhibition room.
2—Two offices for the administration of the school.
3—A large public exhibition room, common to all departments.
4—A sculptors' studio.
5—A studio for ornamental modelling.
6—A painters' studio.
7—A studio for mural painters.
8—An architectural atelier
9—A library.
10—A series of 5 studios for the Paris Prize logists.
11—A series of 5 studios for advanced sculptors or painters.
12—A small apartment for a janitor.
13—Toilets, cloak rooms, freight elevators, etc.

In the basement (plan not required) will be the receiving and shipping room, storage, locker room, kitchen, etc.

Above the basement there will be two main floors, but a portion of the building may have a mezzanine if so desired.

JURY OF AWARDS:—W. Lamb, P. A. Cusachs, W. Warren, J. H. Freedlander, B. W. Morris, H. R. Sedgwick, E. S. Hewitt, G. H. Edgell, F. C. Hirons, H. W. Corbett, J. J. Haffner, A. Ferran, H. Gardner, S. Stevens, F. C. Hitchens, E. A. Park, O. Faelton, F. C. Disque, and W. J. H. Hough.

NUMBER OF DRAWINGS SUBMITTED.—209.

AWARDS:—

FIRST MENTION PLACED:—G. F. Trapp, Columbia Univ., N. Y. C.; W. C. Pyle, Carnegie Inst. of Tech., Pitts.; R. I. Powell and F. W. Roudebush, Princeton Univ., Princeton; H. B. Hoover, Univ. of Washington, Seattle; W. Faulkner, Yale Univ., New Haven.

FIRST MENTION:—A. E. Klueppelberg, Columbia Univ., N. Y. C.; J. F. Taylor, F. J. Taylor and W. W. Hibbs, Carnegie Inst. of Tech., Pitts.; S. Baum, J. Gambaro and W. Ferrari, Atelier Hirons, N. Y. C.; L. W. Ross, Harvard Univ., Cambridge; E. H. Potvin, H. G. Ripley, Jr., J. H. Raftery, Miss R. Hampson and Miss E. F. Cope, Mass. Inst. of Tech., Boston; E. O. Holien, W. A. Backstrom and R. P. Hennessey, Univ. of Minnesota, Minneapolis.

SECOND MENTION:—D. W. Barber, Atelier Barber-McMurry, Knoxville; J. E. Lambert, Catholic Univ., Wash., D. C.; H. H. Rabin, H. P. Maas, R. H. Walter, E. C. Morris, D. E. Milone, A. Grossman and A. Goodman, Columbia Univ., N. Y. C.; J. R. Reed, S. Fiodelise, J. S. Wood, J. D. Mawhinney, H. L. Carter, W. F. Koppes, H. H. Thayer, A. H. Rousseau, A. M. Ham, G. O. Schoonover, A. B. Lowstuter, B. G. Martin, J. S. Douglass, A. D. Reid, D. C. Doig, M. A. Brace, G. A. Deacon, R. R. Young, E. M. McMillin, J. P. Crowgey, A. K. Goehring, P. H. Sload, U. Schoenberger, J. Tillotson, H. I. Lynch, L. Coussins, E. M. Plant, D. S. Garber, E. M. Gearhart, D. M. Patterson, G. B. Allison, C. A. Lundquist, W. S. Forsyth, Elizabeth Constantine, A. S. Vincent, G. D. Schade, M. B. Parker and K. O. Sonnemann, Carnegie Inst. of Tech., Pitts.; R. Frazier, Cleveland Sch. of Art, Cleveland; Mary McCullough, Atelier Denver, Denver; J. M. Leonte, Atelier Fougner, Newark; Dorothea Porter, E. Moore, C. M. Woodward, F. A. Elliott and F. Leota Soars, George Washington Univ., Wash., D. C.; H. W. Swenson, G. E. Kirkpatrick, H. Silverman, J. M. Judge and J. J. Murno, Atelier Hirons, N. Y. C.; H. J. Powell, W. T. Bogner, W. R. L. Josten, T. F. McDonough and D. B. Wetherell, Harvard University, Cambridge; H. A. Dallwigk and A. B. Mitchell, John Huntington Poly. Inst., Cleveland; G. B. Briney, Los Angeles Archtl. Club, Los Angeles; S. E. Davidson and S. Vogelgesang, Mass. Inst. of Tech., Boston; J. S. Shanley and A. P. Davis, Princeton Univ., Princeton; E. R. Willson, H. D. Davies and J. F. Mullins, Atelier Penn State-Penna. State College, State College; I. L. Johnson, H. F. Bossert and F. Eiseman, Atelier Parsons-Chicago Archtl. Club, Chicago; A. E. Hansen, Southern Branch-Univ. of California, Los Angeles; F. C. King, Jr., Syracuse Univ., Syracuse; G. E. Koster, San Francisco Archtl. Club, San Francisco; D. L. Bartels, Univ. of Southern California, Los Angeles; E. P. Newbeury, T. Jacobsen and E. W. Osgood, Univ. of Washington, Seattle; E. C. Johnson, J. W. Radotinsky, W. P. Cunningham and M. L. Sorey, Univ. of Kansas, Lawrence; E. D. Stevens, Univ. of Virginia, Charlottesville; E. Hawkins, M. J. Markuson, E. L. Johnson, T. L. Sime, J. A. Walquist, E. V. Nielsen and H. H. Witte, Univ. of Minnesota, Minneapolis; R. H. H. Hugman, Univ. of Texas, Austin; W. E. Herrick, Atelier Wynkoop-Seymour, N. Y. C.; W. H. Schilling, S. C. Haight, I. Horton-III, W. O. Williams, L. B. LaFarge, C. F. Ferrari, H. P. Staats, R. W. Ramsdell, M. B. Smith and F. C. Johnson, Yale Univ., New Haven.

H. C.:—H. T. Turner, L. Perry and A. I. MacDonald, Columbia Univ., N. Y. C.; V. A. McGowan and V. Galier, Carnegie Inst. of Tech., Pitts.; C. H. Kellogg, Atelier Denver, Denver; L. A. Whelan, Harvard Univ., Cambridge; S. Pokalsky, Atelier Penn State-Penna. State College, State College; S. M. Cundiff and G. V. Palmer, Univ. of Southern California, Los Angeles.

CLASS "A" AND "B" ARCHÆOLOGY—VI PROJET

"A SALON IN THE STYLE OF THE GREEK REVIVAL"

The Greek revival in the United States may be said to be due to the influence of a work on Athens by Stuart and Revett, which was published the latter part of the eighteenth century. Early in the following century Greek monuments began to influence European architecture, and about a quarter of a century later this influence made itself felt on this side of the Atlantic.

Latrobe designed the first Grecian portico in the United States in an edifice in Philadelphia, which is now the Girard Bank. This portico was universally admired and created its influence by immediate imitation. This style became an official one throughout the country and remained so until about 1860. States and cities followed the lead of the Federal Government. Private dwellings, both in town and country, appeared in this style, the distinguishing feature being a Greek order accurately proportioned, but executed in wood. Later there appeared from France the Empire and Neo-Grec variations, which were combined with the later American interpretations. Unsuitable for wooden forms, this style served the purpose nevertheless of familiarizing the public with an orderly and harmonious assemblage of studied architectural compositions.

Throughout the South examples are found grouped around Savannah, Baltimore and Charlottesville, and in the North around Philadelphia and New York and throughout the New England States. New York City is rich in examples particularly around Washington Square and Old Chelsea. The Southern examples are inferior for in most cases their originators were dependent on their own scanty knowledge and the assistance of unskilled slave labor, while the North had access to publications and trained artisans, at least in the large cities.

Summing up, the most notable characteristics of the Greek revival are the use of the Greek orders and proportions, with architraves, ornaments and mouldings inspired by Greek tradition.

This problem is to design a salon in a private dwelling. The room is 36'-0" long, 24'-0" wide and 14'-0" high in the clear. On one of the long sides occurs a fireplace flanked by two windows.

JURY OF AWARDS:—P. A. Cusachs, W. Warren, B. W. Morris, E. S. Hewitt, H. W. Corbett and A. E. Flanagan.

NUMBER OF DRAWINGS SUBMITTED:—25.

AWARDS:—

SECOND MEDAL:—S. R. Moore, Columbia Univ., N. Y. C.; J. D. Tuttle, E. V. Gauger and H. R. Russell, Univ. of Illinois, Urbana.

MENTION:—L. Timotheeff, Columbia Univ., N. Y. C.; E. E. Lundeen, A. Fordyce, R. Billerbeck, C. O. Beeson, Alberta Raffl, Elizabeth Kimball, A. S. Phillips, C. G. McTaggart, Fay N. Harris, W. D. Sorgatz, C. L. Martin, R. D. Henderson, J. A. Drielsma, C. A. Kissinger, J. D. Jeffers and J. H. Chance, Univ. of Illinois, Urbana; J. L. Evans and T. Wharton, Univ. of Pennsylvania, Phila.

The New School of Fine Arts at New York University

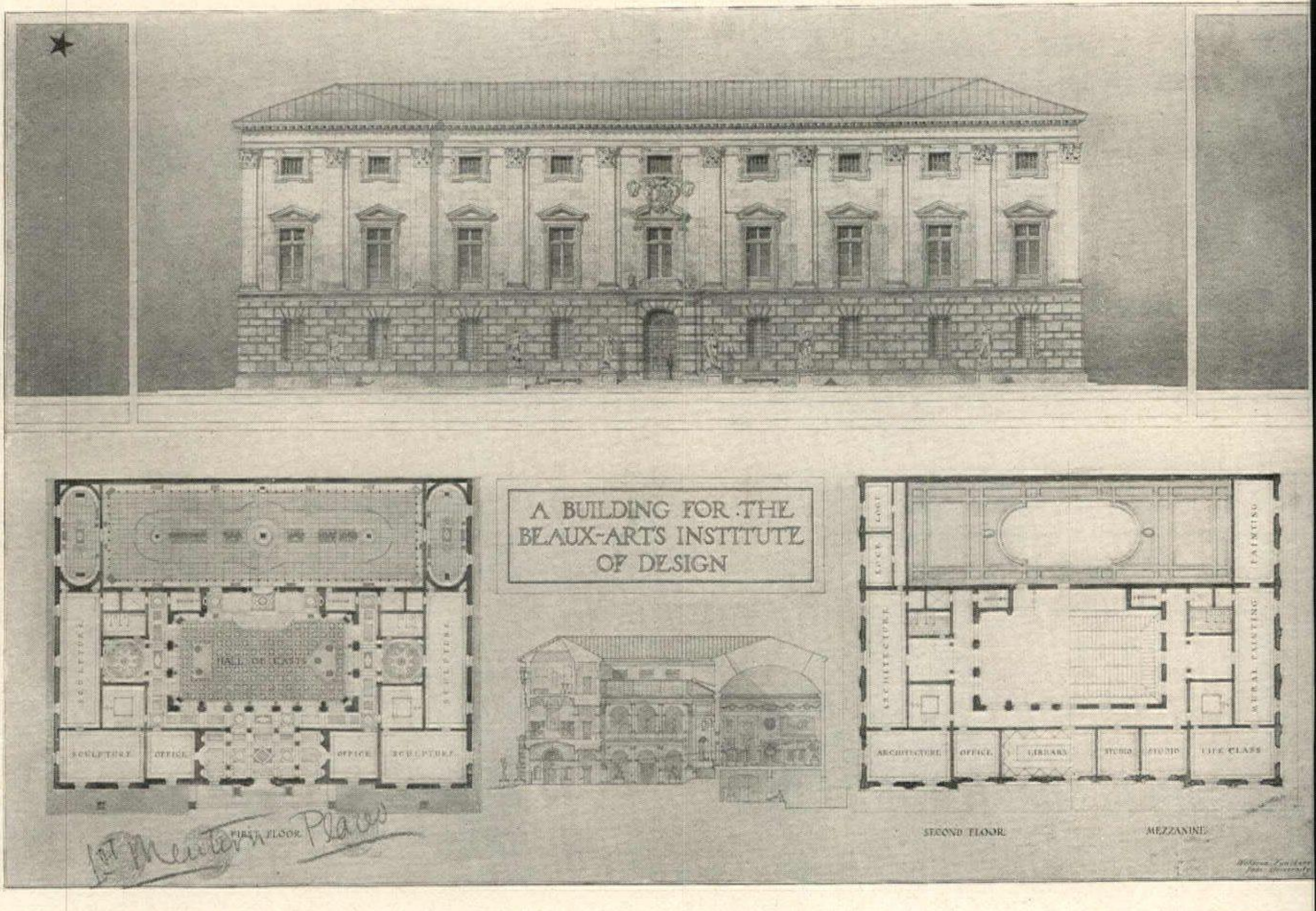
THE first university instruction in Fine Arts given in the United States was inaugurated by New York University on its foundation, through the appointment to its faculty in 1832 of Samuel F. B. Morse, then President of the National Academy of Design. Now, through the generous support of the Altman Foundation, the chair has been established.

A faculty has been assembled under the direction of Fiske Kimball, formerly head of the School of Fine Arts at the University of Virginia, who will hold the Morse Professorship. The study of Italian art will be in charge of Dr. Richard Offner, who now returns after some ten years devoted to research in Italy. Dr. R. M. Riefstahl, known for his writings on textiles and Mohammedan art, will lecture on historic textile fabrics, on tapestries, and on oriental rugs; while Mr. William M. Odom, author of the "History of Italian Furniture" and director of the New York School of Fine and Applied Art in Paris, will give a series of lectures on interiors and decoration in France. A course in the design of interiors and furniture will be under the general supervision of Mr. Francis Lenygon.

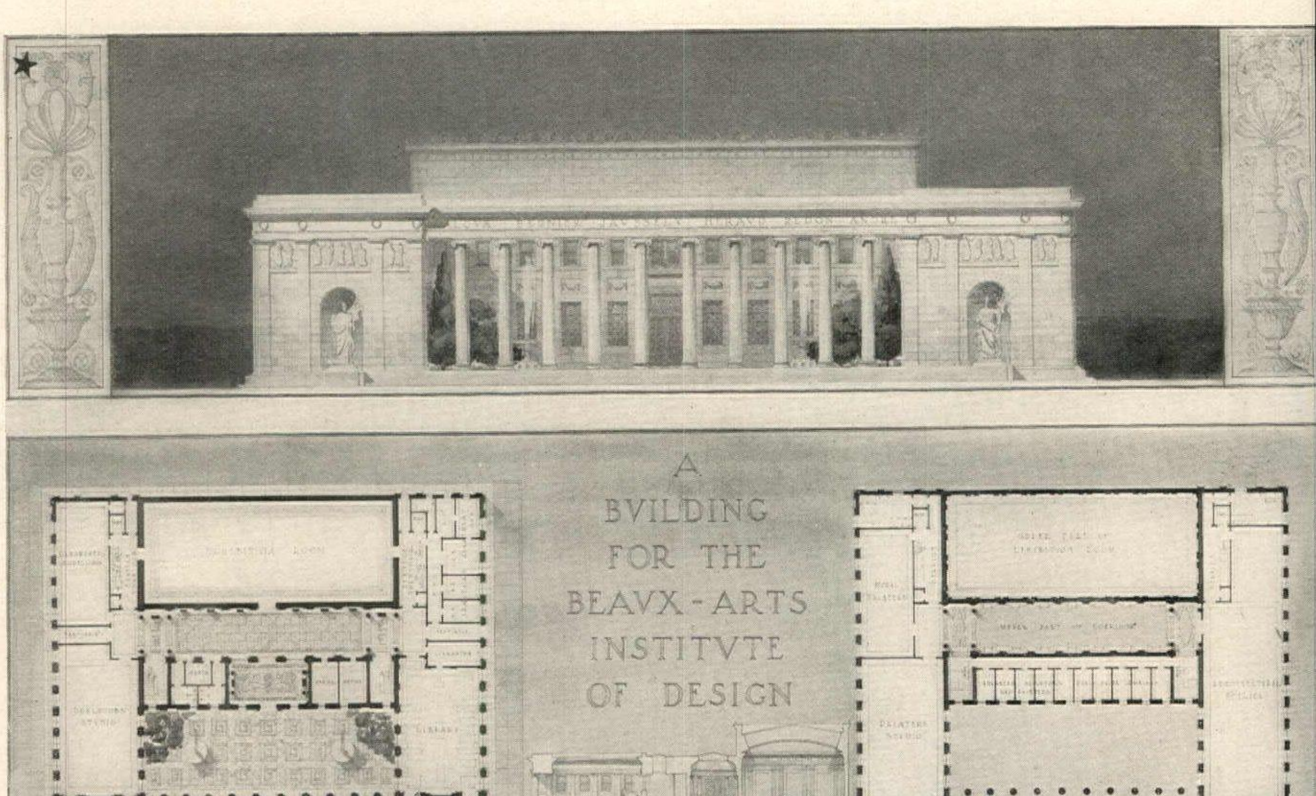
There will also be a number of special lecturers, headed by Edwin H. Blashfield, President of the National Academy of Design.

Through an agreement recently ratified, the old relation between New York University and the National Academy of Design has been restored and extended. The two institutions will offer a combined course for art students who wish also to secure a liberal college education. This will involve a college course of four years, of which the first three will be spent in the study of academic subjects in one of the colleges of the University, and the fourth year will be devoted exclusively to the study of drawing and painting at the Academy.

It has seemed an anomaly that in the city of New York with its valuable artistic sources, its public and private collections, and the display, constantly in progress throughout the city, of paintings, sculpture, and the decorative arts, there should not have been until now a great university department of Fine Arts. The need seems at last about to be filled.



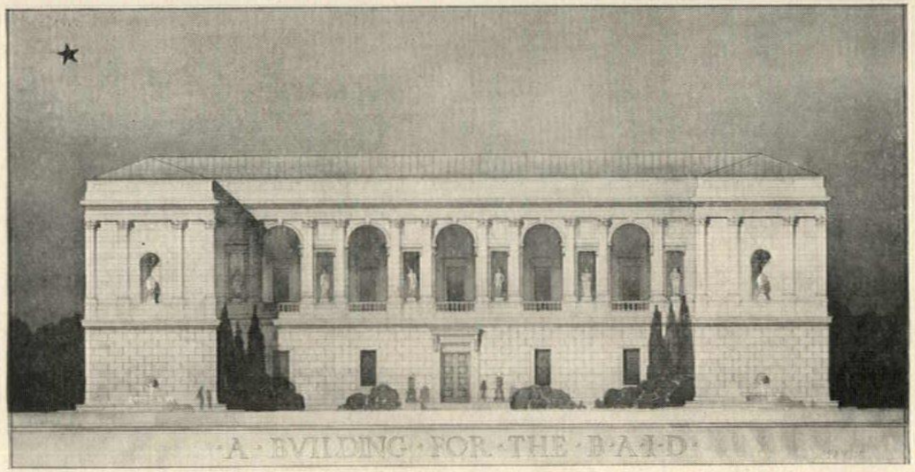
W. FAULKNER — FIRST MENTION PLACED — YALE UNIVERSITY

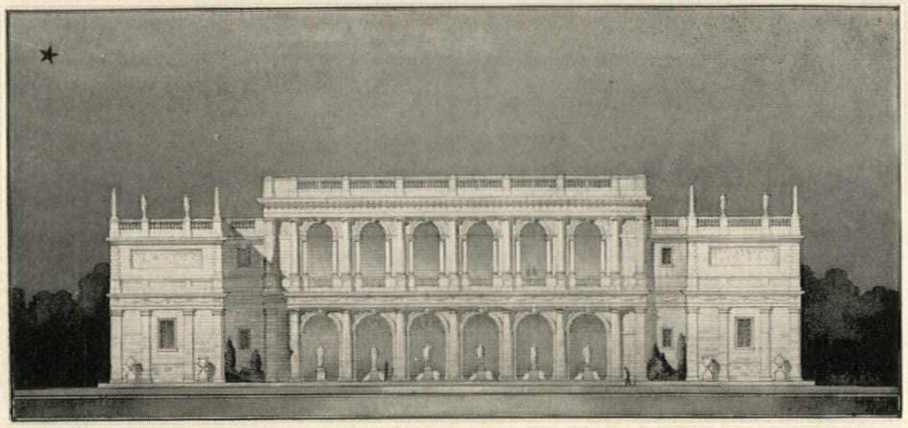


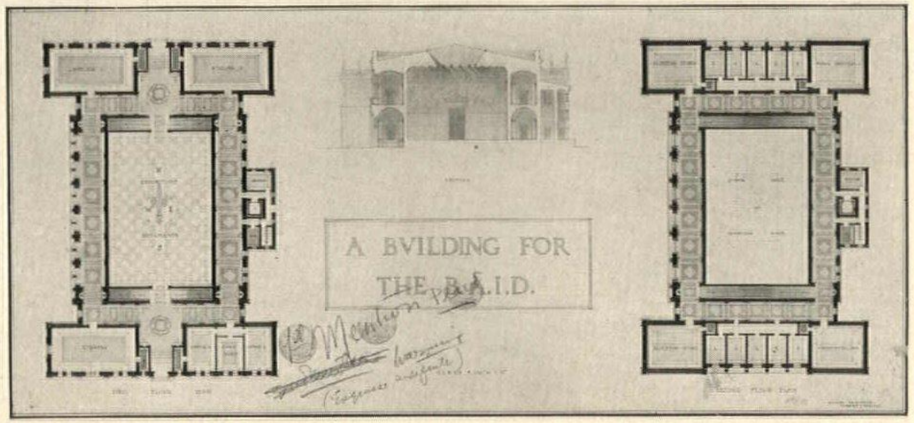
G. F. TRAPP — FIRST MENTION PLACED — COLUMBIA UNIVERSITY

CLASS "B"–V PROJET—A BUILDING FOR THE BEAUX-ARTS INSTITUTE OF DESIGN

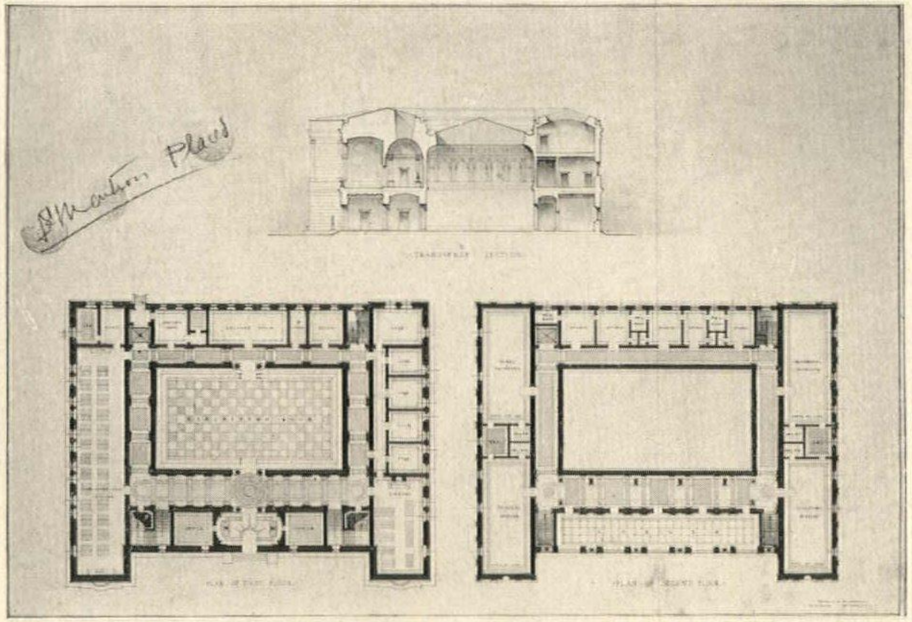
STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN







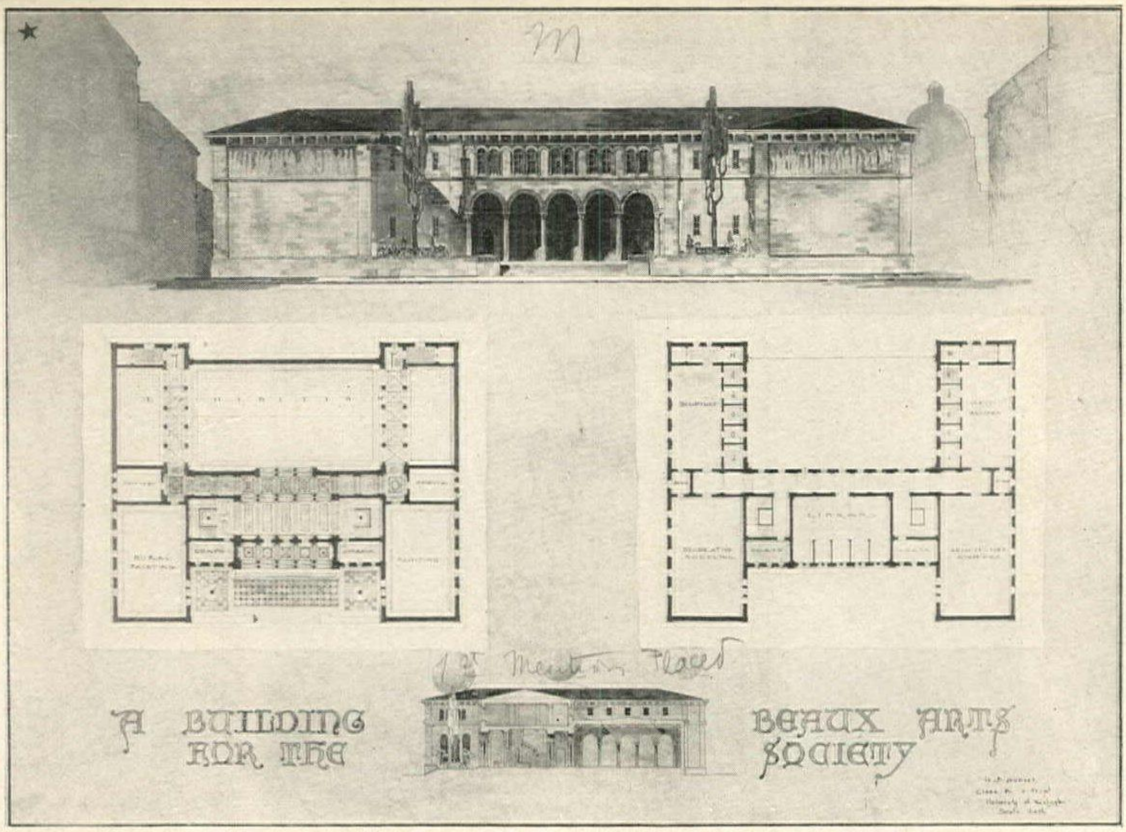
R. I. POWELL — FIRST MENTION PLACED — PRINCETON UNIVERSITY



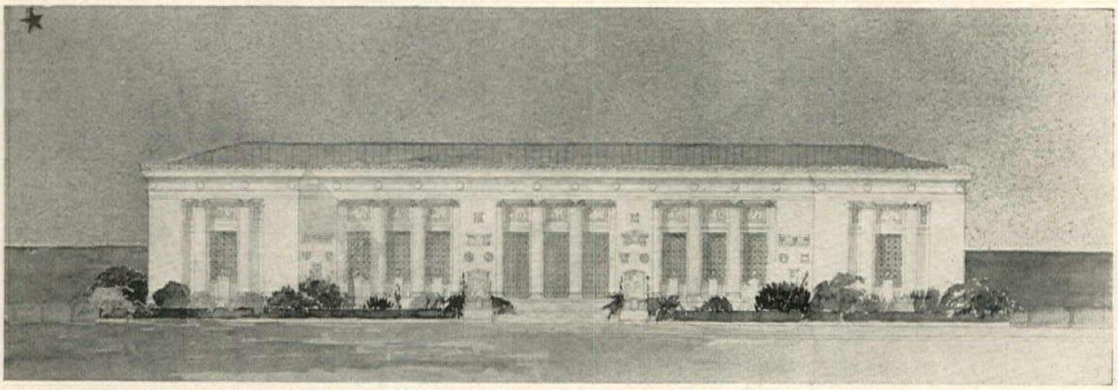
F. W. ROUDEBUSH — FIRST MENTION PLACED — PRINCETON UNIVERSITY

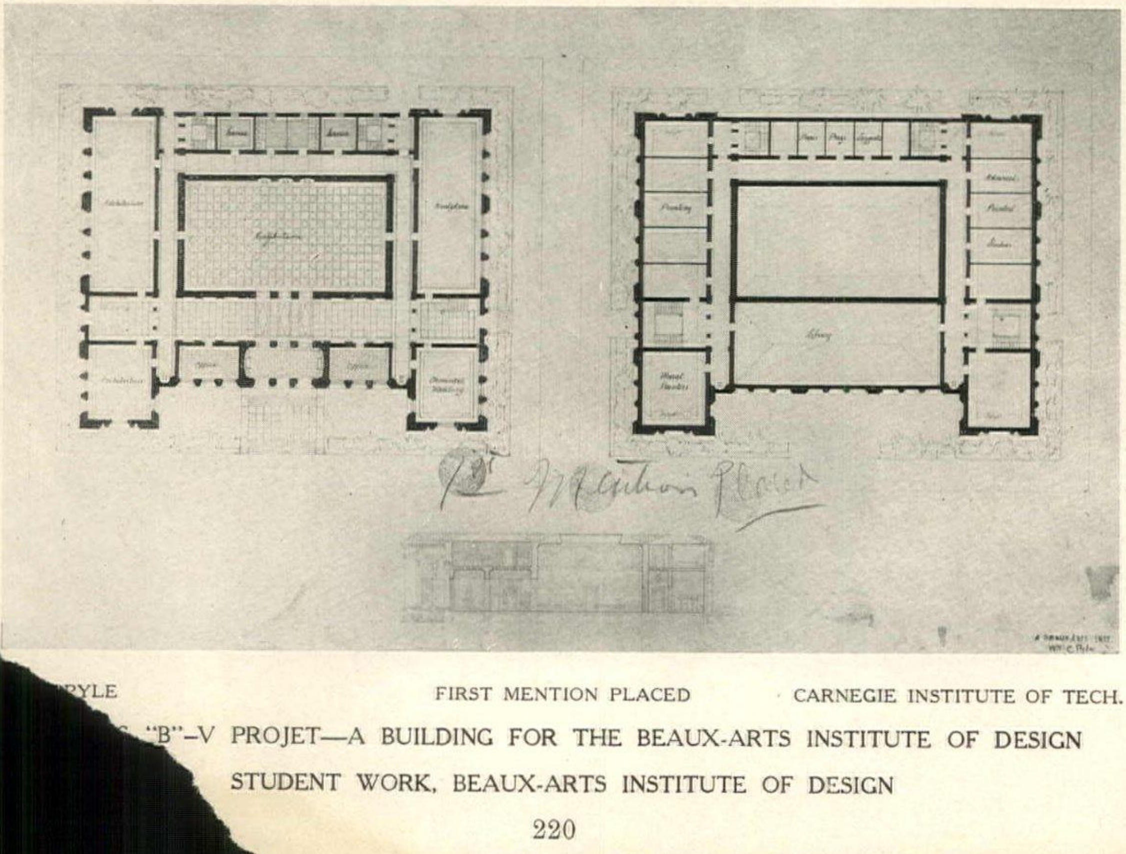
CLASS "B"—V PROJET—A BUILDING FOR THE BEAUX-ARTS INSTITUTE OF DESIGN

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN



H. B. HOOVER FIRST MENTION PLACED UNIVERSITY OF WASHINGTON

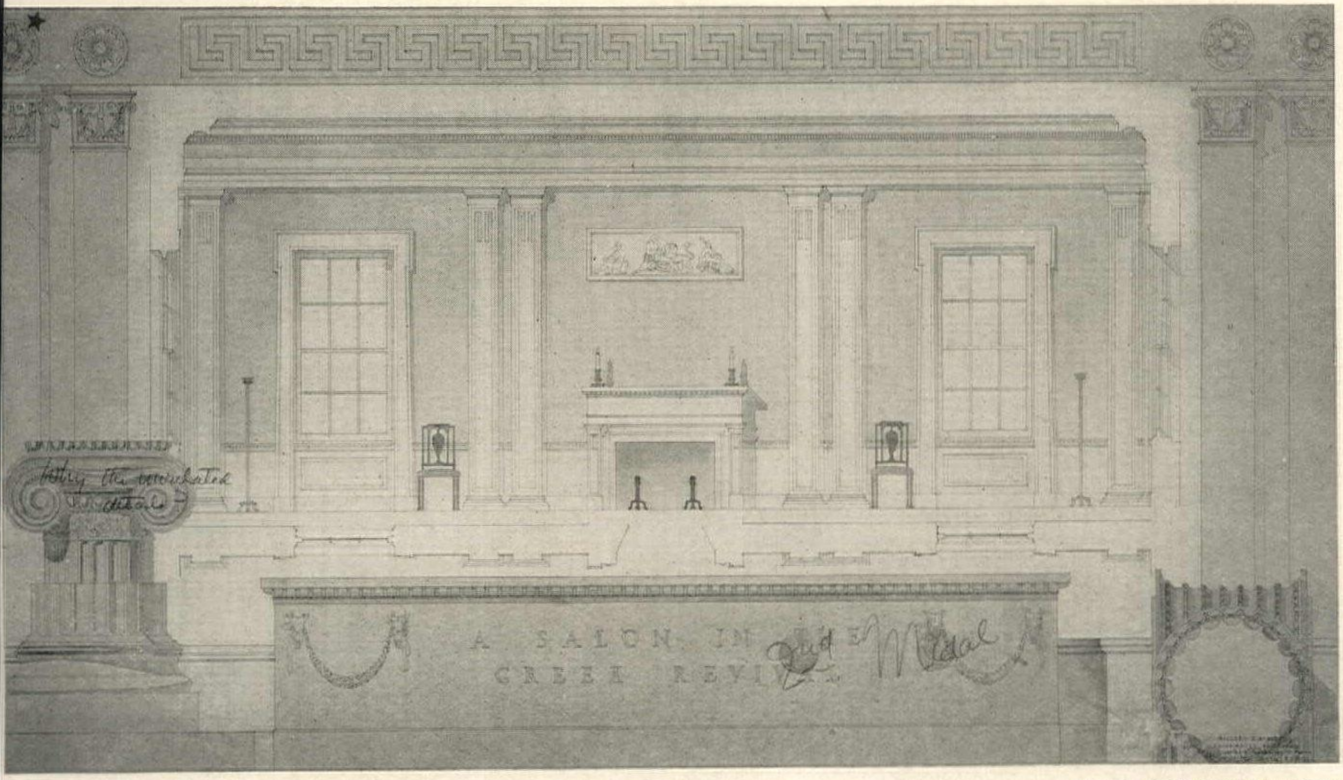




PYLE FIRST MENTION PLACED CARNEGIE INSTITUTE OF TECH.

"B"–V PROJET—A BUILDING FOR THE BEAUX-ARTS INSTITUTE OF DESIGN

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN



H. R. RUSSELL — SECOND MEDAL — UNIVERSITY OF ILLINOIS

J. D. TUTTLE — SECOND MEDAL — UNIVERSITY OF ILLINOIS

A SALON IN THE STYLE OF THE GREEK REVIVAL
CLASS "A" AND "B" ARCHÆOLOGY–VI PROJET
STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

The HEATING *and* VENTILATING *of* HOTELS *and* CLUBS

BY A. L. BROWNE, *Member American Society of Heating and Ventilating Engineers*

THE conditions which control the designing of a heating system are, as a rule, similar to those of any equally large inhabited building. The exception would be the need for mechanical ventilation and medium pressure steam for kitchen, laundry and therapeutic purposes.

Unless the building is very large, a low pressure plant is most desirable. In case the light and power load is insufficient to absorb the K. W. output of a power plant near peak capacity for the greater part of the day, the investment in a power plant, together with operating and maintenance cost, would undoubtedly be greater than the purchasing of the necessary electrical energy from local central station power houses. Exhaust steam available for heating is an important consideration, but if the power load is low, then the exhaust steam would have to be supplemented by live steam through pressure reducing valves. The estimated average hourly power plant requirements together with the overhead and operating expenses of a suitable power plant compared with the central station rates, would indicate which would be the most economical.

Boilers, whether to be cast iron or steel, is a subject leading to an indefinite amount of discussion according to one's experience or predilection, yet a careful study of the conditions will make it possible to determine which selection to make. To a large extent steel fire tube boilers are used for medium sized low pressure installations. The greater uniformity of fire surface and grate area in steel boilers, rated according to accepted standards, undoubtedly is an important factor causing the greater use of this type of boiler. However, the best class of cast iron boilers having approximately the same area of fire surface, grate area and equal rating, would be very satisfactory. However, a cast iron boiler must have a sufficient steam liberating space in order to prevent priming conditions under full draft. This is very important and its lack is a frequent cause of costly reconstructed headers and drips.

If the space available for boiler room requirements is so limited that boiler tubes cannot be cleaned or replaced; or if costly excavation or high sewer levels makes necessary a shallow basement, then the low boiler water line required to permit drainage thereto from the heating system, makes necessary the selection of sectional cast iron boilers. Many other conditions do influence and justify the use of this type of boilers.

In some localities where smoke ordinances are not too severe or where smoke consuming devices are used, bituminous coal burning boilers will show a substantial saving in the cost of fuel. The tonnage of both bituminous and anthracite coal would be approximately the same, but the B.T.U. value of bituminous coal is greater and the ash residue less. It is necessary to have larger and higher chimneys for bituminous than anthracite burning boilers.

Firemen often object to handling soft coal, particularly in small installations where the boiler attendant has other duties to perform because soft coal requires more frequent attention. Many bituminous coal burning boilers are very satisfactory and smoke objectionably only in the hands of inexperienced operators or for a few moments when the fires are cleaned and heavily coaled. Proper coking of green coal will in a large measure prevent this in some types of boilers. Of course, in the double-grate Hawley-type downdraft boiler, the excessive smoking at firing periods is lessened as the gases from the green coal are drawn down through the incandescent fire beneath.

When a low pressure heating plant is used it is necessary also to install a small, medium or high pressure boiler as the case may be, to take care of the steam requirements of the kitchen, laundry and therapeutic departments. The temperatures desired require steam usually from 20 to 40 pounds pressure or 80 to 100 pounds pressure for laundry. In comparison to the total amount of steam required for heating and ventilating, this load is small. Domestic and sanitary hot water may be heated by a steam coil in storage tanks supplied from the pressure boiler, cross connected with the heating boiler header for winter use. In this case, tank coils should be sufficiently large to provide the necessary amount of hot water at the lower temperature and pressure of the heating boilers. At times, in medium sized plants, a hot water boiler is directly connected to the hot water storage tank for summer use—supplemented by steam coil from heating boilers in winter.

In designing plants for hotels and clubs, especially the larger ones, it is the custom of some engineers to lay out a high pressure boiler plant. This requires the installation of additional apparatus. High pressure steam is carried in boilers and header and from this point reduced to various pressures through pressure reducing valves. The reduced pressures to be used for heating, kitchen utensils, hot water and other purposes.

There is required also automatic boiler feed-water regulators, stop and check valves, blow-off or back pressure valves on the various reduced pressure lines, in order to avoid building up pressure beyond a predetermined point. Boiler feed pumps and boiler feed water heater are required and used in high pressure plants in the interest of safety and economy. Where there is no power load, this additional installation and maintenance cost seems unwarranted. It is apparent that, in this case, it is not necessary to install an additional medium or high pressure boiler for summer use as one of the battery of high pressure boilers could be used to provide for all requirements. However, the additional apparatus would more than offset the additional cost of a medium pressure boiler. If the battery of boilers consisted of two or three, it is probable that the one boiler operated in summer would have excess capacity for the requirements.

One and two pipe radiator air valve systems for heating are obsolete. Today the modern building of any size is equipped usually with a two pipe vapor or vacuum system of heating. It is by these means only that complete and rapid circulation of steam with uniform pressure and quietness under absolute control, is secured. These systems usually employ thermostatic radiator return traps, with or without modulation radiator supply valves. First class radiator supply valves of the modulating type seldom, if ever, require attention to their packing glands. Of course, the fresh air fiend who insists on opening windows and keeping the radiator on full blast is a hard nut to crack. By installing a system of temperature control the loss of steam and possible freezing of radiators due to open windows is obviated. The regulation of temperature by automatic mechanical devices is done in a positive, dependable manner. In addition to economy of operation, the greater comfort of the guests, makes temperature control a most desirable feature of a hotel.

Usually, the piping system consists of various circuits of mains in the basement, supplying feed risers. In buildings of low heights, say not over six stories, it is possible to omit the thermostatic dripping of the heels or bottoms of the individual steam supply risers, provided the branches from the steam supply main to the risers are of sufficient size to permit a low velocity steam flow and are pitched back to the main. In this case the mains should be of sufficient size to care for this riser condensation and be provided with ample drip traps. In a down feed system, where the steam is carried to the top of the building and from there distributed through mains and down feed risers, it is necessary to provide thermostatic traps at the heels or ends of these risers. These risers should be provided with either a well constructed mud leg or strainer, which, with the valve should always be easily accessible. Construction problems, such as partly excavated basement or inability to provide adequate trenches or pipe conduits, often determine whether the heating system shall be up or down feed. Either, properly designed, will operate satisfactorily.

Referring to the usual up-feed system, it will prove more satisfactory if it can be designed upon a three pipe basis—that is, steam mains, dry returns and bleeder line or wet return. If the ends of the steam main can be bled directly into a wet return, directly connected to the return to the boilers, more satisfactory operation is assured. If the end of the steam main is thermostatically bled into the dry return, these valves at times, may become greatly overloaded if the steam is excessively saturated or there is a priming condition existing. In such instances an open pipe would have far greater capacity. The ends of the mains should be sufficiently high above the boiler water line to overcome the pressure drop within the mains and usually 18″ or more is sufficient. Where the condensation is returned to the boiler by gravity (vapor type) it has the added advantage of keeping the dry return line considerably higher above the water line than would occur where the main was thermostatically bled into the dry return. The elevation gained would ordinarily amount to 20″ or more. In the vacuum circulating system (pump type) this is of no particular advantage.

These systems may be divided into three general types—vacuum circulating (pump), vapor or vapor vacuum and open end atmospheric types.

In the larger installations vacuum circulating systems employing a vacuum pump, usually of the electric drive type, are used. On the positive or steam side, the pressure carried to zero plus, that is a fraction of a pound gauge, although a greater pressure may be readily carried if desired. On the negative or return side, the vacuum carried is usually 5″ to 10″ mercury reading. If, for instance, the boiler pressure is 1 pound steam and pump pressure 10″ of vacuum, the pressure differential inducing circulation would be equal to approximately 6 pounds. This pressure differential assures rapidity in heating, and will overcome in most instances any small water traps in the runouts from the radiator return valves to return risers that may exist. The effective pressure differential at these points is much less than that indicated at boiler and pump, however, on account of the pressure drop on both sides.

Some conditions that would indicate the use of a vacuum pump circulating system, would be a very large installation where the boiler water line was close to or above dry returns, or where limited space in floor construction would permit little, if any, pitch from radiator runouts to risers. It is becoming a growing custom with many engineers to dispense with vacuum pumps in medium sized and small installations, using what may be termed "vapor-vacuum" and "vapor" systems,— say from 15,000 sq. ft. of radiation down. This, of course, necessitates favorable conditions. The dry returns must be well above water line of boilers, 30″ or more. If the three pipe basement system, previously described is used, it often makes it possible to terminate the dry return line well above the boiler water line. Construction conditions must permit sufficient pitch for runouts, mains and returns. The use of boiler return traps is a generally approved method of disposing of the condensation and returning it to the boilers against boiler pressure. These traps are set in parallel with the dry returns and above the water line of the boiler. Condensation fills them by gravity and at this point equalization of pressure in the boiler and return trap takes place, with the result that the condensation is returned in a positive manner to the boiler. The mechanism of these devices is quite simple and the action positive permitting the boilers to be operated at any desired pressure.

Air is either expelled through the return trap, an open vent pipe or an expelling device on a secondary trap having means of preventing the air from returning. In the latter case, the heating system may be operated for substantial periods below atmospheric pressure or at a vacuum. This occurs when the evaporating rate of the boilers is less than the condensing rate of the radiators. The vacuum, under these conditions, extends throughout the system including the boilers. It is periodic in occurrence, that is, when ratio between boiler evaporation and radiator condensation is the reverse from the ordinary condition of greater boiler evaporation than radiator condensation. This condition would occur between firing periods under average weather conditions. During severe weather, any type of system would require more or less constant pressure above atmosphere. Closed systems of these types are very economical in fuel consumption as they maintain a uniform circulation of steam with less boiler attention and fuel.

Atmospheric, or vapor systems that operate at a constant boiler pressure of a fraction of a pound are used, though more generally in smaller installations. They frequently do not include thermostatic radiator traps but use instead union elbows or other devices with restricted orifices. Larger radiators are required. Return traps or pumps are not used, as they are operated with a constant pressure of ounces and any accidental pressure above that would pass steam into the return lines which produces more or less of an equalization and loss of steam.

Where buildings are very high it is necessary to have expansion joints in the risers. When pipes are heated by steam, they expand about 1½″ per hundred fet of run. Risers are securely anchored midway when no expansion joints are used. This divides the expansion into two parts. Where expansion joints are used, two anchors, each midway between expansion joint and top and bottom of riser, divide the expansion in four parts. These expansion joints are either constructed by making a right angle offset in the riser with swing-joint connections or by using a standard brass sleeve-type expansion joint. The latter require packing and more or less frequent attention. They should always be at or near the floor line in order to be readily accessible and should be provided with liberal sized access doors. The pipe swing-joint type requires from ten to fifteen inches of space and should be situated at the ceiling. This necessitates a furred down ceiling and requires due consideration in the designing of the elevation of the building. Location of expansion joints, as well as control valves, should be plainly charted and in the custody of the superintendent or engineer.

Radiators are sometimes behind enclosures with grilled inlets and outlets. If such is the case, the radiation must be materially increased. If it is at all feasible, these enclosures should be so designed that the entire face can be quickly and easily removed in order to have full face access to the radiator and valves. A hinged top ordinarily will not permit sufficient room in which to use a wrench and it is, therefore, often necessary to disassemble the entire enclosure in order to remove the bonnet of a valve.

Risers should be insulated to prevent undue loss of heat by minimizing the condensation in risers. When they are concealed, insulation tends to prevent cracking of the plastering.

The ventilation of the lobby, dining rooms, ball rooms and other public spaces is done in a manner similar to that employed in other buildings. In some climates, the ventilating system can be used for heating as well. These large rooms, due to their displacement, and relatively limited outside exposure, often require little if any direct radiation. They are under a plenum condition, with more air put in than is exhausted. In the kitchen and laundry it is the reverse with more air exhausted than is put in. Therefore, this slight pressure differential creates a constant flow from dining rooms to kitchen and prevents the escape of cooking odors into other portions of the building. Air cooled by air-washers is circulated during hot weather.

Kitchen cooking apparatus and laundry equipment should have a separate system of ventilation, consisting of exhaust fan located on the roof, as a rule at the end of the main duct. Branch ducts lead to hoods over cooking apparatus and laundry machines. These ducts should be constructed of heavy black iron and be thoroughly insulated for fire protection on account of the vaporized fats and oils which are deposited and are highly inflamable. At the base of these ducts, in the branch ducts to the ventilating hoods or in the lower plane of the hoods, it is possible to place a separator screen which will deposit the vaporized grease and oil thereon. This can then be periodically removed This is accomplished without materially reducing the free venting area. Main duct should be equipped with an automatic damper and fuse link. Wherever possible cleanout doors should be provided. The air change in kitchen is relatively rapid, usually from ten to fifteen changes per hour.

It is becoming the general practice to locate the toilet and bathroom along the corridor walls where they do not have outside window ventilation. It is generally required that these rooms have mechanical ventilation. For this purpose the exhaust fan is placed in the attic or a penthouse, from which ducts lead to vertical vent or pipe shafts which usually serve two rooms on each floor. A register connects the room with the vertical duct. Boiler rooms should have ample fresh air inlets to provide sufficient air to properly support combustion in the boilers. The pipe coil or vento stacks of the ventilating system should be 30″ or more above the water line of the boilers in systems not employing pumps.

It is of great importance, though not generally realized, that heating or heating and ventilating apparatus should be most thoroughly cleaned by the contractors before being turned over to the owners. A great deal of trouble, sometimes more or less obscure as to cause, is occasioned by improper cleaning. The gradual working down of the oil, core sand and grease within the piping system will cause very erratic boiler operation. A priming condition is produced which will cause large quantities of water to leave the boiler with the steam, clogging up the end of steam mains and risers, thus effectively preventing the proper circulation of steam.

It is a good plan to waste the condensation from the heating apparatus to the sump or sewer for ten days or two weeks. In this way a large amount of oil and grease will be removed. This requires a boiler attendant to supply make-up water at more or less frequent intervals. This troublesome condition can usually be detected by pulling open the safety valve and if considerable water is passed with the steam, it is a sure indication of priming. This will sometimes occur at one pressure and not at another. Obviously, with this mixture of water and steam, proper heating cannot be expected. Caustic soda, washing soda, or other agent introduced into the boiler and the mixture allowed to boil out of the top of the boiler and then subsequently blown down with clean water will help a great deal. It is sometimes necessary to repeat this cleansing several times before normally proper operation is secured.

The writer is more or less prone to emphasize the importance of proper cleaning as excessive priming has been invariably prevalent in all kinds of installations during the past few years.

If one is sufficiently interested, this condition can also frequently be detected by ear upon placing a piece of cardboard to a steam main, and possessing an active imagination and certain predilections, one might easily visualize that tumbling white rift—ahead of the deep pool where the big ones lie—and where often fruitlessly yet ever hopefully, be it Cahill, Coachman, or Beaverkill, one is ever willing to try.

LAUNDRY EQUIPMENT *for* HOTELS

HOTELS cannot be successfully operated without properly laundered linen. It is one of the essentials. Hotel operators either do this work themselves in their own plant or have it done elsewhere. The desirability of doing it within the hotel depends on several things, but the controlling factor is the amount of work to be done. Enough work must be done to make the investment and operation profitable. In this proposition, profit is composed of several items that are not fully appreciated on first consideration.

Mr. Eugene G. Miller, Manager Hotel Walton, Philadelphia, in a recent article, stated, as follows: "One urgent reason why the hotel should conduct its own plant is that it will have complete control over the work and is able to keep up a standard of laundering which is almost impossible when it is done on the outside. The mere cost of having work done is not the only factor. It is absolutely necessary to have snow-white, clean-smelling linen for the guests and in addition to give the greatest of care to the washing and ironing in order to preserve the linen. Take the Walton alone, when it is considered that we launder in the neighborhood of five thousand pieces every day, except Sunday, one can easily see how vitally important it is that the best of care should be given to the work in order to prevent waste and destruction, particularly with linen at its present price."

The amount of laundry work required for different hotels varies greatly. First-class hotels completely change bed linen every day, while linen for permanent guests is changed sometimes two to three times per week. There is a great variation in the amount of table linen used. Some hotels have small dining room service, while others have extensive dining room facilities and daily serve thousands of meals to persons who are not guests of the hotel. Many of these large hotels specialize in banquets which require large supplies of linen.

Manufacturers of laundry machinery estimate the capacity of the machine by the number of pounds of goods it will handle in a given time. As a rule goods are not weighed in a hotel laundry. If any account is kept at all, it is the number of pieces handled. Therefore, with the machinery company figuring in pounds, and the hotel operator figuring in pieces, there are two different units of measurement to co-ordinate when an estimate is
le on the machinery required for a hotel laun-
The manufacturers' unit of measurement,
ds of goods, is a definite one; the hotel
ment, pieces of goods, is not. A "piece"
pkin which weighs but a small fraction of a pound, or it may be a large sheet which weighs a pound and a half. If the pieces are classified and counted it does not give an accurate basis on which to figure. For instance, some sheets weigh twice as much as others and it may be the same in the case of napkins, towels and other articles, either because of difference in size or on account of varying weight or thickness of the goods. The best that can be done under present conditions is to base estimates of required equipment for a hypothetical plant on average conditions and weights.

In planning laundry equipment ample provision should be made to take care of all the work that is to be done, and it may be well to have an excess capacity for emergency within reasonable bounds. Neither should the hotel operator, in a mistaken spirit of economy, go to the other extreme and underequip the plant, causing it to be always in an overloaded condition and therefore working under a handicap. The number of hours per week that the machinery is to be used should also be considered. Fifty hours per week is perhaps the longest that a plant can be operated but, on account of the scarcity of labor so prevalent throughout the country at this time, it is well to install machinery that will do all of the work in from forty to forty-five working hours per week. Equipment installed should be of ample capacity to handle all the table and bed linen of the hotel, together with the necessary attendants' uniforms, kitchen and dust rags and other miscellaneous articles.

Battery of Extractors, Hotel Commodore, New York

In the lists for the equipment for hotels, 700 rooms or over, there is included a separate department termed "guest work." This is a branch of service which many large hotels have gone into, and it has proven very profitable. It is not recommended, however, that hotels having fewer than 700 rooms give this service to their guests, unless they are so situated that satisfactory outside laundry service cannot be secured. When the personal laundry of the guests can be secured in volume, good prices can be charged and this service has proven so profitable that practically all the large hotels have installed a laundry department for this work. It also is a great convenience to the guests and an additional service that the hotel can advertise. It is frequently desirable that a separate laundry be provided for the help and this should be carefully considered in the preliminary planning. The equipment of such a laundry usually consists of ordinary

Flat Work Ironers, Hotel Commodore, New York

laundry tubs, drying racks and hand ironing boards—a small hand laundry.

The schedules of equipment which follow are, of course, approximate and based on average conditions and weights. These are conservative and can be used with safety in the preliminary planning and estimating of cost. The final planning, selection and location of machinery should be done with the assistance of manufacturers.

100 ROOM HOTEL LAUNDRY

1—30″ x 36″ Washer,
1—36″ x 54″ Washer,
1—28″ Extractor,
1—30″ x 42″ Drying Tumbler,
1—100″Return Apron Flat Work Ironer,
1—38″ Press
1—Ironing Board with Electric Iron.
Approximate space required—20′ x 40′.
600 gallons hot water per hour.
200 gallons cold water per hour.

300 ROOM HOTEL LAUNDRY

1—36″ x 36″ Washer,
1—42″ x 72″ Washer,
2—28″ Extractors,
1—40″ x 64″ Drying Tumbler,
1—100″ Four Roll Flat Work Ironer,
1—Feeding Device for Flat Work Ironer,
1—38″ Press,
2—Ironing Boards with Electric Irons,
1—Lace Curtain Finisher,
1—Panel Control Board.
Space required—30′ x 50′.
1,500 gallons hot water per hour.
500 gallons cold water per hour.

500 ROOM HOTEL LAUNDRY

1—42″ x 84″ Washer,
1—35″ x 48″ Washer,
2—30″ Extractors,
1—40″ x 64″ Drying Tumbler,
1—120″ Six Roll Flat Work Ironer,
1—Feeding Device for Flat Work Ironer,
2—38″ Presses,
4—Ironing Boards with Electric Irons,
1—Lace Curtain Finisher,
1—Panel Control Board.
Space required—45′ x 60′.
1,800 gallons hot water per hour.
600 gallons cold water per hour.

700 ROOM HOTEL LAUNDRY

2—42″ x 84″ Washers,
1—36″ x 48″ Washer,
2—40″ Extractors,
1—40″ x 94″ Drying Tumbler,
1—36″ x 54″ Shake Out Tumbler,
2—120″ Six Roll Flat Work Ironers,
2—Feeding Devices for Flat Work Ironers,
2—38″ Presses,
5—Ironing Boards with Electric Irons,
1—Lace Curtain Finisher,
1—Panel Control Board.

GUESTS' WORK DEPARTMENT

1—Marking Machine,
1—36″ x48″ Washer,
1—28″ x 33″ Washer,
1—28″ Extractor,
1—Starch Cooker,
1—Starcher,
1—Conveyor Dry Room,
1—Collar Dampener,
1—Collar Ironer,
1—Collar Finishing Table,
2—38″ Presses,
2—Cuff Presses,
1—Neckband Press,
2—Ironing Boards with Electric Irons,
1—54″ Handy Ironer.
Space required—60′ x 75′.
3,700 gallons hot water per hour.
1,200 gallons cold water per hour.

1,000 ROOM HOTEL LAUNDRY

3—48″ x 84″ Washers,
1—36″ x 36″ Washer,
2—48″ Extractors,
1—40″ x 94″ Tumbler,
1—120″ Eight Roll Flat Work Ironer,
1—120″ Six Roll Flat Work Ironer,
2—Feeding Devices for Flat Work Ironers,
1—48″ x 54″ Shake Out Tumbler,
2—38″ Presses,
7—Lroning Boards with Electric Irons,
1—Lace Curtain Finisher,
1—Panel Control Board.

Installation of Direction Motor Driven Washers and Tripod Type of Extractors

GUESTS' WORK DEPARTMENT

1—Marking Machine,
1—36″ x 54″ Washer,
1—28″ x 33″ Washer,
1—28″ Extractor,
1—Starch Cooker,
1—Starcher,
1—Conveyor Dry Room,
1—Collar Dampener
1—Collar Ironer,
1—Collar Finishing Table,
1—Shirt Unit Complete,
2—38″ Presses,
2—Ironing Boards,
1—54″ Handy Ironer.
Space required—60′ x 100′.
5,000 gallons hot water per hour.
1,600 gallons cold water per hour.

The floor space given with the schedules is, of course, only approximate and will vary in each individual case, on account of location of windows, columns, doors and chutes. These areas allow ample space for sorting and the receiving of soiled linen, but do not include space for the storage of ...sh linen. This is taken care of in a room ...department separate from the laundry. The ...s given on hot and cold water consumption are also approximated, as these vary somewhat according to the washing formula used.

Usually hotel laundries are located in the basement and as good ventilation as possible should be provided. A laundry at its best is a steamy, odorous, hot department and large exhaust vents should be so located that the air in the room can be changed every few moments and thus make it more comfortable for the employes. Wherever possible, metal hoods should be placed over washers, tumblers and flat work ironers, as these machines discharge a great deal of odor and steam which can be conducted away from the laundry room direct from the machines without going through the room. In many states, factory inspection laws require the installation of these hoods.

Getting the soiled linen into the laundry department is best accomplished by means of chutes having openings on each floor. Maids or others place the soiled linen directly into the chute and it is deposited as near the washers as possible. It is then assorted into what are termed "lots," that is, a separation made for each class of linen, such as, sheets, tablecloths and towels. If chutes cannot be installed, the goods can be conveyed to the laundry department by means of trucks and elevators. Hotels often employ systems to check the linen into and from the laundry.

In laying out a laundry plant the sequence of the work through the plant must be maintained. After the linen enters the laundry it is classified and assorted, and then placed in the washing machines. From the washers it is put into the extractors where the surplus water is removed, from the extractors all heavy bath towels go direct to the tumbler and thence out. All other articles of flat work go either to the shakeout tumbler and then to the flat work ironer or direct to the flat work ironer. After the goods are ironed they pass out of the laundry and into the linen storage room.

The laundry should be laid out so the linen will pass through without interference, preferably into the room at one end and out at the other. The laundry floor around the washers and extractors should be of concrete and pitched to the drains. The balance of the floor may be of wood or other satisfactory material. Waste water from the washers flows directly into a gutter or trough built in the concrete floor, draining directly to the sewer. If a guest work department is installed, it should be separated from the regular flat work equipment.

The washer thoroughly washes and rinses the linen. It consists of a stationary outer shell with a revolving inside cylinder, together with a driving mechanism. The supports and frame are made of metal. The outer shell and inside cylinder are made of wood; galvanized iron and wood; brass and wood; all brass or other non-corrosive metal shell and cylinder. The wooden shell and cylinder is the least costly machine but the better instal-